

Individualised Music Intervention for People with Dementia: A Mixed Methods Implementation Study

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Statement of Originality

I hereby certify that the work embodied in the thesis is my own work, conducted under normal supervision. The thesis contains no material which has been accepted, or is being examined, for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made. I give consent to the final version of my thesis being made available worldwide when deposited in the University's Digital Repository, subject to the provisions of the Copyright Act 1968 and any approved embargo.

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Acknowledgment of Authorship

I hereby certify that the work embodied in this thesis contains published paper/s/scholarly work of which I am a joint author. I have included as part of the thesis a written declaration endorsed in writing by my supervisor, attesting to my contribution to the joint publication/s/scholarly work.

By signing below I confirm that Minah Amor Gaviola contributed significantly to the design; search strategy, including defining the inclusion and exclusion criteria and search terms; conducting the search and assessing retrieved articles for relevance; documenting a summary table of retrieved articles; assessing risk of bias and critically reviewing selected articles; interpretation of findings from the review, and writing of the publication entitled:

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Associate Professor Kerry Inder

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Glossary

Assistant in nursing (AIN) – refers to care staff and nursing assistants

Individualised music listening – refers to music listening based on the person's preferences. In the literature this is also described as personalised music listening and preferred music listening

Residential aged care facility (RACF) – in this study this refers to long-term care facilities, nursing homes, assisted living facilities, residential care, residential aged care, and residential aged care facilities

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Abstract

Background: Evidence demonstrates the promising impact of individualised music listening for people with dementia, however there is paucity of research on its implementation and uptake.

Objectives: To evaluate the impact of strategies utilised to improve the adoption, acceptability, appropriateness, feasibility, fidelity and sustainability associated with implementing an individualised music listening intervention, costs and effects of the intervention on older people with dementia.

Methods: A parallel mixed methods design was used involving a pre-test-post-test study and focus group and individual interviews. Trained staff and family or guardians implemented the individualised music intervention for older people with dementia in two residential care settings in NSW, Australia. The music intervention involved individualised music listening based on the person's music preferences as determined by the older person with dementia where possible and their family or guardian.

Strategies used to promote the implementation of the music intervention by staff and family or guardian included: training and education of staff, family and guardians regarding the music intervention, identification of program champions, providing and obtaining feedback about the implementation of the intervention, and reminders to prompt staff to implement the intervention. Application of the music intervention was recorded in a logbook over the 3-month research implementation period.

Measurements: At baseline and at the end of the 3-month research implementation, agitation, quality of life, and psychotropic medication use were measured using the Cohen-Mansfield Agitation Inventory, Dementia Quality of Life Questionnaire, and

medical records respectively. The Homecare Measure of Engagement Staff-Questionnaire was administered during each month of implementation. Qualitative interviews were conducted with staff and a guardian during the third month of research implementation.

Results: Of the 32 older people with dementia who consented to the study, 22 completed the individualised music intervention. Fourteen staff and seven family members or guardians participated in the training and implemented the music intervention. A total of 331 entries of individualised music listening implemented to participating older people were documented throughout the 3-month research implementation period. The total annual cost of the music intervention and its implementation for 32 older people across implementation sites was AU\$6,623.76. There were significant improvements in quality of life and the people with dementia's engagement during the intervention increased throughout the implementation period. Findings from the qualitative interviews revealed positive responses from older people with dementia and the simplicity of the intervention. Barriers to routine uptake of the intervention by participants included discomfort from headphones, and care and storage of equipment.

Conclusion: Regular implementation of an individualised music listening intervention in residential care for older people with dementia by staff and family or guardian is feasible. The music intervention is perceived as appropriate for older people with dementia by older people, family and staff. Findings of this study support the promising impact of individualised music listening as a low-cost, simple, and meaningful non-pharmacological intervention for older people with dementia.

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Chapter 1 Introduction

1.1. Overview of ageing and dementia

Without a cure and with a new case every three seconds, dementia has become a global public health priority (Alzheimer's Disease International, 2018; World Health Organization, 2012, 2017). Dementia has a life changing impact on people living with dementia and their family as well as the society and the economy (World Health Organization, 2012, 2017). The continued rise in the number of people living with dementia and its profound impact on their social well-being and quality of life drives governments, policy-makers and stakeholders around the world to seek ways to enhance their care (Alzheimer's Disease International, 2018; World Health Organization, 2012, 2017).

Negative perceptions associated with people living with dementia are widely documented in the literature. Surveys conducted in European countries reveal that dementia is perceived as the most feared condition after cancer with devastating effects on the caregivers and families (Alzheimer's Research UK, 2011; Jones, Mackell, Berthet, & Knox, 2010; World Health Organization, 2012). In 2010, Alzheimer's Australia (NSW) conducted a pilot study to determine the social attitudes about dementia among the general public (n=180), carers of people living with dementia (n=63) and people living with dementia (n=6) (Alzheimer's Australia NSW, 2010). For the general public, dementia emerged as the second most feared condition after cancer; the majority of people believe that residential aged care is inevitable for all people living with dementia. For carers, social isolation of their loved one is a major concern as people tend to avoid a person with dementia; as if dementia it is a contagious disease (Alzheimer's Australia NSW, 2010).

Alzheimer's Disease International (2018) proposes 1% of the societal cost of dementia should be committed to “funding research in: basic science, care improvements, prevention and risk reduction, drug development and public health” (p. 5). Similarly, the Global action plan on public health response to dementia 2017-2018 highlights that to improve the lives of people living with dementia, investment in dementia research and innovation as well as their translation into daily practice are crucial (World Health Organization, 2017). In the absence of a cure (Alzheimer's Disease International, 2018; Moniz-Cook, Vernooij-Dassen, Woods, Orrell, & Network, 2011; World Health Organization, 2017), attention needs to be given to the quality of life of sufferers. To enable people living with dementia to live positively, there needs to be a focus on the person; their history/life story, and their personal interests as a means to engaging them socially and stimulating them cognitively (World Health Organization, 2017). Of concern to this thesis is the quality of life of people living with dementia in residential aged care; the need for personalised and meaningful engagement/entertainment. There are several ways to help people living with dementia live positively including the use of psychosocial interventions (Alzheimer's Disease International, 2018; Lawrence, Fossey, Ballard, Moniz-Cook, & Murray, 2012). Music is one such approach.

Music's powerful memory and emotion-evoking ability makes it an ideal stimulus for people living with dementia in a way that could provide an important link to their past (Baird & Samson, 2015; Gerdner & Schoenfelder, 2010). The use of individualised music listening as a psychosocial intervention has gained popularity over the past decade with the inception of a protocol for implementation of individualised music

(Gerdner, 1997), to increasing media interest (Barclay, 2018; Rossato-Bennett, 2014 #12912; Newby, 2016), and the vast amount of research done on its use for people living with dementia (Garrido et al., 2017). It is for these reasons the ways that individualised music listening can be successfully incorporated into the daily care of the person with dementia living in residential care needs attention.

Several studies have been conducted that investigated the effects individualised music listening have on the older people living with dementia (Gerdner, 2005; Maseda et al., 2018; Sakamoto, Ando, & Tsutou, 2013; Sung, Chang, & Abbey, 2006; Sung, Chang, & Lee, 2010; Thomas et al., 2017). While the promising impact of individualised music for people living with dementia has been established, few studies have focused on implementation processes whereby strategies that promote uptake are explored (Murphy et al., 2018; Sung, Chang, & Abbey, 2008). With the limited evidence in the area of implementation, it remains unclear as to how this relatively simple and meaningful activity could be made widely and routinely available to people living with dementia living in a residential care setting. If this grey area in implementation is not addressed, this could result in underutilisation of an intervention that could potentially optimise the quality of life of people living with dementia. This thesis presents the findings of a mixed methods implementation study designed to identify effective strategies that can be utilised by caregivers to support the regular implementation of an individualised music listening for people living with dementia in residential aged care settings.

1.2. Rationale for the study

As millions of people around the world age with dementia, there are increasing concerns about quality of life and how to keep people meaningfully engaged with the social world. While it is not possible to reverse dementia, there are ways that could alleviate its life changing impact on people living with dementia and help them live positively with dementia. Individualised music listening shows promising effectiveness as an enjoyable and engaging activity and as a way of improving the quality of life for older people living with dementia. Although individualised music listening is a relatively simple intervention, the ways in which it can be successfully integrated by formal and informal caregivers as part of the routine care for people living with dementia in residential aged care remain a grey area in the literature. Thus, the objectives of this study address not only the effectiveness of the music listening intervention for people living with dementia but also the salient aspects of its implementation including the strategies that promote uptake, as well as barriers and facilitators.

1.3. An overview of the study aim and objectives, research questions, methodology, design and methods

The study aim was to evaluate the implementation of an individualised music listening intervention for older people living with dementia living in residential care. There were three objectives of this study and associated research questions:

Objective 1: To explore strategies that promote adoption, acceptability, appropriateness, feasibility, fidelity, and sustainability of implementing an

individualised music listening intervention within a residential aged care facility. The research questions used to address this objective are outlined below.

1. What are the effects of the implementation strategies on the adoption, acceptability, appropriateness, feasibility, fidelity, and sustainability of an individualised music listening intervention in a residential aged care facility for older people living with dementia?
2. What are the actual financial costs associated with the implementation of an individualised music listening intervention for the residential aged care service provider?
3. What are the experiences and perceptions of family and staff regarding the use of an individualised music listening for older people living with dementia in a residential aged care facility?
4. What are the facilitators and barriers to the implementation of an individualised music listening intervention in a residential aged care facility for older people living with dementia?

Objective 2: To determine the impact of an individualised music listening intervention on older people living with dementia. The specific research question for this objective is:

5. Does the use of an individualised music listening intervention for older people living with dementia impact levels of agitation, quality of life, their engagement during the intervention, and prescription and use of psychotropic medications.

Objective 3: To determine the extent to which qualitative results explain the quantitative results. The research question corresponding to this objective is:

6. To what extent do the experiences and perceptions of family/guardian and staff explain the impact of the implementation strategies and the individualised music intervention in a residential care facility for older people living with dementia?

To address the objectives of this study, a parallel mixed methods design (Teddlie & Tashakkori, 2009) was used involving a pre-test post-test design for the quantitative component and focus group, individual interviews, the open-ended section of the implementation questionnaire, and the progress notes documentation of the participating older people for the qualitative component. Qualitative data were intended explain, supplement, and clarify the quantitative data to promote a broader understanding of the study findings.

Participants of this study were older people living with dementia living in a residential aged care facility, their family members or guardian and nursing and allied health staff (e.g. leisure and lifestyle, physiotherapy aid). The implementation strategy in this study included training on the execution of an individualised music intervention for older people living with dementia. Interested staff and family members or guardians were invited to attend a training session, which covered information about dementia, the impact of music on older people living with dementia, an evidence based protocol for use of individualised music, the individualised music intervention protocol to be implemented, implementation outcome variables and resident related outcomes that would be evaluated. The individualised music comprised an audio recording, or playlist of the participating older person's preferred music which was created and loaded to a personal music

player. Trained staff and family or guardians played the music to the participating older people using headphones. The music was applied for various purposes; leisure, prior to care, and prior to expected agitation. The primary outcomes of this research were the implementation outcomes and the secondary outcomes were the impact of the intervention on the participating people living with dementia.

1.4. Outline of the thesis

This thesis contains seven chapters. In Chapter One, a brief introduction consisting of an overview of ageing and dementia, and the rationale and objectives of the study are presented. The candidate's background and inspiration for the choice of this area of study is also presented in this chapter. In Chapter Two, the background to the study presents a critical review of the literature that addresses the key concepts in the succeeding chapters. Included are a detailed discussion of dementia and its management, the value of non-pharmacological interventions, the potential benefits of individualised music for older people living with dementia, the need for further research that evaluates the implementation of individualised music in the real world setting, and the suitability of utilising implementation research in addressing the study objectives.

In Chapter Three, the impact of individualised music on people living with dementia on various outcomes is further explored through a systematic review of literature. In Chapter Four, a detailed discussion of the philosophical underpinnings of the study, the methodology, and design and the methods used to address the study objectives including an outline of the data collection and analysis are presented. Also highlighted

in this chapter are the implementation strategies and the individualised music intervention protocol used for this study.

Findings from the quantitative component of the study are presented in Chapters Five and Six. Results and analysis of the implementation strategies and implementation outcomes are presented in Chapter Five. The impact of the intervention on the participating older people living with dementia are presented in Chapter Six. The findings from the qualitative component of the study are presented in Chapter Seven, which includes the experiences and perceptions of staff and family or guardian regarding the individualised music intervention as well as the facilitator and barriers to the implementation of the music intervention. The resulting inferences from the quantitative and qualitative data are integrated in Chapter Eight as well as the discussion and conclusions about the overall study findings with reference to relevant literature. The methodological considerations of the study and recommendations are also discussed in Chapter Eight.

1.5. The candidate's background and role in the study

This research project emerged from the candidate's personal interest in the care of older people. The candidate was a registered nurse in her home country of the Philippines, working as an educator in a school of nursing for six years. One of the courses she facilitated was Gerontologic Nursing, which provided her with opportunities to engage with older people in the urban and rural communities in the Philippines. Since moving to Australia in 2011, the candidate has been working in aged care, starting as an assistant in nursing (AIN) for two years then as a registered nurse since 2013. From conversations with older people living with dementia and the observations of their daily

activities, the candidate recognised the value of meaningful individualised activities not only as a potentially promising intervention to help manage agitation but also as a leisure activity.

In 2015, the candidate completed her Master of Nursing-Advanced Practice (specialising in Older Person Care). This sparked further interest in pursuing studies relating to the care of older people living with dementia. One of the candidate's supervisors at the time of her PhD application was working for an organisation involved in providing arts based, non-pharmacological interventions to people in residential care. Their similar interest further strengthened the choice of this area of study. The candidate learned from her aged care experience that among the most popular activities for older people in residential care including people living with dementia, were music-based activities such as concerts and sing-alongs. With this, the candidate was drawn to the idea of implementing an individualised music intervention that could be enjoyed by everyone with dementia regardless of dementia severity and physical skills limitations. The candidate also observed that implementation of leisure-related activities was the main responsibility of the leisure and lifestyle staff; which limited the implementation of such activities to the time of the day and days of the week that leisure staff were working. With guidance from published studies and a protocol on the use of individualised music, the candidate designed the protocol for this study in a way that the intervention could be implemented by anyone (including staff and family or guardian) for any purpose (e.g. management of agitation, leisure activity) at any time of the day.

1.6. Conclusion

This chapter presented an overview of ageing and dementia from the national and international context and provides a rationale for the study. The study aim, objectives, research questions, methodology, design and methods were outlined in this section. The candidate's role and background in the conduct of this research was also delineated. In the next chapter, the background literature and the evidence supporting the need for research on individualised music listening that focuses on the implementation process is discussed.

Chapter 2 Background and policy context

2.1. Introduction

This chapter presents a discussion that addresses the key concepts relating to the study including a detailed discussion of the ageing population, dementia, the management of symptoms, the consequences of medication management and the need for non-pharmacological approaches to dementia management. A critical review of the literature relating to the theory and efficacy of music as a non-pharmacological approach for people living with dementia is provided along with and the music related interventions that are commonly used. Drawing upon this discussion a description of the individualised music listening intervention used in this study is provided. The last part of this chapter discusses the gap between the promising efficacy of individualised music and its implementation in the real world setting, highlighting the need for this study.

2.2. Challenges related to a globally ageing population

The number of people living to ages over 60 is growing exponentially worldwide. The *World Population Ageing*, a report released by the United Nations (2017) provides a description of the global trends of the ageing population. In 2017, the estimated global population of people aged 60 years or over was 962 million. This number is expected to double by 2050, projected to reach nearly 2.1 billion. This is attributed to declining fertility and increasing life expectancy. The report also highlights the increase in the number of people at very advanced ages (80 years and over), which is projected to triple by 2050 (increasing from 137 million to 425 million) (United Nations, 2017).

In Australia, the proportion of people aged 65 and older rose from 12.0% in 1996 to 15.3% in 2016 (Australian Bureau of Statistics, 2016). Specifically, around 3.7 million

or 15% of the Australian population were aged 65 and older in 2016 (AIHW, 2017). Of this population, 487,000 or 13% were aged 85 and over. Over the same period (1996 to 2016), the number of those aged 85 and over increased by 141.2% (Australian Bureau of Statistics, 2016). The proportion of older people in Australia is expected to grow continuously over the next decades with a projected number of 8.7 million or 22% of the Australian population by 2056 (AIHW, 2017).

This increase in life expectancy denotes a positive development for humanity as it results from large reductions in mortality both from younger (e.g. childhood and childbirth) and older ages (Sander et al., 2015; World Health Organization, 2015). Specifically, this transition in mortality is attributed to the breakthrough in infectious diseases prevention which contributed to the significant decline in infectious diseases particularly among children (Swerissen & Taylor, 2014; World Health Organization, 2015). However, many challenges can accompany the post retirement years (Sander et al., 2015). Thus, it remains a question as to whether living longer means added years of good health or years of prolonged disability (United Nations, 2013; World Health Organization, 2015). With the physiological changes associated with advancing age, the risk of chronic diseases increases, including heart disease, stroke, chronic respiratory disorders, cancer and dementia (World Health Organization, 2015). Data from the Australian Burden of Disease Study in 2011 (AIHW, 2016) revealed the common diseases causing the most burden among older Australians aged from 65 to 84 were coronary heart disease, chronic obstructive pulmonary disease (COPD), cancers, stroke, diabetes, musculoskeletal conditions and dementia. Among older people aged 85 and over, burden from coronary heart disease, dementia and stroke were also prevalent.

These disease burdens apply equally across countries around the world. In 2016, the Global Health Estimates by the World Health Organization revealed the top ten causes of deaths worldwide: ischaemic heart disease, stroke, COPD, lower respiratory infections, Alzheimer's disease and other dementias, cancers (trachea, bronchus, and lungs), diabetes mellitus, road injury, diarrheal diseases, and tuberculosis (World Health Organization, 2018). In high income countries, the top three causes of deaths include ischaemic heart disease, stroke and Alzheimer's disease and other dementias (World Health Organization, 2018).

2.3. Prevalence of dementia increases with age

Dementia is prevalent among older people, affecting roughly 5% of the world's older people population (World Health Organization, 2012, 2017). With age as the strongest known risk factor (World Health Organization, 2017), it is expected that along with the upsurge in the ageing population is a significant increase in the numbers of irreversible dementias (Sherrell, Iris, & Ramos, 2011). The estimated number of people living with dementia worldwide in 2018 was 50 million. With a new case every 3.2 seconds, it is projected that there will be around 82 million people living with dementia worldwide by 2030 and 152 million by 2050 (Alzheimer's Disease International, 2018). In Australia, the estimated total number of people living with dementia rose from around 400,800 in 2016 to over 413,000 in 2017 (Brown, Hansnata, & La, 2017). The number of Australians with dementia is projected to reach 760,627 in the next 20 years and 1,100,890 by 2056 (Brown et al., 2017).

Statistics from various countries show the prevalence of dementia among people aged 65 and older. In the United States, of the 5.7 million people living with Alzheimer's dementia in 2018, an estimated 5.5 million or one in ten people were aged 65 years and older (Alzheimer's Association, 2018). In the United Kingdom, of the 815,827 people living with dementia in 2013, 773,502 or one in every 14 were aged 65 years or over (Prince et al., 2014). In Australia, it is estimated that nearly one in every ten Australians aged 65 years and over and three in ten aged 85 years and over have dementia (Brown et al., 2017).

2.4. Definition, diagnosis, symptoms and management of dementia

Dementia is not considered as a specific disease. The Australian Institute of Health and Welfare (AIHW, 2012) states that dementia is “an umbrella term describing a syndrome associated with more than 100 different diseases that are characterised by the impairment of brain functions” (p. 2). Summers (2014) describes dementia as “a group of neurodegenerative disorders that produce a condition of cognitive decline and functional impairment” (p. 249). Dementia is chronic, progressive in nature, irreversible, and the onset of symptoms is usually gradual (AIHW, 2012; Sherrell et al., 2011). The most common types of dementia include Alzheimer's disease, vascular dementia, frontotemporal dementia, and dementia with Lewy bodies. Of these, Alzheimer's disease is the most common accounting for about 50% to 75% cases worldwide followed by vascular dementia accounting for about 20% to 30% of cases (AIHW, 2012).

Conditions affecting the brain that lead to neurological degeneration contribute to the development of dementia (Sherrell et al., 2011). Most scientists specifically attributed the build-up of two proteins in the brain (amyloid and tau) as significant contributors to this neurological degeneration (Alzheimer's Disease International, 2018). Apart from increasing age, risk factors associated with dementia also include vascular diseases, smoking, diabetes, midlife hypertension, elevated cholesterol, increased fat intake, obesity, physical inactivity, and low education (Daviglus et al., 2011; World Health Organization, 2012, 2019). To reduce risks of developing dementia, the World Health Organization guidelines on risk reduction of cognitive decline and dementia strongly recommend physical activity interventions for adults with normal cognition, tobacco cessation, balanced diet, and management of hypertension and diabetes mellitus according to existing World Health Organization guidelines (World Health Organization, 2019).

Diagnosing dementia involves a number of assessments and/or tests: a careful history, detailed medical and neurological examination, mental status examination (Chertkow, Feldman, Jacova, & Massoud, 2013) and neuropsychological assessment (Summers, 2014). Summers (2014) highlighted that neuropsychological assessment is pivotal in differentiating various forms of dementia and other non-dementia conditions.

International classifications such as the International Statistical Classification of Diseases and Related Health Problems (ICD) and the Diagnostic and Statistical Manual of Mental Disorders (DSM) also assist with the identification and classification of dementia (AIHW, 2012). Moreover, clinical diagnosis of dementia can be supported by laboratory or imaging tests such as routine haematology, biochemistry, thyroid function

tests, serum vitamin B12 and folate levels, and structural imaging with magnetic resonance imaging (MRI) or computed tomography (CT) scanning (Chertkow et al., 2013; Laver et al., 2016; National Institute for Health and Care Excellence (NICE), 2018).

2.4.1. Symptoms of dementia

Dementia is characterised by two major groups of symptoms: cognitive dysfunction and behavioural and psychological symptoms of dementia (BPSDs) (Sherrell et al., 2011). Loss of cognitive abilities in dementia is characterised by symptoms of disorientation, memory loss, impaired judgment, intellectual and social functioning and personality change (Sherrell et al., 2011). The cognitive decline in dementia is often accompanied by behavioural and personality changes (Chertkow et al., 2013). BPSDs include agitation, irritability, motor disturbance, aggression, sexual and social disinhibition, delusions, hallucinations, depression, psychosis, anxiety, apathy, and night-time behaviours (e.g. waking and getting up at night) (Haibo et al., 2013; Kales, Gitlin, & Lyketsos, 2015).

The BPSDs are considered the most challenging and distressing: associated with poor outcomes, increased burden, decreased quality of life for people living with dementia and their caregivers, increased healthcare utilisation and earlier residential aged care facility placement (Ostaszkievicz, Lakhan, O'Connell, & Hawkins, 2015; Schwarz, Froelich, & Burns, 2012). Thus, the majority of interventions for the management of dementia are aimed at the BPSDs (Sherrell et al., 2011).

The term BPSDs is most commonly used within the medical perspective of dementia (Sherrell et al., 2011). Downs (1997) contended that the medical model, which primarily attributes the manifestations of dementia to the disease process, fails to acknowledge the perspective and experience of the person with dementia. Even if there are common symptoms of dementia, the individual's experience of dementia symptoms is unique and subjective (Sherrell et al., 2011). From the other views on dementia and the behaviours associated with dementia, there has been an increasing preference for the use of more respectful language when describing the behavioural and psychological manifestations of dementia such as "responsive behaviours" (Dementia Training Australia, 2019b). A number of models underpin these responsive behaviours in dementia including the Need Driven Dementia Compromised Behaviour Model (Algase et al., 1996) and the Progressively Lowered Stress Threshold Model (Smith, Hall, Gerdner, & Buckwalter, 2006).

Compared to the medical perspective, the Need Driven Dementia Compromised Behaviour Model and the Progressively Lowered Stress Threshold Model provide insights into the underlying causes of behaviours in people living with dementia within the person-centred context. The Need Driven Dementia Compromised Behaviour Model views the behaviours manifested by people living with dementia as expressions of unmet needs or goals (Algase et al., 1996). The progressively Lowered Stress Threshold Model highlights that people living with dementia have decreased capacity to manage stress and that behaviours emerge when environmental demands exceeds the person's ability to cope and adapt (Smith et al., 2006). The aforementioned models relate to this thesis as provision of an individualised non-pharmacological intervention or a preferred

leisure activity to a person with dementia aligns with the principle of person-centred care, discussed further in section 2.4.2.3 of this chapter.

2.4.2. Management of dementia

2.4.2.1. Pharmacological management of cognitive decline in dementia

Pharmacological management for the cognitive decline in dementia includes the use of acetylcholinesterase inhibitors (e.g. donepezil, galantamine and rivastigmine) and memantine (a N-methyl-D-aspartate (NMDA) receptor inhibitor) (Laver et al., 2016; Touhy, 2014). These medications are used to slow cognitive decline rather than reverse it, and their effectiveness is limited (Sherrell et al., 2011; Touhy, 2014). The Clinical Practice Guidelines for dementia in Australia (Laver et al., 2016) state that clinicians should be aware of the side effects associated with the use of acetylcholinesterase inhibitors: nausea, vomiting, diarrhoea, dizziness, increased urinary frequency, falls, muscle cramps, weight loss, anorexia, headache and insomnia. Awareness of these side effects is an important component of treatment evaluation because negative side effects may outweigh the potential benefits to the person living with dementia. In a systematic review of randomised controlled trials on the clinical effectiveness and cost-effectiveness of donepezil, galantamine and rivastigmine for the management of Alzheimer's disease, Bond et al. (2012) concluded that despite the increasing evidence regarding these medications, "its impact on conclusions about effectiveness appears small" (p.241).

2.4.2.2. Psychotropic medications for the management of behavioural and psychological symptoms of dementia (BPSDs)

Predominantly, the BPSDs are managed with pharmacological interventions such as psychotropic medications (Dutcher et al., 2014; van der Spek et al., 2015). Psychotropic medications affect perception, mood, consciousness, cognition and behaviour and include antidepressants, antipsychotics, sedatives and anticonvulsants (Peisah & Skladzien, 2014). In Australia, a recent cross-sectional study conducted in 53 long-term care facilities revealed that more than half 257 (58%) of 446 people living with dementia, were prescribed with psychotropic medications, mainly antipsychotics (36%) (McMaster, Fielding, Lim, Moyle, & Beattie, 2018). A prospective study conducted in 150 residential aged care facilities in Australia which evaluated the impact of a multi-strategic interdisciplinary intervention on antipsychotic and benzodiazepine prescription revealed that of 12,157 residents across all facilities, 2,195 were regularly prescribed with antipsychotics and 2,247 residents were prescribed with benzodiazepines (Westbury et al., 2018). Results of other studies from the United Kingdom (Backhouse, Killett, Penhale, Burns, & Gray, 2014) and Europe (Wetzels, Zuidema, de Jonghe, Verhey, & Koopmans, 2011) have demonstrated the prevalence of psychotropic medication use among older people living with dementia in residential aged care facilities.

Psychotropic medication use is also common among older people living with dementia living in the community. In a retrospective analysis of psychotropic medication in a community setting in Australia (n=412), between 35% and 69% of people living with dementia across the 13 sites were using psychotropic medications (Goeman et al.,

2015). Analysing the data from a survey among people aged 70 and over in the United States (Aging, Demographics and Memory Study [ADAMS]), Maust, Langa, Blow, and Kales (2017) concluded that in the nationally-representative sample (n=414), 41.4% of people living with dementia were using psychotropic medications.

A recent hearing by the Royal Commission into Aged Care Quality and Safety in Australia held in February 2019 revealed the overuse of psychotropic medication among people living with dementia. Specifically, about 80 percent of people living with dementia in residential care received at least one form of psychotropic medication (Royal Commission into Aged care Quality and Safety, 2019).

The disadvantages of psychotropic medications for people living with dementia

Psychotropic medications may enhance quality of life when used for the management of psychiatric illness (Goeman et al., 2015). However, when used to treat dementia-related behaviours it has a modest effect and can lead to negative outcomes (Goeman et al., 2015; Royal Australian and New Zealand College of Psychiatrists, 2016; Royal Australian College of General Practitioners, 2015; Sterke et al., 2012). Among the adverse events, risk of death is considered as the most significant consequence of psychotropic medication use (Maust et al., 2015; Peisah & Skladzien, 2014). In a systematic review, Maher et al. (2011) concluded that there were small but statistically significant benefits of some atypical antipsychotics (aripiprazole, olanzapine and risperidone) used for older people living with dementia; nevertheless, its use was associated with adverse outcomes (e.g. cardiovascular symptoms and stroke) and an increased risk of death (Maher et al., 2011). A review of evidence from short term

randomised controlled trials on the use of atypical antipsychotics for the management of BPSDs highlighted the modest benefits of risperidone and aripiprazole (Ballard, Creese, Corbett, & Aarsland, 2011). Findings from this review also revealed the adverse events associated with psychotropic medication use: extrapyramidal symptoms, respiratory infections, peripheral oedema, cerebrovascular adverse events and increased mortality of 1.5 to 1.8 fold. Results of a retrospective case-control study among 90,786 older people living with dementia suggested that mortality associated with the use of psychotropic medications is higher than previously reported (Maust et al., 2015).

2.4.2.3. Person-centred and non-pharmacologic approach to dementia care

With the call to focus on the person with dementia rather than the disease, providing care that is person-centred and that acknowledges the person with dementia's sense of self, rights and perspectives is important (Downs, 1997). In Australia, the Dementia Training Australia (DTA) provides a number of resources to guide care providers in addressing the responsive behaviours of people living with dementia such as the DTA Responsive Behaviours Quick Reference Cards (Dementia Training Australia, 2019a). Highlighted in this resource is the importance of a person centred approach to care including identification of individual triggers to behaviours and provision of individualised psychosocial and environmental interventions (Dementia Training Australia, 2019a).

A number of guidelines also recommend the use of person centred care by identifying and responding to the individual needs, preferences, and possible causes of distress of the person with dementia and the use of non-pharmacologic interventions prior to considering pharmacologic treatments (Laver et al., 2016; National Institute for Health and Care Excellence (NICE), 2018). In keeping with these guidelines, the recent hearing by the Royal Commission into Aged care Quality and Safety (2019) in Australia highlighted that the side effects of psychotropic medications for people living with dementia often outweigh the benefits. The hearing emphasised that although non-drug treatments are often time consuming and labour intensive, they should always be tried first and the use of the psychotropic medications should be the last resort.

2.4.2.4. Evidence-based non-pharmacological interventions for people living with dementia

Several non-pharmacological interventions are used for older people living with dementia. In an appraisal of research reviews, Vernooij-Dassen, Vasse, Zuidema, Cohen-Mansfield, and Moyle (2010) enumerated some of the most effective non-pharmacological interventions including behavioural management techniques, cognitive stimulation and physical activities. The behavioural management techniques (e.g. reinforcement of quiet behaviour and stimulation, individualised bathing, habit training for activities of daily tasks) and cognitive stimulation have been proven effective for the management of behavioural symptoms while physical exercise has been found to improve physical and cognitive functioning (Vernooij-Dassen et al., 2010). Results from another systematic review delineated the non-pharmacological interventions that are addressed and recommended by twelve moderate-to-high quality practice guidelines

for dementia (Ngo & Holroyd-Leduc, 2015). For the management of BPSDs, environmental modification, music therapy and animal-assisted therapy; and for depression, cognitive behavioural therapy or psychotherapy are consistently recommended by the guidelines as first-line modalities (Ngo & Holroyd-Leduc, 2015).

A systematic review of randomised controlled trials mainly conducted in care homes revealed that music therapy, sensory interventions (e.g. touch, multisensory involving tactile, light and auditory stimulation such as Snoezelen therapy), communication skills training, person-centred care and dementia care mapping are among the non-pharmacological interventions with evidence of efficacy for managing agitation in people living with dementia (Livingston et al., 2014a).

In an exploratory study (n=89), Cohen-Mansfield, Marx, Dakheel-Ali, and Thein (2015) compared different non-pharmacological interventions for people living with dementia in terms of use and perceived efficacy. The interventions were tailored to the participants' needs and preferences and were presented by the research assistants during the trial phase. The activities with the most beneficial effect on the participants during the trial phase were subsequently utilised during the 2-week treatment phase. Findings revealed the most utilised interventions: social intervention of one-on-one interaction, simulated social interventions (e.g. lifelike doll), theme intervention of magazine, and sensory stimulation intervention of music. The interventions with the highest impact on behavioural problems were one-on-one social interaction, hand massage, music, video, care (activities concerning residents' comfort such as taking the person to the bathroom or bringing a blanket), and folding towels (Cohen-Mansfield et al., 2015).

Key considerations in the use of non-pharmacological interventions for people living with dementia

Some considerations must be noted when using non-pharmacologic interventions for people living with dementia such as the person's preferences, skills and abilities (Laver et al., 2016). Ideally, the intervention should include activities that are enjoyable for the person with dementia (Alzheimer's Disease International, 2018; Laver et al., 2016; National Institute for Health and Care Excellence (NICE), 2018).

In addition, involvement of the formal and informal caregivers in the implementation of the non-pharmacological interventions is crucial. Livingston et al. (2014a) underscored that effective non-pharmacological interventions have the potential to work in the long term with the help of trained care staff and paid caregivers. Brodaty and Arasaratnam (2012) conducted a meta-analysis of non-pharmacological interventions for BPSDs delivered by family caregivers in the community setting. Results demonstrated the promising effectiveness of the caregiver interventions in reducing the frequency and severity of BPSDs.

In keeping with their review (Brodaty & Arasaratnam, 2012) are the findings of a controlled trial (n=306) conducted in a residential care setting (Deudon et al., 2009). Staff participants in the intervention group received an 8-week education and training programme on dementia and management of BPSDs. Results showed that a training programme for staff on the implementation of non-pharmacological interventions could be effective in the management of agitation and aggressiveness among residents with

dementia. In two randomised controlled trials in Australian residential aged care facilities, efficacy of person-centred care (PCC) for people living with dementia as a non-pharmacological intervention implemented by trained staff was demonstrated (Chenoweth et al., 2014; Chenoweth et al., 2009). The PCC training topics included understanding the behaviour and acknowledging the feelings of people living with dementia during social interactions, and use of person-centred approaches in meeting the person with dementia's psychosocial needs. Results showed the potential of PCC implemented by trained staff in reducing agitation and improving quality of life (Chenoweth et al., 2014; Chenoweth et al., 2009).

2.5. Music as therapy in modern and historical contexts

Music is one of the commonly used and recommended non-pharmacologic interventions for people living with dementia (Cohen-Mansfield et al., 2015; Livingston et al., 2014a; Ngo & Holroyd-Leduc, 2015). Several uses of music have been depicted at various times in history and in various cultures (Horden, 2016). Apart from entertainment and spiritual awareness, music has been used as medicine (Horden, 2016). Music as a therapy has evolved from the ancient times as a form of healing in a magical context to a valuable tool in improving clinical outcomes (Claudius, 2010). Some examples wherein music was used for healing during the earliest civilisations such as circumventing the path of evil spirits and conquering passion (Claudius, 2010). Music's role in sustaining wellness was highly regarded in the middle ages and its application in a defined clinical setting was first investigated in the late 19th century through research on the emotional impact of harmonies on the human psyche (Claudius, 2010). Interest in the therapeutic use of music continues to increase and evidence has been published on

music's application in a variety of fields: pain control, anxiety, relaxation, mental health, and in surgical settings, among others (Biley, 2000). Music's ability to activate several brain structures that are involved in cognitive, sensorimotor and emotional processing is attributed to its beneficial effects on a person's psychological and physiological well-being (Koelsch, 2009). Additionally, promising evidence shows that music helps improve health and well-being through its effect on the neurochemical systems (e.g. dopamine and opioids, cortisol, serotonin, oxytocin) which are associated with a number of functions: reward, motivation and pleasure; stress and arousal; immunity; and social affiliation (Chanda & Levitin, 2013).

2.6. Music across the life span

Music provides important meaning in many people's lives and plays a critical role throughout a person's life span (Sarkamo et al., 2012). A survey among 2,465 adolescents in England reveals that music is important to adolescents as it enables them to portray an image to the outside world and satisfy their emotional needs (North, Hargreaves, & O'Neill, 2000). Findings from a qualitative study among 21 interviewees aged 21 to 70 years reveal that emotional self-regulation or regulation of emotional experience and the expressions relating to emotions is one of the most important reasons why people at all ages engage in music (Saarikallio, 2011). Findings from this study also showed the age related changes and individual differences in the use of music such as using music for revival and relaxation mostly during the years in working life and for solace and comfort during difficult life experiences (Saarikallio, 2011).

Music remains a significant part of older people's lives even for those with dementia. For the older population, findings from a survey among 500 community dwelling older adults aged 65 to 75 showed that music listening is a common leisure activity and a source of positive emotions (Laukka, 2007). A qualitative study conducted in two residential aged care facilities in the United States revealed that music is important for older people living with dementia as it taps into their sense of self especially in terms of their preferences and personal history (McDermott, Orrell, & Ridder, 2014). Thus, it is not surprising that music is among the most widely known activities enjoyed by older people including people living with dementia (Baird & Samson, 2015). In a recent study evaluating the types of leisure activities preferred by people living with dementia from seven residential aged care facilities and one senior day centre, family members and recreation staff reported that music was the most liked activity (Cohen-Mansfield, Gavendo, & Blackburn, 2017). This is in agreement with the findings of another study wherein the majority of the people living with dementia (75%) from the twenty participating aged care facilities reportedly enjoyed listening to music (van der Geer, Vink, Schols, & Slaets, 2009).

2.7. Musical memory and dementia

Even though verbal communication skills deteriorate in the late stage of dementia, people living with dementia are still able to respond to and enjoy music (Baird & Samson, 2015; Vasionyte & Madison, 2013). Research shows that musical memory can be preserved in dementia (Cuddy et al., 2012; Jacobsen et al., 2015; Vanstone et al., 2012). It is important to note that there are different forms of musical memory. These include, explicit, implicit, and within explicit, episodic and semantic. Baird and Samson

(2009) highlighted the difference between two forms of long-term musical memory: explicit and implicit memory. Implicit musical memory refers to the procedural musical memory (e.g. ability to play a musical instrument) while explicit memory refers to the recognition of familiar or unfamiliar melodies (Baird & Samson, 2009). Explicit musical memory has two divisions: episodic and semantic. Episodic memory is memory for specific musical events while semantic memory is memory for objects and concepts and represents musical knowledge (Cuddy et al., 2012; Omar, Hailstone, & Warren, 2012).

Semantic musical memory may be spared in individuals with mild, moderate and severe stage Alzheimer's disease (Cuddy et al., 2012; Vanstone et al., 2012). Cuddy et al. (2012) conducted a study using six tests involving different aspects of melody and language processing administered to fifty older adults with Alzheimer's disease in the mild, moderate and severe stages. Results showed preservation of the long-term familiarity with the lyrics of familiar melody across dementia severity (Cuddy et al., 2012). These findings are supported by another study which assessed the episodic and semantic memory of ten individuals in the mild to moderate stage of Alzheimer's disease (Vanstone et al., 2012). The musical tests included unfamiliar and familiar melodies. Results revealed the preserved ability to recognise traditional melodies encoded over the lifespan (Vanstone et al., 2012). In keeping with the findings of these two studies (Cuddy et al., 2012; Vanstone et al., 2012), a review of evidence suggests that although the evidence regarding the effect of dementia on semantic memory is modest, it appears that it can be relatively preserved even with the impairment of other cognitive domains (Omar et al., 2012).

In contrast to the evidence regarding preservation of semantic musical memory, Baird and Samson (2009) concluded in their synthesis of study findings that it is the implicit musical memory that can be preserved in Alzheimer's disease. This is supported by the results of a study using a functional magnetic resonance imaging to compare the brain areas responsible for encoding long-known music with that of the neurodegenerative changes of Alzheimer's disease. Results suggest that the preservation of musical memory in Alzheimer's disease is attributed to the preservation of the brain regions (ventral pre-supplementary motor area and caudal anterior cingulate) that are involved in musical memory encoding and associated with procedural memory functions (Jacobsen et al., 2015). Despite the differences in the type of musical memory that may be preserved, this preservation may contribute to the promising effect of music on people living with dementia as a non-pharmacological intervention for the management of dementia symptoms including BPSDs. This preservation of musical memory also provides a rationale for the development of music-based therapies (Omar et al., 2012) and inspires the development of numerous music based interventions for people living with dementia (Baird & Samson, 2015).

2.8. Use of music for people living with dementia

2.8.1. Goals of music interventions in dementia care

Literature shows that music has been widely used to achieve numerous goals and outcomes for people living with dementia, mostly for the management of BPSDs (McDermott, Crellin, Ridder, & Orrell, 2013; Raglio et al., 2012; Tsoi et al., 2018; van der Steen et al., 2017). Apart from BPSDs, music has been used to enhance memory and

cognition of people with living dementia (Moreira, Justi, & Moreira, 2018; van der Steen et al., 2017; Zhang et al., 2017). Music has also been used as form of leisure activity that contributes to well-being of people living with dementia (Han, Radel, McDowd, & Sabata, 2016; Spiro, 2010).

2.8.2. Forms of musical interventions for people living with dementia

Different forms of music related interventions are used in dementia care. Raglio and Oasi (2015) identified three different applications of music as a form of intervention: music therapy interventions, music listening (individualised or music medicine), and general music based interventions. Music therapy interventions are referred as those that involve a relational component between the patient and the music therapist, use of models based on psychological or neuroscientific theories as reference for the treatment, and presence of a therapeutic goal (Raglio, Filippi, Bellandi, & Stramba-Badiale, 2014; Raglio & Oasi, 2015). In contrast to music therapy techniques, listening to music does not involve a relational component between the patient and the therapist, attributing the therapeutic value of the intervention to the music itself (Raglio & Oasi, 2015). The role of the music therapist, if involved, in this instance is the preparation of a music listening program or a music playlist. Raglio and Oasi (2015) further differentiated two applications of music listening: individualised music listening and music medicine approach. In individualised music listening, a playlist is created using the person's favourite music or music that is emotionally relevant as determined by the person or their caregivers (Raglio & Oasi, 2015).

Music medicine on the other hand includes a selection of music based on its structural characteristics and intends to act on specific symptoms (Raglio & Oasi, 2015). Garrido, Stevens, Chang, Dunne, and Perz (2018b) investigated the influence of musical features on the affective response among people with probable dementia through a randomised factorial experiment. Participants from three residential aged care facilities were randomly assigned to listen to a number of playlists while their facial expressions were filmed. Results revealed that music with fast tempo is associated with increased arousal while music in minor keys is associated with increased sadness. As the results were not influenced by the familiarity of the music to the participants, the authors emphasised that musical selection should take into consideration the music's specific effect on mood and arousal (Garrido, Stevens, et al., 2018b).

Music based interventions are not based on any music therapy models, does not necessarily require the presence of a qualified music therapist, and may lack specific therapeutic goals (Raglio et al., 2014). Music based interventions are usually administered in groups and generally implemented to improve mood and motivation, promote socialization and stimulate sensory, motor and cognitive aspects (Raglio & Oasi, 2015). Apart from the previously mentioned interventions, Raglio et al. (2014) further added caregiver singing performed by formal and informal caregivers and the use of background pre-recorded music in specific situations (e.g. lunch time, rest periods) as among the various forms of music interventions for people living with dementia.

Vasionyte and Madison (2013) illustrated in their meta-analysis the difference between various types of musical activities: active versus receptive music therapy, live versus recorded music, selected versus individualised, and personal versus group interventions. Active music therapy combines one or more music therapy techniques (e.g. playing musical instruments, singing, dancing) while receptive music therapy mainly involves listening to music selected by the therapist (Vasionyte & Madison, 2013). Vasionyte and Madison (2013) also differentiated the means of delivering music as either in the form of live music performances or pre-recorded music and whether the music is administered as a group intervention or individually as a personal intervention. Concerning music selection, Vasionyte and Madison (2013) defined individualised music as selected according to one's preferences while selected music does not take into consideration the input from the person and his family or caregivers.

2.8.3. Evidence supporting the value of music interventions for people living with dementia

Research shows promising outcomes from the various forms of music interventions for people living with dementia delivered by therapists, trained professionals and formal and informal caregivers. An exploratory crossover study (n=132) investigated the effects of music therapy on depression among people with moderate to severe dementia in residential care (Ray & Mittelman, 2017). Two certified music therapists conducted the music therapy to a group of four to six participants three times a week for two weeks. The musical activities included music and movement and singing. Results showed significant reduction in depression with music therapy ($p=0.006$) (Ray & Mittelman, 2017).

In a randomised controlled trial (n=95), the effects of a six-week program of group music with a movement intervention on the cognitive function of people with moderate dementia was compared with group music listening and social activity (Cheung, Lai, Wong, & Leung, 2018). The music with movement group listened to their preferred music and moved their limbs and trunk twice a week guided by a trained professional. The music listening group listened to their preferred music while the social activity group chatted casually twice a week facilitated by trained research assistants. Although the resulting differences between groups did not reach statistical significance, there was improvement in memory storage and delayed memory in the music with movement group, significant improvement in delayed memory in the music listening group, and no improvement in these outcomes in the social activity group (Cheung et al., 2018).

Sarkamo et al. (2014) conducted a randomised controlled trial among 89 dyads of people living with dementia and their caregivers to determine the efficacy of a novel music intervention based on coaching caregivers to use either singing or music listening in the daily care of people living with dementia. Participants in the treatment groups attended a 10-week group based coaching program of either singing (n=30) or music listening (n=29). After the final session, participants were given song books (singing group) and compact discs of favourite songs (music listening group) and encouraged to continue the music activities at home. Participants in the control group (n=30) did not attend a coaching program and were encouraged to continue usual activities at home. Over the 9-month period, participants in the music intervention groups (singing and listening) demonstrated reduced depression levels as shown compared with the control

group (mixed model analysis of variance (ANOVA) time x group interaction $p=.001$; analysis of covariance (ANCOVA) group effect $p=0.006$). Additionally, the short term effects (significant time x group interactions) in the music intervention groups (singing and listening) demonstrated improvements in general cognition ($p=0.041$), attention and executive function ($p=0.039$) compared with the control group.

2.9. The benefits of using preferred/individualised music

Individualised music is defined as music that has been integrated into the person's life and is based on personal preference (Gerdner, 1992; Gerdner, 2012). Individualised music is often incorporated in music therapy and music based interventions involving listening to music. Using familiar songs that are personally significant and that have an emotional meaning to the person with dementia fosters a positive atmosphere and has been found to improve several outcomes including agitation, aggression and depression, increasing sense of self and initiating self-expression (McDermott et al., 2014; Raglio & Gianelli, 2013; Tomaino, 2013). McDermott et al. (2014) conducted focus groups and interviews with people living with dementia ($n=12$) and their families ($n=15$), care home staff ($n=14$), and music therapists ($n=8$) to understand how and why music is beneficial for people living with dementia. From the themes that emerged, McDermott et al. (2014) contended that each person has a musical identity that is closely associated with ones' life events, personal and cultural identity and history. They further highlighted that music preference is preserved among people living with dementia and knowing a person's musical history is important in dementia care (McDermott et al., 2014).

In another study, Cohen-Mansfield, Marx, Thein, and Dakheel-Ali (2010), evaluated the impact of past and present preferences on the engagement with different stimuli presented to the people living with dementia in a residential care facility (n=193). The activities preferred by the person with dementia in the past and enjoyed at present were determined by a phone interview with the person with dementia's closest relative using the Self-Identity Questionnaire (SIQ). The seven categories of stimuli from the SIQ (babies, office work, pets, television, reading, art, music listening) were randomly presented to the participants and their engagement was assessed through direct observation using the Observational Measurement of Engagement (OME). Results suggested that past and present interest in music is associated with greater engagement with the musical stimulus; thus, the authors underscored the importance of taking into consideration a person's preferences for music to increase their responsiveness.

2.10. Individualised music for people living with dementia

Individualised music listening has captured the media's interest. A 2014 documentary titled "Alive Inside" (Rossato-Bennett, 2014) depicts the heart-warming experiences of people who have been "revitalised" by listening to personalised music using iPods and headphones. Of note was the astounding reaction and response of people living with dementia upon hearing their favourite music, indicating a restoration of their identity. In Australia, an episode of the Australian Broadcasting Commission's (ABC) Catalyst program featuring the impact of personalised playlists on people living with dementia and Parkinson's disease titled "Music on the Brain" was broadcast on 8th March 2016 (Newby, 2016). In September 2018, the Big Ideas program of the ABC Radio National featured a segment on "Music and memory" which highlighted the astounding effects of

personalised music listening for people living with dementia especially in terms of improving and evoking memory (Barclay, 2018). In the United Kingdom (UK), the British Broadcasting Corporation (BBC) launched the Music Memories website in 2018 for people living with dementia where music from the last 100 years are available in the website. It was hoped that through the various music selections, people living with dementia would be able to access their favourite music and reconnect with the memories of their past (British Broadcasting Corporation, 2018). A news article published in February 2019 in the Billboard magazine, an American entertainment media, detailed an initiative led by a Lauren Lavern, a BBC radio disc jockey (DJ). The initiative aimed to make music accessible to everyone in the United Kingdom living with dementia by asking various streaming services to offer free music subscriptions for anyone living with dementia (Smirke, 2019).

2.10.1. Theoretical foundation of individualised music for people living with dementia

In 1992, Gerdner tested an evidence based protocol of Individualised Music for Elders with Dementia based on the mid-range theory (Gerdner, 1992; Gerdner, 2012). Cognitive impairment, progressively lowered stress threshold, agitation, and individualised music are the core elements of the mid-range theory. Gerdner (2012) cited the progressively lowered stress threshold model of Hall and Buckwalter (1987), suggesting that cognitive impairment decreases a person's ability to receive and process sensory stimuli leading to a lowered stress threshold and eventually resulting in agitated behaviours. The mid-range theory postulates that the use of individualised music based on the person's preference will stimulate remote memories and change the focus of

attention of the person. This results in an interpretable stimulus overriding the meaningless or confusing stimuli, thereby decreasing agitation. In addition, memories associated with positive feelings will have a soothing effect especially for an agitated person with dementia (Gerdner, 2012). From the mid-range theory, Gerdner developed and published an evidence based protocol for individualised music for people living with dementia (Gerdner & Schoenfelder, 2010).

2.10.2. Individualised music protocol

From its first publication in 1996, the protocol for individualised music for people living with dementia has undergone several revisions and is written not only for professional health care providers but also for family caregivers of a person with dementia (Gerdner, 2012). Gerdner's evidence based protocol of individualised music (Gerdner & Schoenfelder, 2010) includes the following guidelines for implementation:

- (1) Individualising music selection in accordance with the older person's preferences as determined by interviewing the person or a family member.
- (2) Implementing the intervention for a minimum of 30 minutes prior to the older person's usual peak level of agitation to achieve optimal effectiveness.
- (3) Playing the music selection using an audio cassette/compact disc (CD) player or other medium (e.g. MP3 and iPods) for approximately 30 minutes in a location where the older person spends the majority of his or her time. The volume or loudness of the music must be set at an appropriate level for the older person.

(4) Conducting an ongoing assessment to determine the older person's response to the music intervention. If the older person manifests increased frequency of agitation, the music should be stopped immediately and the cause should be determined.

The protocol has been utilised by several researchers who further explored the effectiveness of individualised music on several outcomes for people living with dementia (Gallagher, 2011; Park, 2010; Park, 2013; Park & Pringle Specht, 2009; Sung et al., 2010).

2.10.3. Evidence on the impact of individualised music for people living with dementia

Several studies evaluated the effects of individualised or preferred music implemented by formal and informal caregivers of people living with dementia in residential aged care facilities and at home. This chapter presents the evidence from a number of non-randomised controlled studies. The randomised controlled trials (RCTs) utilising individualised music listening are presented in the following Chapter 3.

A number of non-randomised quantitative studies using Gerdner's evidence-based protocol demonstrated consistent positive effects of individualised music on BPSDs including agitation and anxiety. The majority of these studies were conducted in residential aged care facilities. In a pilot mixed methods study (n=8), Gerdner (2005) evaluated the effectiveness of individualised music on the person with dementia's agitation when implemented by trained staff and family in a long-term care facility. Music was implemented daily for 30 minutes prior to their peak agitation level for two

months. Agitation was assessed using the agitation visual analogue scale (VAS) administered before and after each individualised music session and a modified version of the Cohen-Mansfield Agitation Inventory (MCMAI) at baseline and during the 2-month implementation. Results showed a significant reduction in agitation as measured by the VAS ($p<0.001$) and in overall agitation as measured by the MCMAI on day shifts during weeks 1 to 8 ($p<0.001$) and on evening shift during weeks 5 to 8 ($p=0.027$) (Gerdner, 2005).

Sung et al. (2006) evaluated the effect of preferred music on agitation among people living with dementia in residential care facilities ($n=57$) in a quasi-experimental study. The experimental group ($n=32$) listened to their preferred music delivered by trained nursing staff for 30 minutes in the mid-afternoon biweekly for six weeks while the control group ($n=25$) received usual care. Results revealed a significant reduction in overall CMAI ($p<0.05$) and physically non-aggressive behaviours ($p<0.001$) in the experimental group compared to the control group. Sung et al. (2010) evaluated the impact of preferred music on anxiety. Twenty-nine people living with dementia received a 30-minute individualised music listening intervention delivered by trained nursing staff in the mid-afternoon biweekly for six weeks. The control group participants ($n=23$) received usual standard care. Anxiety was assessed using the Rating Anxiety in Dementia tool with results showing a significant reduction in anxiety among participants in the music intervention group compared to the standard care group ($p=0.001$) (Sung et al., 2010).

Two studies conducted among home dwelling people living with dementia using Gerdner's protocol also showed promising impact of individualised music on agitation (Park, 2013; Park & Pringle Specht, 2009). Participants listened to their preferred music 30 minutes prior to peak agitation twice a week and were assessed for their agitation levels prior to, during, and after listening to their preferred music. Results from a pilot study (n=15) revealed that participants' agitation levels were lower while listening to music compared to before listening to music ($p<0.05$) and after listening to music compared to before listening to music ($p<0.05$) (Park & Pringle Specht, 2009). Similarly, results from a pre-test post-test study (n=26) revealed lower agitation levels while listening to music compared to before listening to music ($p=0.002$) and lower agitation levels after listening to music compared to before ($p=0.032$) (Park, 2013).

Several studies utilised an individualised or preferred music listening intervention without the guidance of Gerdner's evidence-based protocol. Results of these studies also supported the promising efficacy of individualised or preferred music listening for people living with dementia. Garland, Beer, Eppingstall, and O'Connor (2007) compared listening to preferred music with simulated family presence in a single blind randomised crossover trial. Thirty people living with dementia residing in a residential aged care facility were exposed to either 15-minute audiotapes of (1) simulated family presence (conversation prepared by a family member), or (2) preferred music, or (3) a placebo condition (reading from a horticultural text) and 4) a usual care control group. While preferred music was less effective with verbal agitation compared to simulated presence, it was equally modestly effective for physical agitation (difference in means = 0.31, $p=0.388$) (Garland et al., 2007).

Several residential aged care facilities in the United States and Australia adopted a personalised music listening program through the Music and Memory organisation (Music and Memory, 2019). Music and Memory provide support and training to professionals, staff and family from certified organisations for the implementation of personalised music listening. Thomas et al. (2017) evaluated the effects of a personalised music listening program implemented in 98 Music and Memory certified residential aged care facilities in the United States. The intervention involved a personalised music playlist which the people living with dementia listened to through a set of headphones connected to a digital music player. Results showed that from the year 2012 to 2013, there was an increase in the proportion of people living with dementia in the music program who discontinued antipsychotic medication (from 17.6% to 20.1%, $p=0.03$) and a slight increase in discontinued anxiolytic medications (from 23.5% to 24.4 %, $p=0.04$). Additionally, the rates of improvement in behavioural symptoms increased from 50.9% to 56.5% ($p=0.04$) (Thomas et al., 2017). Results from this study adds to the extant literature on the promising effect of individualised music not only on BPSDs but also on psychotropic medication use among people living with dementia.

Overall, evidence from several non-randomised controlled studies support the potential of music listening based on the person's preferences on several outcomes for people living with dementia such as BPSDs and psychotropic medication use. The positive effects were demonstrated by studies involving formal and informal caregivers in residential aged care and community settings. Although the majority of studies

discussed above utilised Gerdner's evidence based protocol, promising impact was also shown by the studies that did not use the protocol for the implementation of the music listening intervention.

2.11. Gap between the efficacy and routine implementation of individualised music listening intervention

2.11.1. Implementation studies on individualised music listening

Despite the promising impact of individualised music listening interventions on older people living with dementia, there are few studies focusing on the evaluation of the implementation process. Sung et al. (2008) conducted a one-group pre-post-test design of an implementation programme among 17 nursing staff on the use of an individualised music protocol in a residential aged care facility in Taiwan. Multifaceted implementation strategies were utilised including interactive education, reminders, local opinion leader and audit. The main outcomes measured were the nursing staff's knowledge using the music knowledge questionnaire and adherence to the protocol and using a self-reported audit checklist. Results showed improvement in the staff's knowledge ($p < 0.001$). For older people living with dementia in a hospice setting in the United States, Gallagher (2011) evaluated the implementation of an individualised music protocol based on Gerdner's guideline by 24 hospice staff. Outcome measures were the Knowledge Assessment Questionnaire (KAQ) (pre-test and post-test) and the Process Evaluation Monitor (PEM) questionnaire (post-test only) which evaluates knowledge and confidence. The training provided to staff on the implementation of the protocol resulted in high scores on the PEM (mean=34.5; range 26 to 36) and increased

mean scores on the KAQ ($p < 0.001$), demonstrating improved knowledge and confidence among participants.

Although these implementation studies showed positive results (Gallagher, 2011; Sung et al., 2008) the focus was mainly on the knowledge and skills of staff while other crucial aspects of implementation were not explored. This is congruent with the results of two systematic reviews on the implementation of psychosocial interventions for people living with dementia, which revealed that most studies measure staff or caregiver –related outcomes: knowledge transfer, skills training, and attitude change (Boersma, van Weert, Lakerveld, & Dröes, 2015; Kuske et al., 2007).

A recent study in the United States utilised the Reach, Effectiveness, Adoption, Adoption, Implementation, and Maintenance (RE-AIM) framework in the evaluation of the implementation process of a volunteer-driven personalised music listening program for people living with dementia in an assisted living facility ($n=17$) (Murphy et al., 2018). The participating people living with dementia listened to their preferred music through a set of headphones connected to a digital music player. The medical student volunteers were involved in the creation of individual playlists, orientation or education of the facility staff in the administration of the intervention, and implementation of the intervention during their visits. Findings from this study revealed the key elements involved when developing the program, which include targeting a particular population, program champions, choice of technology, music playlist titration, and continuous protocol improvement. Although the study significantly illuminated the evaluation of the implementation process, the student volunteers who were external to the facility

mainly spearheaded the program. Additionally, although some of the staff were involved in the implementation of the intervention, they were not able to find family members who were capable of engaging with the program. Notably, guidelines highlight the importance of providing education and training to families or carers of people living with dementia on interventions as well as activities that are enjoyable and meaningful for the person with dementia (Laver et al., 2016; National Institute for Health and Care Excellence (NICE), 2018).

2.11.2. More research needed to advance implementation of individualised music interventions

In Australia, several residential aged care facilities have adopted a personalised or individualised music listening program independently (BaptistCare, 2019; HammondCare, 2019) or with the support of Music and Memory program Australia (Music and Memory, 2019). However, it is noteworthy that to date there is no published study that evaluated the implementation process of this form of music listening program primarily implemented by staff and family in residential aged care facilities in Australia. Additionally, with the paucity of research focusing on implementation, little is known as to how this intervention is successfully embedded in the daily care of older people living with dementia in residential care, creating a gap between theory and practice. Murphy et al. (2018) highlighted that there is a need for further research to extend understanding on the processes involved that will foster access and optimise implementation of the personalised music listening program.

For future studies, Kuske et al. (2007) recommend that organisational or system factors in aged care facilities must be taken into consideration. Additionally, Boersma et al. (2015) underscore the importance of using a proper evaluation process when evaluating the successful implementation of an intervention and focusing not only on the intervention's effectiveness but also on the implementation, adoption and maintenance to obtain insights into its successful implementation.

2.12. Addressing the gap between the efficacy of individualised music and routine uptake through implementation research

The nomenclature used for implementation research remains an ongoing challenge for academics (Peters, Tran, & Adam, 2013). A plethora of terms are used interchangeably to describe the study of implementing research findings including knowledge translation, diffusion, dissemination, and implementation research (Graham et al., 2006; Grimshaw, Eccles, Lavis, Hill, & Squires, 2012; McKibbon et al., 2010). Attempts have been made to distinguish implementation research from these related concepts.

Dissemination is specific to the application of an innovation to targeted groups while implementation encompasses its integration within an organisation (Greenhalgh, Robert, Macfarlane, Bate, & Kyriakidou, 2004). Greenhalgh et al. (2004) highlighted that in contrast to the active and planned efforts involved in dissemination and implementation, diffusion is characterised by the passive spread of innovation.

Bhattacharyya, Reeves, and Zwarenstein (2009) coined the term passive dissemination to describe diffusion while Graham et al. (2006) cited the definition of dissemination as the spreading of knowledge or research in their review of terms and definitions.

Although the concepts underpinning knowledge translation and implementation research are interrelated and overlapping, different geographical locations have specific preference for the term used such as knowledge translation in Canada and implementation research in the United Kingdom and Europe (Bhattacharyya et al., 2009; Graham et al., 2006). Grimshaw et al. (2012) maintained that knowledge translation focuses on ensuring that the health and health care decision-making of various stakeholders are informed by research-based evidence.

This PhD study focuses on the underlying concepts specifically relating to implementation research which is referred to by various authors as a scientific study of processes (Peters et al., 2013; Proctor et al., 2009), methods (Foy, Eccles, & Grimshaw, 2001), and strategies (Proctor et al., 2009). Peters et al. (2013) defines implementation research as “the scientific study of the processes used in the implementation of initiatives as well as the contextual factors that affect these processes” (p.27).

Implementation research is also referred to as the “scientific study of methods to promote the uptake of research findings” (Foy et al., 2001) (p. 353). Proctor et al. (2009) describes implementation research as the “study of processes and strategies that move, or integrate, evidence-based effective treatments into routine use, in usual care settings” (p5). Implementation research intends to understand what is working and what is not, why implementation is going right or wrong and testing the approaches to improve it (Peters et al., 2013).

2.12.1. The use of a conceptual model of implementation research

Use of frameworks and models to guide the implementation research is critical for its success (Proctor et al., 2009; Tabak, Khoong, Chambers, & Brownson, 2012).

Frameworks and models help in gaining valuable insights to better understand the reasons for the implementation's success or failure (Nilsen, 2015). In their evidence synthesis, Tabak et al. (2012) identified several models both for dissemination and implementation (e.g. RE-AIM) and those which are mainly focused on implementation (e.g. CFIR, Conceptual Model of Implementation Research). From the RE-AIM framework, Glasgow, Vogt, and Boles (1999) postulate that the ultimate impact of an intervention is determined by its combined effects on the five evaluative dimensions: Reach, Efficacy, Adoption, Implementation, and Maintenance. This framework has been used in the evaluation of psychosocial interventions for people living with dementia in residential care (Boersma et al., 2015; Murphy et al., 2018). Damschroder et al. (2009) developed the Consolidated Framework for Implementation Research (CFIR) which comprises five major domains (intervention, inner and outer setting, the individuals involved, and the process of implementation) that influence the effectiveness of implementation. The CFIR has been used by a wide range of studies conducted in various settings (Kirk et al., 2015).

Peters et al. (2013) designed the Practical Guide for Implementation Research in Health supported by the World Health Organization to foster implementation research capacity by diverse stakeholders, implementers and researchers. The Guide highlights the importance of using implementation outcome variables (acceptability, adoption,

appropriateness, feasibility, fidelity, implementation cost, coverage and sustainability) that will serve as indicators of how well an intervention is being implemented. These implementation outcomes (acceptability, adoption, appropriateness, feasibility, sustainability, and implementation costs) are derived from the Conceptual Model of Implementation Research developed by Proctor et al. (2009) (Figure 2.1). The model distinguishes between three different but interrelated types of outcomes: implementation outcomes, service outcomes and client outcomes. Although consumer well-being is highlighted as the most important criteria for evaluating both intervention and implementation research, implementation research specifically evaluates improvements at a population level and has specific outcomes that are distinct from that of service and clinical effectiveness (Proctor et al., 2011). Guided by the model, Proctor et al. (2011) proposed a working taxonomy for each implementation outcome to advance clarity in the language used to describe these outcomes:

Acceptability – satisfaction with various aspects of the innovation.

Adoption – uptake, utilisation, initial implementation, intention to try.

Appropriateness – perceived fit, relevance, compatibility, suitability, usefulness, practicability.

Feasibility – actual fit or utility, suitability for everyday use, practicability.

Fidelity – delivered as intended, adherence, integrity, quality of program delivery.

Implementation cost – marginal cost, cost-effectiveness, cost benefit.

Penetration – level of institutionalisation, spread, service access.

Sustainability – maintenance, continuation, durability, incorporation, integration, institutionalisation, sustained use, routinisation.

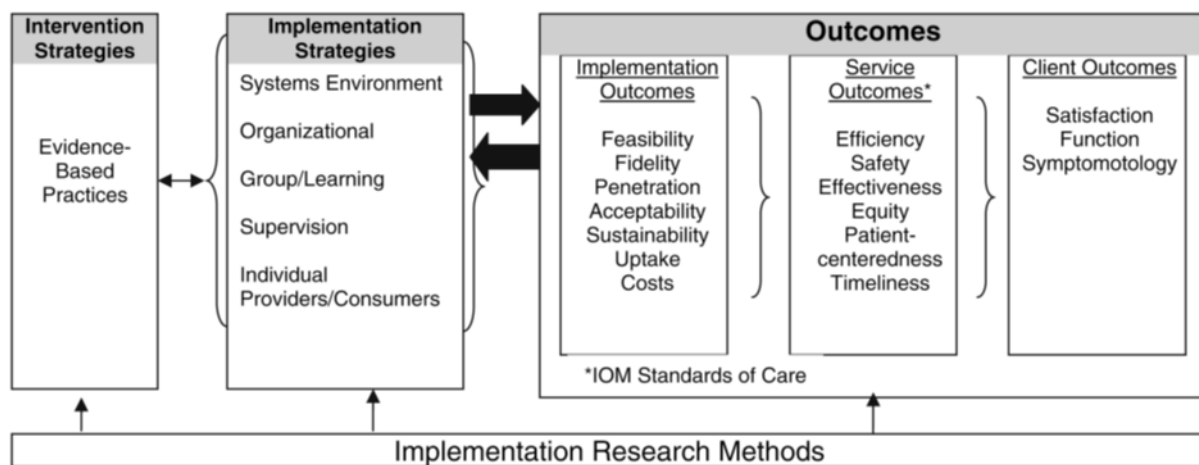


Figure 2.1. Conceptual model of implementation research (Proctor, 2009)

2.12.2. Implementation strategies

An implementation strategy is defined as a “systematic intervention process to adopt and integrate evidence-based health innovations into usual care”(Powell et al., 2012) (p.2). Implementation strategies influence the uptake of interventions (Grol & Grimshaw, 2003) and are critical in the conduct of implementation research (Peters et al., 2013; Powell et al., 2012). These strategies are deliberately and purposively employed at different levels (professional, team, patient, organisation) (Grol & Grimshaw, 2003) and must be tailored to the system and setting of implementation (Proctor et al., 2009) including the local situations and contexts (Powell et al., 2012).

Implementation strategies could either be the focus of the implementation research or be incorporated in the evaluation of the health intervention. A number of implementation strategies are delineated in the literature including single or discrete and multifaceted

strategies (Grimshaw et al., 2006; Grimshaw et al., 2004; Grol & Grimshaw, 2003; Powell et al., 2012). Single or discreet strategies involve one process while multifaceted strategies utilise a combination of two or more discrete strategies. (Grol & Grimshaw, 2003; Powell et al., 2012). For the single strategies, among the commonly used and evaluated in published studies include educational materials, audit and feedback, and reminders (Grimshaw et al., 2006; Grimshaw et al., 2004; Grol & Grimshaw, 2003). Definitive conclusions cannot be made about the efficacy of multifaceted strategies over single strategies due to the inconsistent findings from a number of reviews (Grimshaw et al., 2006; Grimshaw et al., 2004; Grol & Grimshaw, 2003). However, multifaceted strategies tend to require more costs compared to single strategies (Grimshaw et al., 2012). Grimshaw et al. (2006) underscored that when choosing a strategy, it is important for decision makers to take into consideration its feasibility, costs, and benefits. Furthermore, it is noteworthy that effectiveness of implementation strategies vary in different circumstances, warranting considerable judgment from decision makers (Grimshaw et al., 2006; Grimshaw et al., 2004).

2.12.3. The need for implementation research

Numerous barriers contribute to the gap between scientific knowledge and practice (Bhattacharyya et al., 2009; Grimshaw et al., 2012; Grol & Wensing, 2004). These barriers operate at different levels of healthcare including the individual professionals (e.g. knowledge, attitude, skills, motivation), social context (e.g. culture of network, patient collaboration, leadership) and organisational and economic context (e.g. resources, policies, staff), among others (Grimshaw et al., 2012; Grol & Wensing, 2004). While the majority of innovations in health care are aimed at individual

professionals, a range of factors (e.g. behaviour modelling, opinion leaders, formal and informal leaders, organisational characteristic, multidisciplinary collaboration) interacting at different levels influence successful implementation of innovations (Grimshaw et al., 2012; Grol, Bosch, Hulscher, Eccles, & Wensing, 2007). The complex interplay of these factors are comprehensively illustrated by Greenhalgh et al. (2004) in the Conceptual Model for Considering the Determinants of Diffusion, Dissemination, and Implementation. Greenhalgh et al. (2004) posited that the success or failure of dissemination and implementation initiatives lies within these multiple interactions. When overlooked, this could result in a number of implementation issues that could potentially hinder the scaling up of evidence-based interventions or translating effective programs and services into practice (Grimshaw et al., 2012; Peters et al., 2013). Of immense value in addressing this concern is properly conducted implementation research that focuses on the processes involved in the implementation and elucidates contextual issues that could significantly impact the sustained integration of promising interventions in the real-world setting (Greenhalgh et al., 2004; Peters et al., 2013).

2.13. Conclusion

Chapter 2 provided the background literature and the evidence supporting the need for research on individualised music listening that focuses on the implementation process. While the promising impact of individualised music listening as a non-pharmacological intervention has been introduced in this chapter, this is also discussed further in the next chapter. In Chapter 3, a systematic review of randomised controlled trials and the evidence relating to the positive effects of individualised music listening on a number of outcomes for older people living with dementia is presented. The outcomes evaluated by the included studies were the behavioural and psychological symptoms of dementia, physiological outcomes, mood and emotion, cognitive function, dementia severity, and quality of life.

Chapter 3 Impact of individualised music listening intervention on persons with dementia: A systematic review of randomised controlled trials

This Chapter is published as an original research article in the peer reviewed journal Australasian Journal on Ageing with copyright permission. The final Word version is included below and a PDF version of the publication is included in [Appendix 1](#).

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3.1 Abstract

Objective: To summarise the evidence regarding the impact of individualised music listening on persons with dementia.

Methods: Six electronic databases (CINAHL, Medline, ProQuest, PsycINFO, Music Periodicals and Cochrane) were searched up to July 2018 for randomised controlled trials (RCTs) evaluating the efficacy of individualised music listening compared to other music and non-music based interventions.

Results: Four studies were included. Results showed evidence of a positive impact of individualised music listening on behavioural and psychological symptoms of dementia including agitation, anxiety and depression and physiological outcomes. Evidence for other outcomes such as cognitive function and quality of life were limited.

Conclusion: The limited evidence suggests individualised music listening has comparable efficacy to more resource-intensive interventions. However, there was a small number of RCTs and some outcomes were evaluated by a single study. This limits the conclusions drawn, warranting more RCTs evaluating other outcomes beyond the behavioural and psychological symptoms of dementia.

Key words: Dementia, intervention, individualised music, older persons, systematic review

3.2. Introduction

In the previous chapter the literature relating to the background to the study and the need to conduct the study was reviewed and critiqued. The value of music as a non-pharmacologic intervention and as a meaningful activity was underscored. Findings from several non-randomised controlled studies presented in the previous chapter showed the promising impact of individualised music listening for people living with dementia. This chapter presents additional evidence on the benefits of individualised music on a number of outcomes for people living with dementia through a systematic review of randomised controlled trials (RCTs). By limiting the eligibility criteria relating to the study design to RCTs, it was hoped that the methodological issues are minimal and the findings are more robust.

3.2.1. Rationale

Along with the worldwide growth in the ageing population is an upsurge in the number of persons with dementia (PWDs) (Brown et al., 2017; World Health Organization, 2011, 2012). Dementia is a chronic and progressive syndrome characterised by cognitive dysfunction and behavioural and psychological symptoms of dementia (BPSDs), which can include agitation, anxiety, depression, hallucination, and delusion, among others (Sherrell et al., 2011). Management strategies for dementia are mostly aimed at promoting quality of life by alleviating the disabling experience of the PWDs (Sherrell et al., 2011; Touhy, 2014). While there are medications that slow cognitive decline, their effectiveness is limited (Sherrell et al., 2011; Touhy, 2014). Psychotropic medications are predominantly used in the management of BPSDs (Dutcher et al., 2014; van der Spek et al., 2015). However, evidence demonstrates modest benefits of

psychotropic medication for management of PWDs and a range of adverse outcomes (Ballard et al., 2011; Maher et al., 2011; Maust et al., 2015). With safety and efficacy issues surrounding the use of medications for the management of dementia symptoms, non-pharmacologic interventions are promoted in dementia care (Laver et al., 2016; National Institute for Health and Care Excellence (NICE), 2018).

Music is one of the recommended and commonly used non-pharmacologic interventions for PWDs (Cohen-Mansfield et al., 2015; Livingston et al., 2014a; Ngo & Holroyd-Leduc, 2015; van der Steen et al., 2017). The relative preservation of music memory in dementia and evidence demonstrating that PWDs are still able to enjoy music even in the late stage of cognitive impairment, provide a rationale for the development of music-based therapies and interventions (Baird & Samson, 2015; Omar et al., 2012; Vasionyte & Madison, 2013). There are various applications of music including music therapy, music listening (individualised or music medicine), and general music based interventions (Raglio & Oasi, 2015). This review focuses on individualised music listening intervention that does not involve a relational component with a music therapist, attributing the therapeutic effect of the intervention on the music itself (Raglio et al., 2014; Raglio & Oasi, 2015). Although music medicine doesn't require the presence of a therapist (Brandes, 2009), the selection of music is based on its structural characteristics to act on specific symptoms (Raglio & Oasi, 2015). With individualised music listening, music selection is based on the person's preferences as indicated by the person or his/her caregivers (Gerdner, 2012; Raglio & Oasi, 2015). General music based interventions involve an assortment of activities which could include music listening and are usually administered in groups (Raglio et al., 2014; Raglio & Oasi, 2015).

There has been growing popularity of individualised music listening for PWDs. The results of several nonrandomised studies, conducted in various settings (e.g. residential care, home) with the intervention implemented by formal and informal caregivers, showed individualised music listening was effective on a number of outcomes, especially the BPSDs, for PWDs (Clark, Lipe, & Bilbrey, 1998; Gerdner, 2005; Park, 2013; Park & Pringle Specht, 2009; Sung et al., 2006; Sung et al., 2010). Such interventions have also captured the media's interest, evidenced by the creation of a documentary titled *Alive Inside* which depicts the positive experiences of people with dementia who have been rejuvenated by listening to personalised music (Rossato-Bennett, 2014). Previous literature reviews on the use of pre-recorded music playlists (Garrido et al., 2017) and music as a therapy (Wall & Duffy, 2010) for PWDs found that positive effects were evident in therapist or non-therapist-led interventions as well as caregiver implemented interventions. Similarly, results from a meta-analysis suggested the higher likelihood of positive outcomes with music listening compared to music therapy (Vasionyte & Madison, 2013). Being a relatively inexpensive intervention that does not require trained professionals for implementation (Gerdner & Schoenfelder, 2010), individualised music listening has a potential advantage over other resource-intensive interventions. However, the majority of published systematic literature reviews on music for PWDs are focused on music therapy or music based interventions delivered by a qualified professional, including both individualised and group interventions (Fusar-Poli, Bieleninik, Brondino, Chen, & Gold, 2017; McDermott et al., 2013; Moreira et al., 2018; Tsoi et al., 2018; Ueda, Suzukamo, Sato, & Izumi, 2013; van der Steen et al., 2017; Vink, Bruinsma, & Scholten, 2003; Zhang et al.,

2017). Although Vasionyte and Madison (2013) evaluated the effects of different types of music interventions, there was no separate analysis for individualised music listening. One systematic review performed a separate evaluation of individualised music listening during free time as a leisure activity, but excluded the studies that used music during caregiving routines (Han et al., 2016). In addition, the aforementioned systematic reviews were not restricted to RCTs. This limits the strength of the conclusions drawn due to the weak methodological quality of most studies (Han et al., 2016; Vasionyte & Madison, 2013). To our knowledge, this is the first systematic review of RCTs on individualised music listening implemented for various purposes and that evaluated a variety of outcomes for PWDs.

3.2.2. Objectives

This review aims to provide a summary of RCTs that explore the effectiveness of individualised music listening intervention for PWDs. The review aims to answer the question: What are the effects of individualised music listening intervention on PWDs? The authors considered the effects on the BPSDs, cognitive function, physiological outcomes and quality of life.

3.3. Methods

This review was developed in accordance to the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) statement (see [Appendix 2](#)) (Moher, Liberati, Tetzlaff, & Altman, 2009). A review protocol has not been published.

3.3.1. Eligibility criteria

PICOS (participants, intervention, comparison, outcomes, study design)(O'Connor, Green, & Higgins, 2008) is adopted to set the eligibility criteria.

Participants: Persons with a diagnosis of dementia.

Intervention: Individualised music listening based on the person's music preferences administered for various purposes (e.g. management of BPSDs, prior to care, leisure activity).

Comparison: Other types of music and non-music based therapy or interventions, usual care, and control conditions.

Outcomes: BPSDs including agitation, anxiety and depression, mood and emotion, cognitive function, physiological changes, and quality of life.

Study Design: Randomised trials with a control or comparator group.

3.3.2. Exclusion

Studies were excluded if the diagnosis of the participants was not specifically dementia.

For the intervention, studies were excluded if they involved music listening that was not based on the person's preferences, active music therapy or interventions that combined music listening with other activities in one session, music listening incorporating features of music medicine, and group music listening. Also excluded were studies that did not evaluate outcomes for PWDs and those that are published in non-English language.

3.3.3. Information sources

A literature search was conducted up to July 2018 through the following electronic databases: CINAHL, Medline, ProQuest, PsycINFO, Music Periodicals and the Cochrane databases including the Cochrane Central Register of Controlled Trials. The search strategy was developed with the assistance of an academic librarian. Search terms included “music” or “music therapy” combined with “dementia” or “Alzheimer*” or “lewy body” (see [Appendix 3](#) for Medline search details). The search also included papers identified in the reference list of reviewed studies. No limitation was applied to publication date to include all relevant studies.

3.3.4. Study selection

One review author (MG) screened the titles and abstracts to determine the potential eligibility and relevance of the study. For those studies judged relevant or if relevance was unclear, full text articles were retrieved. Two other review authors (KI and SD) were then consulted to reach a consensus on the studies included in this review.

3.3.5. Data collection process

Data extracted from the full text articles included the citation, study design, setting, sample, dementia severity, the intervention and control or comparison conditions, duration of the intervention and frequency of implementation, outcomes and outcome measures, and results. One review author (MG) extracted data in consultation with the other review authors.

3.3.6. Risk of bias in individual studies

The Cochrane's Collaboration tool for assessing risk of bias in randomised trials was used for the critical appraisal of included studies (Higgins et al., 2011). The following domains were evaluated for each study: random sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessment, incomplete outcome data, selective reporting and other sources of bias.

3.3.7. Risk of bias across studies

The quality of evidence was assessed across studies restricted to randomised controlled trial design.

3.3.8. Synthesis of results

Effects of the individualised music and other interventions on each of the outcomes evaluated were compared. The p value was used in evaluating the statistical significance of the results was set at $P < 0.05$.

3.4. Results

3.4.1. Study selection

A total of 2,904 articles were identified by electronic searching and 2 papers identified by hand-searching. After removing duplicates, 1,771 papers remained. Of these, 1,630 papers were excluded during the preliminary screening based on the title and abstract. Further data extraction of 141 full text articles excluded 135 papers based on the inclusion criteria. Although six papers met the inclusion criteria, three papers were from

the same research project as confirmed by the study author (Maseda et al., 2018; Sanchez et al., 2016; Valdiglesias et al., 2017). Thus, a total of four studies were included in this review as shown in Figure 3.1.

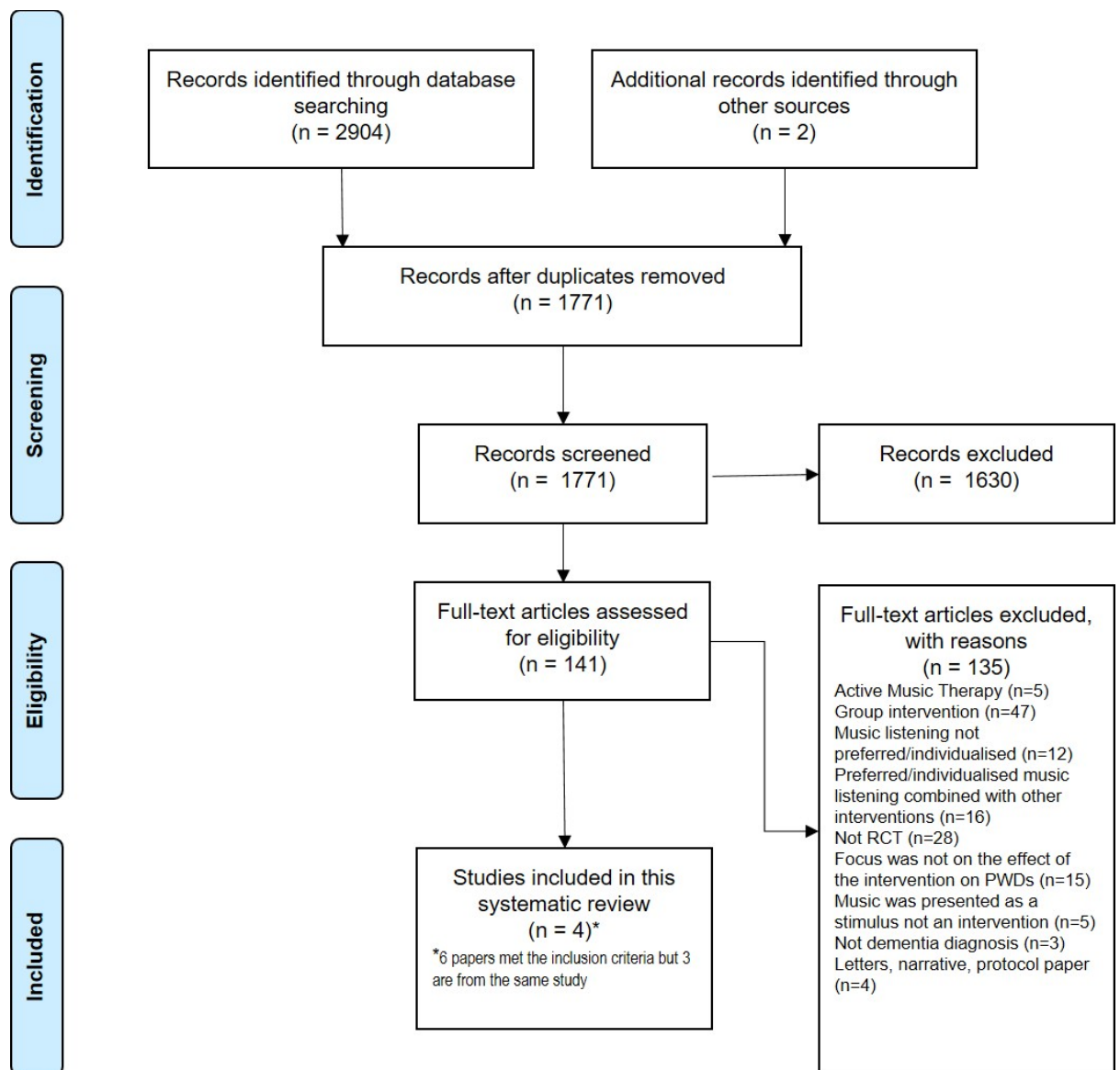


Figure 3.1. Preferred Reporting Items for Systematic Reviews and Meta-analyses flow diagram of the study selection procedure for reviewing the impact of individualised music listening intervention on persons with dementia

3.4.2. Study characteristics

The included studies were randomised trials with a control or comparison group conducted in Canada, Italy, Japan and Spain. The study setting was heterogeneous: residential care, specialised dementia complex, dementia hospital, group homes, activity centres, and inpatient centres. Participants were PWDs aged 65 years and older. Severity of cognitive impairment was from mild to very severe. The number of participants ranged from 21 (Maseda et al., 2018) to 120 (Raglio et al., 2015). Only one study specified the type of dementia (Alzheimer's' Disease) (Sakamoto et al., 2013).

The studies included a music listening intervention based on the person's preferences. As the included studies had participants in the severe to very severe stage of dementia, information about music preferences were determined from the PWDs where possible (Raglio et al., 2015; Sakamoto et al., 2013) and/or their family members (Hicks-Moore & Robinson, 2008; Maseda et al., 2018; Sakamoto et al., 2013; Sanchez et al., 2016; Valdiglesias et al., 2017) or from formal and informal caregivers (Raglio et al., 2015) who have knowledge about the music preferences of the PWD. Music was played through a compact disc (CD) player or a computer in the participant's room, in a private/quiet room or a familiar area. Trained professionals (Maseda et al., 2018; Sanchez et al., 2016; Valdiglesias et al., 2017) and a research assistant (Hicks-Moore & Robinson, 2008) delivered the intervention. In one study, it was stated only that the participants passively listened to their preferred music (Sakamoto et al., 2013) while in another study the music therapist prepared the music playlist but the participants listened to the music without interaction with the therapist (Raglio et al., 2015). The prescribed duration of the intervention was 30 minutes in three studies (Maseda et al.,

2018; Raglio et al., 2015; Sakamoto et al., 2013; Sanchez et al., 2016; Valdiglesias et al., 2017) and 10 minutes in one study (Hicks-Moore & Robinson, 2008). Except for one study wherein the participants were randomly exposed to each of the three treatments (Hicks-Moore & Robinson, 2008), the intervention was implemented either once (Sakamoto et al., 2013) or twice a week (Maseda et al., 2018; Raglio et al., 2015; Sanchez et al., 2016; Valdiglesias et al., 2017) for 10 weeks in two studies (Raglio et al., 2015; Sakamoto et al., 2013) and 16 weeks in another study (Maseda et al., 2018; Sanchez et al., 2016; Valdiglesias et al., 2017). However, in one paper, the outcomes presented were evaluated only in the first 12 weeks (Maseda et al., 2018). The details of each study are summarised in Table 3.1.

Table 3.1. Summary of included randomised controlled trials in systematic review of impact of individualised music listening intervention on persons with dementia

Citation	Design	Setting	Sample and severity of cognitive impairment	Intervention	Duration and Frequency	Outcomes	Measure	Results
Hicks-Moore & Robinson 2008	Experimental 3x3 repeated measures design	Special care units in three nursing homes (Canada)	41 PWDs (mild to moderate)	Treatment: Hand massage (HM), Favourite music (FM) and HM + FM (HMFm) Control: Usual care	10 minutes	Agitation	CMAI	TG: Reduction in verbally agitated (p=0.001) and non-aggressive behaviours (p<0.001) CG: higher agitation scores(p<0.001)
Maseda et al 2018	RCT	Specialised dementia Gerontological Complex (Spain)	21 PWDs (severe to very severe)	MSSE and individualised music	Two 30-minute weekly sessions for 16 weeks. However, the outcomes evaluated were only from the first 12 weeks.	Mood, behaviour and biomedical parameters	Interact scale, HR, SpO2	Improvement in mood and behaviour, decrease in HR (p=0.013), and increase in SpO2 (p=0.011) for both groups.
Raglio et al 2015	RCT	Nine institutions (Italy)	120 PWDs (moderate to severe)	Standard Care (SC) alone, SC + Music Therapy and SC + Listening to Music (LTM)	Music Therapy and LTM: 30 minutes biweekly for 10 weeks.	BPSDs, QoL	NPI, CSDD, CMAI, CBS-QoL	All groups showed reduction in NPI global score (p<0.001), CSDD (p=0.001), and CBS-QoL (p=0.01)

Sakamoto, Ando & Tsutou 2013	RCT	Group homes and a special dementia hospital (Japan)	39 PWDs (severe)	Treatment: interactive and passive music group control group: silent environment	30 minutes weekly for 10 weeks.	BPSDs	Faces Scale, Autonomic Nerve Index, BEHAVE-AD, Videotape of participants' behaviours	TG (passive and interactive): parasympathetic nerve activity dominance ($p<0.01$), improvement in emotional state ($p<0.01$); reduction in BEHAVE-AD items ($p<0.025$) CG: increase in affective and activity disturbance ($p<0.025$)
Sanchez et al 2016	RCT	Specialised dementia Gerontological Complex (Spain)	22 PWDs (severe to very severe)	MSSE and individualised music	Two 30-minute weekly sessions for 16 weeks.	Agitation, mood, anxiety, cognitive function, and dementia severity	CMAI, CSDD, RAID, SMMSE, BANS-S	Improvement in agitation for both groups between pre, mid and post intervention ($p=0.031$) and at follow up ($p=0.032$).
Valdiglesias et al 2017	RCT	Specialised dementia Gerontological Complex (Spain)	22 PWDs (severe or very severe)	MSSE and individualised music	Two 30-minute weekly sessions for 16 weeks.	Changes in Salivary Chromogranin A (sCgA)	sCgA	No significant differences in the sCgA levels for both groups.

Abbreviations: RCT: randomised controlled trial; PWDs: persons with dementia; MSSE: multisensory stimulation environment; HR: heart rate; SpO2: oxygen saturation; BPSDs: behavioural and psychological symptoms of dementia; QoL: quality of life; NPI: neuropsychiatric inventory; CSDD: Cornell Scale Depression in Dementia; CMAI: Cohen-Mansfield Agitation Inventory; CBS-QoL: Cornell Brown Scale- quality of life in dementia; TG: treatment group; CG: control group

An assortment of measures was used to evaluate outcomes. The BPSDs in general were evaluated using the Neuropsychiatric Inventory (Raglio et al., 2015) and the Behavioural Pathology in Alzheimer's Disease (Sakamoto et al., 2013). Specific BPSDs were evaluated using the Cohen-Mansfield Agitation Inventory for agitation (Hicks-Moore & Robinson, 2008; Raglio et al., 2015; Sanchez et al., 2016), the Rating Anxiety in Dementia scale for anxiety (Sanchez et al., 2016), and the Cornell Scale Depression in Dementia for depression (Raglio et al., 2015; Sanchez et al., 2016). In one study, mood and behaviour were also assessed using the Interact scale (Maseda et al., 2018). Cognitive function was assessed using the Severe Mini Mental State Examination (Sanchez et al., 2016) while dementia severity was determined using the Bedford Alzheimer Severity Scale (Sanchez et al., 2016). Other outcome measures include the Cornell Brown Scale – Quality of Life in Dementia (Raglio et al., 2015) to evaluate quality of life and the Faces Scale to assess emotion (Sakamoto et al., 2013). The physiological outcomes were evaluated using the heart rate (Maseda et al., 2018), oxygen saturation (Maseda et al., 2018), autonomic nerve index (Sakamoto et al., 2013) and salivary chromogranin A (Valdiglesias et al., 2017).

3.4.3. Risk of bias within studies

The included studies were randomised controlled trials employing random sequence generation. The allocation concealment was unclear for all studies as details were not clearly reported. All studies were at high risk of bias based on not blinding participants or personnel, due to the nature of the intervention. For the blinding of outcome assessment, the ratings were mixed: two studies were at low risk (Raglio et al., 2015;

Sakamoto et al., 2013), one was at high risk (Hicks-Moore & Robinson, 2008) and one was unclear (Maseda et al., 2018; Sanchez et al., 2016; Valdiglesias et al., 2017). Three studies were at low risk for incomplete data (Hicks-Moore & Robinson, 2008; Raglio et al., 2015; Sakamoto et al., 2013) while one study was rated unclear due to the lack of description as to how the authors managed missing data (Maseda et al., 2018; Sanchez et al., 2016; Valdiglesias et al., 2017). All of the included studies were rated unclear for the selective outcome reporting as there was no published protocol paper for reference on further details about the study outcomes. The Risk of Bias assessment is summarised in Table 3.2.

Table 3.2. Risk of bias summary

Citation	Random sequence generation	Allocation concealment	Blinding of participants and personnel	Blinding of outcome assessors	Incomplete outcome data	Selective outcome reporting
Hicks-Moore & Robinson 2008	Low	Unclear	High	High	Low	Unclear
Maseda et al 2018	Low	Unclear	High	Unclear	Unclear	Unclear
Sanchez et al 2016	Low	Unclear	High	Unclear	Unclear	Unclear
Valdiglesias et al 2017	Low	Unclear	High	Unclear	Unclear	Unclear
Raglio et al 2015	Low	Unclear	High	Low	Low	Unclear
Sakamoto et al 2013	Low	Unclear	High	Low	Low	Unclear

3.4.4. Results of individual studies

3.4.4.1. Behavioural and Psychological Symptoms of Dementia (BPSDs)

Two studies evaluated the impact of individualised music listening on BPSDs in general (Raglio et al., 2015; Sakamoto et al., 2013). In a study of 120 PWDs (Raglio et al., 2015), participants were randomised to standard care) alone and standard care with either music therapy or listening to music. The activities for the standard care included educational, occupational and physical activities, with no music exposure. All groups showed improvement in behavioural symptoms (delusion, anxiety, and disinhibition; $p \leq 0.001$) with no significant differences between groups. In another study (Sakamoto et al., 2013), 39 PWDs were assigned to music intervention groups (passive or interactive) or a no-music control group. Participants in the passive group listened to their preferred music while the interactive group participants engaged in interactive activities guided by a music facilitator. BPSDs associated with affective disturbance and anxieties and phobias ($p < 0.025$) were reduced in the passive group. Five Behavioural Pathology in Alzheimer's Disease (BEHAVE-AD) items were reduced in the interactive group including affective disturbance, anxieties and phobias, paranoid and delusional ideation, aggressiveness and activity disturbance ($p < 0.025$). Activity and affective disturbance were increased in the control group ($p < 0.025$). However, three weeks post intervention, BPSDs had significantly increased in both the passive and interactive groups ($p < 0.025$) while the control group showed no changes ($p = 0.025$).

3.4.4.2. Agitation

Specific BPSDs were also evaluated. For agitation, results from two studies showed positive effects of the individualised music listening (Hicks-Moore & Robinson, 2008;

Sanchez et al., 2016). Hicks-Moore and Robinson (2008) compared the effectiveness of listening to favourite music and/or hand massage in reducing agitation. Thirty-two PWDs were randomly assigned to one of three treatment groups (hand massage, favourite music, and a combination of hand massage and favourite music) and nine to the control group. For all of the three treatment types, there was a significant reduction in verbally agitated behaviours ($p=0.001$) and non-aggressive agitation ($p<0.001$). The combined treatment of favourite music and hand massage failed to demonstrate a significant reduction in agitation compared to each single treatment. The control group demonstrated significantly higher agitation scores than each treatment group. Sanchez et al. (2016) compared the multisensory stimulation environment (MSSE) with individualised music listening in a study of 22 PWDs. Improvement in agitation was noted for both groups between pre, mid and post intervention ($p=0.031$) and at follow up ($p=0.032$) with no significant differences between groups. In the study of Raglio et al. (2015), the analysis of Neuropsychiatric Inventory (NPI) subscales did not support the significant effects of preferred music listening on agitation.

3.4.4.3. Anxiety and Depression

Another outcome evaluated from the study of Sanchez et al. (2016) was anxiety. During the intervention, only the MSSE group showed reduction in anxiety. However, during follow up, the anxiety scores improved for both MSSE and individualised music group ($p=0.013$) with no significant differences between groups. Results of the NPI subscale analysis in another study (Raglio et al., 2015) showed significant improvement overtime in some of the behavioural symptoms including anxiety for all treated groups.

In the study of Sanchez et al. (2016) there was worsening of the Cornell Scale for Depression in Dementia (CSDD) scores during the intervention for the individualised music group while the scores remained stable in the MSSE group. During the follow up period, the CSDD scores of both individualised music and MSSE participants improved with no significant differences between groups ($p=0.021$) (Sanchez et al., 2016). The CSDD scores of the participants from the study of Raglio et al. (2015) improved for all groups ($p = 0.001$).

3.4.4.4. Physiological Outcomes

Physiological outcomes were evaluated in two studies (Maseda et al., 2018; Sakamoto et al., 2013; Sanchez et al., 2016; Valdiglesias et al., 2017). In one of the articles from the study comparing individualised music with MSSE (Valdiglesias et al., 2017), the effects of the interventions on the salivary chromogranin A (sCgA) as a biomarker of psychological stress was reported. Results showed no significant differences in the sCgA levels before and after each MSSE and individualised music sessions. In another article from the same study reporting the results for the biomedical parameters (Maseda et al., 2018), participants from both groups demonstrated a reduction in heart rate ($p=0.013$) and an increase in oxygen saturation ($p=0.011$) from before to after each session with no significant differences between groups. Sakamoto et al. (2013) also evaluated the short-term effects of passive and interactive music interventions on parasympathetic nerve activity. Participants from both groups showed parasympathetic versus sympathetic nerve activity dominance ($p<0.01$) indicating reduced stress and increased relaxation. The improvement however was greater in the interactive group.

3.4.4.5. Mood and emotion

Effects of the interventions on mood and emotions were evaluated in two studies (Maseda et al., 2018; Sakamoto et al., 2013). During the intervention, MSSE group participants were noted to be more observant ($p=0.044$) while the individualised music group participants were more relaxed ($p=0.003$) (Maseda et al., 2018). Ten minutes after each session, participants from both MSSE and individualised music were more happy/content ($p<0.001$), talked more spontaneously ($p=0.009$), related to people better ($p=0.002$), were more attentive/focused on their environment ($p<0.001$), enjoyed themselves more ($p=0.003$), were less bored/inactive ($p=0.004$), and were more relaxed/content ($p=0.003$) (Maseda et al., 2018). Similarly, in the study by Sakamoto et al. (2013), analysis of the Faces Scale revealed that participants who passively listened to their preferred music were in a more comfortable mood after the intervention ($p<0.01$) while participants who engaged in interactive activities showed even greater improvement in emotional state ($p<0.01$).

3.4.4.6. Other outcomes

In the article of Sanchez et al. (2016), the effects of MSSE and individualised music on dementia severity and cognitive function were reported. For the dementia severity, only the MMSE group showed some improvement during the pre-, mid-, and post-intervention assessments. However, during the follow-up period, both MSSE and individualised music group demonstrated worsening of dementia (Sanchez et al., 2016). The cognitive status of the participants from both groups declined during the trial (Sanchez et al., 2016). In addition to BPSDs, Raglio et al. (2015) included the

evaluation of quality of life (QoL) of the PWDs. Improvement in the QoL was noted ($p=0.01$) for all treated groups with no significant differences between groups.

3.4.5. Risk of bias across studies

Due to the restriction of the eligibility criteria to RCTs and the intervention to individualised music listening, there were only four studies included in this review. Thus, some of the outcomes were evaluated by a single study. Also, three of the included studies had a sample size of less than 50. The small number of eligible studies and the small sample size of included studies limit the conclusions that can be drawn about the interventions and outcomes evaluated.

3.5. Discussion

3.5.1. Summary of evidence

Consistent with previous reviews (Han et al., 2016; McDermott et al., 2013; van der Steen et al., 2017; Vasionyte & Madison, 2013; Vink et al., 2003), BPSDs were commonly evaluated outcomes in the included studies. The result of this systematic review supports the promising impact of individualised music listening on a number of BPSDs. These include verbally agitated behaviour (Hicks-Moore & Robinson, 2008), non-aggressive behaviours (Hicks-Moore & Robinson, 2008), delusion (Raglio et al., 2015), disinhibition (Raglio et al., 2015), anxiety (Raglio et al., 2015; Sakamoto et al., 2013; Sanchez et al., 2016), phobias (Sakamoto et al., 2013), affective disturbance (Sakamoto et al., 2013) and depression (Raglio et al., 2015; Sanchez et al., 2016). Individualised music listening interventions also had positive short-term effects on

mood and emotion (Maseda et al., 2018; Sakamoto et al., 2013). Interestingly, in the study that compared music therapy with music listening and standard care (Raglio et al., 2015), no significant differences were noted between groups. This is in contrast with the findings from previous reviews which demonstrated the superiority of music therapy over other interventions in the reduction of BPSDs (Raglio et al., 2012; Ueda et al., 2013). Raglio et al. (2015) delineated some factors that may have contributed to this including the large number of dropouts and the outcome measurement used.

In this review, results of some outcomes varied between studies. For agitation, the two studies that used Cohen-Mansfield Agitation Inventory (CMAI) as a measurement tool showed positive effects of individualised music (Hicks-Moore & Robinson, 2008; Sanchez et al., 2016) while another study that used the global NPI did not support this positive outcome for the music listening group (Raglio et al., 2015). Raglio et al. (2015) contended that compared to music therapy where the PWD's interaction with a music therapist could possibly contribute to treatment efficacy, the therapeutic effect of music listening is mainly from the music exposure itself. For anxiety, two studies reported improvement in anxiety in all study groups including the music listening (Raglio et al., 2015; Sakamoto et al., 2013). However, in another study, the individualised music group failed to show improvement in anxiety during the intervention but showed improvement during the follow up period (Sanchez et al., 2016). For depression, CSDD scores for all groups including music listening improved in one study (Raglio et al., 2015) but worsened during the intervention period then improved at follow up in another study (Sanchez et al., 2016). Likewise, for the physiological outcomes, positive effects of individualised music listening were demonstrated in two studies such as

decreased heart rate, increased oxygen saturation (Maseda et al., 2018) and parasympathetic nerve activity dominance (Sakamoto et al., 2013). However, evaluation of the salivary chromogranin A (sCgA) levels failed to demonstrate beneficial effects for both the individualised music and the comparison group (MSSE) (Valdiglesias et al., 2017).

Cognitive function, dementia severity (Sanchez et al., 2016) and quality of life (Raglio et al., 2015) were evaluated by a single study. Results showed decline in cognitive function and worsening of dementia severity for the individualised music group (Sanchez et al., 2016). This is consistent with the findings from previous reviews of music based therapy and interventions where significant effects on cognitive function were not demonstrated (Fusar-Poli et al., 2017; Ueda et al., 2013). The minimal effectiveness of treatments could be attributed the irreversible and progressive nature of cognitive disabilities associated with dementia (Sherrell et al., 2011). For the quality of life of PWDs, improvement was noted over time in all treated groups (Raglio et al., 2015).

Regarding the duration and frequency of the implementation, three of the included studies administered the interventions for 30 minutes weekly or biweekly. One study had the shortest duration with 10 minutes each of the three treatments (hand massage, favourite music, and combined favourite music and hand massage) (Hicks-Moore & Robinson, 2008). Although the optimal dosage of the intervention to achieve therapeutic effects remains unclear (Blackburn & Bradshaw, 2014; Tsoi et al., 2018; van der Steen et al., 2017), it must be noted that the long term effects of the interventions were not

evaluated in this study, with assessments performed 10 minutes before, immediately after and 1 hour post intervention (Hicks-Moore & Robinson, 2008).

Considering the harrowing impact of BPSDs on PWDs and their family and caregiver (Ostaszkiwicz et al., 2015), results of this systematic review demonstrating the promising impact of individualised music on some BPSDs is valuable. Even though the benefits of the other interventions were greater or better compared to individualised music for some outcomes (Sakamoto et al., 2013; Sanchez et al., 2016), individualised music listening requires minimal resources compared to these interventions. The authors of the study involving MSSE stressed that the greater economic investment involved in MSSE must be taken into consideration when individualised music interventions may be as effective (Maseda et al., 2018). In addition, Bellelli, Raglio, and Trabucchi (2012) highlighted that from a cost-effective perspective, it is important to also consider the economic sustainability of an intervention (Bellelli et al., 2012). Another important consideration is the ease of administering the intervention so it can be implemented in various settings without requiring the presence of professionally trained facilitators such as music therapists (Tsoi et al., 2018). Blackburn and Bradshaw (2014) posited that it remains unclear whether involvement of a music therapist in the delivery of a music intervention is crucial for its success. With the guidelines recommending the involvement of family and carers in the management of BPSDs and the use of non-pharmacologic interventions that are tailored to the individual's preferences (Laver et al., 2016; National Institute for Health and Care Excellence (NICE), 2018), this relatively safe, simple and inexpensive intervention could be of great value.

3.5.2. Limitations of this review

Limitations include only literature found in the electronic databases searched (n=6), the language of publication (English), and the small number of studies that met the inclusion criteria. Some of the outcomes were evaluated by a single study (e.g. cognitive function, dementia severity, quality of life), limiting the conclusions drawn about these outcomes. Due to the heterogeneity of the population with PWDs in the mild to very severe stages of cognitive impairment, it is not possible to conclude which dementia severity would benefit most from the individualised music.

3.6. Conclusion

This systematic review supports the promising impact of individualised music listening intervention on a number of short-term and long-term BPSDs and physiological outcomes for PWDs. Three of the included studies demonstrated positive short-term or immediate outcomes for the individualised music listening intervention (Hicks-Moore & Robinson, 2008; Maseda et al., 2018; Sakamoto et al., 2013; Valdiglesias et al., 2017). Although most of the long-term outcomes were heterogeneous, there was consistent evidence in favour of the beneficial effects of individualised music listening. The efficacy of individualised music listening was comparable to other interventions requiring more resources. While the individualised music listening intervention did not have a positive effect on cognitive function and dementia severity, these outcomes were evaluated in a single study only (Sanchez et al., 2016). Overall, the findings from this review must be interpreted with caution due to the small number of RCTs that evaluated individualised music listening. In agreement with the recommendations from previous

reviews on music based therapy and interventions, there is a need for more rigorously conducted studies that explore the impact of individualised music listening on other outcomes apart from BPSDs. Additionally, with individualised music listening's potential for large-scale implementation in various settings, future studies should take into consideration the evaluation of the economic aspect (Bellelli et al., 2012; Raglio et al., 2012) as well as the processes and contextual issues involved for its sustained implementation (Greenhalgh et al., 2004; Peters et al., 2013).

In this chapter, findings from the included RCTs support the promising impact of an individualised music listening on a number of outcomes for people living with dementia especially BPSDs. Gaps in the literature in terms of the limited number of RCTs conducted and the outcomes evaluated (mainly BPSDs) were identified. In the following chapter, the methodology and study design which are built on the evidence relating to the use of individualised music for older people living with dementia and the need to conduct a research that focuses on the implementation of an individualised music listening for people with dementia in a residential aged care setting are presented.

Chapter 4 Methodology, design and methods

4.1. Introduction

In the previous chapter, evidence of the effectiveness of individualised music listening on a number of outcomes for older people living with dementia from randomised controlled studies was summarised and discussed. While there were limited findings from four studies that met the inclusion criteria, the review highlighted the promising effectiveness of individualised music listening in improving behavioural and psychological symptoms of dementia (BPSDs), physiological outcomes, and mood and emotion of the person with dementia. The effectiveness of individualised music listening was comparable to other resource-intensive interventions such as multisensory stimulation environment and interactive group music intervention. A recommendation from the review was for future studies to be designed to explore the processes and contextual issues involved for a sustained implementation of the individualised music listening intervention for people living with dementia.

This chapter provides an outline of the aim, objectives and research questions for such a study to examine these issues and provides justification for the use of mixed methods methodology, design and methods. The underlying philosophy, methodology, design and methods used, the processes and contextual issues in residential aged care affecting the integration of the individualised music listening in the daily care of the person with dementia are described and explored. The content of this chapter includes a detailed discussion of the study setting, sample, recruitment, implementation strategies used, the individualised music listening intervention, outcomes evaluated, measures used, data collection and analysis and ethical considerations for the implementation of this research.

4.2. Study aim, objectives, and research questions

The study aim was to evaluate the implementation of an individualised music listening intervention for older people living with dementia living in residential care. There were three objectives of this study, each associated with specific research questions:

Objective 1: To explore strategies that promote adoption, acceptability, appropriateness, feasibility, fidelity, and sustainability of implementing an individualised music listening intervention within a residential aged care facility. The research questions used to address this objective are outlined below.

1. What are the effects of implementation strategies on the adoption, acceptability, appropriateness, feasibility, fidelity, and sustainability of an individualised music listening intervention in a residential aged care facility for older people living with dementia?
2. What are the actual financial costs associated with the implementation of an individualised music listening intervention for the residential aged care service provider?
3. What are the experiences and perceptions of family and staff regarding the use of an individualised music listening for older people living with dementia in a residential aged care facility?
4. What are the facilitators and barriers to the implementation of an individualised music listening intervention in a residential aged care facility for older people living with dementia?

Objective 2: To determine the impact of an individualised music listening intervention on older people living with dementia. The specific research question for this objective is:

5. Does the use of an individualised music listening intervention for older people living with dementia impact levels of agitation, quality of life, their engagement during the intervention, and prescription and use of psychotropic medications.

Objective 3: To determine the extent to which qualitative results explain the quantitative results. The research question corresponding to this objective is:

6. To what extent do the experiences and perceptions of family/guardian and staff explain the impact of the implementation strategies and the individualised music intervention in a residential care facility for older people living with dementia?

4.3. Pragmatism

As with qualitative and existential methodologies such as phenomenology, grounded theory, and ethnography, pragmatism views knowledge and truth as both constructed and based on the reality of the world in which humans live and experience (Liamputtong, 2013). The main aim for pragmatists and existentialists alike is to understand reality, the lived world as it is experienced (Lipps & Hills, 2010). For pragmatists however, action precedes knowledge: action begs no “explanation but rather is the starting point for explanation” (p.1) (Kilpinen, 2008). Pragmatism argues that knowledge and truth about the world are acquired based on action, through observation, experience, and experimentation (Grbich, 2013; Kaushik & Walsh, 2019; Kilpinen, 2008). As Lipps and Hills (2010) argue, “we never experience things in some isolated fashion as ‘objects’, but always in the context of situations” (p.109). Therefore,

knowledge about the world is always based on episodes, or encounters in action.

Knowledge itself is a reconstruction of action, activity. Knowledge is not an isolated event; for pragmatists knowledge is always relatable, situational (Lipps & Hills, 2010).

Thus, knowledge and truth can only be understood or meaningful through their subsequent effect, as practical experience and in our transactions with the things of the world. Knowledge and truth can only be discovered in the “field of action” (Lipps & Hills, 2010) and are always based on experience (Kaushik & Walsh, 2019).

The reason why pragmatism does not begin from questions of knowledge, although it does not belittle its importance, is primarily ontological (Kilpinen, 2008). Pragmatism’s ontology reflects evolution of humankind thus acknowledges humans as constantly changing and adapting to new situations and that the world in which we live; our environment also undergoes constant change (Johnson & Onwuegbuzie, 2004; Kaushik & Walsh, 2019; Kilpinen, 2008). Thus, rather than asking what it means to be human in the world, to live in and experience the world, the ontology of pragmatism is interested in the processes of being in the world; what happens to beings in the world (Kilpinen, 2008). While traditional existential epistemologies and ontologies assume that the human subject approaches the world of which she wishes to gain knowledge, the situation may also be one where the world approaches the human subject (Kilpinen, 2008). Kilpinen (2008) argues that the world itself impinges on being, that unprecedented things can happen beyond an individual’s beliefs, expectations or assumptions about the world. The world itself creates the notion of “initiative”, the world around us is not static, and thus it shapes being.

For pragmatists, the choice of explanations and methodological tools are guided by the epistemic interest of the researchers; what we want to know, and pragmatic aspects, such as efficacy, efficiency or simplicity, rather than ontological investigations (Lohse, 2017). Works of classic pragmatists including Charles Sanders Pierce, William James and John Dewey have been instrumental in understanding the pragmatic method (Johnson & Onwuegbuzie, 2004). Pragmatism is not a doctrine but a method both of explaining the meaning of concepts and showing the meaninglessness of certain metaphysical ideas (Pierce, 1897, as cited by Haack, 1977). That is to say, pragmatism is not guided or influenced by a set of preconceived beliefs or views about a concept. The core of pragmatism according to Pierce lies in its account of meaning (Haack, 1977). Pierce suggests that to determine the meaning of words, concepts, ideas, and beliefs, we must “consider what effects, that might conceivably have practical bearings, we consider the object of our conception to have, then our conception of those effects is a whole of our conception of the object” (p.389) (Haack, 1977). In other words, we understand the meaning of a concept (or an idea) on the basis of our understanding of its practical consequences or the outcomes resulting from our experience with such concept (or idea). Additionally, we act on the basis of our understanding of the practical consequences of our actions f (Kaushik & Walsh, 2019).

James, in his seminal writings (James, 1907), stresses the value of practical consequences in pragmatism and argues that the pragmatic method is a method of settling metaphysical disputes by tracing its practical consequences. Examining practical consequences help in deciding which action to take to better understand real-

world phenomenon (Johnson & Onwuegbuzie, 2004). Actions according to Kaushik and Walsh (2019) are linked to consequences. As the world and reality are not static (Kaushik & Walsh, 2019), action's link to consequences is subject to change in a way that change in the situations of the action results to change in their consequences. Understanding the link between action and consequences is fundamental in the concept of inquiry in pragmatism according to Dewey (Kaushik & Walsh, 2019). Dewey argues that inquiry is a form of experiencing which aims to create knowledge (Kaushik & Walsh, 2019; Talisse, Aikin, & Goffey, 2008). Dewey also views that one conducts an inquiry as a response to problematic situation under which and within which an individual organism functions at a given time (Talisse et al., 2008). In the light of the practical consequences, pragmatism offers a practical and outcome-oriented method of inquiry (Johnson & Onwuegbuzie, 2004).

4.3.1. How pragmatism relates to the research topic, the study participants, and the music intervention

4.3.1.1. Epistemic interest

Knowledge according to Lipps and Hills (2010) always responds to a question one examines and one desires to “know” in order to gain something from such knowledge. For this study, the candidate was interested in evaluating the effects of the implementation strategies on the implementation of the music intervention. The effects in this context relate to a number of things: actual episodes of music intervention implementation by staff and family or guardian, staff and family or guardians' experience with the implementation (e.g. positive or negative), and responses of the participating older people living with dementia to the music intervention.

Contemplating on the setting and the context of implementation, the candidate took into account a number of practical experiences where knowledge about the outcomes of interest could be derived. These include the actual experience of the music intervention implementation by the stakeholders involved, the candidate's observation and experience throughout the research implementation period, and the objective measures (assessments) of the music intervention's effects on older people living with dementia completed by the candidate and the staff members through the various points of data collection. This reflects the epistemology of pragmatism discussed earlier where action comes before knowledge and knowledge is acquired through experimentation, experience, and observation.

A researcher's beliefs that influence the design and conduct of research are shaped by a number of factors including the researcher's previous experiences and the larger research communities (Kaushik & Walsh, 2019). The candidate's previous understandings about implementation of non-pharmacologic interventions in a residential aged care setting were important in guiding the methodological approaches for this study. In the conceptualisation of this research project, the candidate initially considered her knowledge about the implementation setting from her own work experience in residential aged care as initially discussed in Chapter 1 section [1.5](#). The candidate was aware that workflow and staffing patterns were among the factors that could potentially affect the implementation of the music listening intervention. For example, in the case of an assistant in nursing, routine duties are mainly focused on the basic activities of daily living of the older people. Provision of recreational or leisure activities on the other hand is the main responsibility of the leisure and lifestyle staff.

Each staff has a set of duties to complete within a specified period during their shift in accordance to their job description. The candidate anticipated that implementation of the music intervention on a prescribed basis may not be workable as implementation would likely depend on the staff members' availability and interest or the family or guardians' visiting times. To answer the research questions, it was deemed necessary by the candidate to employ methods that are practical and workable for the people involved in the implementation and in the context of the residential aged care.

4.3.1.2. Views of the human subjects (study participants)

Apart from the setting and organisational context, another consideration was the various stakeholders involved in the implementation of the music intervention (facility management, staff members, people living with dementia, family or guardian of people living with dementia). Lipps and Hills (2010) highlights that ones' action corresponds to the situation and the given truth. The staff and family or guardian may have different experiences with the music intervention implementation in accordance to the varying day-to-day situations that they encounter. Although a protocol for the implementation of the music intervention was designed to help standardise the implementation and similar implementation strategies were employed across implementation sites, it was assumed that there might be variations that staff and family or guardian may employ to adapt to the local contexts and situations.

Regarding music, evidence demonstrates its promising impact for older people and people living with dementia. The music used in this study are based on the older person's preferences as discussed in section [4.8.4](#) of this chapter. Although listening to

their favourite music may have been a positive experience for the participating older people in the past (e.g. prior to the onset of dementia or prior to their admission to residential aged care) it is worth noting that pragmatists view organisms (human beings) and realities as constantly changing. A given truth or point of view which may be correct at the moment can be outstripped in the course of time (Lipps & Hills, 2010). The candidate expected that there might be instances where some of older people may not positively respond to the music intervention. Thus, various methods were employed to ensure that the older people's responses to the music intervention were captured from different perspectives.

4.3.1.3. Consideration of other paradigms

The positivist and constructivist paradigms are considered as the dominant paradigms used to explain the nature of knowledge and reality (Liamputtong, 2013). Positivist paradigm is underpinned by the belief that reality is objective and the enquiry in research aims at explaining, predicting or controlling that reality (Liamputtong, 2013). Conversely, constructivist paradigm highlights that research is a subjective process and reality is defined by the participants' interpretation of their own realities (Liamputtong, 2013). Pragmatism on the other hand is not driven by any point of view; it rather resorts to practical experiences in its pursuit for truth (Lipps & Hills, 2010). Thus, the focus of the underlying methodology in this study are the research questions that required answers from an assortment of data collection approaches that suit the study setting, study population, and the day to day situation of music intervention implementation (Liamputtong, 2013)

The candidate took into consideration the possible consequences if a single quantitative or quantitative method was used in relation to answering the research questions. For instance, if a quantitative approach was used, evaluation of the effects of the implementation strategies used and the music intervention were only viewed from the candidate's observations and the objective measures or instruments used. In the context of the residential aged care setting, the objective measures were insufficient to determine the extent of the implementation and the underlying processes involved as realities are not only natural or physical but also psychological and social (Johnson & Onwuegbuzie, 2004; Liamputtong, 2013). In other words, an exclusively quantitative approach would fail to capture the lived experiences of the people involved in the implementation. Thus, the candidate recognised that it was equally important to consider the varying experiences and perspectives of the study participants in the implementation of the music intervention. Meanwhile, if a qualitative method was solely used, the candidate considered that the staff and family or guardian's participation in the regular implementation of the music intervention would be challenging and this may limit their participation in the qualitative component of the study. For practical reasons, the candidate did not rely on the focus group and interview data as the main source of research data as the study participants may change their minds regarding their participation along the course of the research implementation period.

4.3.3.4. Applicability of pragmatism in mixed methods research

The philosophical underpinnings of pragmatism align with the objectives of this mixed methods implementation study wherein understanding the processes and contexts

involved in the implementation require various sources and viewpoints based on the real world experience. From a philosophical perspective, mixed methods research is most often associated with the philosophical orientation of pragmatism which “attempt to fit together the insights provided by qualitative and quantitative research into a workable solution” (Johnson & Onwuegbuzie, 2004) (p. 16). Pragmatism rejects the either-or choice between positivism (quantitative) and constructivism (qualitative) (Teddlie & Tashakkori, 2009). Rather than focusing on the two opposing poles of quantitative versus qualitative, (Teddlie & Tashakkori, 2009), pragmatists focus on the issues existing on a continuum throughout the research process and the research questions that require various data collection approaches (Grbich, 2013; Teddlie & Tashakkori, 2009).

Johnson and Onwuegbuzie (2004) argue that both quantitative and qualitative approaches have benefits and costs. Gaining understanding of the strengths and weaknesses of quantitative and qualitative research enables the researchers to collect multiple data using different methods and strategies. (Johnson & Onwuegbuzie, 2004). Research findings resulting from the use of different methods and strategies are characterised by the complementary strengths and non-overlapping weaknesses of the quantitative and qualitative research methods (Johnson & Onwuegbuzie, 2004).

Additionally, putting together the procedures and insights from both quantitative and qualitative approaches enables the researchers to produce a more workable solution and offer the best opportunities for answering the research questions (Johnson & Onwuegbuzie, 2004). For this study, the complexity of implementation research compounded by the setting where the study was carried out and the various stakeholders

involved contributed to the candidate's decision to incorporate both the quantitative and qualitative perspectives to see what works and what answers the research questions (Teddle & Tashakkori, 2009).

4.3.3.5. Limitations of the pragmatic methodology

Issues relating to combining research methods

One of the issues with pragmatism is the view among some researchers that it is impossible to integrate quantitative and qualitative methods thus one should always work within the quantitative or the qualitative paradigm (Johnson & Onwuegbuzie, 2004; Teddle & Tashakkori, 2009). Teddle and Tashakkori (2009) cited the debate of incompatibility thesis, which highlights that each paradigm is associated with specific research methods. As the underlying tenets of different paradigms are in conflict with one another, it is thought that mixing the methods associated with these paradigms is inappropriate (Teddle & Tashakkori, 2009). The justification for the use of pragmatism as an underlying philosophy in mixed methods research is supported by the literature (Grbich, 2013; Johnson & Onwuegbuzie, 2004; Teddle & Tashakkori, 2009) and the underlying ontological and epistemological considerations of this study.

Bryman (2006) however pointed out that among the issues associated with combining quantitative and qualitative approaches is that using mixed methods may not be appropriate to the research questions and in some instances may not have a well-founded rationale. The mixing of the research methods in this study was mandated by the research questions. The potential limitation relating to the appropriateness of the mixed methods approach in relation to the research questions was addressed during the

conceptualization and design of the study. The candidate identified the research questions that addressed the outcomes of interest. Each research question was carefully evaluated in relation to the best approach in which it could be answered in the context of the research topic and the study aims. Quantitatively oriented questions were addressed using a quantitative approach and qualitatively oriented questions were addressed using a qualitative approach, as discussed in section [4.9.3](#) of this chapter.

The candidate anticipated that there was a possibility of dominance of data gathered from one approach over another due to the challenges with data collection involving staff and family or caregivers for both research methods as discussed in sections [4.3.1.3](#) and [4.10](#) of this chapter. This was addressed prospectively during the design of the study where the purpose or use of the inferences from each research method was clearly described (see section [4.9.3](#) of this chapter). The intent of integrating the data was primarily to enhance understanding. For instance, for the quantitatively oriented questions, the qualitative inferences were used to explain, supplement or clarify the quantitative inferences. For the qualitatively oriented questions, the quantitative inferences were compared to or used to supplement the quantitative inferences.

Utility of the pragmatic solution

Johnson and Onwuegbuzie (2004) enumerated a number of limitations of pragmatism including the question as to for whom is the pragmatic solution useful and that what is meant by workability can be vague. In the preceding sections, the pragmatic solution was deemed useful by the candidate in terms of answering the questions that seeks to

investigate the implementation of the music intervention and workable in the context of the residential aged care setting and the people involved in the implementation.

Another consideration of the pragmatic method is the influence of the researcher's world view and beliefs in the choice of the research questions which are considered as worthy of inquiry and the appropriate methodology (Kaushik & Walsh, 2019). The justification for the need to conduct this implementation study was discussed in Chapter 2 section [2.11](#) where a gap between the efficacy and routine implementation of an individualised music listening intervention for people with dementia was highlighted.

Citing Dewy's work on inquiry, Kaushik and Walsh (2019) stressed that once a research problem is identified by the researcher, it is important to investigate the problem from various perspectives in accordance to the purpose of the inquiry. This was dealt with in this study by obtaining regular feedback from study participants as one of the implementation strategies. While it was the candidate who initially identified the research problem, the feedback process enabled the candidate to investigate the problem from the perspectives of the people involved in the music intervention implementation. The regular feedback also addressed another limitation relating to the constancy of change among people and situations, which is a prominent view in pragmatism. Thus, flexibility was considered in the design of the study. The study protocol was open for changes in order to adopt to the possibly changing situations throughout the research implementation period.

4.4. Methodology and study design: Mixed methods approach

The study used a mixed methods design incorporating a pre-test post-test design (quantitative component) and qualitative description through focus groups and individual interviews (qualitative component). Tashakkori and Creswell (2007) define mixed methods as “research in which the investigator collects and analyses data, integrates the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or program of inquiry” (p.4). Creswell (2015) highlighted that the core assumption of a mixed methods approach is that the collective strength of combining statistical trends (quantitative data) with personal experiences (qualitative data) fosters a broader understanding of the research problem.

4.4.3. Application of parallel mixed method design to the study

The research objectives and questions were generated at the start of the study addressing both the quantitative and qualitative components (conceptualisation stage). The first research objective aimed to explore strategies that promote adoption, acceptability, appropriateness, feasibility, fidelity, and sustainability of implementing an individualised music listening intervention within a residential aged care facility. Using the approach outlined by Creswell (2015), separate quantitative and qualitative questions were included. The questions addressed using the quantitative approach were: (1) What are the effects of the implementation strategies on the adoption, acceptability, appropriateness, feasibility, fidelity and sustainability of an individualised music listening intervention in a residential care facility for older people living with dementia and (2) What are the actual financial costs associated with the implementation of an

individualised music listening intervention for the residential aged care service provider?. The questions addressed using the qualitative approach were: (3) What are the experiences and perceptions of family and staff regarding the use of an individualised music listening for older people living with dementia in a residential aged care facility and (4) What are the facilitators and barriers to the implementation of an individualised music listening intervention in a residential care setting for older people living with dementia in a residential aged care facility?

The second research objective was to determine the impact of an individualised music listening intervention on older people living with dementia. The research question formulated for this objective was: (5) Does the use of an individualised music listening intervention for older people living with dementia impact levels of agitation, quality of life, their engagement during the intervention, and prescription and use of psychotropic medications? This was answered using quantitative method.

The third research objective addressed the integration of both quantitative and qualitative results. The mixed methods research question for this objective was: (6) To what extent do the experiences and perceptions of family and staff explain the impact of the implementation strategies and the individualised music listening intervention in a residential care facility for older people living with dementia? This was answered by exploring the inferences drawn from the qualitative data to help understand the findings of the quantitative data.

Quantitative and qualitative data were collected independently from different data sources and analysed separately (see experiential stages as detailed in Figure 1).

Quantitative data collection included pre and post measures using the implementation outcomes questionnaire, assessments of the outcomes relating to impact of the music intervention on older people living with dementia (e.g. agitation, quality of life, engagement during the intervention, psychotropic medication prescription and use) and documented records of implementation from the music intervention logbooks. These measures are described in detail in section [4.8.5](#) of this chapter. Quantitative data were analysed using statistical methods, as described in section [4.9.1](#) of this chapter. Qualitative data collection included focus group and individual interviews, open-ended section of the implementation questionnaire, and the progress notes documentation of the participating older people which were analysed using qualitative content/thematic analysis as described in section [4.9.2](#). An exception relating to the independent collection of quantitative and qualitative data was the data from the open-ended section of the questionnaire, which was collected together with the rest of the questionnaire items used as part of the quantitative data. However, analysis of the data from the open-ended section of the questionnaire was undertaken with the other qualitative data components. The resulting inferences from each method (inferential stages in Figure 3.1) were integrated into meta-inference and this is reported in Chapter 8.

4.4.1. Parallel mixed design

A parallel mixed design (as illustrated in Figure 4.1) was used to allow inferences from both quantitative and qualitative components of the study. This design is also referred to as concurrent or simultaneous (Teddlie & Tashakkori, 2009). The design consists of at least two relatively independent parallel strands (quantitative and qualitative) in terms of questions, data collection and analysis. The quantitative and qualitative phases of the study either occur simultaneously (where both phases start and end approximately at the same time) or with some time lapse (where one phase starts or ends later than the other). Inferences are derived from the integrated results of both strands (Teddlie & Tashakkori, 2009).

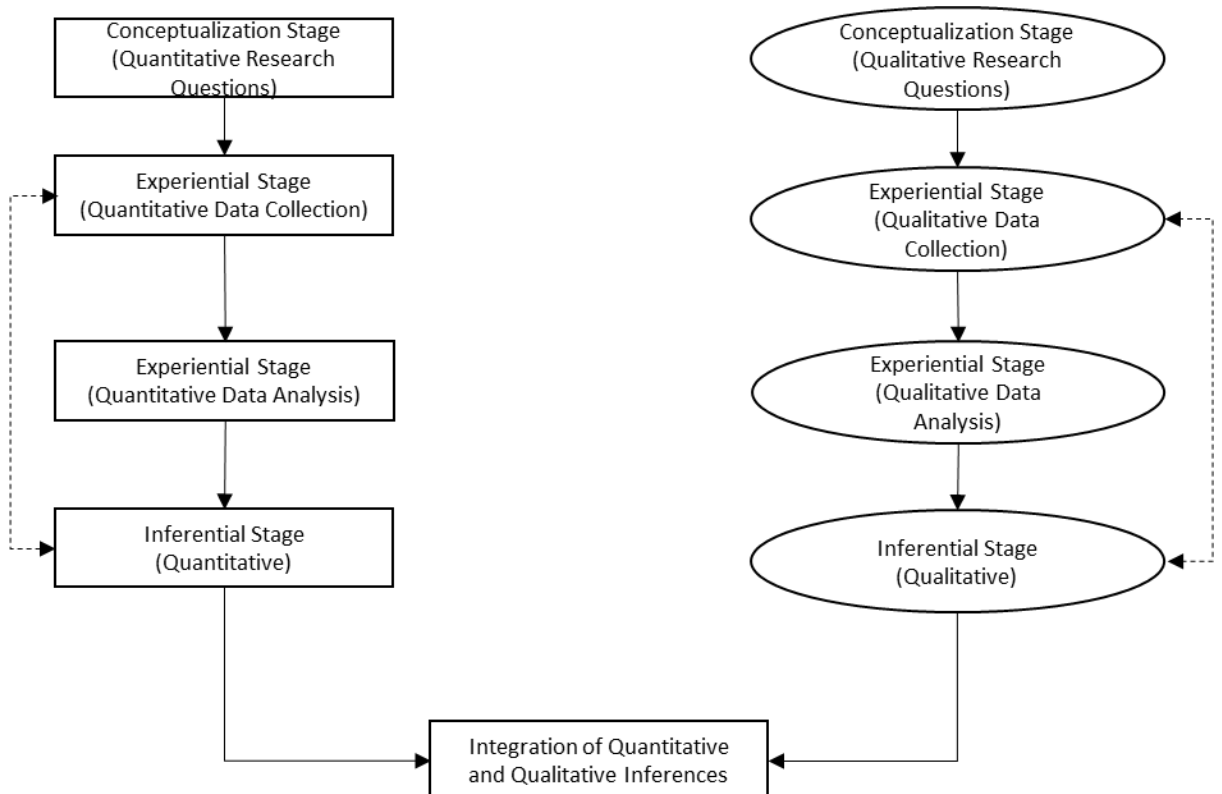


Figure 4.1. Application of parallel mixed design (Teddlie, 2009)

4.4.2. Rationale for a mixed methods design

4.4.2.1. Suitability of mixed methods design for implementation research

A variety of research methods and approaches are used for implementation research including pragmatic trials, effectiveness-implementation hybrid trials, quality improvement studies, participatory action research, realist review, and mixed methods research (Peters et al., 2013). Although it was not specifically designed for implementation research, Peters et al. (2013) stated that a mixed methods design is suitable for this type of research activity as it “provides practical ways of understanding multiple perspectives, different causal pathways and multiple types of outcomes” (p. 51). This is in agreement with Greenhalgh et al. (2004) contending that when exploring the processes involved in the implementation and sustained integration of an innovation, an in-depth mixed-methodology study is recommended to obtain a rich picture of these processes. If a study is implementation-heavy (e.g. implementation strategies are the primary focus and/or implementation variables are the primary outcomes), the recommended research designs include mixed methods and quasi-experimental studies (Figure 4.2) (Peters et al., 2013). As implementation variables are the primary outcomes and implementation strategies are addressed in the research questions, this research is implementation-heavy. Also, the opportunity to include assorted divergent views (Teddle & Tashakkori, 2009) was important for this research to provide a more accurate evaluation of the implementation strategies and their impact on the implementation outcomes, as well as the impact of the music intervention on older people living with dementia.

While the other approaches, for example a pragmatic trial or effectiveness-implementation hybrid trial, were considered appropriate to address the process involved in the implementation of the music intervention as well as the effectiveness of the music intervention for people living with dementia, a number of considerations were noted in terms of the limited resources and the timeframe for the conduct of this study. The funds were mainly from the research training scheme of the Australian government and the candidate was enrolled full time, which meant that the research must be completed within the three-year period of the PhD candidacy. Also, a research approach where heavy involvement was expected from study participants is challenging in a residential aged care setting as recruitment and attrition of participants is a widely documented issue (Garcia, Kelley, & Dyck, 2013; Hall, Longhurst, & Higginson, 2009; Lam et al., 2018; Murfield, Cooke, Moyle, Shum, & Harrison, 2011; Tilden, Thompson, Gajewski, Buescher, & Bott, 2013). Thus, a mixed methods design was considered appropriate for addressing the objectives of this study.

A parallel mixed methods design was chosen for this study due to anticipated challenges associated with data collection, in particular, the quantitative data. The constraints on conducting research in residential aged care settings are well documented (Garcia et al., 2013; Hall et al., 2009; Lam et al., 2018; Zapka et al., 2014) including limitations of time and other factors such as waning of initial enthusiasm in participating in research and high staff turnover. For informal caregivers such as family members of older people, potential issues include their work schedules and visit times that make accommodating the demands of the study challenging (Lam et al., 2018; Leach, Ziaian, Francis, & Agnew, 2016). These constraints may impact the quality of the research such

as low response rates for questionnaires or surveys that participants are asked to complete and incomplete or missing data (Garcia et al., 2013; Lam et al., 2018). In light of these challenges it was important to integrate qualitative interviews with the pre-test post-test study so as not to limit understanding about the implementation of the music intervention from one perspective especially as the pre-test post-test study involved measures that were completed by participating staff and family or guardian.

The parallel mixed methods design involved implementation and analysis of the quantitative and qualitative data collection strategies independently and simultaneously. Data from the qualitative interviews with staff and guardians, the progress notes documentation of participating older people, and the open-ended section of the implementation questionnaire were designed to enhance understanding about the implementation of the music intervention and its impact on older people living with dementia by supplementing or clarifying the quantitative data obtained from the questionnaire, assessments, and logbook entries.

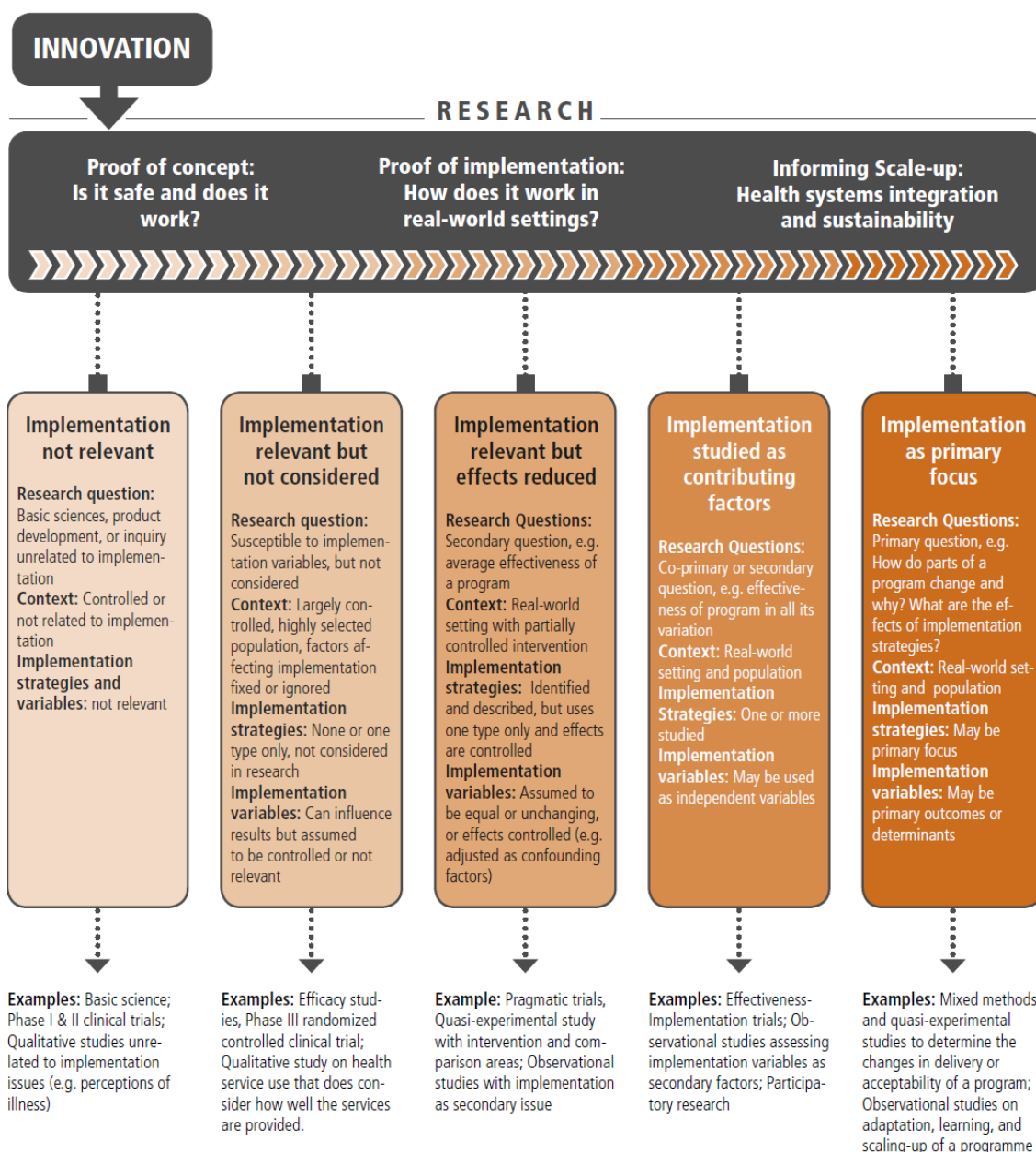


Figure 4.2. The continuum of implementation research

4.5. Study setting

The study was conducted in two residential aged care facilities (RACFs) in a regional area of New South Wales (NSW) Australia. NSW is one of Australia's states, which is located on the east coast bordering Queensland to the north, Victoria to the south and South Australia to the west. The capital of NSW is Sydney, Australia's most populous city¹. As of the end of June 2016, total population of NSW was 7,725,900 (Australian Bureau of Statistics, 2016), about 16% of which were people aged 65 and over (AIHW, 2017). Both RACFs in this study are located in the Hunter region about 2 hours' drive north of Sydney.

In Australia, residential aged care predominantly provides long-term or permanent accommodation. Although other terms are predominantly used in other countries such as nursing homes in United States^{2 3}, Canada⁴, and the United Kingdom⁵ (Roberts, 2017), the type of services and care provided include assistance with day-to-day tasks (e.g. meals, laundry, housekeeping), assistance with activities of daily living (e.g. eating, bathing, dressing), and 24-hour nursing care by qualified nurses (AIHW, 2012, 2018; Joenperä, 2017).

As with other westernised countries such as the United States and the United Kingdom, the government contributes to the funding for residential aged care services in Australia

¹ https://en.wikipedia.org/wiki/New_South_Wales

² <https://www.kff.org/medicaid/report/medicaid-and-long-term-services-and-supports-a-primer/>

³ <http://www.ncsl.org/research/health/long-term-services-and-supports-faqs.aspx>

⁴ <https://www.canada.ca/en/health-canada/services/home-continuing-care/long-term-facilities-based-care.html>

⁵ <https://www.nhs.uk/conditions/social-care-and-support-guide/care-services-equipment-and-care-homes/care-homes/>

(Roberts, 2017). To be eligible to move or stay in a residential aged care facility in Australia, a person must be assessed by a member of an Aged Care Assessment Team (ACAT). The person must have care needs that exceed what can be provided in the community (Commonwealth of Australia, 1997, 2018). Residential care in Australia is subsidised by the Commonwealth Government. The Aged Care Funding Instrument, which was first implemented in 2008, is used to appraise the care needs of people in residential aged care for subsidy payment assessment purposes (AIHW, 2018; Joenperä, 2017).

For this study, initial discussions occurred between the management of both facilities, the candidate, and research supervisors. Written consent was obtained from the facility manager at each facility for the conduct of this research. The candidate worked as a Registered Nurse in RACF1 prior to and throughout the research implementation period. In order to ensure the separation of the candidate's role as a nurse and a researcher in this setting and to maintain the integrity of each role, the candidate liaised closely with management staff in RACF1 to ensure a third party approach was used during recruitment as described below and in section [4.11](#). On the days when the candidate was rostered for duty, the candidate wore the facility's uniform and did not engage in research. On the days when the candidate engaged with the research study, the candidate wore a University of Newcastle shirt with logo that clearly identified the candidate's role as a student of the University of Newcastle and informed the staff that the candidate was there solely for PhD research purposes.

4.5.1. RACF1

RACF1 is located in a town about 26 kilometres by road north of Newcastle, the second most populated area in NSW which is located 162 kilometres north-northeast of Sydney⁶. RACF1 is an 80-bed home providing high-level care, respite care and specialist dementia care. RACF1 is part of a large private residential aged care provider in Australia. The facility has three wings (A, B and C) providing all levels of care including dementia care. One of the wings (Wing C) is a secured area being a dementia-specific unit. All of the rooms were single occupant private rooms. Morning shift was from 6:15 AM to 2:30 PM while afternoon shift was from 2:30 PM to 10:00 PM. At time of implementation, the staff to resident ratio for the morning shift (AM) include one registered nurse for 25 to 30 residents, two assistant in nursing (AIN) for 15 residents in wing A, and three AIN for 25 residents in wings B and C. For the evening (PM) shift, there were three AIN in wing A, two AIN in wings B and C, and one AIN who worked short shift from 4:00 PM to 8:00 PM. Between 32 and 35 residents (40-43%) had a diagnosis of dementia during the recruitment period.

Leisure and lifestyle staff were employed to implement recreational activities. There were two full time leisure and lifestyle staff on the weekdays and one on the weekends, during daytime hours. Recreational or leisure activities mostly included group activities (e.g. bingo, sing-along, live music performances, cooking, indoor sports). There was a television in each wing's lounge area. Apart from the regular television shows, the staff played digital versatile disc (DVD) movies, some of which were from the older resident's generation. There were bus trips once or twice a week where the residents

⁶ https://en.wikipedia.org/wiki/Newcastle,_New_South_Wales

were taken to various places in the surrounding suburbs. Individualised activities were provided to some residents if they showed interest in these activities or if their family members or guardian suggested these activities. Activities included knitting, arts and crafts, and music listening, among others. Some residents had their own compact disc (CD) player and some CDs of their favourite music. Most of the residents relied on staff to turn on their CD player. One older person with dementia had her own set of headphones and music player with her favourite music provided by her family. She was excluded from the study sample. Other residents had their own television in their bedroom where they could watch the shows that they like. Older people living with dementia were encouraged to participate in activities of interest based on their leisure and lifestyle assessments.

Older people living with dementia usually joined other residents without a diagnosis of dementia for the leisure activities. While there were several activities provided to the residents, these were mainly viewed as “leisure” activities rather than non-pharmacologic interventions. The incorporation of non-pharmacologic interventions by nursing staff included approaches such as redirecting the resident or spending one on one time with the resident to de-escalate behaviours such as agitation. For residents with prescription of psychotropic medications for the management of behaviours, the nursing staff would usually ask the registered nurse for pro re nata (PRN or as needed) medications when attempts to redirect or manage behaviours through communication and addressing possible unmet needs did not work.

As discussed further in section [4.8.4.4](#) of this chapter, implementation of the individualised music listening for this study took place in the person with dementia's bedroom or in the lounge and dining room areas of the wing. Staff training and focus group/individual interviews were held in the facility's education/lecture room while the person with dementia's assessments involving staff interviews occurred in the staff room or a quiet section in the unit.

4.5.2. RACF2

RACF2 is located within a suburb of the city of Newcastle. RACF2 is an independent privately owned residential aged care provider. RACF2 has a variety of accommodation options designed to meet the needs of the residents including self-care, semi-independent and full residential care. Participants were recruited from a 25-bed dementia specific unit within a 100-bed high care accommodation area in the facility. There were private and shared rooms in the unit. Morning shift was from 6:00 AM up to 2:30 PM and afternoon shift was from 2:30 PM to 10:30 PM. Nursing staff in the unit include a team leader for each shift. The team leader was an AIN with a minimum of Certificate IV in Ageing Support qualification. The team leader was in charge of administering medications from a blister pack and attending to less complicated wound dressings. There were also two AIN who worked a long shift (8 hours) and one AIN who worked a short shift (4 hours) for both morning (AM) and evening shifts (PM). The AINs attend to the residents' personal care and activities of daily living. One registered nurse was in charge of the unit (together with other units in the high care accommodation). There was one regularly assigned leisure and lifestyle staff member in the unit who delivered a variety of daily group activities for people living with dementia

in the lounge and/or dining area. Activities included indoor sports, exercise, concerts or live music performances, arts and crafts, among others. There was a television in the lounge area. Apart from the regular television shows, the staff played movies and music through a DVD player. The majority of the residents in the dementia specific unit in RACF2 spend their time in the lounge area.

At the time of the research implementation, RACF2 had recently been certified by the Music and Memory Australia program (Music and Memory, 2019). Some of the units in the facility had residents who were receiving the personalised music listening intervention through the Music and Memory program. In the dementia-specific unit allocated for this study, there was one older person with his own iPod shuffle and headphones from the Music and Memory program. This older person was excluded from the study sample.

As described in section [4.8.4.4](#) below, the individualised music listening was implemented in the person with dementia's bedroom, lounge area, or dining room. Staff training and interviews were conducted in a small lounge area of a wing in the unit. Some of the older person with dementia's assessments were completed through interviews with staff. The interviews for the person with dementia's assessments were held at the nursing station.

4.6. Study population

Implementation of this music intervention used a multidisciplinary approach involving those who were part of the multidisciplinary team providing care to the participating older people living with dementia. Participants were older people living with dementia, family members or guardians of participating older people living with dementia, and nursing and allied health staff of the residential aged care facility. The staff mix participating in both RACFs comprised enrolled nurse, assistant in nursing (AIN), leisure and lifestyle staff, and physiotherapy aide.

4.6.1. Eligibility criteria

4.6.1.1. Staff

(1) Nursing and allied health staff employed full time, part time or casual, including registered nurses, enrolled nurses, AIN, leisure and lifestyle staff, physiotherapists and physiotherapy aides. There were no limits regarding the staff's age, experience in the aged care or the number of years they have worked in the facility.

(2) Providing direct care to residents with dementia for at least 8 hours a week.

4.6.1.2. Older people

(1) Aged 60 years and older. This age criteria is based on the United Nation's (UN) agreed cut-off when referring to older population (United Nations, 2017).

(2) A resident of the RACF for at least one week.

(3) With a diagnosis of dementia (Alzheimer, mixed, vascular, frontotemporal or Lewy body type)

(4) Absence of significant hearing impairment affecting the ability to listen to music using headphones.

(5) Able to provide input regarding music preferences or has a guardian or family member that can provide input regarding their music preferences.

4.6.1.3. Guardian/Family members

(1) Has knowledge of the participating person with dementia's preferred music.

(2) Has ongoing and regular contact with the participating older person (visits at least twice a month).

4.7. Study outcomes

4.7.1. Primary outcome: Implementation outcomes

Considering that this research was implementation-heavy, the primary outcomes of this study were the implementation outcomes. This was addressed in the first objective, which aimed to explore implementation strategies influencing the implementation outcomes of this study.

Implementation outcomes are distinct from service system and clinical outcomes (Proctor et al., 2011). A conceptual model of implementation research proposed by Proctor et al. (2009) reflects the key implementation processes and outcomes. This conceptual model of implementation research is initially discussed in Chapter 2.

Implementation outcomes are defined as the effects of purposive actions to implement new treatments, practices or services. They serve as indicators of implementation success and proximal indicators of implementation process (Proctor et al, 2011). The

implementation outcomes (Proctor et al., 2011; Proctor et al., 2009) included in the Practical Guide for Implementation Research in Health (Peters et al., 2013) and which were used in this study were adoption, acceptability, appropriateness, feasibility, fidelity, sustainability, and implementation cost. Some of the terms used in the literature to describe these implementation outcomes overlap. For the purpose of this study, these terms are defined as follows based on the definition provided by (Proctor et al., 2011):

Adoption: The intention, initial decision, or action to try to employ the music intervention in the care of older people living with dementia.

Acceptability: The perception among nursing and allied health staff and family or guardian of older people living with dementia that the music intervention is agreeable; assessed based on the respondents' perceptions of the music intervention's complexity or comfort.

Appropriateness: The perceived fit or relevance of the music intervention for the care providers and the older people living with dementia living in the residential aged care facility.

Feasibility: The extent to which the music intervention was successfully used or carried out in a residential aged care facility.

Fidelity: The degree to which the music intervention was implemented as it was designed.

Sustainability: The extent to which the music intervention program was maintained within the residential aged care setting as part of ongoing operations.

Implementation cost: The total cost of the music intervention and the implementation.

4.7.2. Secondary outcome: Impact of the intervention on older people living with dementia

The secondary outcome of this study was addressed in the second objective. The objective aimed to determine the impact of the individualised music listening intervention on older people living with dementia in terms of agitation, quality of life, engagement during the intervention and prescription and use of psychotropic medications.

4.8. Study procedures

4.8.1. Recruitment

4.8.1.1. RACF1

In RACF1, the candidate submitted an application to the organisation's Clinical Governance Committee for consent to conduct this research in the facility. Upon receipt of the approval from the organisation's Clinical Governance Committee and the University's Human Research Ethics Committee (HREC), the candidate met with the facility manager. Discussions were made regarding the details of the research project and the support needed from the management for the implementation. Recruitment of participants occurred from July 2017 to August 2017.

As the candidate was an employee (registered nurse) of RACF1, the facility management took an active role in the recruitment of staff, family members or guardians and people living with dementia after the candidate discussed eligibility criteria with them. Posters advertising the research project (see [Appendix 4](#)) were placed in the staff room and the reception area where the family or guardian and friends

of people living with dementia sign in and out during visits. The facility manager announced some details of the research project such as the purpose, the music intervention and nature of participation during the registered nurse meeting and general staff meeting for the month of July 2017. The facility manager also sent text messages to all staff about the research project. Participation from staff was encouraged by the management and they were informed that they would be paid their regular hourly rate (by the organisation) for the time spent during the training. Copies of the information statement and consent form for staff, older person and family/guardian were placed in the clinical manager's office (see [Appendix 5](#)). Interested staff were provided with a copy of the participant information statement and consent form and asked to approach the candidate with further queries. Signed consent forms were returned either to the clinical manager or directly to the candidate as per ethics approval.

Apart from participating in the study, some of the staff (both participants and non-participants of the study) were asked if they were happy to be interviewed for information regarding the person with dementia's cognitive function, level of agitation and quality of life. Staff who regularly administered the music intervention to the person with dementia were asked to complete an assessment form evaluating the person with dementia's level of engagement during the music intervention, which is detailed in section [4.8.5](#) of this chapter. Staff who verbally consented to participate in the person with dementia's assessments were reimbursed for their time in the form of a gift card (see [Appendix 6](#) for details of ethics approval).

In order to identify people living with dementia who met the eligibility criteria, the candidate met with the clinical manager. The clinical manager appointed a staff member to contact the family members or guardians of people living with dementia who were assessed as having met the eligibility criteria. This was to initially determine their interest in having their loved one participate in the research as well as their interest in attending a training session for the implementation of the music intervention. Interested family members or guardians were asked to take a copy of the information statement and consent form from the clinical manager or the appointed a staff member, to sign, and to provide a list of their family or next of kin's music preferences. The family member or guardian returned the signed consent forms and the music preference list to the clinical manager or the administrative staff who then handed these forms to the candidate. The candidate used the music preferences listed in selecting the music for the person with dementia's music playlist (see section [4.8.4](#) below). Written consent was also sought from the people living with dementia who were assessed by the candidate for their ability to provide informed consent. This was done by asking the older person in the mild to moderate stage of cognitive impairment three questions about the research, which are discussed below in section [4.11.1](#). Free and informed consent. If the questions were answered correctly, he/she was invited to consider consenting to the study. Details regarding obtaining consent are provided in the ethical considerations section of this chapter.

4.8.1.2. RACF2

In RACF2, the candidate and the research supervisors met with the facility management and discussed the details of the research project and the support needed for the

implementation. The management nominated a dementia-specific unit for the research implementation. Recruitment occurred from September to October 2017. Posters about the research project ([Appendix 4](#)) were placed in the unit with attached participant information statement ([Appendix 5.8](#)). The candidate conducted an information session with morning and afternoon staff and discussed the purpose of the research study, requirements to participate, and the risks and benefits. Staff who expressed interest were given the information statement with an attached consent form. To communicate with staff not present during the information session, the candidate asked one of the care team leaders to relay the information to these other staff. Copies of the information statement and consent form were available in the nursing station. Interested staff returned the signed consent form directly to the candidate or placed it in the area in the nursing station designated for the research documents.

As with RACF1, assessments of the people living with dementia from RACF2 also involved information provided by staff (e.g. cognitive function, agitation, quality of life, and level of engagement during the intervention). One of the staff participants verbally consented to participating in all these assessments at baseline, during the 3-month implementation, and at post implementation. This staff member was reimbursed for her time in the form of a gift card.

As the unit in RACF2 was dementia specific, all of the older people living within the unit were initially determined as eligible to participate. the candidate contacted the family members or guardians of the older people by telephone and discussed the purpose of the research, the nature of the music intervention and the benefits and risks

of participating. Those family members who expressed interest were asked to take a copy of the information statement and consent form from the unit's nursing station to read and sign the consent form when they are supportive of their loved one to be included in the study. The staff helped with the distribution and collection of the information statements and consent forms from family members or guardians. Any family members or guardians who initially consented verbally by telephone but did not pick up the forms were contacted again by phone. Some of them lived far away from RACF2 and were not sure when they were able to visit the facility. They provided the candidate with their family member's music preferences and gave their consent to proceed with the implementation of the music intervention over the phone.

4.8.2. Implementation strategies

Published studies and literature reviews on implementation strategies guided the conceptualisation of the strategies for the implementation of the individualised music listening intervention. The implementation strategies used in this study were as follows:

- Providing training and education (Grimshaw et al., 2006; Grimshaw et al., 2004; Grimshaw et al., 2012; Grol & Grimshaw, 2003; Leeman, Baernholdt, & Sandelowski, 2007; Powell et al., 2012; Sung et al., 2008) as described below in section [4.8.2.1](#).
- Appointment of a program leader (Greenhalgh et al., 2004; Leeman et al., 2007; Powell et al., 2012; Sung et al., 2008) as described below in section [4.8.2.2](#).
- Providing and obtaining feedback to participating staff and family or guardian (Grimshaw et al., 2006; Grimshaw et al., 2004; Grimshaw et al., 2012; Grol &

Grimshaw, 2003; Leeman et al., 2007; Powell et al., 2012) as described below in section [4.8.2.3](#).

- Providing reminders (Grimshaw et al., 2006; Grimshaw et al., 2004; Grimshaw et al., 2012; Grol & Grimshaw, 2003; Leeman et al., 2007; Powell et al., 2012; Sung et al., 2008) described below in section [4.8.2.4](#).

In addition to the implementation strategies, common barriers to implementing evidence based practices including those specific to the residential care context were reviewed and considered in planning for the structure of the training session and implementation of the music intervention (Argyle & Kelly, 2015; Chenoweth, 2015; Greenhalgh et al., 2004; Grimshaw et al., 2012; Grol & Wensing, 2004; Grol et al., 2007).

4.8.2.1. Training and education

The candidate conducted a training session for staff and family members or guardians to help standardise the implementation of the music intervention. The training included a didactic presentation, interactive demonstration and take away materials. A slide show presentation was designed and developed for the training session. The presentation included both written information and short video clips about dementia and the potential impact of music on dementia. During the training session, each participant was given a set of the music listening equipment (iPod shuffle, headphones and charger). The candidate demonstrated how each piece of equipment worked and the participants were asked to practice using the equipment. At the end of the session, the training participants were given a laminated card to take with them, 10.5 by 7.5 centimetres in size, that they could easily place in their pocket and carry with them during work (see

[Appendix 7](#)). The content of the card included summary information about the benefits of the music intervention and the protocol for implementation for them to refer to during the implementation. Details of the training session are provided below in section [4.8.3](#).

4.8.2.2. Program leader

Initially the research planned to appoint program leaders for each RACF, preferably a leisure and lifestyle staff or a senior staff during the shift such as registered or enrolled nurses. The roles of the program leader include overseeing the implementation, providing feedback to the candidate, and ensuring that issues regarding the implementation of the music intervention and sustaining/continuing the implementation of the program beyond the 3-month research implementation period were communicated. The program leaders were to receive additional training as detailed in section [4.8.3](#) below. Regular meetings between the candidate and the program leaders were to occur in person or over the phone to discuss the implementation. At the end of the 3-month implementation period, the candidate would hand the music library and equipment to the program leaders so they could continue the enrolment of new participants and the implementation of the program beyond the research implementation period. Chapter 5 section [5.4.7.2](#) details modifications made to the protocol regarding the program leaders.

4.8.2.3. Providing and obtaining feedback to participating staff and family or guardian

The candidate provided feedback to the participants (staff and family or guardian of people living with dementia participants) through informal discussions or conversations regarding the progress of the implementation, issues encountered and addressed and the responses of the older people living with dementia.

Discussion regarding the music intervention and implementation of the intervention was planned to be conducted at certain times, preferably during handover time such as at. 0630 hours (6:30 AM) for incoming morning and outgoing night staff, 1400 hours (2:00 PM) for incoming afternoon staff, and 0900 hours (9:00 AM) for allied health staff to clarify issues and provide feedback and support. This was to be done daily to second daily in the early phase of the implementation (first two weeks) to ensure that issues encountered by staff and/or older people during the implementation of the music intervention are promptly addressed. Supplementary discussion and feedback regarding the music intervention and its implementation were to be provided every month by the candidate during the scheduled staff meetings thereafter. Participants were encouraged to promptly report issues and concerns regarding the implementation of the music intervention to the program leader, facility/clinical manager and researchers at the time they occurred.

The candidate regularly followed up on the participating staff and family members or guardians to ensure that they were not having any issues or difficulties in implementing the music intervention. For anonymity and confidentiality purposes, a feedback form

(see [Appendix 8](#)) was initially designed for participants to fill in and place in the research drop box. The feedback form contained tick boxes on the type of feedback provided (e.g. comments, concerns, suggestions, questions) and the details of the feedback.

4.8.2.4. Reminders

The candidate suggested to the facility management of both RACFs that the music intervention be included in the daily appointments of the participating older people living with dementia. These daily appointments were able to be viewed by staff when they logged in to the facility's database and were printed in paper form on a daily basis for them to check at the start of a shift. A list of residents enrolled in the program was posted in the nursing station notice board and in the leisure and lifestyle staff's office.

4.8.3. Training session

4.8.3.1. Staff

In both RACFs, the candidate asked the staff who initially consented to participate to list their name and their preferred day and time for the training session in a document placed in the staff room in RACF1 and in the nursing station in RACF2 (see [Appendix 9](#)). In RACF2, the director of care also sent e-mails to staff who consented to participate in the study regarding their preferences for the training session. The facility manager from RACF1 and the director of care from RACF2 determined the tentative date and time for the training session as discussed with the candidate based on the staff's availability. The duration of the comprehensive training session was one hour. The content included information about dementia, management of dementia, the impact of

music on people living with dementia, an evidence-based protocol for use of individualised music, the individualised music intervention protocol to be implemented, implementation outcome variables, and the outcomes relating to the impact of the intervention on the older people living with dementia that were to be evaluated. Staff participants were taught how to use the iPod shuffle with the headphones and how to charge the iPod shuffle. The importance of properly turning off the iPod shuffle after use and charging it as soon as needed was highlighted to staff during the training session. Each of the trained staff members were given a set of the music intervention equipment to practice with during the training session. Participants were also provided with education material (laminated card, [Appendix 7](#)) containing summary information about the music intervention protocol for their reference. A computer-based version of the training module was developed to be uploaded in the facility's intranet for access by staff and as part of the orientation package for newly recruited staff.

Additional training/education was designed for program leaders to enable them to independently construct an individualised playlist for the recruited older people to support sustainability. The content included information and instruction about downloading music/songs from iTunes, creating and loading playlists to an iPod shuffle and storing the music/songs in a hard drive (music library). While the candidate performed these tasks (downloading music and creating music playlist) during the research implementation, the trained program leaders would be able to facilitate implementation and maintenance of the music intervention when the research implementation period had concluded.

4.8.3.2. Family/Guardian

The candidate contacted family members or guardians who had indicated in the consent form that they would like to undergo the training to implement the music intervention. Those who responded received one-on-one training from the candidate at their preferred day and time at the bedside or in a quiet lounge area at the RACF. The content of the training sessions mainly included information about dementia and the impact of individualised music on dementia, the music intervention protocol to be implemented, how to use the music intervention equipment and charge the iPod shuffle, and how to document in the music intervention logbook. Family members or guardians were also given a brief overview about the resident-related outcomes that were evaluated for this study.

4.8.4. Study intervention

4.8.4.1. Evidence-based protocol for the use of individualised music for people living with dementia

The individualised music listening intervention was guided by Gerdner's evidence based guideline for individualised music (Gerdner & Schoenfelder, 2010). As previously noted in Chapter 2, the mid-range theory developed by Gerdner (1997) served as the theoretical foundation for the individualised music intervention. A summary of the key features of the evidence-based protocol of individualised music is outlined in Table 4.1 below. Permission was sought from the author Linda Gerdner for the use of the protocol for this research project ([Appendix 10](#)).

Table 4.1. Evidence-based protocol of individualised music for elders with dementia

Key Features of the Evidence-Based Protocol of Individualised Music for Elders with Dementia (Gerdner & Schoenfelder, 2010)
<ol style="list-style-type: none"> 1. Individualise music selection in accordance with patient preferences. 2. Implement the intervention for a minimum of 30 minutes prior to the elder's usual peak level of agitation. 3. Play the music selection using audio cassette/CD player or MP3 players and iPods for approximately 30 minutes in a location where the patient spends most of his or her time. 4. Conduct an ongoing assessment to determine response to the music intervention.

A modified version of the protocol (Table 4.2) was developed for this research. The aim was to make the individualised music intervention available to all older people living with dementia regardless of whether they were manifesting agitated behaviours or not. From the reviewed literature, the usual duration of music interventions is 30 minutes. Based on the candidate's experience in caring for older people living with dementia in a residential aged care setting, some of those who were unable to participate in group activities due to dementia severity and other factors tended to have little to do for most of the day. Thus, the modified protocol included that music may be played for more than 30 minutes as long as the older person was enjoying it, as assessed by the staff or family members or guardian by asking the older person or through observation. The music was able to be played any time on a regular or as needed basis (e.g. agitation, prior to care) during the day or night.

Table 4.2. Modified version of the evidence protocol for individualised music for older people living with dementia

Individualised Music Listening Intervention for Older People Living with Dementia
<ol style="list-style-type: none"> 1. Individualise music selection in accordance with the older person's preferences 2. Play the music to the older person for various purposes (e.g. as a leisure activity, before or during care, prior to perceived or expected agitation, management of agitation and/or apathy). 3. Play the music selection using an iPod shuffle with headphones in a location where the older person spends most of his or her time. 3. Suggested duration is 30 minutes however, you may play the music for as long as the older person enjoys it as assessed (by asking or by observation). 4. If used for agitation, the recommendation is for music to be played 30 minutes prior to expected agitation. 5. Regularly check on the older person to assess responses to the music intervention (monitor the older person closely at the beginning of the intervention and then approximately every 15 minutes thereafter). 6. If the older person shows signs of discomfort and/or distress and if the behaviour warranting the intervention continues, stop the intervention and report to the registered nurse or senior staff during the shift.

4.8.4.2. Creating music playlist

The music preferences of older people living with dementia were determined by asking them and/or their family members or guardian to complete the Assessment of Music Preference Questionnaire (AMPQ) designed by Gerdner (Gerdner, Hartsock, & Buckwalter, 2000; Gerdner & Schoenfelder, 2010) which was attached to the information statement ([Appendix 11](#)). The AMPQ (Family Version) is designed to

assist in individualised music selection when the person with dementia is unable to provide information about music preferences (Gerdner & Schoenfelder, 2010). The AMPQ contains items assessing the importance of music on the person's life, whether or not he/she plays instrument, enjoys singing and dancing and his/her favourite music/song selections, artists and albums (Gerdner et al., 2000).

The iTunes application was used to purchase the music preferred by the older person with dementia. iTunes is software developed by Apple Incorporated in 2001. iTunes can be used to download and play music and videos on mobile devices or personal computers. iTunes was chosen as it offered a wide collection of music that may otherwise be difficult to find in compact discs especially where the person with dementia's music preferences were from previous (their) generations. Another advantage of iTunes was the option to purchase songs individually rather than as whole album. This was important as some of the person with dementia's music preferences were an assortment of songs from various artists. The candidate compiled a selection of songs based on each older person's preferred music selections. This playlist was loaded into an iPod shuffle (music player) which is detailed below.

4.8.4.3. Music intervention equipment

The music intervention equipment consisted of an iPod shuffle (music player), headphones, and charger. The 2 Gigabyte 4th generation iPod shuffle (Figure 4.3.) is a small (29 x 31.6 x 8.7 mm) digital music player designed by Apple Inc. and released in 2010. The iPod shuffle was small, light and easily secured on the person with dementia with its built in clip, attached to sleeves, belt or a collar. The iPod shuffle has a

clickable track and volume controls and allows songs to be played in a random order (shuffle)⁷. The earphone port in the iPod shuffle enables the device to be connected to the computer for syncing songs and to a power adapter for charging. The iPod shuffle was chosen as it is supported by iTunes and was less costly compared to other Apple Incorporated devices. Each older person with dementia's playlist contained a minimum of 20 songs and played for at least an hour. Each older person has his or her own iPod shuffle with the older person's printed name in a sticker placed at the back of the iPod shuffle.



Figure 4.3. iPod shuffle

The headphones used for this study (Figure 4.4) were foldable with an in-line volume control and had a cable which can be attached to a music listening device. Apart from affordability, these headphones were chosen as they were light and were padded for comfort. Each older person has his or her own set of headphones. A sticker was placed in the headphones with the older person's printed name. The music intervention equipment were placed in a plastic container. The staff and management of both

⁷ https://en.wikipedia.org/wiki/iPod_Shuffle

facilities were consulted regarding the storage of the equipment (either in the older person's bedroom or in the nursing station).



Figure 4.4. Headphones

4.8.4.4. Implementing the intervention

The staff and/or family members or guardians played the music to the participating older people living with dementia using the headphones attached to the iPod shuffle for various purposes: as a leisure activity, before or during care, prior to perceived or expected agitation, or for management of apathy, among others. If used for agitation, the suggested duration was 30 minutes prior to expected agitation as determined by the staff who regularly care for the participating older people living with dementia and were familiar with their behaviours. Although guidelines in the protocol indicated the reasons for and duration of implementation, the timing of implementing the music intervention was mainly based on the staff and family or guardian's discretion.

Staff and family members or guardians were instructed to check the music volume prior to putting the headphones on the older people living with dementia (by trying the headphones on themselves with the music playing before putting it on the person with dementia). They were required to ask the older person if the volume was audible and comfortable for them and observe them for non-verbal cues of discomfort after they had the headphones on. The person administering the music was required to check the older person with dementia to assess their response to the music intervention (positive or not) and level of comfort. The response was monitored closely at the beginning of the intervention and then approximately every 15 minutes thereafter. The protocol highlighted that if the older person with dementia manifests discomfort and/or distress and if the behaviour warranting the music intervention continues (e.g. agitation), the music must be stopped immediately and this was to be reported to the registered nurse or senior staff during the shift. Implementation of the individualised music listening took place in the person with dementia's bedroom or in the lounge and dining room areas of the wing. To integrate the music intervention in the plan of care for the older person with dementia, a music intervention care plan was to be created for each participating older person. Information in the care plan would include the older person's music preferences, the reasons for implementing the music intervention, the usual timing and frequency when known, and details of the music intervention equipment.

4.8.5. Measurement tools

4.8.5.1. Primary outcomes

Implementation Outcomes Questionnaire: Acceptability, Appropriateness, and Feasibility

An implementation outcomes questionnaire utilising a Likert scale ([Appendix 12](#)) was used to measure the implementation outcomes of acceptability, appropriateness, and feasibility, by assessing staff's feelings/perceptions regarding the training provided and the implementation of the individualised music listening intervention. Developed by Rensis Likert, a Likert scale is a psychometric scale containing multiple categories that respondents can choose to convey their opinions, attitudes or feelings. It is one of the most commonly used instruments in measuring affective variables (Nemoto & Beglar, 2014). A range of possible responses such as "strongly agree", "agree", "neutral", "disagree", and "strongly disagree" are coded numerically (e.g. 1 for strongly agree, 2 for agree, etc.) in relation to a particular statement or question (Boslaugh, 2008).

The content of the questionnaire was adapted from two unpublished implementation outcomes questionnaires, the Training/Practice Acceptability / Feasibility / Appropriateness Scale (Lyon, 2011) and the Measure of Disseminability (MOD) (Trent, Buchanan, & Young, 2010). These questionnaires were reviewed by Lewis et al. (2015) in a systematic review of quantitative instruments of implementation outcomes. The Measure of Disseminability (MOD) (Trent et al., 2010) is a 32 item instrument that measures perceptions about the ethical aspects as well as effectiveness, acceptability and potential success of an intervention or treatment. The MOD items are rated on a seven-point scale with the responses ranging from not at all (1) to very much (7). Lewis

et al. (2015) categorised the MOD as a measure of feasibility and highlighted that of the eight feasibility instruments reviewed, the MOD showed the highest overall rating for structural validity (4 - excellent), reliability (3 - good) and usability (3 - good).

The Training/Practice Acceptability/Feasibility/Appropriateness Scale (Lyon, 2011) is a 14-item instrument rated on a five point scale with responses ranging from not at all (0) to extremely (5). The Training/Practice Acceptability/Feasibility/Appropriateness Scale is used to assess participants' perception regarding acceptability, appropriateness and feasibility of an intervention. Although there is limited information about its psychometric properties, this scale has a good (3) rating for its usability (Lewis et al., 2015). The authors (Lyon, 2011; Trent et al., 2010) were contacted and permission was provided for the use of the instruments (see [Appendix 10](#)).

Music intervention logbook: Fidelity and Feasibility

Each participating older person with dementia had a music intervention logbook completed by staff and family or guardian every time the music intervention was implemented. The logbook entry included the date, shift, duration of the intervention, reason for implementation and the observed effect(s) where possible. Details of the music intervention logbook are in [Appendix 13](#). This logbook was developed by the candidate to evaluate fidelity or adherence to the music intervention protocol and feasibility of incorporating the music intervention in the daily care of older people living with dementia.

Costs

The actual costs calculated included the cost of the music intervention and the cost of implementation. The cost of the music intervention was determined by calculating the total amount spent for the music intervention equipment (iPod shuffle, headphones, charger, and container), and the iTunes download for the 32 people living with dementia from both facilities who participated in the study.

The cost of the implementation included the operating costs, training costs, and music intervention implementation. The operating costs covered the time spent for creating the individualised music playlists for 32 participating older people. This include the time it takes to ask the older person and his or her family about the older person's music preferences, time to research and download music from iTunes, and time to put together the playlist and load into an iPod shuffle. Although it was the candidate who created the music playlists for all older people participants, the cost of labour was calculated based on the assumption that the facility would adopt the program and a facility staff member (e.g. leisure and lifestyle coordinator) would be responsible for assessing music preferences and creating music playlists. Therefore, the pay rate used is based on the pay rate for staff with the potential to spearhead the implementation. The pay rate and overhead costs of a leisure and lifestyle coordinator was used for this purpose and was based on information provided by the facility manager from RACF1.

The training costs include the time spent by the number of staff who participated and the amount that they were paid (pay rate by skills) during the training session. This was determined by asking the facility management about the staff/employees' pay rate

during the implementation period as well as the rate for the overhead cost for each staff. Overhead costs cover annual leave, leave loading, long service leave, worker's compensation, parental leave, superannuation, and payroll tax, among other overheads. The training costs also included the resources used during the training such as the educational materials, including the laminated card.

As the frequency of implementing the music intervention was not prescribed, the median number of music intervention implementation occurrences calculated from the music intervention logbook data was used as a reference for the frequency of implementation for each participating older person across implementation sites throughout the 3-month implementation period. Included in the costs of implementing the music intervention to older people living with dementia were estimates of the time it takes to put the music on, check the older person during the intervention, remove the headphones and put the equipment back to its storage and charge the iPod shuffle as required. The time to put the music on included the time spent from gathering the equipment to finally having the headphones on the older person with the music playing, and the older person in a comfortable position. Staff were not required to stay with the older person for the duration of the music intervention implementation. However, as per music intervention protocol, they were required to regularly check on the older person to monitor their responses and stop the intervention if negative responses were noted.

Other Outcomes: Adoption and Sustainability

The number of staff and family or guardian who participated in the training session and implemented the music intervention was used to evaluate the adoption of the music

intervention. Sustainability of the music intervention was assessed over the 3-month implementation period, specifically as to how the implementation of the music intervention was maintained. Data to support sustainability was collected from the music intervention logbook, which documented implementation details such as date, shift, and the duration of the intervention, and the feedback sought by the candidate from the study participants.

4.8.5.2. Secondary outcomes

Cohen-Mansfield Agitation Inventory (CMAI)

The Cohen-Mansfield Agitation Inventory (CMAI) ([Appendix 14](#)) is an instrument used to assess the frequency of manifested agitated behaviours in older people (Cohen-Mansfield, Marx, & Rosenthal, 1989). The CMAI was originally developed for use in the aged care facility for research related purposes and it can also be used for clinical purposes and can be administered by caregivers or completed through interviews with family members (Cohen-Mansfield et al., 1989). The CMAI questionnaire consists of 29 agitated behaviours. Each behaviour is rated on a 7-point scale of frequency: 1 – never; 2 – less than once a week but still occurring; 3 – once or twice a week; 4 – several times a week; 5 – once or twice a day; 6 – several times a day; 7 – several times an hour. The time required to complete the CMAI is 10 to 15 minutes. When a behaviour occurred rarely during one week and frequently during another, the frequency may be determined by calculating the average over the past two weeks. However, calculating total scores does not necessarily contribute to analysis purposes. Cohen-Mansfield et al. (1989) highlighted that analysis of the CMAI can be performed by referring to specific behaviours of interests or each of the three factors of agitation

(aggressive behaviour, physically non aggressive behaviour and verbally agitated behaviour). Approaches to calculating agitation scores include factor analyses based on the population studied, weighting behaviours according to their disruptive impact, and then combining them.

Validity and reliability of the CMAI have been established in previous studies. Suh (2004) administered the Korean version of the CMAI (CMAI-K) among 257 residential aged care residents with Alzheimer' and vascular dementia. Results demonstrated satisfactory reliability ($r=0.79$, $p<0.001$) and validity (Spearman's rho for total score = 0.81 , $p<0.001$) of the CMAI- K in measuring agitation. Zuidema et al. (2011) estimated the inter-observer and test-retest reliability of the Neuropsychiatric Inventory Nursing Home Version (NPI-NH) and CMAI among 105 residential aged care residents with dementia in Netherlands. Assessments were conducted by physicians and certified nurses. While the reliability estimates for NPI-NH total score were modest, the CMAI total score demonstrated higher test-retest correlations ($r = 0.5$ and 0.89) supporting its usefulness in clinical practice.

Dementia Quality of Life questionnaire (DEMQOL and DEMQOL-proxy

The Dementia Quality of Life questionnaire (DEMQOL) ([Appendix 15](#)) is available in self and proxy report versions for people living with dementia and their formal and informal caregivers. The DEMQOL questionnaire (self-report) consists of 28 items addressing five domains: daily activities and looking after self; health and well-being; cognitive functioning; social relationships; self-concept (Smith, Lamping, et al., 2005). In addition to the DEMQOL an overall quality of life rating was included. There were a

total of 29 items related to quality of life. The DEMQOL-proxy is carer-rated and designed for people with severe dementia containing 31 items addressing two domains: functioning and emotion. Responses to each DEMQOL and DEMQOL-proxy item include a lot, quite a bit, a little, and not at all with corresponding scores of 1 to 4 (1 for the most negative response and 4 for the most positive response). Higher scores indicate better health related quality of life (HRQOL) (Smith, Lamping, et al., 2005). Smith, Lamping, et al. (2005) developed the DEMQOL questionnaire to measure the HRQOL among people living with dementia. The global impact of dementia on all areas of functioning make HRQOL an important area of evaluation for people living with dementia (Smith, Murray, Banerjee, Foley, & Cook, 2005). The HRQOL concepts that guide the DEMQOL reflect the individual's subjective perception of the impact of a health condition in everyday life (Bullinger, Anderson, Cella, & Aaronson, 1993; Smith, Lamping, et al., 2005). Bowling et al. (2015) postulated that compared to other QoL measures, the DEMQOL is distinct in the way that it focuses on the areas affected by the health condition and relates to the impact of the symptoms on the functional status.

In a systematic narrative review of quality of life measures for people living with dementia, Bowling et al. (2015) highlighted that although poor results were demonstrated for people living with severe dementia, the DEMQOL is among the best measures of HRQOL for those with mild to moderate dementia. Smith et al. (2007) evaluated the psychometric properties of the item reduced versions of DEMQOL (28 items) and DEMQOL-proxy (31 items) among 101 people living with dementia and 99 caregivers. Results showed that DEMQOL had high reliability (intra class correlation =

0.76) and moderate validity in people living with dementia in the mild to moderate stage. The DEMQOL-proxy demonstrated good acceptability and internal consistency (Cronbach's alpha = 0.87) (Smith et al., 2007). Lucas-Carrasco et al. (2010) validated the Spanish version of the DEMQOL and DEMQOL-proxy among 119 people living with dementia and their caregivers. The authors concluded that the Spanish DEMQOL had good acceptability (14.3% missing data), internal consistency (Cronbach's alpha = 0.85) and test-retest reliability (intra class correlation = 0.71). Likewise, the DEMQOL-proxy, had good acceptability (0% missing data) and good internal consistency (Cronbach's alpha=0.86) (Lucas-Carrasco et al., 2010).

Psychotropic medications use

An introduction to the use of psychotropic medications was presented in Chapter 2. Prescription and use of regular and PRN (or as needed) psychotropic medications were recorded for all older people living with dementia participants. The specific information gathered for the psychotropic medications include the name, dosage, time, and frequency of administration.

The Homecare Measure of Engagement Staff Questionnaire (HoME-S)

The Homecare Measure of Engagement Staff Questionnaire (HoME-S) ([Appendix 16](#)) was used to assess the person with dementia's engagement during the music intervention. The HoME-S is a measure for evaluating psychosocial interventions in residential aged care settings (Baker, Harrison, & Low, 2016). The HoME-S specifically measures six engagement dimensions: (1) rate of refusal (2) duration (3) attention (4) attitude (5) duration and appropriateness of activity and (6) passivity.

Scores on each Likert item are divided by the maximum score for that item. Higher total scores from the six items indicate higher engagement. The maximum possible total score is 6. The HoME-S demonstrated good internal consistency (Cronbach's alpha = 0.88), test-retest reliability (95% CI = 0.80 – 0.97), and inter-rater reliability (Cronbach's alpha = 0.87) (Baker et al., 2016; Baker, Webster, Lynn, Rogers, & Belcher, 2017).

4.8.5.3. Other assessments: Baseline assessments

Demographics

Demographic data included the older person with dementia's date of birth, age in years, gender (male or female), diagnosis and type of dementia and presence or absence of hearing problems. For the participating staff members, only their role/position in the facility was identified. Participating staff who completed the implementation outcomes questionnaire provided demographic data such as date of birth, gender, years of employment in aged care, employment status, and usual hours worked each week. Provision of this information was not mandatory. For RACF1, data also included the pay rate and overheads of the participating staff as discussed in section [4.8.5.1](#) of this chapter.

Psychogeriatric Assessment Scales (PAS)

The Psychogeriatric Assessment Scales (PAS) ([Appendix 17](#)) is used to assess changes in dementia and depression. This instrument was used in this study to assess the cognitive function of the person with dementia. The PAS has three sub-scales, one of which assesses cognitive changes over time. This sub-scale comes in two forms: the

Cognitive Impairment Scale (PAS-CIS) for an interview with the subject and the Cognitive Decline Scale (PAS-CDS) for an interview with an informant (Jorm et al., 1995). The PAS assesses changes using a set of psychometrically derived scales instead of categories. The Cognitive Impairment Scale (PAS-CIS) consists of nine questions assessing memory and other cognitive functions while the Cognitive Decline Scale (PAS-CDS) consists of 10 questions that assesses changes in the person's daily cognitive functioning (Jorm et al., 1995). Each question has a score of 0 for a correct answer and 1 for an incorrect answer. Higher scores correspond to greater impairment. Specifically, a score of 4 or more from the PAS-CDS assessment reflects approximately 80% of dementia cases while a score of 5 or more from the PAS-CIS reflects approximately 80% of dementia cases (Jorm et al., 1995).

A study involving a community and institutional sample of 1,045 from Canberra Australia, provided evidence of validity for the PAS scales correlated with other commonly used scales. Specifically, PAS-CIS was correlated 0.80 with the Mini-Mental State Examination (MMSE) and 0.45 with the Informant Questionnaire on Cognitive Decline in Elderly (IQCODE) while PAS-CDS was correlated 0.48 with MMSE and 0.78 with the IQCODE (Jorm et al., 1995). Internal consistency for the PAS-CIS and PAS-CDS measured by Cronbach's alpha were 0.60 and 0.81 respectively (Jorm et al., 1995). Jorm et al. (1997) provided further data on the psychometric properties of PAS using the Canberra sample from their earlier study who were interviewed again using the same items three and a half years later where the Cronbach alphas for PAS CIS and PAS-CDS were 0.58 and 0.84 respectively. The PAS-CIS was highly correlated with other measures of cognitive impairment including the MMSE (0.77), IQCODE (0.49),

and National Adult Reading Test (NART) (0.33). PAS-CDS was highly correlated with MMSE (0.42) and IQCODE (0.83) only (Jorm et al., 1997).

The candidate planned to complete the PAS-CIS interview with some of the participating older people living with dementia where possible. For those older people living with dementia whom PAS-CIS was not feasible to administer, the PAS-CDS was used through interviews with staff.

Global Deterioration Scale

The Global Deterioration Scale (GDS) ([Appendix 18](#)) is a validated instrument developed by (Reisberg, Ferris, de Leon, & Crook, 1982) to determine the stage of dementia. The GDS is designed for use by informal caregivers and clinical staff. This instrument was used in this study to determine the severity of cognitive decline of participating older people living with dementia. The GDS consist of seven items describing specific behaviours/observations that are reflective of each stage of dementia. Scores between 1 and 3 indicate pre-dementia stages and scores between 4 and 7 indicate dementia stages. Stage 6 specifically indicates severe cognitive decline while level 7 indicates very severe cognitive decline.

Oremus, Perrault, Demers, and Wolfson (2000) enumerated several studies which evaluated the psychometric properties of GDS. Included were two studies with inter-rater reliability coefficients for the GDS of 0.82 (Gottlieb and colleagues' work from 1988) and 0.97 (Foster and colleagues' work from 1988). For construct validity, Oremus et al. (2000) cited the findings from the study of Cohen-Mansfield and

colleagues from 1996 which found a strong correlation between the neurologists' rating of 240 normal elderly and 142 actual cases of Alzheimer's disease (0.97). In a study of twenty outpatients referred for memory complaints, Kørner, Lauritzen, and Bech (1996) found significant correlations of GDS with other measurement scales including the Clinical Global Impressions (CGI) (0.88), MMSE (0.93), Cambridge Cognition Examination (CAMCOG) (0.94) Alzheimer's Disease Assessment Scale-cognitive subscale (ADAScog) (0.92).

4.8.6. Data collection

A summary of the data collection process for both the pre-test post-test design and the qualitative interviews is shown in Table 4.3. Collection of quantitative data was done at baseline (prior to the implementation of the music intervention), during the 3-month implementation period, and at the end of the 3-month implementation period. Qualitative data was collected during the third month of implementation.

Participating older people living with dementia's demographic data as well as assessments of their cognitive function and stage of dementia were performed at baseline through a review of the relevant documentation from the person with dementia's medical records, assessments, and care plans. Data collection and assessments were done by the candidate and were supplemented by interviews with staff who were familiar with the person with dementia.

4.8.6.1. Quantitative data collection

After the training session and prior to the implementation of the music intervention, participating staff were asked to complete a questionnaire addressing the implementation outcomes intended for the pre-implementation period or early phase of the implementation ([Appendix 12.1](#)). Each time the music intervention was implemented, staff and family members or guardians were asked to document this in the older person with dementia's music intervention logbook (in the form of a checklist), including the reason for implementation and the observed effect(s) where possible ([Appendix 13](#)). At the end of the 3-month implementation period, staff completed the implementation outcomes questionnaire for the post-implementation period ([Appendix 12.2](#)).

Participating older people living with dementia were assessed for their levels of agitation and quality of life at baseline (two weeks prior to implementation) and at the end of the 3-month implementation period. The candidate interviewed the staff who were familiar with and regularly cared for the participating older person with dementia regardless of whether the staff member was a participant of the study or not. This was to ensure that the staff member had adequate knowledge of the older person with dementia's agitation, mood, memory, and daily functioning. For those people living with dementia whom self-report of quality of life (PAS-CIS) was not feasible to administer, the proxy version (PAS-CDS) was used through interviews with staff.

The older person with dementia's prescription and use of psychotropic medications was recorded four weeks prior to the start of the implementation and four weeks prior to the

end of the 3-month implementation period. This was done by review of the older person with dementia's primary medication charts, signing sheets, progress notes and/or the facility's database entry of PRN medications administered.

Towards the end of each month of the 3-month implementation (months 1, 2 and 3), the participating older people living with dementia were assessed for their engagement with the music intervention using the HoME-S. The staff selected to complete the HoME-S were those who were actively involved in the implementation, as determined by the candidate through staff feedback and the candidate's observation of the implementation. The candidate conducted a brief individual discussion with the staff on how to complete the HoME-S. Data were collected at three points: end of first month, second month and third month of implementation. The same staff filled in the HoME-S for all data collection points in both facilities. Staff who completed the HoME-S were reimbursed with a gift card.

The costs of the music intervention and the implementation throughout the 3-month implementation period were calculated as part of the quantitative data for this study. Details of the costs are reported in section [4.8.5](#) of this chapter.

4.8.6.2. Qualitative data collection

The candidate conducted a focus group interview at one RACF (RACF1) and individual interviews at both facilities during the 3rd month of implementation with staff and family or guardians to collect qualitative data. The interviews explored perceptions regarding the implementation of the music intervention and its impact on the older

people living with dementia. The interviews were conducted during the third month to ensure that participants (staff and family or guardian) had experience in the implementation of the music intervention.

Focus group interviews

The focus group method of data collection is characterised by active interaction among group participants in the discussion of a certain experience or issue (Marks & Yardley, 2004). This can be used in any research requiring discussion of the topic being investigated (Gavin, 2008). A focus group usually involves a small number of participants (4-8) and a moderator (e.g. researcher) who poses the question and encourages the discussion (Marks & Yardley, 2004). A smaller number of participants may be appropriate if the participants are able to contribute extensively on the topic being discussed (Gavin, 2008). One of the advantages of focus group interviews is that they allow analysis of people's collective sense of their individual experiences and beliefs (Marks & Yardley, 2004).

The candidate conducted an audiotaped semi-structured focus group interview with six staff members to gather qualitative data on the implementation strategies and their impact on the implementation outcomes, barriers and facilitators in the implementation process as well as the effectiveness of the music intervention as perceived by nursing and allied health staff. Both written (consent form, see [Appendix 5.3](#)) and verbal consent were sought. The focus group interview in RACF1 was conducted in the facility's education/lecture room.

Prior to the start of the focus group interview, the candidate discussed the purpose of the focus group interview and provided details about maintaining privacy and confidentiality as stated in the information statement. The candidate highlighted that anything focus group participants said or any information shared during the discussion would be confidential and that when all the data is analysed participants would not be named or identified. After this, the participants were asked if they were happy to proceed with the recorded interview. The candidate ensured that participants were comfortable and no background noises could interrupt the discussion. The meeting/education room was closed to ensure privacy and encourage participants to openly and honestly contribute to the discussion. An iPhone 5s (a smartphone released by Apple Incorporated in 2013) was used to record the interview.

A focus group interview guide was developed by the researchers to provide a general structure to the interview. Details of this interview guide are presented in Chapter 7 section [7.2](#). The questions addressed the staff's experiences and perceptions as well as the barriers and facilitators encountered in the implementation of the individualised music intervention. The candidate ensured that everyone heard and understood the questions asked by repeating or re stating them as necessary. Before proceeding to the next guide question, the candidate made sure that everyone had the opportunity to respond and encouraged any additional comments about the question asked or the discussion. Both non-reflective and reflective listening were used depending on the participants' responses (Fern, 2001). Non-reflective listening involves minimal responses to encourage the participants to participate in the discussion while reflective listening uses reflective responses (e.g. clarifying, paraphrasing, reflecting feelings,

summarising) to promote clarification and accuracy of the participants' responses (Fern, 2001). The candidate used minimal responses (e.g. nodding) to encourage participants to talk more about a topic of interest. There were also instances when the candidate clarified, paraphrased and summarised what was said to ensure the accuracy of the participants' responses. At times, some of the participants shared information or asked questions that were not relevant to the phenomenon being investigated (e.g. about other interventions that can be used for older people living with dementia). The candidate listened, responded, and then redirected the conversation back to the topic of interest by either making a statement or asking a question to lead them to the focus of the discussion. After the final question and before ending the interview, the candidate asked the participants if there was anything else that they wanted to say or share that was not covered during the discussion.

Individual interviews

The candidate contacted those participants who indicated in the consent form that they would like to participate in the interviews to share insights regarding the implementation and its impact on the participating older people living with dementia. Only one guardian (from RACF1) responded and agreed to sit down with the candidate during one of her visits for the individual interview. The candidate contacted staff who actively and regularly provided feedback about the implementation of the music intervention to participate in an individual interview. The candidate conducted an audiotaped semi-structured individual interview with one staff member from RACF1 who could not make it to the focus group discussion. The candidate attempted to contact the other four staff participants of the study, however due to personal reasons and time

constraints contact was not successful. For RACF2, all three staff participants preferred an individual interview to accommodate the time they were available for interview. Both written (consent form, see [Appendix 5.3](#)) and verbal consent were sought for the interview.

The interviews were conducted in a secluded area (e.g. quiet section of the unit) to promote open and honest discussion. The candidate discussed the purpose of the interview and ways to maintain privacy and confidentiality before asking the participant if she/he was happy to proceed with the recorded interview. The candidate highlighted that the information they shared would be confidential and when data analysis is completed they would not be named or identified. The interview guide questions used were the same as the focus group interview (see Chapter 7 section [7.2](#)). The candidate used non-reflective and reflective listening and probing questions were asked to prompt the participant to provide in depth information about some responses of interest. Additional comments were encouraged at the end of each discussion relating to a particular guide question. Before ending the interview, the candidate asked if there was anything else the participant wanted to say or discuss.

Other sources of qualitative data

In addition to the interviews, the qualitative data also comprised the open-ended section of the implementation questionnaire completed by participating staff and the progress notes' entries of participating older people living with dementia throughout the 3-month research implementation. The progress notes documentation included were only those that talked about the implementation of the music intervention and its effects on the

participating older people living with dementia throughout the three-month research implementation period.

Creation of an individualised music listening care plan for the participating older people living with dementia was planned to be discussed with the management at the start of the research implementation. Registered nurses would evaluate the care plans on a regular basis in both facilities (e.g. every three to four months). Evaluation of the music listening care plan was planned to be included in the study's qualitative data. However, the creation of individualised care plan was not materialised as reported in Chapter 5 section [5.4.7.5](#).

4.9. Data analysis

Quantitative data was analysed using exploratory data analysis while qualitative data was analysed using qualitative content analysis; these are described below. Inferences from the quantitative and qualitative components of the study were integrated and discussed in the final chapter. A summary of the components of data analysis is presented in Table 4.3.

4.9.1. Quantitative data analysis

Exploratory data analysis was undertaken using STATA version 15 (StataCorp, 2017) after data cleaning and checking for implausible values and missing data. Continuous variables were summarised as median and interquartile ranges as appropriate and analysed using non-parametric statistics for the skewed distribution: Two-sample Wilcoxon rank-sum (Mann-Whitney) test for comparing the data between the two implementation sites and the Wilcoxon Signed-Rank Test for comparing the pre-implementation and post-implementation data of a single sample (older people living with dementia participants from each implementation site). The Wilcoxon Signed Rank Test is the type of non-parametric test used for comparing repeated measurements from a single sample.

Categorical variables were described using frequencies and percentages and analysed using the Fisher's exact test. Cross tabulations were used to examine associations between categorical variables using the Chi-square statistic. For the Training Acceptability, Feasibility, and Appropriateness questionnaire, those who responded with "extremely" were combined and compared with the combined proportion of those

who either responded with “not at all” or “moderately”. For the Measure of Disseminability, the “very much” responses were combined and compared with the combined proportion of who either responded with “not at all” or “somewhat”.

The financial costing was taken from the perspective of the residential aged care facility and the residents. Costs were assessed by stipulating the resources included in the costing delineated in section [4.8.5.1](#), the units of measurement used for these resources, and the monetary units applied. Actual costs included the cost of the equipment and the labour costs based on the staff’s minimum pay rate including the overhead costs. For the costs of music intervention equipment including the iPod shuffle, headphones, charger, and container, a 3-year straight-line depreciation was used. This assumed that the equipment has a life of three years. As the equipment was used for a 3-month period during the research implementation, the costs of the equipment were amortised for the proportion that it was used over the 3-year period. For the depreciation costs, the music downloaded from iTunes were excluded. This is based on the assumption that once iTunes membership is cancelled, all the downloads are automatically deleted. For this study, the iTunes download is considered as a consummable even though it may be reused for the creation of other residents’ music playlists.

The pay rate per hour for staff including the overhead costs that were used for the calculation of labour costs (operating, training, and implementation of the intervention) across implementation sites based on data provided by RACF1. RACF2 did not provide details regarding the staff’s pay rate. The pay rate provided by RACF1 management was based on the minimum pay rate for each job description. The cost of the laminated card

which include the laminating pouches, board paper, and ink cartridges were assumed as fixed consumable costs for the duration of the 3-month implementation. The base year for the costing was 2017 and the monetary values were in Australian dollars.

Results of the quantitative data analyses are presented in Chapters 5 and 6. In Chapter 5, the implementation outcomes are reported while in Chapter 6 the outcomes relating to the impact of the music intervention on older people living with dementia are presented.

4.9.2. Qualitative data analysis

Qualitative description was used for the qualitative component of this study. Qualitative description aims at providing a rich and direct description of an informant's experience (Neergaard, Olesen, Andersen, & Sondergaard, 2009). It is suited for mixed methods inquiries and health services research that intend to present facts from patient's perspectives and evaluations (Neergaard et al., 2009). Qualitative content analysis is the most commonly used data analysis method in qualitative description methodology (Neergaard et al., 2009; Sandelowski, 2000). Hsieh and Shannon (2005) define qualitative content analysis as a "research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns" (p. 1278). Qualitative content analysis summarizes the informational contents of the data and involves application of codes from the data themselves (Sandelowski, 2000) The amount of data is reduced as the researcher focuses on selected aspects of meaning that relate to the overall research question (Schreier, 2014). The qualitative content analysis was guided by the steps in conventional content analysis outlined by (Hsieh & Shannon, 2005) highlighting

significant words and statements, applying codes, clustering ideas that were similar, and then categorising these to help identify emerging themes.

As previously mentioned in section [4.8.6](#). Data Collection, the qualitative data set comprised a focus group, individual, face-to-face interviews, the open-ended section of the implementation questionnaire, and progress note entries for the participating older people living with dementia. The recorded focus groups and individual interviews were transcribed verbatim by a professional transcription service. The interview transcripts were reviewed, ensuring that they were complete, in accordance with the audio file. The candidate undertook the analysis after reading and re-reading the transcripts several times. Data from the open-ended section of the implementation questionnaire and progress notes entries for the participating older people living with dementia were also analysed as part of the qualitative data set.

Analysis was undertaken manually by the candidate, under supervision, by highlighting significant words and statements and identifying initial codes. Codes were clustered and categorised using a table and sorted in accordance with the key ideas conveyed. Codes with similar ideas, patterns or thoughts were grouped together. Moving backwards and forwards with the highlighted statements comparing parts and whole of coded data, potential themes emerged. Additional codes emerged as analysis progressed which led to identification of emergent themes. Results of the qualitative data analysis are presented in Chapter 7.

4.9.3. Integration of inferences

In this mixed methods study, integration of the quantitative and qualitative data occurred in the final phase of data analysis. Data from the pre-post-test design and the qualitative interviews were analysed separately and resulting inferences were presented in their respective chapters. The inferences from each quantitative and qualitative component were combined and integrated in the final chapter (Chapter 8).

The primary outcomes of this study comprised research questions that were answered using quantitative and qualitative approaches as detailed in section [4.7.1](#). For the research questions addressed using the quantitative approach, quantitative inferences were presented first followed by the qualitative inferences. In this instance, inferences from the qualitative component of the study were used to explain, supplement, or clarify the quantitative inferences. For the research questions addressed using the qualitative approach, qualitative inferences were discussed first followed by quantitative inferences. In this instance, the quantitative inferences were used to supplement or were compared with the qualitative findings. The secondary outcomes of this study were primarily addressed using a quantitative approach. The quantitative inferences were presented first followed by qualitative inferences, which explained, supplemented, or clarified the quantitative inferences. Conclusions were then drawn from the integrated quantitative and qualitative inferences.

Table 4.3. Summary of data collection and analysis

Quantitative Data Collection

1. Questionnaire on the implementation outcomes completed by participating nursing and allied health staff at baseline/prior to the implementation of the music intervention and at the end of the 3-month implementation period.
2. Record of implementation from the participating person with dementia's music intervention logbook during the 3-month implementation period
3. Assessments of participating people living with dementia's level of agitation using the Cohen-Mansfield Agitation Inventory (Cohen-Mansfield et al., 1989) and quality of life using the Dementia Quality of Life Questionnaire (Smith, Lamping, et al., 2005) at baseline and at the end of the 3-month implementation period.
4. Register of prescription and/or use of psychotropic medications from the primary medication chart, medication signing sheets and progress notes at baseline (4 weeks prior to implementation) and 4 weeks prior to the end of the 3-month implementation period.
5. Assessment of participating people living with dementia's engagement during the implementation of the music intervention using the Homecare Measure of Engagement Staff Questionnaire (Baker et al., 2016) at the end of month 1, 2 and 3 of implementation.
6. Costs of the music intervention and implementation of the music intervention by trained staff were determined from the start to the end of the 3-month implementation period.

Qualitative Data Collection

1. Semi structured focus group and individual interviews with nursing and allied health staff and family or guardian during the 3rd month of implementation.

2. Documentation about the music intervention and its impact on the participating older people living with dementia from the open-ended response section of the implementation questionnaire and the person with dementia's progress notes during the 3-month implementation period.

Data Analysis

1. Quantitative data were analysed using exploratory data analysis.
2. Qualitative data were analysed content / thematic analysis (Neergaard et al., 2009; Sandelowski, 2000).

Inferences

Results of the quantitative and qualitative data analysis are presented within respective chapters and integrated in the final chapter.

4.10. Limitations of the methodology and methods

4.10.1. Quantitative component

One of the limitations of this study design was the use of a pre-test post-test study for the quantitative component, which has its drawback in terms of potential biases and confounding due to the absence of randomisation and a control group. A randomised controlled trial (RCT) which is considered as the most rigorous experimental study design would have provided stronger evidence especially relating to the effects of the music intervention to the participating people living with dementia. However, a RCT was not possible due to the limited sample size both of the participating staff and family or guardian and the people living with dementia, time constraints and limited funding/resources. Sample size and power calculations were initially performed with a view to randomisation however the target sample size of older people living with

dementia necessary for proper randomisation and allocation to different groups was not feasible to reach within the available time period. With limited funding allocated for the research implementation, including other interventions for comparison to ensure potential biases and contamination were controlled for was difficult. The pre-test post-test design means that unknown confounders were not able to be assessed and therefore potentially other mechanisms may have led to the changes observed other than the individualised music intervention.

In terms of quantitative data collection, one of the limitations was the reliance on the study participants especially the staff members in the completion of a number of assessments and questionnaire as well as in the documentation of the episodes of implementation. Issues with data collection involving caregivers is well documented such as incomplete data and time constraints (Garcia et al., 2013; Kaasalainen et al., 2010; Lam et al., 2018; Zapka et al., 2014). In the context of the residential aged care setting and with the voluntary nature of participation, accuracy of the assessments and documentation involving staff members was not able to be guaranteed in this study.

4.10.2. Qualitative component

Decisions regarding participation in the qualitative component of this study as well as when to conduct the interviews and focus group were based on the consent to this part of the study staff and family or guardian of participating older people. Of the fourteen staff and seven family or guardian who participated in the study, ten staff members and one guardian participated in the focus group and interviews. Thus, not all of the study participants were able to provide their insights or share their experiences regarding the

implementation of the music intervention. Additionally, as most staff who consented to participate worked permanent part time, their availability depended on the day and the shift that they worked.

While sample size is not primarily an issue in qualitative research, there was a limitation relating to the amount of time that staff and family or guardian spent with the focus group or the interviews. As discussed in Chapter 7 section [7.4.4](#), the focus group and the interviews with staff members were short in duration as they were conducted either before the start or at the end of their shift based on their preferences. Either way, time was limited as they hurried to get back to work or to go home. While there is no specified sample size in qualitative research, consideration of the sample size in relation to data saturation is important (Creswell, 2015). Creswell (2015) defines saturation as “the point in data collection when the researcher gathers data from several participants and the collection of data from new participants does not add substantially to the codes or themes being developed” (p.77). In this study, the candidate did not make a decision to stop the qualitative data collection. Attempts were made to contact the other staff participants for their participation in the qualitative interviews but was unsuccessful, as previously mentioned in section [4.8.6.2](#) of this chapter. Attempts were also made to prompt the participants during the interview for more insights however most participants did not ask further questions or make additional comments. While data saturation was not achieved in this study, this is not primarily a qualitatively driven study and potential issues with qualitative data collection were already considered during the design of the study. Data were integrated in a way that the qualitative data

was used to explain, supplement or clarify the quantitative inferences as previously discussed in sections [4.3.3.5](#) and [4.9.3](#) of this chapter,.

4.10.3. The candidate

The candidate, being a new researcher, also has her own limitations. Challenges with mixed methods research include the difficulty with conducting both quantitative and qualitative research simultaneously and whether or not the researcher has a deep understanding of the various research methods and in mixing these methods (Johnson & Onwuegbuzie, 2004). This is the candidate's first experience with conducting a mixed methods study. Apart from the mixed methods, qualitative methods are relatively new to the candidate. There was a mix of skills and expertise of the research supervisors (quantitative, qualitative, and mixed methods researchers) who provided guidance from the design of the study to the study implementation and analysis of the research data. However, the candidate solely collected the quantitative and qualitative data. Being a novice qualitative researcher, the candidate may have not explored the qualitative data in sufficient depth. Involvement of an experienced researcher in moderating and contributing to questions at the time of the qualitative interviews may have improved the depth of the qualitative data.

4.10.4. Short implementation period

Another limitation of this study in general was the short research implementation period. Decisions regarding the duration of the research implementation was initially discussed in section [4.4.2](#) of this chapter and include the limited resources and the enrolment of the candidate on a full time basis, which requires the completion of the

research within the timeframe of the candidacy. Conclusions regarding sustainability of the implementation of the music intervention beyond the 3-month period need to be drawn with caution. As people and situations change, a follow up data collection time-point would have provided additional insights on sustainability especially in the context of residential aged care where staff turnover is high as discussed in Chapter 8 section [8.7.7.1](#). Regarding the effects of the music intervention on the participating older people, this data were only collected at two points (before and after the music intervention implementation period) and the music intervention was only implemented over a 3-month period. A longer implementation period or use of repeated measures including post implementation follow up would have strengthened the quantitative study findings on the effects of the music intervention. However, the progressive nature of dementia and the inclusion of older people with dementia who are in the palliative stage who might not potentially complete the research implementation, are other considerations for conducting the study for a longer period.

4.11. Ethical considerations

Approval for the implementation of this research was obtained from the University of Newcastle's Human Research Ethics Committee (HREC). A copy of the approval letter is attached in [Appendix 6](#) (Approval number H-2017-0116). The names of the participating institutions are removed from the HREC letters attached in the appendices to protect the participating institution's privacy. Approval was also obtained from management at both RACFs. In RACF1, the candidate sought approval from the organisation's regional manager and the Clinical Governance Committee who reviewed the research proposal prior to their decision to allow the candidate to conduct the study

in the facility. In RACF2 approval for the conduct of the study was sought directly from the facility management.

This study involved participants from a vulnerable population (older people living with dementia), and in one of the facilities (RACF1), the participating older people living with dementia were in a dependent relationship with the candidate and the staff participants were the candidate's co-workers. Thus, several ethical considerations were addressed and are discussed below specifically in terms of securing consent and identifying and managing potential risks.

4.11.1. Free and informed consent

Posters/advertisement about the research project were placed in the staff room and the reception area in RACF1 and in the nursing station in RACF2. As per ethics approval, where a person responded to the advertisement of the research within the facility, the first contact was initiated by the potential participant with either the facility management in RACF1 or with the candidate in RACF2. This was to ensure that their decision to seek further information about the research project was their own.

In RACF1, the candidate's dual role as a researcher and an employee was managed by ensuring that any research-related activities including recruitment were undertaken during the days when the candidate was not rostered for work as initially described in section [4.5](#) of this chapter. Potential participants' decision to approach the facility management or the candidate for further information about the research project was on a self-select basis. The candidate did not engage in any effort to promote the research or

encourage participation to RACF1 staff, older people and their family or guardian.

When potential participants approached the candidate, the candidate ensured that they had read the information statement which detailed information about the research project. All potential participants were given time to think and decide if they wanted to participate. As per ethics approval, the staff and family member or guardian participants had the option to take the forms home and return the signed consent form if they were interested when they next came to the facility, by email or by post. Some potential participants took the information statement home with them while some read the information statement while in the facility. In addition to what was indicated in the information statement, the candidate reinforced during conversations with interested staff, family members or guardians, and older people living with dementia (where possible) the components involved with their participation and the music listening intervention to be implemented. The candidate highlighted that participation was voluntary and only those who provided their informed consent would be included in the project. The candidate emphasised that they could withdraw participation at any time (e.g. up to the point of publication) without giving a reason and they had the option of withdrawing any data relating to them. Whether or not they decided to participate, they were reassured that their decision would not disadvantage them and would not affect their relationship with the candidate or the organisation.

Family members from RACF1 were contacted by a staff member appointed by the management. The candidate verified with this staff member that all of the family members or guardian of people living with dementia who initially indicated interest over the phone received a copy and read the information statement before they signed

the consent. Upon meeting the consenting participants from RACF1, the candidate reiterated the aim and objectives of the study and their role in relation to the music intervention, checked to see if there were any questions and also re checked their consent.

4.11.1.1. Family Members or guardians and older people living with dementia

Both the consent of the family members or guardians and the older people living with dementia were taken into consideration regarding the older people's participation in the study. The family member or guardian was first contacted for their consent before the older person was approached. As previously mentioned in section [4.8.1](#), the facility management in RACF1 took an active role in the recruitment of staff, family or guardian, and older people living with dementia due to the candidate's role in the facility as an employee (registered nurse) mindful that this may impact the potential participants' decision making regarding the study. The management appointed a staff member to contact the family or guardian of people living with dementia over the phone. The family member or guardian were asked to see the clinical manager or an administrative staff member for a copy of the information statement during their visit if they were interested and to read the detailed information about the research project. They were encouraged to take the forms home and return the signed consent form during their next visit if they were happy for their loved one with dementia to participate in the study. Even though the candidate was not able to have a personal conversation with some of the family or guardian participants, it was highlighted in the

information statement that they may contact the candidate for further information about the research project.

In RACF2 where the candidate was not an employee, the candidate was the one who initially contacted the family or guardians of the older people living with dementia over the phone with permission from the facility management. The family members or guardian were provided with information regarding the research project such as the music intervention, what participation entails for them and their loved ones, the benefits and risks, among others over the phone. Family members or guardians who showed initial interest were asked to pick up the information statement in the nursing station when they visited if they were interested to read further details about the research project. If they decided to involve their loved one in the research project, they were asked to sign the attached consent form, list the music preferences of their loved one in the designated form, and return the forms (consent and music preferences list) when they visited the facility.

For both facilities, after the family or guardian provided their consent, the candidate reviewed the most recent cognitive function assessment of the older people living with dementia. As per ethics approval, those with mild to moderate cognitive impairment were assessed by the candidate for their ability to understand the information provided, assess risks and make informed decisions to determine whether they were capable of providing informed consent. This was done by asking the older person with dementia to answer three questions about the study:

- i) related to what participants are being asked to do: What activities are involved when you participate in this study?
- ii) potential harms: What are the potential harms or negative effects of participating in this study and/or receiving the individualised music listening intervention?
- iii) potential benefits: What are the potential benefits or positive effects of participating in this study and/or receiving the individualised music listening intervention?

Those who answered correctly were asked to provide written consent. For those who did not answer correctly or those with cognitive impairment that significantly affected their ability to assess risks or make a decision, the informed consent was primarily sought from their family or guardian. Specifically, in New South Wales, substitute decision makers for personal and/or health care decisions include Enduring Guardian and/or Guardian. This meant that if a potential participant had not appointed an Enduring Guardian, someone designated in the State/Territory law as a "Person Responsible" could make decisions on the participant's behalf. The Person Responsible was generally a family member or another person who had a relationship with the potential participant (e.g. spouse, non-professional carer, close friend or relative).

In RACF1, a staff member made initial contact with the older people living with dementia who was initially determined as potentially capable of providing informed consent in the facility. The staff member provided a copy of the information statement to the older person with dementia and briefly discussed the research and the music

intervention, highlighting their role in the research and the music intervention. After this, the older person with dementia was asked if he or she was interested in participating. The candidate met with those who verbalised initial interest and further discussed details of the research as reflected in the information statement. The headphones, iPod shuffle, and the drawing version of the information statement (see [Appendix 5.2](#)) were shown during the discussion about the music intervention and nature of participation. The participating older people living with dementia were assessed for their capacity to provide informed consent using the three questions mentioned above. The candidate checked the older person's understanding about the information provided based on their answers to the three questions and asked if they have further questions. The older person was given the time to think and the option to decide when they would like the candidate or a staff member to come back and check their decision regarding participation. It was emphasised that their decision to participate was voluntary and that they can withdraw their participation any time without giving a reason. For the older people who expressed that they were happy to participate, the candidate read the consent form to them and they were asked if they were happy to sign the consent form to indicate their decision to participate.

In RACF2, an older person with dementia who was determined by the candidate and the team leader of the unit as potentially capable of providing informed was approached by the candidate after her family member consented for her to participate in the study. The family member of this older person lived in another state so he was not present during this process. The candidate showed the older person the drawing version of the information statement (see [Appendix 5.8](#)), provided details about the research project,

and asked if there were any other questions. The candidate determined the older person's ability to provide informed consent through the three questions mentioned above. The older person was given the time to think and the option to decide when she would like The candidate or a staff member to come back and check her decision regarding participation. When the older person expressed that she was happy to pursue with participation, the candidate read the consent form and asked the older person if she was happy to sign to indicate her decision to participate.

Consideration of the person with dementia's objection or refusal aligns with the fundamental ethical concepts of assent and dissent. Obtaining assent involves acknowledging the person with dementia's residual capacity to express a choice while dissent involves respecting a person with dementia's objection during a study procedure (Black, Rabins, Sugarman, & Karlawish, 2010; Slaughter, Cole, Jennings, & Reimer, 2007). Both the assent and dissent are critical in research involving people living with dementia (Black et al., 2010; Slaughter et al., 2007). Thus, as per ethics approval, even if the family/guardian and/or the older person provided consent, the staff and/or family or guardian who implemented the music intervention acknowledged the older person's objection or refusal when offered the music intervention. For instance, two participating people living with dementia from RACF1 did not receive the music intervention as they refused it from the beginning of the implementation. In RACF2, although most of the participants accepted the music intervention early during the implementation, some of them refused the intervention when offered later on during the implementation as reported by staff. These participants' refusals were respected and acknowledged; they were not included in any further activities relating to the music intervention. Any data

collected from these participants prior to their refusal of the music intervention was included in the data analysis as they did not withdraw from the study.

4.11.1.2. Staff

In RACF1, the facility manager provided some information about the research project (e.g. purpose, the intervention and nature of participation) through short message service (SMS) and during the staff meetings for the month as detailed in section [4.8.1](#) of this chapter. Interested staff were asked to get a copy of the information statement from the clinical manager. The staff who approached the clinical manager were asked to read the information statements for further information and to see the candidate if they have further questions. If they were willing to participate, they were asked to sign the consent form and return the signed form to either the clinical manager or the candidate.

The information statement specified that the staff's decision regarding participation was voluntary, would not negatively affect their working relationship with the candidate, and would not have any negative consequences on their employment status/condition in the organisation. This was reinforced by the candidate during the initial conversation with the staff who consented to participate, prior to the training session, and prior to any activities conducted as part of the research project (e.g. qualitative interviews, interviews for resident's assessments). As per ethics approval, the candidate maintained a professional relationship with the staff as a registered nurse during work hours.

Research-related activities were carried out and research-related queries were responded outside the candidate's work days. The management also acknowledged the staff's decision regarding participation. While it was highly encouraged during the recruitment period, there were no further measures undertaken by the management for those who

chose not to participate. Copies of the information statements were made available in the staff room throughout the implementation period. The identity of those who accessed or read the information statements was not identifiable.

In RACF2, after the information session detailed in section [4.8.1](#) of this chapter, staff were asked get a copy of the information statement in the nursing station for further information and to approach the candidate if they have any questions. For staff who were happy to pursue participation after having read the information, they were asked to sign the consent form attached to the information statement. The information statement stated that their decision to participate would not have any impact on their employment status/condition in the organisation. As with RACF1, there were no further measures undertaken by the RACF2 management for those who chose not to participate. The management was provided with a list of the staff who provided their consent to participate. There was no information provided as to the staff who were present during the information session. As the information statements were placed in a designated area in the nursing station, the staff did not have to approach the candidate or the team leader for a copy. Thus, the identity of those who accessed or read the information statements were not identifiable.

4.11.1.3. Consent for other research related activities

Completion of the implementation outcomes questionnaire (see section [4.8.5.1](#)), was highlighted as important for the research project however, it was not mandatory. Staff were given the option to take the implementation outcomes questionnaire home to complete and place it in a drop box designated for completed questionnaires located in the facility's staff room (RACF1) and in the area in the nursing station designated for

the research documents (RACF2). As the staff's personal details in the questionnaire were optional (e.g. date of birth, role in the facility) and the questionnaire was not handed personally to the candidate, the identity of those who completed or did not complete the questionnaire was not identifiable. For the qualitative interviews, both written and verbal consent were sought.

For the music intervention logbook that staff and family or guardian were asked to complete during intervention implementation, it was emphasised that although this would be very helpful for the research, it was not compulsory. Participants had the option to complete it another time if they could remember and not to be concerned if they missed it. For the participating older people living with dementia's assessments that involved staff input, the staff's verbal consent to partake in the assessments was sought by the candidate. The assessments either required them to sit down with the candidate for those requiring interview with staff (e.g. cognitive assessment, dementia severity, agitation, quality of life) or have them fill in an assessment form (measure of engagement). Their preferred day and time to do this were considered. They were also given reimbursement for their time in the form of a gift card/voucher as approved by the HREC.

4.11.2. Identifying and managing potential risks

4.11.2.1. Older people living with dementia

Participating older people living with dementia were anticipated to potentially experience discomfort with the headphones and iPod shuffle. The candidate also anticipated that some music may prompt recall of unwanted or sad memories which

could trigger a negative emotional response. However, as demonstrated in the literature, the use of individualised music as an intervention is generally safe. To minimise or manage the discomfort or negative responses, padded headphones were used for comfort. The candidate highlighted during the training that staff and family or guardian need to ensure that the headphones and iPod shuffle are positioned properly, volume adjusted appropriately and that the older person is in a comfortable position. As part of the protocol detailed in section [4.8.4](#) of this chapter, staff and family or guardian who were implementing the music intervention were instructed to monitor the person with dementia closely at the beginning of the intervention and then approximately every 15 minutes thereafter. If signs of discomfort were manifested or if the older person became agitated or distressed, they were required to stop the music intervention immediately.

4.11.2.2. Staff and Family/Guardian

For participating family members or guardians and staff, risk for inconvenience was possible considering that the research involved attending a training session, filling in forms and questionnaire and participating in focus group or individual interviews, all of which would require some of their time. Staff and interested family or guardian were consulted regarding their preferred day and time for the training and the interviews. Staff were encouraged to report promptly any issues regarding the implementation to the management and the candidate. The RACF1 management paid the staff who attended the full one-hour training in accordance to their hourly rate. Staff were reimbursed in the form of a gift card for their participation in the focus group or individual interviews.

4.11.3. Privacy and confidentiality

Details about privacy and confidentiality were highlighted in the information statements ([Appendix 5](#)). Due to the nature of the music intervention, it was not possible to ensure anonymity with participation for the older people, the staff, and family or guardian with regard to the implementation of the music intervention. However, during the qualitative interviews, anonymity was addressed. Each participating older person with dementia, staff and family or guardian was given a pseudonym that was used throughout the conduct of the study, data analysis, and presentation of results. Information that could identify or possibly identify the research participants were removed at the end of qualitative data analysis. As detailed in section [4.8.6.2.](#), prior to each recorded interview, the candidate discussed with each participant the strategies being implemented to maintain privacy and confidentiality. During the focus group interview, the candidate highlighted that anything focus group participants said or any information shared during the discussion would be confidential. Participants were then asked if they were happy to proceed with the recorded interview.

The encrypted Universal Serial Bus (USB)/external hard drive used for data storage, audio recordings and hard copies of the questionnaires and assessments were physically stored in a locked filing cabinet in the Chief Investigator's office at the University of Newcastle, School of Nursing and Midwifery. In addition to the encrypted USB hard drive, electronic data was also stored in the University of Newcastle's ownCloud service.

4.12. Ensuring the quality of the study

A number of considerations were incorporated in the study protocol to ensure rigor of the quantitative and qualitative components of the study. For the pre-test post-test study, finding a validated implementation outcomes questionnaire was a challenge. Lewis et al. (2015) highlighted that implementation outcomes instrumentation is underdeveloped in terms of the number of available instruments as well as the psychometric properties of existing instruments. Although there was limited information about the psychometric properties of the implementation questionnaires used as noted in section [4.8.5.1](#) (Lyon, 2011; Trent et al., 2010), these questionnaires were included in a systematic review that appraised the reliability, validity, and usability of several implementation outcomes instruments (Lewis et al., 2015). The music intervention logbook designed by the candidate which aimed to evaluate feasibility and fidelity outcomes were completed by the participating staff and family or guardian to ensure that the extent to which the music intervention was regularly implemented and the reasons and timing for implementation were captured from the people who were involved in the implementation. For the implementation cost, a health economist was consulted for advice regarding the data analysis involving the costs of the music intervention and its implementation.

Validity and reliability of the instruments used to measure the secondary outcomes of agitation, quality of life, and engagement were taken into account as noted in section [4.8.5.2](#). To ensure that the participating older people's levels of agitation and quality of life were truthfully captured, the candidate conducted interviews with staff who routinely provided care and were familiar with the participating older people. As the

level of engagement was meant to be assessed by the person who administered the music intervention, the candidate briefly discussed with participating staff the Homecare Measure of Engagement Staff (HoME-S) questionnaire as noted in section [4.8.6.1](#) to ensure that they understand the outcome evaluated and how to complete it. The same staff across implementation sites completed the HoME-S throughout the three points of data collection. The candidate undertook statistical analysis of the quantitative data with the guidance of one of the supervisors who is a biostatistician.

For the qualitative component of the study, the interviews were conducted during the third month of implementation to ensure that the participants have adequate experience in the implementation of the music intervention. Mays and Pope (1995) delineated a number of strategies to ensure rigour in qualitative research such as detailed documentation of the data analysis, independent assessment and coding by more than one researcher, and use of a wide range of qualitative data sources. Trustworthiness in this study was addressed through a clear delineation of the steps involved in the data analysis as reported in section [4.9.2](#). To ensure reliability of the transcribed interview data, the candidate verified the transcription against the audio file. To ensure reliability and consistency of the coding, the candidate and one supervisor who is a skilled qualitative researcher performed independent assessment of the transcripts and initial coding. Direct quotations from the participants were used in the reporting of the findings in Chapter 7 to enable the reader to evaluate the interpretations. Apart from the interview data, the qualitative data set included written sources such as the open-ended responses from the implementation questionnaire completed by participating staff and

progress notes documentation for the participating older people as detailed in section [4.8.6.2](#).

4.13. Conclusion

In this chapter, the application of a mixed methods design in addressing the objectives of the present study was detailed. The study setting, study population, procedures involved in the conduct of the study, and the study outcomes evaluated were delineated. This chapter also presented a description of the individualised music listening intervention used and the strategies incorporated for its implementation in the daily care of older people living with dementia, including the ethical considerations. Findings from the study will be presented in the subsequent chapters (Chapter 5, 6, 7 and 8). In the next chapter, the results from the quantitative component of the study addressing the primary (implementation) outcomes is discussed.

**Chapter 5 Effects of implementation
strategies on implementation outcomes –
A pre-test post-test study**

5.1. Introduction

The promising impact of individualised music listening on people with dementia was demonstrated from the results of the systematic review presented in Chapter 3.

However, the background literature discussed in Chapter 2 revealed the paucity of research focusing on implementation, creating a gap between the efficacy of the individualised music listening and its routine implementation in the daily care of people with dementia. This study aimed to address this gap with the evaluation of the effects of the implementation strategies on the implementation outcomes (defined below). In Chapter 4, a detailed description of the study design and the methods used to address the objectives of this study were presented. In this chapter, the results from the quantitative component of this study addressing the primary implementation outcomes of adoption, acceptability, appropriateness, feasibility, fidelity, sustainability, and implementation costs are discussed. The results section includes a description of the participating older people with dementia, data from the implementation outcomes questionnaire and the music intervention logbook, and the costs associated with the music intervention and its implementation. The data from the questionnaire and logbook were delineated in accordance with the implementation outcomes addressed. Fidelity to the implementation strategies used are discussed to highlight the contextual issues that prompted some modifications from the protocol. The impact of the implementation strategies on the implementation outcomes are discussed and the findings are compared with current literature.

5.2. Overview of the study objective and methods

This study aimed to evaluate the implementation of an individualised music listening intervention for older people with dementia. This chapter reports the results from the data addressing the implementation outcomes specifically on the following objective:

Objective 1: To explore strategies that promote adoption, acceptability, appropriateness, feasibility, fidelity, and sustainability of implementing an individualised music listening intervention within a residential aged care facility.

1. What are the effects of the implementation strategies on the adoption, acceptability, appropriateness, feasibility, fidelity and sustainability of an individualised music listening intervention in a residential care setting for older people with dementia?
2. What are the actual financial costs associated with the implementation of an individualised music listening intervention for the service provider?

Details about the study design, setting and sample, study outcomes, study procedures and data analysis methods for this part of the study were presented in Chapter 4.

5.3. Study participants and recruitment

As described in Chapter 4, participants of the study included older people living with dementia, the family or guardian of older people living with dementia and staff members from both implementation sites. Details of the older people living with dementia who participated, including those where consent was provided by their family or guardian are described below.

Active recruitment of the participants occurred from July 2017 to August 2017 in RACF1 and from September 2017 to October 2017 in RACF2. In RACF1, two older people living with dementia were recruited after the planned recruitment period. One of these two participants was recruited by a participating staff member during the second month of implementation (October 2017) and the other was recruited by the leisure and lifestyle coordinator during the third month of implementation (November 2017).

Details of the participating family or guardian and staff members who consented to participate are included in the evaluation of the implementation outcome of adoption and are provided in section [5.4.1](#) of this chapter.

5.3.1. Research implementation period

Following recruitment, the 3-month implementation period was from August 2017 to November 2017 in RACF1 with the exception of the two older people living with dementia who commenced during the second and third month of implementation and had all assessments completed in January and February 2018. In RACF2, the implementation period was from October 2017 to February 2018. The 2-week period

covering Christmas and New Year (December 18, 2017 to January 1, 2018) was not counted as part of the implementation period as it was a very busy time in the facility. Thus, the 3-month implementation was completed in February 2018.

5.3.2. Participant flow – older people living with dementia

Of the 38 eligible older people living with dementia from RACF1, 18 consented (3 older people living with dementia and 15 family members/guardians of the older persons) to participate in the study. One older person with dementia passed away before the implementation of the music intervention started, thus only 17 older people living with dementia from RACF1 commenced the implementation. Of the 25 family/guardian of people living with dementia contacted from RACF2, 15 expressed interest and consented to their family or next of kin with dementia to participate in the study. In total 32 older people living with dementia participated in this study (see Figure 5.1).

A total 22 of 32 (68.8%) older people living with dementia completed the 3-month implementation period. Five older people living with dementia dropped out from the study during the implementation period (two from RACF1 and three from RACF2). Reasons for drop out were continuous refusal of the music intervention (n=4) and severe hearing impairment (n=1). Five older people living with dementia passed away during the music implementation period: one in the first month, three in the second month and one in the third month.

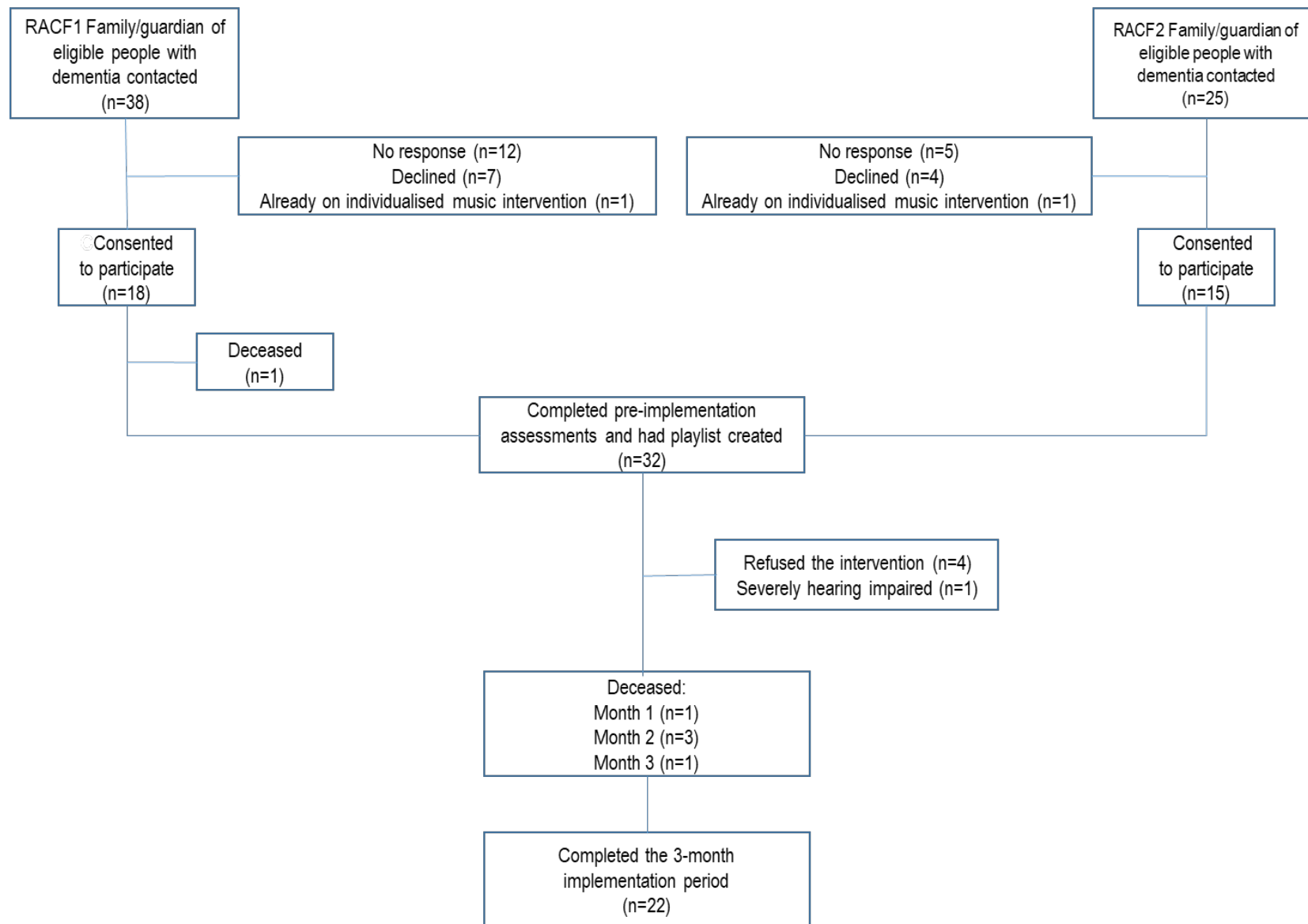


Figure 5.1. Flow of participating older people living with dementia

5.3.3. Baseline Characteristics

Results of information collected on participants prior to commencing the music intervention are provided below.

5.3.2.1. Demographic characteristics and type of dementia

The baseline characteristics of people living with dementia from both implementation sites are presented in Table 5.1. The median age of the participating people living with dementia was 86 years (range 60 to 97) and the majority of participants were female (n= 23, 71.9%). The majority of participants had Alzheimer type dementia (n=19, 59.4%). Five older people (15.6%) did not have a specific type of dementia indicated in their diagnosis. The three other types of dementia included frontotemporal (n=1), vascular (n=1) and Lewy body dementia (n=1). Participants from both RACF were similar at baseline in terms of age, gender and dementia diagnosis as shown in Table 5.1. There were no significant differences between implementation sites in terms of age, gender, diagnosis, cognitive function, agitation and quality of life.

5.3.2.2. Cognitive function and level of cognitive decline

Cognitive function was assessed using the Psychogeriatric Assessment –Cognitive Decline Scale PAS-CDS for the informant interview with staff members and the Psychogeriatric Assessment– Cognitive Impairment Scale PAS-CIS for the interview with the older person where possible. The median score of PAS-CDS was 10 (range from 4 to 10) reinforcing the diagnosis of dementia (a score of 4 or more reflects approximately 80% of dementia cases). Four participants were able to complete the subject interview version of the PAS (three from RACF1 and one from RACF2). The combined median score was 8 (range from 2 to 13), reflecting dementia diagnosis (a score of 5 or more reflects approximately 80% of dementia

cases). No significant differences were noted in cognitive function among participants from both sites.

Table 5.1. Comparison of baseline characteristics between implementation sites (n=32)

Baseline Characteristics	RACF1 (n=17)	RACF2 (n=15)	Combined	p-value
Gender, frequency (%)				
Female	12 (70.6)	11 (73.3)	23 (71.9)	1.000
Male	5 (29.4)	4 (26.7)	9 (28.1)	
Age in years, median (IQR)	85 (11)	87 (13)	86 (12)	0.664
Diagnosis, frequency (%)				
Alzheimer	7 (41.2)	12 (80)	19 (59.4)	0.181
Mixed	4 (23.5)	1 (6.7)	5 (15.6)	
Dementia (type not specified)	4 (23.5)	1 (6.7)	5 (15.6)	
Other types	2 (11.8)	1 (6.7)	3 (9.4)	
Global Deterioration Scale (GDS), median (IQR)	6 (1)	6 (1)	6 (1)	0.756
Global Deterioration Scale (GDS), frequency (%)				
Mild to Moderate Cognitive Decline	3 (17.7)	1 (6.7)	4 (12.5)	0.429
Severe Cognitive Decline	6 (35.3)	9 (60.0)	15 (46.9)	
Very Severe Cognitive Decline	8 (47.1)	5 (33.3)	13 (40.6)	
PAS-Cognitive Decline Scale, median (IQR)	10 (1)	9 (2)	10 (2)	0.411
PAS-Cognitive Impairment Scale, median (IQR); n=4	8 (5)	*2	8 (5.5)	0.157
CMAI, median (IQR)	50 (21)	47 (20)	47.5 (22)	0.720
DEMQOL proxy, median (IQR), n=28	107.5 (15)	102 (18)	106.5 (15.5)	0.448
DEMQOL, median (IQR), n=4	115 (24)	*97	106 (21)	0.655

p-value calculation: Two-sample Wilcoxon rank-sum (Mann-Whitney) for continuous variables and Fisher's exact test for categorical variables.

*PAS-Cognitive Impairment Scale and DEMQOL: pre-implementation n=1 from RACF2, the actual score is reported.

Abbreviations: RACF=residential aged care facility; IQR=interquartile range; PAS=Psychogeriatric Assessment; CMAI=Cohen Mansfield Agitation Inventory; DEMQOL=Dementia Quality of Life Questionnaire.

The Global Deterioration Scale (GDS) was used to determine the severity of cognitive decline. The median GDS score was 6, with most participants in the severe (46.9%) to very severe (40.6%) stages of cognitive decline. No significant differences were noted in the level of cognitive decline among participants from both sites.

5.3.2.3. Agitation and quality of life

Agitation was evaluated using the Cohen-Mansfield Agitation Inventory (CMAI) and quality of life was assessed using the Dementia Quality of Life Questionnaire (DEMQOL) proxy and patient version. As previously noted in Chapter 4, the CMAI used in this study comprised 29 behaviours rated on a 7-point scale. The possible total score generated from the CMAI ranged from 29 to 203, with higher scores indicating greater level of agitation. The median agitation score of people living with dementia participants from RACF1 was 50 and for participants from RACF2 was 47. There were no significant group differences between RACF1 and RACF2 participants' agitation scores. The median agitation score of the pooled sample was 47.5.

For the DEMQOL, there were three participants from RACF1 and one participant from RACF2 who completed the assessment. With the items rated on a 4-point scale (see Chapter 4 section [4.8.5.2](#)), the total score generated from the DEMQOL ranged from 29 to 116, with higher score indicating greater quality of life. The median score for the combined sample was 106. The total score generated from the DEMQOL proxy ranged from 31 to 124. For the DEMQOL proxy version assessment of 28 older people living with dementia, the median score was 107.5 from RACF1 participants and 102 from RACF2 participants with no significant differences between groups. The median quality of life score for the pooled

sample was 106.5. Further details about the comparison of the agitation and quality of life scores between sites and data collection points are presented in Chapter 6.

5.4. Results: Effects of the implementation strategies on the implementation outcomes

As detailed in Chapter 4 section [4.8.2](#), the implementation strategies used in this study include providing training and education to staff and family or guardian of people living with dementia, identification of program leaders, providing and obtaining feedback to participating staff and family or guardian, and the use of reminders for the implementation of the music intervention. In this section, findings on the impact of the implementation strategies on the implementation outcomes of adoption, acceptability, appropriateness, feasibility, fidelity, and implementation cost are presented. Definition of the implementation outcomes are presented in Chapter 4 section [4.7.1](#).

The number of staff and family or guardians of people living with dementia who participated in the study as detailed in section [5.4.1](#) below were used to measure the primary outcome of adoption. Identification of the participating staff's role or position in the facility was collected. Staff members who completed the implementation outcomes questionnaire (see section [5.4.2](#)) provided minimal demographic data. No demographic data was collected for the participating family or guardian. Primary outcomes of acceptability, appropriateness, feasibility, fidelity, and sustainability were measured using the implementation outcomes questionnaire and the music intervention logbook. Data collection occurred in RACF1 from August 2017 to February 2018 and in RACF2 from October 2017 to February 2018.

5.4.1. Adoption

At the time of the recruitment, there was approximately 74 nursing and allied health staff in RACF1. As there was approximately 38 people living with dementia during the recruitment period, 38 family or guardian of people living with dementia were estimated to be eligible to participate in the study. Of those who initially expressed interest (12 staff members and 7 family or guardian), 11 staff and six family or guardian participated in the study.

All of the staff and family members received the training for the implementation except for one guardian who had already been implementing the music intervention before the candidate had the opportunity to conduct the training with her. This guardian stated and demonstrated that she knew how to operate the equipment, turn it on and off and charge it. One staff member who initially consented did not participate while one family member who expressed interest in receiving the training did not respond during the subsequent conversations regarding the training schedule. The staff participants from RACF1 comprised assistant in nursing (AIN) (n=5), leisure and lifestyle staff (n=2), AIN and part-time leisure and lifestyle (n=2), a physiotherapy aid (n=1) and an endorsed enrolled nurse (n=1). The recruitment and flow of staff and family or guardian participants is illustrated in Figure 5.2.

In RACF2, approximately 20 nursing and allied health staff were regularly assigned to work in the dementia specific unit where the study was conducted. Within a 25-bed dementia specific unit, approximately 25 family or guardian were estimated to be eligible to participate. Three staff members and six family members initially expressed interest. The final sample of study participants included all three staff (2 AIN and 1 leisure and lifestyle staff) and one family member. For the other family members in RACF2 who indicated that

they would like to be trained for the implementation of the music intervention (n=5), two changed their minds and stated that they were happy for staff to implement the music intervention while three did not respond when contacted. Evidence of implementation by the staff and family or guardian was noted in the music intervention logbook.

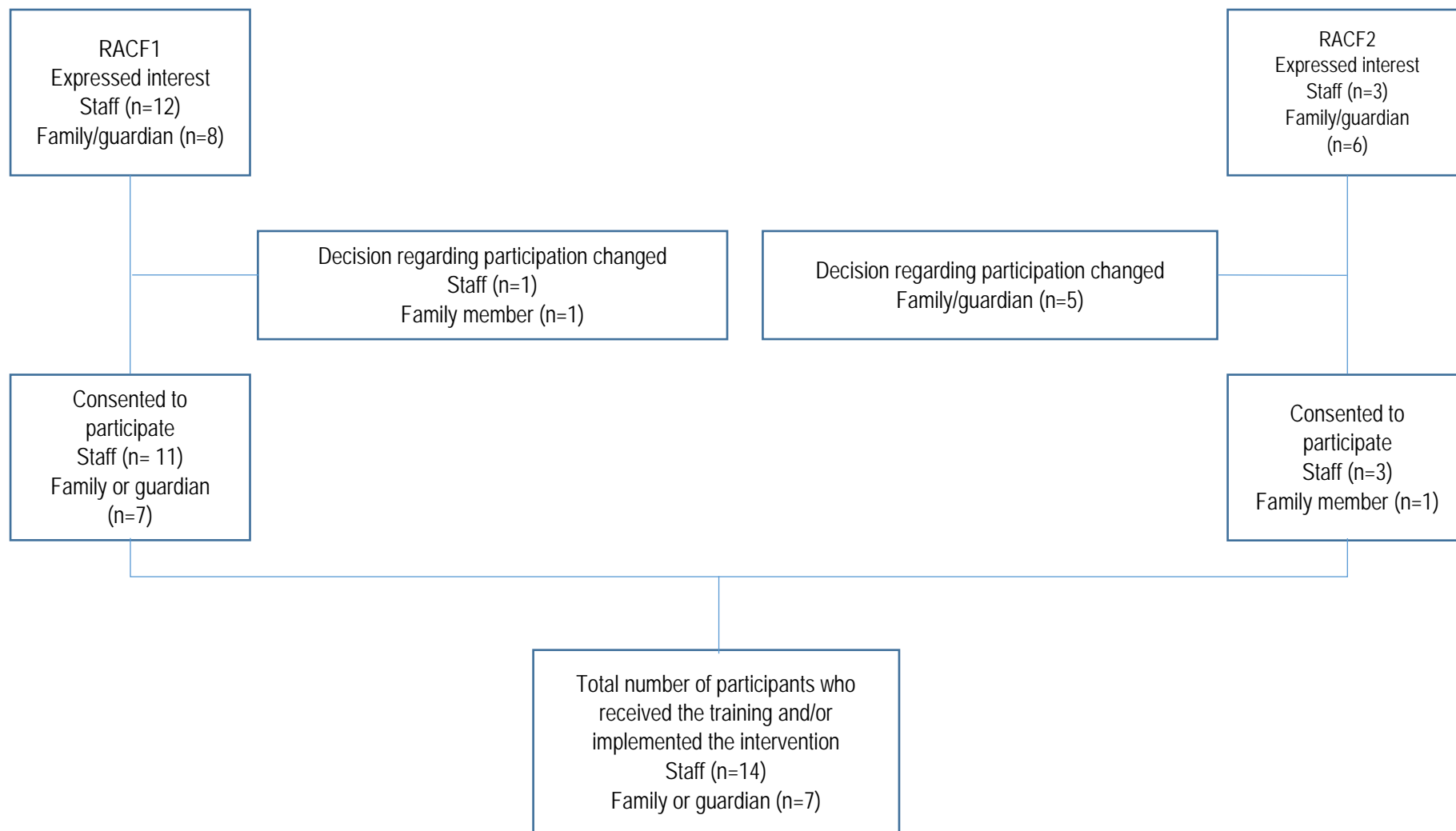


Figure 5.2. Flow of participating staff, family, and guardian

5.4.2. Acceptability, appropriateness and feasibility: Staff perceptions from the implementation outcomes questionnaire

At pre-implementation, staff members were asked to complete the implementation outcomes questionnaire after the training session. They were asked to place the completed questionnaire in a research box located in the staff room in RACF1 and in the nursing station area designated for the research documents in RACF2. Of the fourteen-trained staff, only four completed the pre-implementation questionnaire. Three staff were from RACF1 and one from RACF2. Two of the staff were AIN and two were leisure and lifestyle. Employment status of the respondents was mainly permanent part time and they each worked for more than twenty-four hours each week in the facility. Three of the four staff had been working in aged care for over five years. For the post implementation questionnaire, seven staff members responded. Six staff members were from RACF1 and one was from RACF2. The majority of the participating staff were AIN employed permanent part time and worked more than 24 hours each week in the facility. The majority of the respondents have been employed in aged care for more than five years. Table 5.2 presents the demographics of the respondents.

Table 5.2. Profile of staff who completed the implementation questionnaire

Demographics	Pre-implementation, frequency (%) n=4	Post-implementation, frequency (%) n= 7
Site		
RACF1	3 (75)	6 (86)
RACF2	1 (25)	1 (14)
Gender		
Female	4 (100)	7 (100)
Male	0	0
Years of employment in aged care		
1-4 years	1 (25)	0
5-9 years	2 (50)	3 (43)
10+ years	1 (25)	3 (43)
Preferred not to answer	0	1 (14)
Role/Position		
Assistant in nursing (AIN)	2 (50)	6 (86)
Leisure and lifestyle staff	2 (50)	1 (14)
Employment status		
Full time	1 (25)	0
Permanent part time	3 (75)	7 (100)
Usual hours worked each week		
8 to 24 hours	0	1 (14)
More than 24 hours	4 (100)	6 (86)

5.4.2.1. Training/Practice Acceptability/Feasibility and Appropriateness Scale:

Pre-implementation

Acceptability

The majority of the respondents perceived the music intervention was acceptable. In Table 5.3, the frequency of respondents in each category for each item of the Training/Practice Acceptability/Feasibility and Appropriateness Scale are presented. From a scale of 0 to 4, results show that three out of four respondents had a rating of 4 (indicating extreme agreement) on training satisfaction, organised and executed training program, satisfaction with training content and training complexity while one respondent had a rating of 3 in these items. All four of the respondents had a rating of 4 on their perception regarding the presenter's credibility and their comfort with the music intervention.

Appropriateness

The majority of the respondents perceived that the training and the music intervention was appropriate. Three out of four respondents rated the following items with either 3 or 4 (extreme agreement): compatibility of the music intervention with the mission or service provision mandate, relevance of the training information to the client population, compatibility of the music intervention with staff's workflow timing, and fit between the music intervention and the overall approach to service delivery and the setting. For the fit between the music intervention with staff's workflow timing, three respondents had a rating of 3 and one had a rating of 4.

Feasibility

For the three items on feasibility, the majority of the respondents perceived that the training was useful with a rating of 3 or 4 (extreme agreement) by three out of four respondents. The

music intervention was perceived to be compatible with the practical realities and resources in the setting with a rating of 3 by three respondents and 4 by one respondent. On the ability to incorporate the training concepts and techniques into daily work, two respondents had a rating of 4, one respondent had a rating of 2 (moderate agreement) and one did not respond to this item.

Table 5.3. Training/practice acceptability, feasibility, and appropriateness

	No response	Not at all (0)	(1)	Moderately (2)	(3)	Extremely (4)
Training Acceptability						
Training satisfaction					1	3
Credibility of presenters						4
Organised and executed training program					1	3
Satisfaction with training content					1	3
Satisfaction with training complexity					1	3
Comfort with the intervention						4
Training Feasibility						
Usefulness of the training information in everyday clinical practice				1	2	1
Ability to incorporate training concepts and techniques in daily work	1			1		2
Compatibility of the intervention with the practical realities and resources in the service setting					3	1
Training Appropriateness						
Compatibility of the intervention with the mission or service provision mandate	1				2	1
Relevance of the training information to the client population	1				1	2
Fit between the intervention with staff's current skill					3	1
Compatibility of the intervention with staff's workflow timing				1	3	
Fit between the intervention and the overall approach to service delivery and the setting				1	2	1

5.4.2.2. Measure of Disseminability: Pre-implementation

The 31-item measure of disseminability (MOD) (Trent et al., 2010) is classified as a measure of feasibility (Lewis et al., 2015). This was included both in the pre-implementation and post-implementation questionnaire. In the pre-intervention phase, the total number of respondents was four. Three items had no response from one participant.

Responses to the MOD administered at pre-implementation generally supported the proposed intervention as shown in Table 5.4, using a scale of seven, where 1 (not at all) indicates no agreement with the statement and where seven (very much) indicates a very high level of agreement. Of the 26 positively worded questionnaire items, 17 had a rating of either 6 or 7 indicating strong agreement. The majority of respondents perceived that the music intervention would be effective, successful in symptom reduction, efficient, humane, safe, and appealing, and fits with their outlook on life. The goals of the music intervention were perceived to be worth the cost, and the music intervention was perceived to be much better compared to other interventions that they have seen or heard about. The researchers were perceived to be knowledgeable.

Two items were rated 7 by all respondents. All respondents agreed that the music intervention fits with their personal ideas about what treatment should be and that their emotional reaction to the music intervention was very positive. The majority of respondents indicated that they: were confident in recommending this music intervention to a friend experiencing similar problems, would likely use the music intervention if it was suggested by a friend or co-worker who may or may not have never used it, and would seek out information about this music intervention if they were experiencing similar problems.

From the pre-implementation responses, there was some doubt around acceptability of the music intervention, ethics, time and effort required, the rate of improvement, the likely success in symptom reduction, whether the music intervention would have lasting effects and if the music intervention compared favourably to medication. The number of respondents indicating doubt was small.

For the items pertaining to improvement resulting from the music intervention, and the positive long-term effects of the music intervention, the ratings varied, ranging from 2 to 6. An inclination towards more agreement than disagreement was noted in the responses on whether they would pursue this treatment/intervention as their first choice if they had dementia (ranged from 4 to 6), and how positively would participation in this music intervention affect the people living with dementia' everyday life (ranged from 5 to 6).

For four of the five negatively worded items including how stressful the music intervention would be for the person with dementia, how intrusive the music intervention would be, and the discomfort that it could cause, the ratings varied and ranged from 1 (not at all) to 6. One respondent perceived that the music intervention might be stressful for the person with dementia, quite stressful for others and potentially be intrusive. Generally, the music intervention was not perceived as uncomfortable. For the fifth negatively worded question, three responded with a rating of 2 while one had a rating of 1, indicating disagreement that participation in this music intervention would have negative effects on life.

Table 5.4. Measure of disseminability - Pre implementation

	No response	Not at all (1)	(2)	(3)	Somewhat (4)	(5)	(6)	Very much (7)
How acceptable					1	1	1	1
How ethical					1	1	1	1
How effective							4	
Knowledge of researchers							2	2
Success in symptom reduction					1		3	
Recommend to a friend							3	1
Patient time and effort	1			1	1		1	
Treatment efficiency						1	2	1
Stress on patient			2	1			1	
Stress on others		1	1	1		1		
Fit with personal ideas								4
How intrusive		2	1			1		
How much improvement			1			1	2	
How humane	1						2	1
Suggestion never used							2	2
Suggestion good experience							1	3
Goals worth cost							1	3
Uncomfortable as result			2	2				
Pursue as first treatment option					2		2	
Rate of improvement	1				1	2		
Positive effects on life						2	2	
Negative effects on life		1	3					
Treatment safety						1	2	1
Seek out more information							3	1
Lasting effects				1	2		1	
Positive long-term effects			1			1	2	
How appealing							2	2
Emotional reaction								4
Fit with outlook on life							2	2
Compared to other treatments							2	2
Compared to medication					1			3

5.4.2.3. Measure of Disseminability: Post-implementation

Seven staff members completed the 31-item measure of disseminability administered post implementation. On a scale of seven, with seven indicating the highest level of agreement: “very much”, the majority of the respondents rated the 22 out of the 26 positively worded questionnaire items with either 6 or 7 (see Table 5.5) indicating agreement. Three items were not responded to by one respondent: treatment efficiency, fit with personal ideas and how humane.

Specifically, the majority perceived that the music intervention was acceptable, ethical, effective, successful in symptom reduction, efficient, fits with the staff’s personal ideas about what treatment should be, associated with much improvement, humane, positively affects the people living with dementia’s lives, has positive long term effects for the people living with dementia, is appealing, and fits with the staff’s outlook in life. The majority of respondents also indicated that their emotional reaction to the music intervention was positive. If a friend or co-worker who had or had never used the music intervention suggested it, the majority stated that they would likely use it. Compared to other interventions that they have seen or heard about including medication, the majority regarded the music intervention as much better.

Five positively worded items were rated 7 by all respondents, indicating strong agreement. All of the respondents regarded the music intervention as safe and the goals of the music intervention as worth the cost. All of the respondents indicated that they were confident in recommending the music intervention to a friend experiencing similar problems and would seek out more information about the music intervention if they were the ones experiencing similar problems. All respondents agreed the researchers were knowledgeable.

For the potential negative effects including stress caused by the music intervention on the person with dementia and others, intrusiveness of the music intervention, the discomfort that it could cause and negative effects on the person with dementia's life, the majority of the respondents' ratings were 1 (not at all) or 2, indicating disagreement or lesser degree of agreement. One respondent indicated the music intervention was stressful on others and one respondent indicated that the music intervention was uncomfortable.

Interestingly, four respondents had ratings of either 1 or 2 on the item regarding the patient (person with dementia) putting forth the necessary time and effort outside of the session. Ratings were mixed for three items: the music intervention as the first treatment choice if they had dementia, rate of improvement as a result of the music intervention, and the lasting effects of the music intervention. The ratings for these items mainly ranged from 4 (somewhat) to 7 (very much).

Overall, it is noteworthy that from the MOD questionnaire, there was a shift towards greater agreement in the feasibility of implementing the individualised music intervention for people living with dementia at the post-implementation compared to the pre-implementation. Specifically, the respondents' ratings of the positively worded questionnaire items increased from pre-implementation to post-implementation, indicating greater agreement. Of the 26 positively worded questionnaire items, 17 items were rated 6 or 7 at pre-implementation while 22 items were rated 6 or 7 at post-implementation. A rating of 7 was given by all the respondents to two positively worded items at pre-implementation while five positively worded items were rated 7 by all the respondents post implementation.

Of the negatively worded items, there was more disagreement noted at post implementation compared to pre-implementation.

Table 5.5. Measure of disseminability - Post implementation

	No response	Not at all (1)	(2)	(3)	Somewhat (4)	(5)	(6)	Very much (7)
How acceptable						1	1	5
How ethical							2	5
How effective							1	6
Knowledge of researchers								7
Success in symptom reduction					1		3	3
Recommend to a friend								7
Patient time and effort		1	3				1	2
Treatment efficiency	1					1	2	3
Stress on patient		3	4					
Stress on others		5	1				1	
Fit with personal ideas	1						3	3
How intrusive		4	3					
How much improvement			1			1	2	3
How humane	1						2	4
Suggestion never used						1	2	4
Suggestion good experience							2	5
Goals worth cost								7
Uncomfortable as result		4	2				1	
Pursue as first treatment option		1			1	1	1	3
Rate of improvement					4		1	2
Positive effects on life							4	3
Negative effects on life		2	4	1				
Treatment safety								7
Seek out more information								7
Lasting effects					3	2	1	1
Positive long-term effects						1	1	5
How appealing							1	6
Emotional reaction							1	6
Fit with outlook on life							3	4
Compared to other treatments							4	3
Compared to medication						2	4	1

5.4.3. Feasibility: Evidence from the music intervention logbook

The candidate collected the completed music logbook sheets either weekly or fortnightly.

However, some of the music logbook documentation was not retrieved for two participants from RACF1 as they passed away during the second month of implementation.

5.4.3.1. Number of logbook observations

Group differences for the music logbook entries revealed statistically significant differences in the number of logbook entries and duration of the music intervention. The majority of the logbook documentation was from RACF1. The number of logbook observations are presented in Table 5.6. A comparison of the total number of logbook observations between implementation sites is illustrated in Figure 5.3, highlighting the differences between implementation sites. Of the 337 music intervention logbook observations (range from 0 to 70) over the 3-month implementation period, 299 (median 13) were from RACF1 and 38 (median 2) were from RACF2 ($p < 0.001$). The median of the combined logbook observations was 11. Six participating older people living with dementia had no logbook entry (three from RACF1 and three from RACF2) while one participant had 70 entries (RACF1) and another had 47 entries (RACF 1). These two participants from RACF1 with 70 and 47 entries respectively constituted the outliers in the boxplot in Figure 5.3.

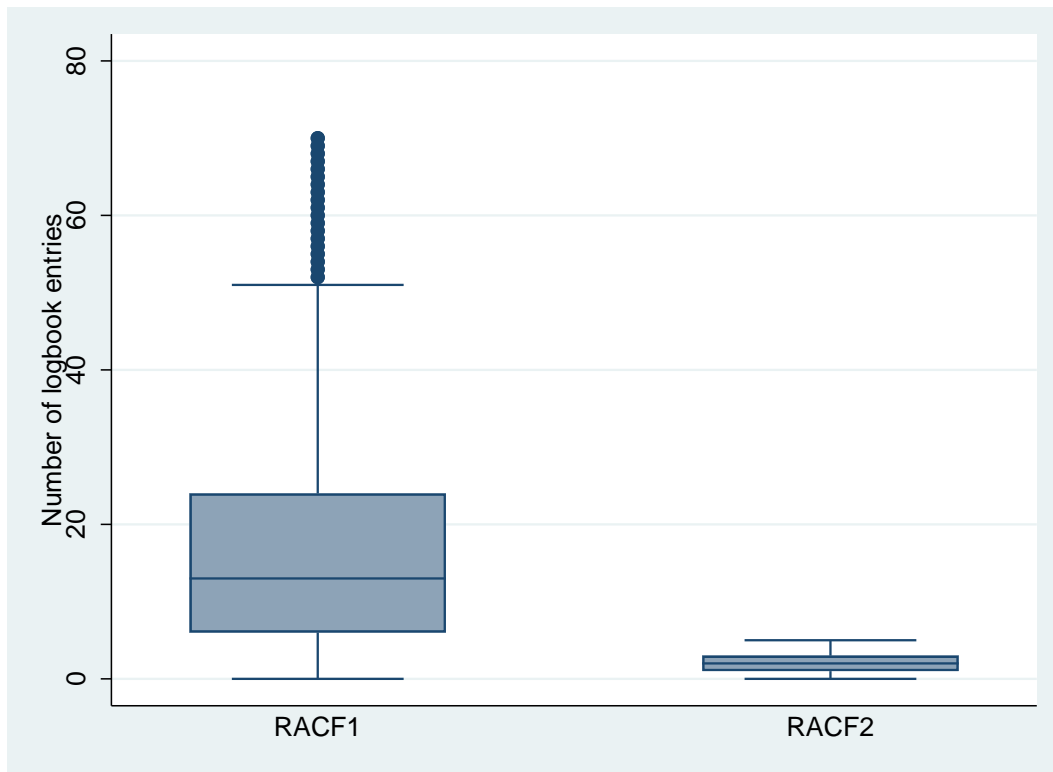


Figure 5.3. Comparison of logbook observations between implementation sites

5.4.3.2. Time of day for the intervention implementation

The shift when the music intervention was usually implemented was found to be similar between RACF1 and RACF2. For both facilities, the music intervention was predominantly implemented during the morning (AM) shift (06:15am – 2:30pm and 06:00am – 2:30pm respectively) with 274 entries (82.8%) as shown in Table 5.6. The difference may be attributed to the AM shift being the usual shift of the majority of the staff who participated in the study. No implementation entry was recorded from both sites during the night shift (10:00pm – 06:00am).

5.4.3.3. Duration of implementation

The duration of implementing the music intervention was significantly longer in RACF1 compared to RACF2 ($p < 0.001$). In RACF1 the music intervention was mainly implemented for more than 30 minutes (63.6%) followed by 15 to 30 minutes (20.1%). In contrast, the music intervention was usually implemented for less than 15 minutes in RACF2 (85.3%) with only two entries (5.9%) of more than 30 minutes implementation. Differences in the music intervention implementation duration are presented in Table 5.6.

Table 5.6. Details of the music logbook observations

Music Intervention Logbook Observations	RACF1 n=299	RACF2 n=38	Combined n=337	p-value
Number of observations, median (min/max)	13 (0/70)	2 (0/5)	11 (0/70)	<0.001
Month, frequency (%)				
1	87 (29.3)	34 (100)	121 (36.6)	<0.001
2	125 (42.1)	0	125 (37.8)	
3	85 (28.6)	0	85 (25.7)	
Shift, frequency (%)				
AM	245 (82.5)	29 (85.3)	274(82.8)	1.000
PM	47 (15.8)	5 (14.7)	52 (15.7)	
Not specified	5 (1.7)	0	5 (1.5)	
Duration of intervention, frequency (%)				
Not specified	18 (6.1)	0	18 (5.4)	<0.001
<15 minutes	28 (9.4)	29 (85.3)	57 (17.2)	
15-30 minutes	62 (20.1)	3 (8.8)	65 (19.6)	
>30 minutes	189 (63.6)	2 (5.9)	191(57.7)	

Note: The number of observations included those with no logbook entry (n=6). Thus the minimum entry is 0.

p-value calculation: Two-sample Wilcoxon rank-sum (Mann-Whitney) for continuous variables and Fisher's exact test for categorical variables.

Abbreviations: RACF= residential aged care facility; min/max= minimum and maximum values.

5.4.3.4. Reasons for implementing the intervention

Pooled sample

Staff and family or guardian had the option to select more than one reason for implementing the music intervention, which included to manage agitation and or apathy, prior to care, as a leisure activity plus an open-ended response option for other reasons that were not specified. For those who ticked more than one, the reasons were categorised as reason one, two and three as shown in Table 5.7. Each category of reason is then summed up, totalling 346

reasons documented. Overall, leisure activity emerged as the main reason for implementation, comprising 200 (57.8%) of the 346 entries (Table 5.7). This was followed by agitation with 91 entries (26.3%). Of the few entries on other reasons (n=8), half did not specify the reason for implementation while half stated that it was to promote food intake.

Table 5.7. Reasons for implementing the intervention of the pooled sample (n=346 entries)

Reasons	Reason 1, frequency (%)	Reason 2, frequency (%)	Reason 3, frequency (%)	Total, frequency (%)
Leisure activity	185 (61.7)	14 (40.0)	1 (33.3)	200 (57.8)
Agitation	91 (30.3)			91 (26.3)
Apathy	13 (4.3)	11 (31.4)		24 (6.9)
Prior to care	11 (3.7)	10 (28.6)	2 (66.7)	23 (6.6)
Other reasons	-	-	-	8 (2.3)

Within implementation site

In parallel with the result from the pooled sample, analysis of data from each implementation site revealed that the main documented reason for implementing the music intervention was leisure activity, comprising 173 (55.4%) and 27 (79.4%) of the total entries from RACF1 and RACF2 respectively. This was followed by agitation with 84 entries (26.9%) in RACF1 and 7 entries (20.6%) in RACF2. Only the participant from RACF1 had entries on apathy, prior to care and other reasons as illustrated in Table 5.8.

Table 5.8. Breakdown of reasons per implementation site (n=346)

Reasons	RACF1, frequency (%)	RACF2, frequency (%)
Leisure activity	173 (55.4)	27 (79.4)
Agitation	84 (26.9)	7 (20.6)
Apathy	24 (7.7)	-

Prior to care	23 (7.4)	-
Other reasons	8 (2.6)	-
Total	312	34

5.4.3.5. Effects of the intervention

Pooled sample

Participants had the option to select more than one effect of the music intervention on the older person with dementia (in the form of tick boxes) and document in the open-ended response option other effects that were not covered in the specified choices. For those who ticked more than one, the effects were categorised as effect one, two and three and then a total score of each type of observed effect is calculated as shown in Table 5.9. Overall, there were 351 documented effects of the music intervention. Enjoyment during the music intervention comprised more than half (n=228; 65.0%) of the entries followed by decreased agitation (n=61; 17.4%) (Table 4.9). Negative effect or no effect had the least number of entries (n=16; 3.7%). Of the 16 “negative or no effect” responses, eight specifically indicated an increase in agitation while eight indicated that the music intervention had no effect on the older people living with dementia.

Table 5.9. Effects of the intervention on the pooled sample of people living with dementia (n=351 entries)

Effects	Effect 1, frequency (%)	Effect 2, frequency (%)	Effect 3 frequency (%)	Total, frequency (%)
Enjoyed the activity	198 (70.1)	29 (69.1)	1 (100)	228 (65.0)
Decreased agitation	60 (21.4)	1 (2.4)		61 (17.4)
Decreased apathy	14 (5.0)	11 (26.2)		25 (7.1)
Other effects	-	-	-	21 (6.0)
Negative effect or no effect	15 (3.56)	1 (2.4)		16 (4.6)

Some participants who ticked the “other effects” response documented more than one observation; their specific responses are enumerated in Table 5.10. Increased alertness and involvement of body movements while listening to music had the most entries (7 and 6 respectively). Interestingly, there were three entries on eating better and half of the entries on “other reasons” (n=4) were to promote food intake.

Table 5.10. Frequencies of other effects (n=26)

Effects	Frequency
Increased alertness	7
Body movements while listening to music (e.g. hands, feet, fingers, legs)	6
Sleepy/sleeping	5
Eating better	3
Didn't want the headphones on	3
Verbally responding	2

Within implementation site

Consistent with the pooled sample, enjoyment during the activity had the most number of documented entries on the effect of the music intervention on older people living with dementia from both RACFs as shown in Table 5.11. Specifically it comprised 207 entries (65.3%) from RACF1 and 21 entries (61.8%) from RACF2. Decreased agitation followed in RACF1 with 61 entries (18.9%), however there were no entries for decreased agitation in RACF2. The remaining entries in RACF2 were for negative or no effect (n=9), decreased apathy (n=1), and other effect (n=3). In RACF1, the least number of entries was for negative or no effect (n=7).

Table 5.11. Breakdown of effects per implementation site (n=351 entries)

Effects	RACF1, frequency (%)	RACF2, frequency (%)
Enjoyed the activity	207 (65.3)	21 (61.8)
Decreased agitation	61 (19.2)	
Decreased apathy	24 (7.6)	1 (2.9)
Other effects	18 (5.7)	3 (8.8)
Negative or no effect	7 (2.2)	9 (26.5)
Total	317	34

5.4.4. Fidelity: Evidence from the music intervention logbook

Some of the data from the music intervention logbook provided information on the intervention fidelity. Duration of the music intervention was usually more than 30 minutes (63.6%) in RACF1 and less than 15 minutes in RACF2 (85.3%). The suggested dosage specified in the study protocol was 30 minutes or longer (as long as the person with dementia enjoys it). Fidelity to the music intervention protocol in terms of the prescribed dosage of administration may be more evident in RACF1 with only 28 (9.4%) out of 299 observations of less than 15 minutes implementation. However, some factors need to be considered in interpreting this finding apart from the aforementioned differences in the number of staff and family or guardian trained. In RACF2, of the 29 entries with less than 15 minutes administration, seven specified in the effects as negative (increased agitation or became annoyed) and three specified that the person with dementia did not want the headphones on. These are positive indicators of fidelity to the protocol as the protocol highlighted that if signs of discomfort or distress are noted the music intervention must be stopped.

5.4.5. Sustainability: Evidence from the music intervention logbook

The music intervention logbook entries provided some information on how the intervention was maintained over the 3-month period (see Table 5.6). There were documented evidence of sustained implementation in RACF1 throughout the 3-month implementation period. The majority of the logbook entries from RACF1 were from the second month of implementation (42.1%) while the least number of entries were from the third month (28.6%). In RACF2, all of the entries were from the first implementation month only. A comparison of logbook observations each month for each implementation site is illustrated in Figure 5.4.

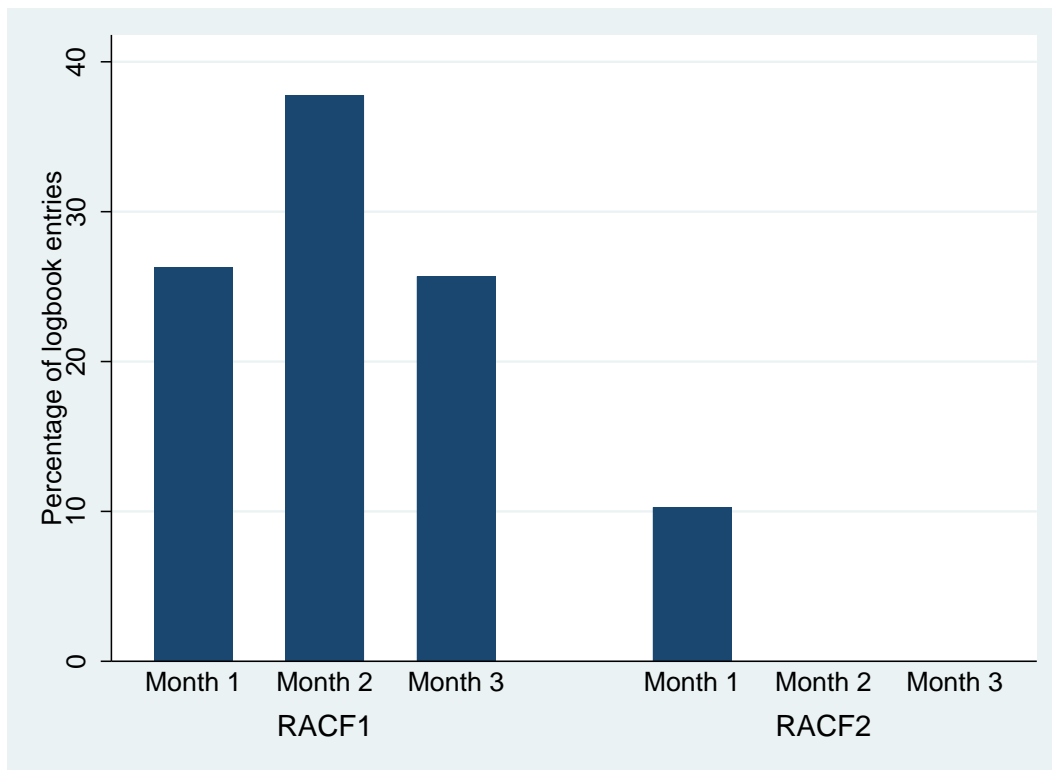


Figure 5.4. Comparison of logbook observations per month between implementation sites

5.4.6. Implementation cost

The costings in this study are based on the residential aged care facility and residents' perspective. Thus, the time spent by family or guardian of people living with dementia for training and implementation of the music intervention was excluded and opportunity costs were not considered. A schematic presentation of the steps involved in measuring the costs is presented in Figure 5.5. The total implementation cost includes the actual operating costs, plus the equipment costs, training costs, and music intervention implementation costs.

Operating costs were measured by the labour of the staff who will be designated by the residential aged care facility to download music and create music playlist for the older person (see details in Chapter 4 section [4.8.5.1](#)). Equipment costs were measured by the costs of the music intervention equipment (iPod shuffle, headphones, charger, and equipment storage) and the music downloaded from iTunes. Depreciation was applied to the fixed costs as detailed in section [5.4.6.1](#) below. Training costs were measured by the pay rate per hour and overhead of each staff involved as well as the supplementary educational material.

Implementation of the music intervention involved the labour cost for the staff implementing the music intervention as determined by the pay rate per hour and overhead costs. Overall, the total annual cost of the music intervention and its implementation for 32 older people living with dementia from two residential aged care facilities was AU\$6,623.76. Details of the components of the costing are provided in the succeeding sections (5.4.6.1 to 5.4.6.4).

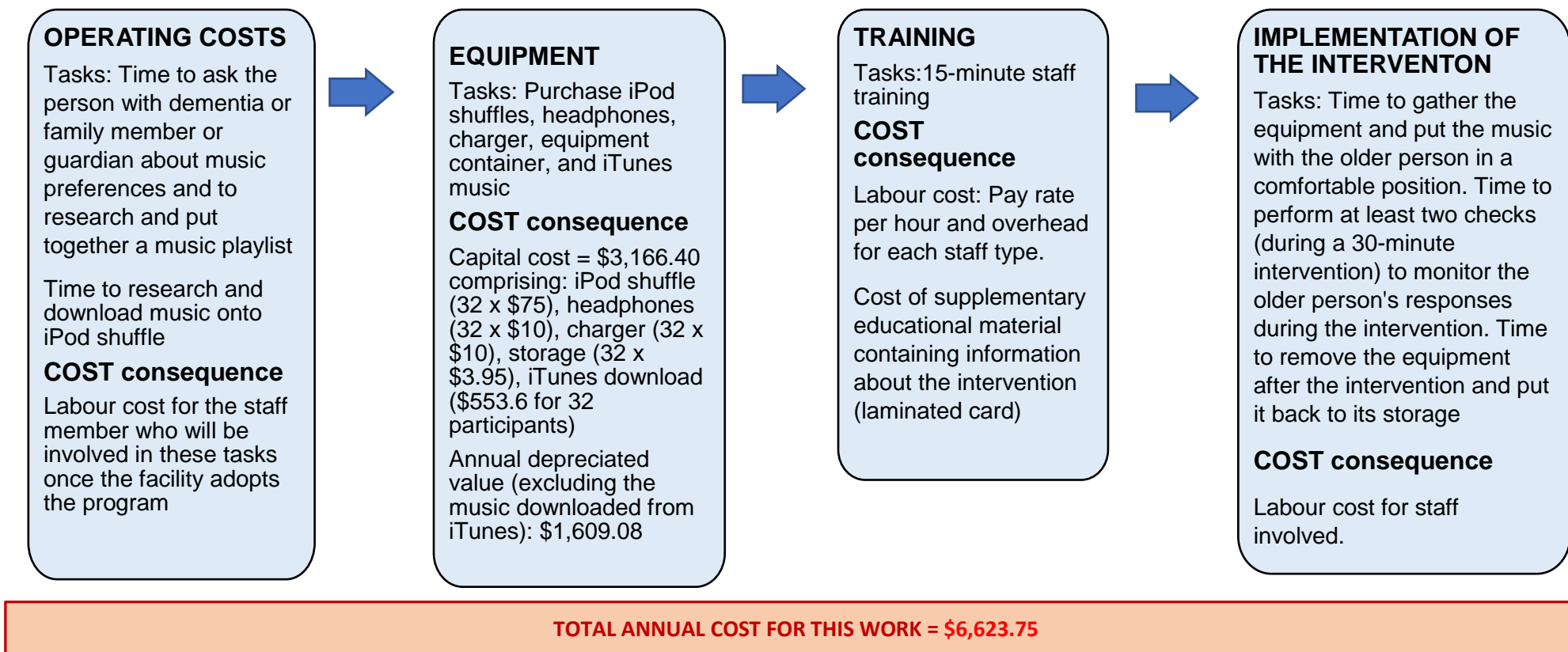


Figure 5.5. Consumer registry flow chart

5.4.6.1. Operating costs

The costs of labour involved in creation of an individualised playlist were calculated as part of the operating costs. As previously noted in Chapter 4 section [4.8.5.1](#), it was assumed that if the facility would adopt the program, a staff member would be designated to assess music preferences and create music playlists. In the calculation of the operating costs for this study, the pay rate of the leisure and lifestyle coordinator was used as an estimate of this cost.

As shown in Table 5.12, the labour includes the time spent for music preferences assessment, researching and downloading music from iTunes, and putting together a playlist and loading to an iPod shuffle. Creation of individualised music playlists were estimated to take a total of 90 minutes or 1.50 hour for each older person participant.

Table 5.12. Data inputs for the operating costs

Data Inputs	Pay rate	Overhead proportion	Value used in calculations	Unit of measure	Source
Asking people living with dementia or family about music preferences			30	Minutes	The Candidate
Time to research and download music from iTunes			40	Minutes	The Candidate
Time to put together a playlist and load into an iPod shuffle			20	Minutes	The Candidate
Estimated total time in hour for the creation of individualised playlist for each older person (from assessment to upload to iPod shuffle)			1.50	Hour	The Candidate
Number of older people participants			32	Number	The Candidate
Minimum pay rate for leisure and lifestyle coordinator	\$27.16	30%	\$35.31	Pay rate/hour	Facility Management

From the estimated time to create an individualised playlist for each older person, a total of 48 hours is calculated for the creation of playlists for 32 participants. With the minimum pay rate of AU\$35.31 per hour for the leisure and lifestyle coordinator, the total costs of the labour involved in the creation of music playlists for 32 participants is AU\$1,694.78 as shown in Table 5.13.

Table 5.13. Total cost of the individualised music playlist creating for the study participants

Total number of hours spent in creating individualised playlist for 32 participants	48
Hourly pay rate including overhead	\$35.31
LABOUR TOTAL	\$1,694.78

5.4.6.2. Music intervention equipment and music download costs

Details of the resources relating to the music intervention equipment, the measurements used, the monetary units, and the source of the costing information are presented in Table 5.14. The equipment included 32 iPod shuffles (4th generation), headphones, charger and equipment storage. The cost of the music downloaded from iTunes was AU\$553.60 for the 32 participants across implementation sites.

Table 5.14. Data inputs for the music intervention equipment

Data Inputs	Cost	Overhead proportion	Value used in calculations	Unit of measure	Source
Cost per iPod shuffle	\$75.00	0%	\$75.00	Item cost	Apple store
Number of iPod shuffle purchased			32		
Cost per headphones	\$10.00	0%	\$10.00	Item cost	Kmart
Number of headphones purchased			32		
Cost per charger	\$10.00	0%	\$10.00	Item cost	Kmart
Number of charger purchased			32		
Cost per equipment storage	\$3.95	0%	\$3.95	Item cost	Woolworths
Number of equipment storage purchased			32		
Total iTunes download for 32 participants	\$553.60	0%	\$553.60	Total cost	iTunes store
Months to fully depreciate			36	Months	Health Economist
Proportion of time the equipment was used (research implementation period)			3	Months	The Candidate

The total costs of the equipment including the depreciation costs are presented in Table 5.15.

A 3-year or 36-month straight line depreciation method was used (details in Chapter 4 section [4.9.1](#)). The depreciated cost of the iPod shuffles, headphones, chargers, and equipment storage was AU\$263.87 for the 3-month research implementation period and AU\$1,055.48 for one year. The total costs of the equipment and iTunes download was AU\$817.47 for the 3-month research implementation period and AU\$1,609.08 for one year.

Table 5.15. Total cost of music intervention equipment and iTunes download

Cost of equipment for 32 participants	
iPod shuffles	\$2,400.00
Headphones	\$320.00
Charger	\$320.00
Equipment Storage	\$126.40
Total	\$3,166.40
Depreciation	
Months to depreciate	36
Proportion of time used of the total number of months to depreciate	3
Depreciation cost of 3 months	\$263.87
Annual depreciation	\$1,055.48
Total cost of the iTunes download	\$553.60
<i>Total cost of the equipment (depreciated) and iTunes download for the 3-month implementation</i>	\$817.47
<i>Total annual cost of the equipment (depreciated) and the iTunes download</i>	\$1,609.08

5.4.6.3. Training and education for participating staff members

The costs involved in the training and education for the implementation of the music intervention including labour (staff) and non-labour (educational material) are shown in Table 5.16.

Table 5.16. Data inputs for the staff training and education costs

Data Inputs	Pay rate	Overhead proportion	Value used in calculations	Unit of measure	Sources
Minimum pay for assistant in nursing (AIN)	\$23.49	30%	\$30.54	Pay rate/ hour	Facility Management
Minimum pay for leisure and lifestyle coordinator	\$27.16	30%	\$35.31	Pay rate/ hour	Facility Management
Minimum pay for physiotherapy aid	\$22.80	30%	\$29.64	Pay rate/ hour	Facility Management
Minimum pay for endorsed enrolled nurse (EEN)	\$28.14	30%	\$36.58	Pay rate/ hour	Facility Management
Number of AINs in group training (full version)			5	Number	The Candidate
Number of leisure and lifestyle coordinator in group training (full version)			1	Number	The Candidate
Number of physiotherapy aid in group training (full version)			1	Number	The Candidate
Number of EEN in group training (full version)			1	Number	The Candidate
Number of AINs in individual unpaid training (short version)			5	Number	The Candidate
Number of leisure and lifestyle staff in individual unpaid training (short version)			1	Number	The Candidate
Number of family or guardian in individual unpaid training (short version)			6	Number	The Candidate

Number of family or guardian who implemented the intervention without the training			1	Number	The Candidate
Full group version training time			60	Minutes	The Candidate
Short individual training time			15	Minutes	The Candidate
Number of full group training			1	Number	The Candidate
Number of short individual training			12	Number	The Candidate
Others: Laminated card	Cost				
Laminating pouches	\$7.00	0%	\$7.00	Item(bulk) cost	Officeworks
Board paper	\$16.48	0%	\$16.48	Item(bulk) cost	Officeworks
Ink cartridges	\$47.96	0%	\$47.96	Item cost	Officeworks

The duration of the training session designed in the original protocol was one hour. However, only eight staff members received the full one-hour version due to difficulty in organising a schedule for training that suited staff and management's varying preferences. For pragmatic reasons, a shortened 15-minute version (equivalent to 0.25 hour) was designed which the candidate delivered on a one-on-one basis with the rest of the staff participants as discussed in section [5.4.7.1](#) of this chapter. Through observation, acquired knowledge from staff feedback, and the qualitative interviews, the one-hour training version did not deliver added benefits to the implementation of the music intervention. Staff who received the shortened version were equally involved and competent in the implementation. Thus, the 15-minute version of the training was used for calculating the labour cost related to the training.

The calculation of the total costs of training comprising the labour and non-labour costs are shown in Table 5.17. For the delivery of a 15-minute or 0.25 hour training, program the estimated total labour costs for 14 staff, comprising ten assistant in nursing (AINs), two leisure and lifestyle, one physiotherapy aid, and one endorsed enrolled nurse was AU\$110.55. The total cost of the materials used for the laminated card was AU\$71.44. Altogether, the total labour and non-labour costs for the training and education was AU\$181.99.

Table 5.17. Total staff training and education cost (labour and non-labour)

Labour costs (Staff)	Number of participants	Hourly pay rate including overhead	Hours spent with training	Labour sub total
AIN	10	\$30.54	0.25	\$76.34
Leisure and lifestyle coordinator	2	\$35.31	0.25	\$17.65
Physiotherapy aid	1	\$29.64	0.25	\$7.41
Endorsed enrolled nurse	1	\$36.58	0.25	\$9.15
Total				\$110.55
Non labour costs (Laminated card)				Non Labour sub total
Cost of laminating pouches (bulk)				\$7.00
Cost of board paper (bulk)				\$16.48
Cost of ink cartridges				\$47.96
Total				\$71.44
TOTAL COST OF TRAINING (LABOUR AND NON LABOUR)				\$181.99

5.4.6.4. Implementation of the music intervention

Implementation of the music intervention comprises putting the music on, monitoring the older person for their responses during the music intervention, and removal of the equipment to put back to its storage once the intervention was completed. The calculation of the time it takes to implement the music intervention was mainly based on estimates. As previously noted in Chapter 4 section [4.8.4.4](#), the frequency of implementing the music intervention was not prescribed as it was based on the staff and family or guardian's discretion. The median number of music intervention implementation calculated from the music intervention logbook data was used as a reference for the frequency of implementation for each participating older person across implementation sites throughout the 3-month implementation period.

As shown in Table 5.18, the total time it takes to put the music on the older person (from gathering the equipment, turning the iPod shuffle on, putting the headphones and putting the music on) was approximately 10 minutes. The time it takes to check on the older person at least twice for a 30-minute intervention was approximately 4 minutes. The time it takes to remove the equipment and put it back to its container or storage once the intervention is completed was approximately 2 minutes. The total time involved in the implementation of the music intervention was 16 minutes or 0.27 hour. The median number of entries across implementation sites was 11. The labour costs was averaged based on the RACF1 staff's pay rate.

Table 5.18. Data inputs for the implementation of the music intervention

Data Inputs	Pay	Overhead proportion	Value used in calculations	Unit of measure	Sources/notes, etc.
Total number of participating older people throughout the 3-month implementation			32	Number	The Candidate
Time to gather the equipment, turn the iPod shuffle on, check the volume, put the headphones on, and put the music on and check the older person with dementia is in a comfortable position			10*	Minutes	Staff participants.
Time to check on the older person during the intervention (at least twice for the 30 minute session)			4	Minutes	The Candidate
Time to remove the headphones and iPod shuffle after the intervention and put the equipment back to its container			2	Minutes	The Candidate
Total time (in hour) to implement the intervention (from gathering equipment, checking/monitoring responses, and removing equipment when completed)			0.27	Hour	The Candidate
Median number of logbook entries (pooled sample)			11	Number	Music intervention logbook documentation
Minimum pay for assistant in nursing (AIN)	\$23.49	30%	\$30.54	Pay rate / hour	Facility Management
Minimum pay for leisure and lifestyle coordinator	\$27.16	30%	\$35.31	Pay rate/ hour	Facility Management
Minimum pay for physiotherapy aid	\$22.80	30%	\$29.64	Pay rate/ hour	Facility Management
Minimum pay for endorsed enrolled nurse (EEN)	\$28.14	30%	\$36.58	Pay rate/ hour	Facility Management

*This is the average time. Could be shorter if the older person is already in a comfortable position and the equipment is easily/readily accessible (e.g. the staff doesn't have to look for it)

As shown in Table 5.19., the total number of hours spent for the implementation of the music intervention for 32 participating older people over a 3-month period was 95.04. Using the average hourly pay rate of the RACF1 staff involved in the implementation, the total labour cost involved in the implementation of the music intervention was AU\$3,137.91.

Table 5.19. Total cost of implementing the music intervention to the study participants over the 3-month period

Time (in Hours) it takes to implement the music intervention for one resident	0.27
Total number of participating older people	32
Median number of music intervention implementation for each resident	11
Total number of hours spent for the implementation of the music intervention for 32 residents over a 3-month period	95.04
Average hourly pay rate of staff involved in implementation	\$33.02
LABOUR TOTAL	\$3,137.91

5.4.6.5. Summary of total implementation cost

From the data presented in sections 5.4.6.1 to 5.4.6.4 above, summarised in Table 5.20 below, a total annual cost of AU\$6,623.76 was calculated for the music intervention and its implementation to 32 older people from two implementation sites by trained staff. The total annual cost is inclusive of the time taken to download and create an individualised music playlist by a designated staff member, the music equipment and downloads, pay rate for staff attendance in the training session, the educational material for staff and family or guardian, and the time spent by staff in the implementation of the music intervention.

If the total annual cost of AU\$6,623.76 is broken down to each older person participant, this cost would be equivalent to approximately AU\$3.98 per older person per week, assuming that there are 52 weeks in a year.

Table 5.20. Summary of total annual cost

Cost Component			
Equipment	Total cost	\$3,166.40	
		Amortised one year	\$1,609.08
Operating costs		\$1,694.78	
		Amortised one year	\$1,694.78
Training		\$181.99	
		Amortised one year	\$181.99
Implementation		\$3,137.91	
		Amortised one year	\$3,137.91
TOTAL COST FOR ONE YEAR			\$6,623.76

5.4.7. Fidelity to implementation strategies as planned and adaptation to suit context and preferences

Contextual issues that came about during the implementation prompted several modifications to the protocol. These issues and subsequent modifications are explained below and involved training and education, program champions, feedback and reminders.

5.4.7.1. Training/Education

In RACF1, the schedule for the training session as decided by the management based on staff's availability was moved several times due to an outbreak of influenza. Thus, only eight of the eleven staff participants attended the one-hour training session. With difficulty in scheduling another training session due to a very busy time post outbreak, the candidate designed a shortened version of the training intended for a one-on-one session. This shortened version lasted for at least 15 minutes and the content included a brief information about dementia and its management, benefits of the individualised music listening intervention, the protocol for implementation, how to use the equipment, and documentation in the music intervention logbook. The family or guardian of the older person with dementia participants who indicated that they would like to be trained for the implementation of the music intervention had varied preferences regarding the training schedule. To accommodate each family or guardian's preferences, the candidate conducted individual training using the shortened version in their loved one's bedroom or in a quiet section of the facility at their nominated day and time. The trained family or guardian were also given a laminated card for their reference. Ethical approval was sought to give reimbursement to the staff who participated in the one-hour training session in the form of a gift card, however, the management decided during the recruitment that the organisation would pay the staff in

accordance to their hourly pay rate as part of their training and education needs. Those who had the short version did not receive any form of reimbursement.

In RACF2, there was a one-month delay in commencement due the candidate's personal circumstances (illness). This along with some delays in the management's response regarding the training schedule and conflicting preference by staff regarding the time of the training session warranted a decision by the candidate (in consultation with supervisors and facility management) to conduct the shortened version of the training. The candidate conducted individual training with staff and a family member at their preferred day and time in a quiet section of the unit. No reimbursement was given to the participants from RACF2 for the training time.

A few days after the commencement of implementation of the music intervention in RACF1, study participants reported that some of the staff who were not study participants were implementing the individualised music intervention. To promote proper uptake of the music intervention in accordance to the protocol, the candidate designed an education material for all staff ([Appendix 19](#)) which was placed in the staff room for interested staff to read and sign. This material contained information about the benefits of the music intervention and the protocol for implementation. The University's Human Research Ethics Committee approved the variation application submitted in relation to this modification. Two nursing staff indicated that they read the information and provided their signature. One of these staff eventually approached the candidate to be included as one of the study participants and subsequently received the short version of the training session. This educational material was made available in the nursing station in RACF2 although no one completed documentation to

indicate that they had read it. The impact of this educational material on the uptake of the music intervention among the staff who did not undergo the training is unclear.

As noted in Chapter 4 section [4.8.3](#), a computer-based version of the training module was planned to be uploaded in the facility's intranet for access by staff and as part of the orientation package for newly recruited staff. This did not occur due to the short implementation period, as the candidate was not able to discuss this plan with the facility management from both implementation sites early in the implementation period.

5.4.7.2. Program Champion

In the original protocol, appointment of program leaders at the start of the implementation (e.g. a leisure and lifestyle staff or a senior nursing staff) was one of the planned strategies. However, varying degrees of interest were noted among staff during the course of the implementation. The candidate noted that while the majority of the staff were happy with being involved in the regular implementation of the music intervention, there were a few who showed interest in the overall implementation including the recruitment of potential participants, maintenance of equipment, and communicating issues and concerns. Instead of using the term “program leaders”, these staff were referred to as the “program champions”. The program champion in RACF1 was not formally appointed but rather identified based on the staff's demonstrated passion and their extent of involvement. The program champion identified by the candidate in RACF1 was the leisure and lifestyle coordinator.

In RACF2, the facility management initially recommended a particular staff member to be approached by the candidate for help with the research project. This staff member was a team leader during the day shift. Apart from the management's recommendation, the candidate

noted that the recommended staff member showed more passion and was more involved with the recruitment of potentially participating older people as well as with the overall implementation compared to the other two staff participants. Thus, she was the identified program champion from RACF2.

Instead of formally delineating the program champions' duties and responsibilities, the candidate worked collaboratively with them providing additional informal training (e.g. downloading music through iTunes, and creating music playlist) so they would be equipped with the necessary knowledge and skills to sustain the implementation of the music intervention in the unit or the facility. The program champion from RACF2 indicated that she already knew how to use the iTunes application including how to search for and download music. The candidate handed the music library to the program champions at the end of the implementation period.

The program champions were the immediate point of contact for the candidate in terms of providing and obtaining feedback about the implementation especially on issues that needed to be addressed. In both facilities, the program champions were instrumental in the care and maintenance of the music intervention equipment. They kept track of the missing and broken equipment and ensured that the equipment was secured when a participating person with dementia passed away. By the third month of implementation in RACF1, the program champion requested extra sets of headphones and iPod shuffles, which she used to demonstrate and recruit new participants to the study. She consulted the family about it and one of them ultimately became a participant of the study. In RACF2, the program champion suggested the modification of a participating person with dementia's playlist based on the older person's responses. This worked well as this participant's acceptance of the music

intervention was better and the duration was longer compared to the older playlist comprising of music suggested by her family.

5.4.7.3. Providing and obtaining feedback to participants

As detailed in Chapter 4 section [4.8.2.3](#), the candidate intended to meet with the staff during shift handover times to discuss the music intervention and its implementation. This was planned to be done daily to second daily in the first two weeks of the implementation anticipating that the candidate would be able to provide feedback to support staff during the early phase of the implementation and seek feedback from staff regarding issues encountered. With only a few staff participating during the early phase of implementation, this was not practical. The candidate also planned to attend the monthly staff meetings and seek feedback from participating staff regarding the music intervention and its implementation. With the few participants who may or may not be present during the staff meetings, this was not pursued. However, the candidate visited both facilities at least twice a week during the first month of implementation and once to twice a week during the second and third month to regularly provide and obtain feedback from staff and family or guardian participants.

An ethics variation form was submitted and approved to allow anonymous staff feedback for research participants but was not actioned as the variation was approved when implementation in RACF1 was almost completed. As there were only three participants in RACF2 this anonymous feedback form was not used.

5.4.7.4. Reminders

Reminders for the inclusion of the music intervention in the daily appointments of the participating older people living with dementia was possible in RACF1. A printed copy of the

daily appointments was placed in each nursing station for staff to check prior to the start of their shift. Staff were also able to check the appointments when they logged in to their database account in the facility. In addition to the appointments, a list of residents using the music intervention was placed in each nursing station and in the leisure and lifestyle office. In RACF2, reminders were not possible due to a different system. Staff were made aware of the older people living with dementia using the music intervention through a list in the nursing station area where the music intervention equipment were placed, accessible by all staff.

5.4.7.5. Other contextual issues identified

Equipment storage and care

In RACF1, equipment was placed in the residents' rooms for easy access by those implementing the music intervention. Although the secured medication area was considered as another alternative for the equipment storage in RACF1, the staff and management highlighted the limited access by the participating staff as the key was kept by the registered nurse/enrolled nurse only. The equipment was placed in a plastic container including the charger. Most of the rooms had spare power boards for charging the iPod shuffle. For those rooms wherein all of the power boards were being used, the staff charged them in the nursing station. Charging in the nursing station or in a less visible area of the person with dementia's room was a barrier to implementation at times when staff did not put the equipment back in the participant's room or in the container. There were instances when the staff reported that they were not able to implement the music intervention as the iPod shuffle was missing, however, the reportedly missing iPod shuffle was charging in the power board.

In RACF2, the staff and facility manager verbalised concerns regarding keeping the equipment in the resident's rooms. Concerns included the possible loss if placed in an

obvious location (especially rooms shared by two residents) and missed implementation if equipment was kept inside a drawer or cupboard. Thus, the facility management and staff participants decided to place the music equipment in an area in the secured nursing station as all facility staff had access to it. There were power boards for charging in the area where equipment was stored.

For the 3-month implementation period, there was only one documented missing charger and one broken headphones in RACF1. In RACF2, no missing or broken equipment were noted or reported.

Assessment of music preferences

Some details in the information statements for the family and older person with dementia as well as staff were not materialised in the protocol. The Assessment of Music Preference Questionnaire (AMPQ) designed by Gerdner (Gerdner et al., 2000; Gerdner & Schoenfelder, 2010) was initially chosen to facilitate the assessment of music preferences however it was not used as the majority of the family members or guardian from RACF1 simply stated the music preferences of their loved ones on the back of the consent form. The staff member from RACF1 appointed by the management to contact the family members or guardians only asked about the person with dementia's music preferences. There were several other items in the AMPQ as detailed in Chapter 4 that may have been time consuming to complete. Thus, for RACF2 where implementation commenced at a later date, the candidate designed a simple version of the music preferences assessment form with a focus on the types of music preferred by the older person with dementia (see [Appendix 20](#)).

Music intervention care plan

The original protocol also indicated that a music intervention care plan would be created for each participating older person with dementia as noted in Chapter 4. Developing the care plan required decision and support from the management and from staff involved in the creation and evaluation of care plans (e.g. registered nurses). This was not realised due to the short duration of the research implementation period.

Music intervention logbook documentation

Issues with documentation that hampered the accuracy of the music intervention logbook in demonstrating the extent of implementation were identified from regular feedback sought by the candidate from the study participants. For instance, the staff from RACF2 who regularly implemented the music intervention told the candidate that they implemented the intervention over the 3-month period however time constraints were a major issue with documentation. Likewise, despite better music intervention logbook documentation noted in RACF1, several staff, family members and guardian reported to the candidate that there were times when they implemented the music intervention but were not able document in the logbook.

One of the six participating people living with dementia with no music logbook documentation was enrolled during the third month of implementation. She received the music intervention each time her guardian visited which was at least twice a week as reported by her guardian during one of her conversations with the candidate. However, the guardian admitted that she did not document the implementation in the logbook and asked the candidate if she would like for her to fill in the logbook for the missed entries. The candidate reiterated what was highlighted in the information statement that although it would be helpful for the research, her participation in any activities is entirely her choice. Furthermore, from

the information gathered by the candidate from the program champions and staff during the informal conversations, there were staff who were not participants to the study who implemented the music intervention without documentation.

5.5 Discussion

Findings from the implementation outcomes questionnaire and the music intervention logbook demonstrate the positive effects of the implementation strategies on the adoption and perceived appropriateness of the music intervention by the participating staff and family or guardian. The findings also reveal the fidelity of implementation in accordance to the protocol and the feasibility of routine implementation of the music intervention in the daily care of older people living with dementia. Sustainability was limited to the 3-month implementation.

5.5.1. Effects of implementation strategies

5.5.1.1. Training and education

Consistent with the results of an implementation study on personalised music listening (Murphy et al., 2018), the training provided highlighted the value of individualised music listening for people living with dementia and played an integral role in the implementation of the music intervention. Data from the implementation outcomes questionnaire revealed that a majority of staff who responded, perceived the training and the music intervention as acceptable, appropriate and feasible in the context of residential aged care. Fourteen staff and six family or guardians participating in the training and education demonstrate their involvement regardless of the version of training they received. This participation and involvement in the implementation of the music intervention indicate that both the short and the long versions of the training were beneficial. This reinforces the value of taking into account the simplicity and practicality of delivering the training and education especially in residential aged care setting where time constraints relating to pre-existing workload could be a potential issue among staff (Garcia et al., 2013; Lam et al., 2018; Murphy et al., 2018). For the family or guardian of the participating older people living with dementia, findings

from this study support the role of training and education in promoting their involvement in the regular implementation of this music intervention (Gerdner, 2005; Park, 2013; Park & Pringle Specht, 2009; Sarkamo et al., 2014).

Flexibility in the schedule of the training sessions in accordance with the participants' preferences contributed to the successful training of the majority (20 out of 28, including one guardian who implemented the intervention who successfully implemented the intervention without the training) who expressed interest in participating (Boersma et al., 2015). The number of staff and family members or guardians trained influenced the frequency of implementation. There was evidence of more regular implementation from the music logbook entries in RACF1 where there were more trained staff and family or guardians compared to RACF2. However, the candidate's employment in RACF1 and the working relationship cultivated with the study participants (Kaasalainen et al., 2010; Powell et al., 2012; Zapka et al., 2014) prior to the conduct of the study may have influenced the staff's and family or guardian's attendance during the training and involvement in the study.

Additionally, the financial incentive involved may have influenced participation in the training session. In RACF1, there was financial reimbursement for the staff as the management indicated during the recruitment that staff would be paid for their attendance at the one-hour training session. Although financial incentive is among the implementation strategies documented in the literature (Grol & Grimshaw, 2003; Leeman et al., 2007; Powell et al., 2012), it is noteworthy that three staff from RACF1 expressed interest in receiving the short version of the training without the reimbursement. Likewise, in RACF2, although paid training was initially planned, the change to an unpaid short version did not deter participation from the staff who initially expressed interest.

5.5.1.2. Program champions

Identification of program champions in this study was through an informal process with no clearly defined expectations set out apart from an agreement to promote the implementation of the music intervention as well as monitor and report any issues regarding the intervention and its implementation. Nevertheless, the program champions played a vital role in the implementation. A number of studies that focused on implementation or knowledge translation of evidence-based interventions underscored the value of program champions (Murphy et al., 2018; Vedel et al., 2018). With the various terms used to describe people who are instrumental in effecting change, Leeman et al. (2007) made a clear distinction between a leader and a champion, guided by Rogers (2003)' concept of "champions". In contrast to the change leaders with a designated authority to lead, champions emerge spontaneously during the process with their commitment to effect change (Leeman et al., 2007). However, with the short implementation period, it remains unclear whether the program champions will contribute to the sustained implementation of the music intervention without the support of the candidate who acted as the external resource person. Leeman et al. (2007) highlighted the influential role of external change agents (e.g. academic researchers) in implementing change. Consistent with the findings from the study of Mellor et al. (2015), the support provided by the candidate may have been instrumental in the motivation and active involvement of staff especially the program champions. In another implementation study (Sung et al., 2008) where a local opinion leader acted as the resource person to other nursing staff, results revealed that the opinion leaders felt unprepared for the role and they suggested that an external expert for consultation should be available (Sung et al., 2008). Thus, the need for further training and education and ongoing support to develop and support program

champions in facilitating evidence-based practice is warranted (Murphy et al., 2018; Sung et al., 2008).

5.5.1.3. Feedback

Collecting data from various stakeholders and providing feedback are among the strategies that enable the monitoring of the implementation processes and reinforcing the positive outcomes of the music intervention (Leeman et al., 2007; Powell et al., 2012). From this study, the regular feedback obtained from the staff and family or guardian contributed to the prompt actions undertaken to address a number of issues that occurred especially during the first few weeks of implementation including the implementation by staff who did not receive the training and issues with equipment use and care. The feedback sought also illuminated the extent of the music intervention uptake that was not captured in the music intervention logbook.

5.5.1.4. Implementation reminders and equipment storage

Reminders

Overall, from the data gathered for this part of the study, the impact of reminders in promoting the uptake of the music intervention is not clear. The use of a reminder system was one of the commonly suggested implementation strategies to prompt the uptake of an intervention (Grimshaw et al., 2006; Leeman et al., 2007; Powell et al., 2012). Despite the evidence of more frequent implementation of the music intervention in RACF1 compared to RACF2, it is not possible to conclude which reminder system worked better due to the presence of other factors such as the number of staff and family or guardians trained that may have contributed to the better uptake of the music intervention in RACF1.

Choice of equipment storage

Definitive conclusions cannot be made on whether storing the music intervention equipment in the person with dementia's room (RACF1) promoted better uptake of the music intervention compared to storing them in the locked nursing station area (RACF2). However, easy accessibility of the equipment promoted utilisation by staff in RACF1 who were not study participants and did not receive the training. The safety of the equipment however was demonstrated with more secure storage in RACF2 as there was no reported lost or broken equipment compared to RACF1 where there was one broken headphone and one missing charger.

5.5.2. Implementation highlights from the music intervention

logbook data

5.5.2.1. Documented feasibility of regular implementation, sustainability throughout the 3-month period, and fidelity to the music intervention protocol

Acceptability of the music intervention to the person with dementia and feasibility of its implementation by trained staff and family members or guardians were evident in the music logbook entries. Feasibility of implementation on a regular basis was specifically demonstrated in the music intervention entries from RACF1 with evidence of sustained implementation throughout the 3-month implementation period. However, regular feedback sought from the participants from both sites revealed that the logbook documentation did not accurately reflect the number of times that the music intervention was implemented. There were several undocumented episodes of implementation as reported by the staff and family or guardian. Issues with documentation by participating staff and family are demonstrated in other studies on individualised or personalised music listening (Gerdner, 2005; Murphy et al., 2018). In a study by Murphy et al. (2018), findings revealed the challenge of sustained data

collection even when the staff recognised the importance of tracking the intervention's use. In another study (Gerdner, 2005), the staff reported implementing the intervention on an as need basis however this was only documented 11.5% of the time. Also, despite family members verbally reporting that they implemented the intervention each time they visited, only four of the eight family members documented the response of the person with dementia (Gerdner, 2005).

Data from the music intervention logbook provided information on the intervention fidelity, which refers to the degree to which it was implemented in accordance to the protocol (Proctor et al., 2011). In RACF1, the majority of participants received the music intervention as indicated in the protocol, which was approximately 30 minutes or longer. Although the majority of RACF2 participants had shorter duration of implementation, this was supplemented by logbook on the effects of the music intervention that indicated increased agitation or the older person did not want the headphones on. As noted in the protocol (see Chapter 4 section [4.8.4](#)), the music intervention was to be stopped if the older person showed signs of discomfort or distress.

5.5.2.2. Reasons for implementation and effects of the intervention

For both facilities, leisure activity constituted the main reason for implementation (57.8%) and the main effect on the participating older people living with dementia reported was “enjoyed the activity” (65%). This contradicts the findings of Murphy et al. (2018) which revealed that perception of music as entertainment was a great barrier to adoption of the personalised music listening program. Instead, the authors indicated that the calming effect of the intervention on a person with dementia who is agitated was an important catalyst to routine implementation (Murphy et al., 2018). As previously noted in Chapters 2 and 3, an

array of studies on individualised music listening intervention explored effectiveness of the intervention on behavioural and psychological symptoms of dementia (BPSDs) especially agitation. A systematic review of individualised leisure and social activity interventions, which included individualised music listening revealed that BPSDs were evaluated by the majority of studies included in their review (Han et al., 2016). In light of the findings of this study, the recommendation by Han et al. (2016) on the need to conduct further studies that explore the use of individualised music listening as a pleasurable and meaningful leisure activity is supported.

Furthermore, there were a few noteworthy entries revealed from the open-ended response section of 'other reasons and effects' in the music intervention logbook. For other reasons, notably half of the entries were to promote food intake with three entries on eating better documented in the other effects. Cohen, Post, Lo, Lombardo, and Pfeffer (2018) evaluated the impact of individualised music listening on the swallowing of four older people with advanced dementia. Results revealed enhanced swallowing, decreased choking, improved nutrition, reduced weight loss, reduced need for speech interventions and enhanced quality of life with the music listening intervention (Cohen et al., 2018). In another study, familiar background music was played to 12 people living with dementia in residential care during meals to decrease agitation, which would result in increased caloric consumption. Results indicated increased caloric consumption with familiar background music compared to mealtimes without music (Thomas & Smith, 2009). Findings from these studies however must be interpreted with caution due to some methodological weaknesses (Cohen et al., 2018; Thomas & Smith, 2009). For the other effects, the positive impact of preferred music on the mood of the participating people living with dementia, as demonstrated in previous studies (Gotell, Brown, & Ekman, 2009; Maseda et al., 2018), were documented by the staff in this

study. Included were increased alertness and body movements while listening to music (e.g. tapping fingers and feet, hands were moving with the song).

5.5.3. Costs of the music intervention and its implementation by participating staff

For the present study, the annual total cost of implementing an individualised music listening intervention to 32 older people living with dementia by 14 trained staff from two residential aged care facilities was AU\$6,623.76 in 2017 which was equivalent to approximately AU\$3.98 per person per week. This is the first published study that included the evaluation of the costs involved in various aspects of the implementation of an individualised music listening intervention such as the training and education and the labour involved in the creation of a music playlist and the implementation of the music intervention.

Despite the importance of evaluating the costs associated with the implementation of a non-pharmacological intervention in a residential aged care setting (Ballard et al., 2018), there is a paucity of literature on the financial costing involved in the implementation of an individualised music listening intervention. Previous studies have reported the cost of music listening equipment or devices and the music library (Dimopoulos-Bick et al., 2019; Murphy et al., 2018). Dimopoulos-Bick et al. (2019) conducted a study which aimed to evaluate the feasibility of implementing a personalised music listening program in various health care settings in NSW, Australia funded by the Music and Memory program (Music and Memory, 2019). The settings included palliative care, mental health, trauma services, multipurpose services, dementia care, inpatient aged care, and residential aged care. The costs mentioned by Dimopoulos-Bick et al. (2019) were limited to the iTunes voucher given to each implementation site valued at AU\$150.00 and the estimated cost for each music playlist

containing 10 songs which was AU\$20.00. In the study of Murphy et al. (2018) which was implemented in a residential aged care setting in the United States, the total cost of the equipment and the music library over the 4-year implementation period for 20 residents was US\$2,000. The study of Murphy et al. (2018) was primarily driven by volunteers and did not take into account the evaluation of the costs associated with the work that volunteers contributed for the implementation of the program.

Gallagher (2011) utilised Gerdner's protocol in the implementation of an individualised music intervention for people living with dementia who were receiving palliative care and hospice services over a 3-month period. The estimated cost of the implementation was US\$1,000 (Gallagher, 2011). Assuming the base year of costing was 2010, the year that the study was conducted, this cost would be equivalent to approximately AU\$978 that year or AU\$1,132 in 2017. The costs evaluated include the paid 60-minute training for 24 staff participants and the project leader, MP3 or CD players, portable speakers, musical selections, and educational materials (Gallagher, 2011). The costs associated with the creation of the music listening playlist as well as the actual implementation of the music intervention by trained staff were not evaluated.

Comparing the costs associated with the use of individualised music listening to other forms of music based interventions or therapy for people living with dementia is worthwhile.

Various forms of music therapy and music based interventions are previously discussed in Chapter 2 section [2.8](#). Bellelli et al. (2012) investigated the costs associated with the implementation of a group music therapy from the study of Lin et al. (2011). The intervention comprised 12 music therapy sessions among 49 participants which included various musical activities such as singing and music listening. As Lin et al. (2011) did not indicate the number

of participants for each group, (Bellelli et al., 2012) assumed that it was 3 to 4 participants each group or 12 groups in total. Bellelli et al. (2012) calculated that the overall cost of 12 sessions of music therapy administered to 12 groups was 3,600 euros. When converted to Australian dollars based on the year that the study of Lin et al. (2011) was conducted (2008-2009), this would be approximately AU\$7,299 in 2009 or AU\$8,690 in 2017. Nevertheless, apart from the reliance on the presence of a music therapist for the implementation of music therapy, the involvement of a music therapist entails additional costs. In Australia, a 30-minute individual music therapy session costs approximately AU\$90 while a 30-minute group music therapy session costs approximately AU\$40 per participant as of May 2019 (Music Beat, 2018).

Promoting ownership of the music intervention program for its sustainability in the context of the residential aged care facility was taken into account in the costing. The total cost is inclusive of the time that the staff spent during the training session and in the implementation of the music intervention over a 3-month period. The total cost also includes the time spent by the nominated staff who would be in charge of creating the music playlists.

Implementation of a psychosocial intervention within the staff's work hours is a well-documented barrier due to the potential disruption in the workflow that it could cause (Dimopoulos-Bick et al., 2019; Garcia et al., 2013; Murphy et al., 2018). Dimopoulos-Bick et al. (2019) specifically underscored that the time spent by staff in creating music playlists was one of the main barriers to the implementation of a personalised music listening intervention. Although provision of person-centred care such as an individualised music listening intervention is part of the regular duties of care staff, this study takes into account the potential interruption in workflow that could impede routine uptake of the music intervention. Providing extra pay to staff members for the time spent doing activities related to the

implementation of the intervention may be valuable in overcoming the barrier related to potential workflow disruption however, this may not be realistic.

The costs involved at the start of the music intervention implementation is expected to be greater compared to when the program has become established in the facility. For example, the costs of the music downloads could be minimised in subsequent years of implementation when the facility has a wide collection of music in their music library (Murphy et al., 2018). Some RACF may have existing CD collections or may wish to request music CDs or iTunes vouchers donated to the facility as part of fundraising to reduce consumable costs. However, coordinating, collecting and uploading of CDs or donated iTunes vouchers may be associated with time and labour of the nominated staff. Also, the iPod shuffles and the chargers could be used by new residents when the residents enrolled in the program pass away. The same iPod can have more than one play list and could be used for more than one person if the facility wishes to save on costs. However, this could limit access if there are competing demands for the equipment.

While there is limited literature on other music-based interventions and music therapy that could be used for comparison in terms of the costs associated with implementation, findings from this study reveal that individualised music listening is a low-cost intervention that does not require expensive certifications or the presence of certified music therapists. Trained staff and family or guardian can implement the music intervention. The family or guardian's involvement in the implementation of the music intervention could potentially reduce costs as they could save staff from implementing music intervention during their visits.

5.5.4. Limitations related to implementation outcomes

A number of limitations must be considered when interpreting the findings from this quantitative data. One is the small sample size for both the staff and family or guardian. Definitive conclusions cannot be drawn about the general perceptions of the staff regarding the training and the music intervention based on responses to the implementation outcomes questionnaire, considering the small number of staff who completed the questionnaire. Moreover, the use of the music intervention logbook as a measure for evaluating the feasibility of implementing the music intervention in the daily care of the participating older people living with dementia was unreliable due to the reports of missed documentation. This was a particular challenge with data collection since the documentation in the logbook was not mandatory and there was no re-imbursement involved. Another limitation was the short implementation period, which limits the evaluation of sustainability to the 3-month implementation period.

As with the implementation costs, the evaluation was limited to the costs associated with the music intervention and its implementation by trained staff members. The evaluation did not take into account the economic impact of the music intervention on a number of outcomes relating to older people living with dementia such as agitation and psychotropic medication use. Evaluating the cost effectiveness of the intervention is critical in increasing utilisation, support, and funding for its integration into routine clinical practice (Dimopoulos-Bick et al., 2019).

5.6. Conclusion

Findings from the quantitative data addressing the implementation outcomes suggest that the individualised music listening intervention is appropriate for older people living with dementia and its implementation in a residential care setting by staff, family members, and guardians is acceptable and feasible. Intervention fidelity was reflected in some of the logbook entries. While the music intervention was usually implemented with the suggested duration in RACF1, the responses of the older people from RACF2 were taken into consideration with shorter implementation of the intervention (e.g. increased agitation, person with dementia did not want the headphones on). Findings from this study also reveal that implementing the music intervention in a residential aged care setting is low cost. Key strategies utilised that facilitated the implementation of the music intervention include the training and education of staff and family, identification of program champions, and providing and obtaining feedback. The advantage of a longer version of training over a shorter version was not demonstrated. However, the number of trained staff and family members or guardians of older people living with dementia was positively associated with the number of documented evidence of music intervention implementation. This calls for the need to train and educate more staff and to involve family members and guardians of people living with dementia for wider implementation of the music intervention. Although documented evidence of the implementation's sustainability was only from RACF1, implementation of the music intervention was sustained during the 3-month implementation period for both facilities.

In this chapter, data from the quantitative component of the study addressing the primary implementation outcomes of adoption, acceptability, appropriateness, fidelity and feasibility of implementing the individualised music listening intervention were presented. In the

following chapter, the secondary outcomes pertaining to the impact of the individualised music listening intervention on the participating older people living with dementia are reported. Specifically, the outcomes of agitation, quality of life, engagement, and prescription and or use of psychotropic medication are discussed.

**Chapter 6 Impact of individualised music
listening on older people living with dementia
– A pre-test post-test study**

6.1. Introduction

In the previous chapter the quantitative data addressing the primary implementation outcomes were presented. The results showed that the individualised music listening intervention was perceived as acceptable and appropriate for older people living with dementia and the intervention's integration into the daily care of the people living with dementia was feasible and low cost. The results presented in this chapter address the secondary outcomes of the study, which evaluated the impact of the individualised music listening intervention on older people living with dementia. The chapter reviews the study objective, research question, plan and methods used which were described in more detail in Chapter 4. The results reveal the effects of the music intervention on agitation, quality of life, level of engagement during the music intervention, and psychotropic medication prescription and use.

6.2. Overview of the study objective and methods

The objectives of this part of the study address the second objective which was to determine the impact of an individualised music listening intervention on older people living with dementia in residential care. The research question asked:

1. Does the use of an individualised music listening intervention for older people living with dementia impact levels of agitation, quality of life, their engagement during the intervention, and prescription and use of psychotropic medications?

The baseline data on agitation, quality of life, and psychotropic medication use for the participating people living with dementia were collected during August 2017 in RACF1

and October 2017 in RACF2. The post implementation assessments for these outcomes were completed in February 2018 for both implementation sites as some of the participants from RACF1 were recruited during the second and third month of implementation (details in Chapter 5 section [5.3](#)). The level of engagement during the music intervention was assessed at different time points: September, October, and November 2017 for the majority of participants from RACF1 and November 2017, January and February 2018 in RACF2. The two participants from RACF1 who commenced in October and November had their level of engagement completed at three time points starting from the last two weeks of the first month when they began receiving the music intervention.

6.3. Results

The participant flow and the baseline characteristics of the participating people living with dementia were shown and discussed in Chapter 5 section [5.3](#). At baseline, there were no significant differences in the demographic data: age, gender, and dementia diagnosis, cognitive function, level of cognitive decline, agitation and quality of life among older people living with dementia between the implementation sites.

6.3.1. Effects on agitation, quality of life, and level of engagement: Comparison between implementation sites

6.3.1.1. Agitation

There were no significant differences in the pre-implementation or post-implementation agitation and quality of life scores between participants from RACF1 and RACF2 based on Wilcoxon rank-sum test, as shown in Table 6.1. However, in the analysis of each implementation site, contrasting findings were noted in the agitation scores measured using the Cohen-Mansfield Agitation Inventory (CMAI) with improvement noted among RACF1 participants but worsening among RACF2 participants. See Figure 6.1.

Specifically, RACF1 participants' agitation scores significantly decreased from a median of 50 (range: 29-115) at baseline to 49.5 (range: 29-64) at the end of 3-month implementation ($p=0.037$). Conversely, there was a non-significant increase in the median agitation score of participants from RACF2 from 47 (range: 29-91) at baseline to 50 (range: 29-85) at post implementation based on the Wilcoxon signed rank test ($p=0.646$). The absolute difference in the median agitation scores among RACF2 participants is noteworthy despite being non-

significant. This could be attributed to the small sample size and the smaller number of participants who completed the post implementation assessment limiting statistical power.

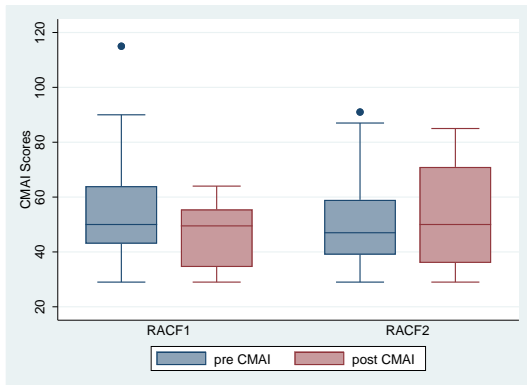


Figure 6.1. Differences in the pre-implementation and post-implementation agitation scores between implementation sites

Table 6.1. Comparison between implementation sites on CMAI (agitation), DEMQOL (quality of life), and HoME-S (engagement during the intervention) scores

Outcomes	RACF1				RACF2				p- value (between implementation sites)
	n	Median (IQR)	Min/Max	p-value	n	Median (IQR)	Min/Max	p-value	
CMAI Pre Implementation	17	50 (21)	29/115	0.037	15	47 (20)	29/91	0.646	0.720
CMAI Post Implementation	12	49.5 (21)	29/64		10	50 (35)	29/85		0.667
DEMQOL proxy Pre Implementation	14	107.5 (15)	92/111	0.01	14	102 (18)	74/118	0.504	0.448
DEMQOL proxy Post Implementation	11	112 (5)	93/117		10	105 (10)	97/115		0.156
DEMQOL Pre-Implementation	3	115 (24)	92/116		4		97*		0.655
DEMQOL Post-Implementation	1		116*						
HoME-S Month 1	15	4.65 (1.96)	2.57/5.60	0.209**	14	3.75 (1.68)	1.56/6.00	0.473**	0.077
HoME-S Month 2	12	4.90 (1.58)	1.75/5.80	0.410	10	4.66 (0.62)	3.05/5.80	0.059	0.597
HoME-S Month 3	12	4.76 (1.39)	1.93/5.86	0.505	10	4.13 (2.11)	1.98/6.00	0.262	0.575

p-value calculated using Two-sample Wilcoxon rank-sum (Mann-Whitney) and Wilcoxon Signed-Rank Test as appropriate.

*DEMQOL: pre-implementation n=1 from RACF2, the actual score is reported; post implementation n=1, the actual score is reported, group comparison not possible.

**Differences between HoME-S Month 1 and Month 3.

Abbreviations: RACF=residential aged care facility; Min/Max= minimum and maximum values; IQR= interquartile range; CMAI=Cohen Mansfield Agitation Inventory; DEMQOL= Dementia Quality of Life Questionnaire; HoME-S= Homecare Measure of Engagement (Staff Version).

6.3.1.2. Quality of life

For the quality of life as perceived by the informants using the DEMQOL proxy, improvements were noted for the participating people living with dementia from both facilities. There was a significant increase from a median of 107.5 (range: 92-111) to 112 (range: 93-117) ($p=0.01$) among RACF1 participants. The median quality of life of RACF2 participants as perceived by the informants (DEMQOL proxy) increased from 102 (range: 74-118) to 105 (range: 97-115) showing a pattern of improvement, however the difference was not statistically significant. This non-significant difference in the quality of life of the RACF2 participants may be attributed to the same reasons mentioned above regarding the agitation scores. It was not possible to compare the pre-implementation and post-implementation quality of life patient/subject interview (DEMQOL) due to the small number of participants who completed the assessment. At baseline, there were four participants (three from RACF1 and one from RACF2) while at post-implementation there was only one participant (from RACF1) as the other three had dropped out from the study. Differences in the pre-implementation and post-implementation quality of life scores between implementation sites are shown in Figure 6.2.

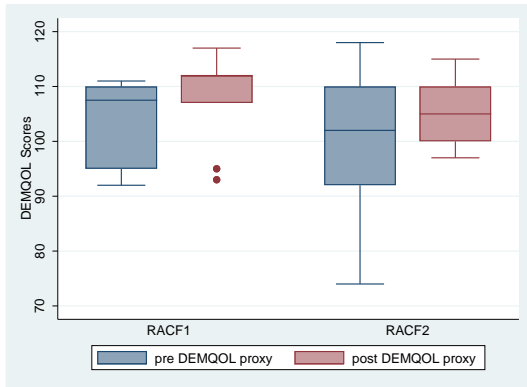


Figure 6.2. Differences in the pre-implementation and post-implementation scores between implementation sites

6.3.1.3. Level of engagement

The engagement during the individualised music intervention was measured using the homecare measure of engagement staff questionnaire (HoME-S). Higher scores reflect higher level of engagement. As shown in Table 6.1, participants from RACF1 had notably higher engagement scores with medians of 4.65, 4.90 and 4.76 for months 1, 2 and 3 respectively whereas RACF2 participants' median engagement scores were 3.75, 4.66 and 4.13 respectively for the three time points (months 1, 2 and 3). The group differences however, were not statistically significant based on Wilcoxon rank-sum test.

Analysis of level of engagement at each implementation site suggested a pattern of increase from the first to the second month and a decrease from the second to the third month for both

RACF1 and RACF2 participants as presented in Table 6.1 and illustrated in Figure 6.3. In addition, both RACF1 and RACF2 participants' level of engagement were higher during the third month compared to the first month. However, the differences between the data collection points for both groups were not statistically significant based on Wilcoxon signed-rank test.

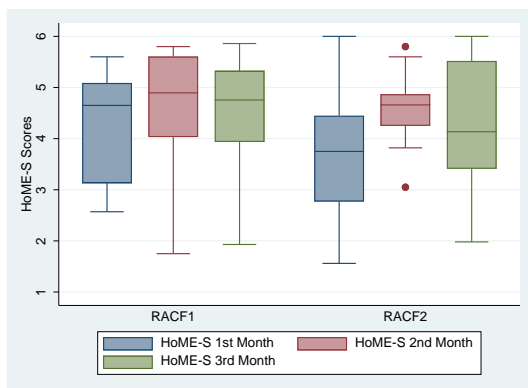


Figure 6.3. Differences in the level of engagement scores between implementation sites across the three time points

Frequency of implementation

Included in the HoME-S form are sections on the frequency and duration of the music intervention administered over the 2-week period before the end of each month of implementation. Although the staff completed the sections on the level of engagement assessment, there were several missing entries on the frequency and duration of the music

intervention as shown in Table 6.2. All of the forms with entries on duration and frequency were from RACF1 only.

The frequency of implementation started high in the first month then dropped off during the second month and came back to the same frequency (as the first month) during the third month. Specifically, for the 3 points of assessment, the median frequency of implementation during the 2-week period were 5.0 (first month), 4.5 (second month) and 5.0 (third month). The minimum frequency of implementation across the three data collection points was one while the maximum was ten.

Duration of implementation

The duration of implementation was longer in the first month, decreasing during the second month and increasing again in the third month. In the third month however, the duration of implementation was shorter than in the first month. The median duration of the music intervention was 195 minutes, 120 minutes and 165 minutes for months 1, 2 and 3 respectively. The patterns of duration and frequency for implementation were similar.

Table 6.2. Frequency and duration of implementation as documented in the HoME-S assessment

HoME-S Assessment	Frequency of implementation (2-week period)			Duration of implementation in minutes (2-week period)		
	Number of entries	Median	Min/Max	Number of entries	Median	Min/Max
Month 1 (n=29)	15	5	2/8	8	195	90/510
Month 2 (n=22)	12	4.5	2/10	7	120	90/330
Month 3 (n=22)	12	5	1/7	12	165	60/330

Abbreviations: HoME-S= Homecare Measure of Engagement-Staff Version; Min/Max= minimum and maximum values.

6.3.2. Effects on agitation, quality of life and level of engagement: Comparison between data collection points of the pooled sample

6.3.2.1. Agitation

In the pooled sample of older people living with dementia from both implementation sites, there was a non-significant increase in the median agitation score from 47.5 (range: 29-115) at pre-implementation to 50 (range: 29-85) at the end of the 3-month implementation (see Table 6.3). Distribution of agitation scores were skewed to the right especially the pre-implementation scores, indicating a non-normal data distribution with the median lesser than the mean. The differences between pre-implementation and post-implementation agitation scores combining results from RACF1 and RACF2 are illustrated in Figure 6.4.

Table 6.3. Effects of individualised music listening intervention on agitation and quality of life: comparison of pre-implementation and post-implementation scores in the pooled sample

Outcome Measure	Pre-Implementation		Post-Implementation		p-value
	n	Median (IQR)	n	Median (IQR)	
CMAI	32	47.5 (22)	22	50 (20)	0.172
DEMQOL (proxy)	28	106.5 (15.5)	21	108 (10)	0.032
DEMQOL	4	106 (21)	1	116*	

p-value calculated using Wilcoxon Signed-Rank Test

*DEMQOL: post implementation n=1, actual score is reported, pre and post comparison not possible

Abbreviations: IQR= interquartile range; CMAI= Cohen Mansfield Agitation Inventory; DEMQOL= Dementia Quality of Life Questionnaire; HoME-S= Homecare Measure of Engagement (Staff Version).

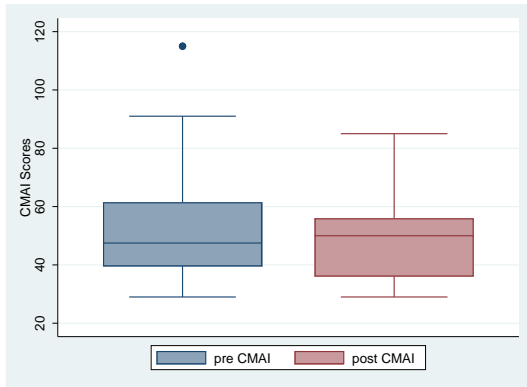


Figure 6.4. Differences between pre-implementation and post-implementation agitation scores (pooled sample)

6.3.2.2. Quality of life

The quality of life of the pooled sample of participating older people living with dementia as perceived by the informants (DEMQOL proxy) significantly improved with a median score of 106.5 (range: 74-118) at pre-implementation and 108 (range: 93-117) at post-implementation ($p=0.032$) (see Table 6.3). The distribution of quality of life scores were skewed to the left indicating that the median is greater than the mean. It was not possible to compare the pre-implementation and post-implementation scores of the patient/subject interview version of the DEMQOL as there was only one participant who completed the 3-month implementation period. The differences between pre-implementation and post-implementation quality of life scores combining results from RACF1 and RACF2 are illustrated in Figure 6.5.

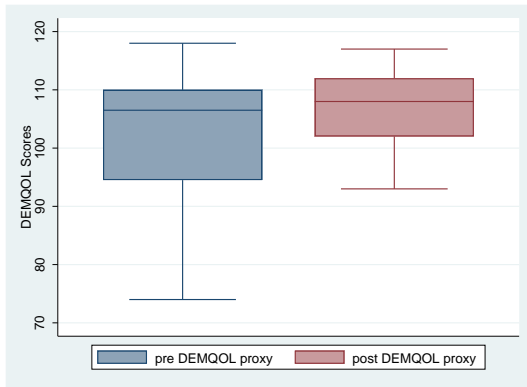


Figure 6.5. Differences between pre-implementation and post implementation quality of life scores (pooled sample)

6.3.2.3. Level of engagement

In agreement with the analysis of each implementations site, a pattern of increase during the second month and decrease towards the third month is noted in the HoME-S scores of the pooled sample summarised in Table 6.4. Specifically, the level of engagement was significantly higher during the second month (median 4.70; range 1.75 to 5.8) compared to the first month (median 4.25; range 1.56 to 6) ($p=0.051$). Following this was a non-statistically significant decrease in the level of engagement from the second month to the third month (median 4.46, range 1.93 to 6) of implementation. Although not statistically significant, the participant's engagement was higher during the third month compared to the first month. The distribution of HoME-S scores for the three time points were skewed to the left indicating that the median is greater than the mean. Figure 6.6 illustrates the level of

engagement over the 3-month implementation period combining results from RACF1 and RACF2.

Table 6.4. Effects of individualised music listening intervention on level of engagement: comparison between points of data collection

Homecare Measure of Engagement – Staff Version (HoME-S) Assessment	n	Median (IQR)	p-value
Month 1	29	4.25 (1.67)	0.194*
Month 2	22	4.70(1.35)	0.051
Month 3	22	4.46 (1.87)	0.204

p-value calculated using Wilcoxon Signed-Rank Test

*Difference between Month 1 and Month 3

IQR= interquartile range

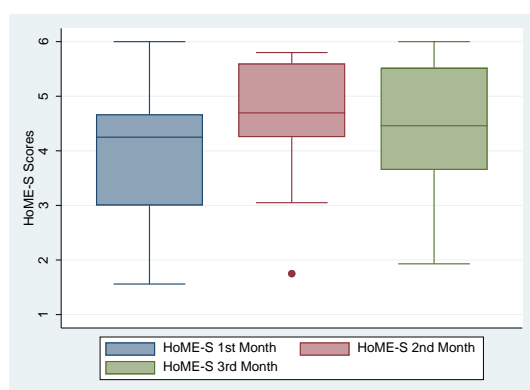


Figure 6.6. Differences in the level of engagement scores between time points of data collection (pooled sample)

6.3.3. Effects on the use of psychotropic medications

6.3.3.1. Comparison between implementation sites

A total of 21 participants (66%) were prescribed regular psychotropic medication at pre-implementation and 13 participants (59%) at post implementation. Regular psychotropic medications included antidepressants (celebram, citalopram, escitalopram, mirtazapine, sertraline, and venlafaxine), antipsychotics (quetiapine and risperidone), anticonvulsant (sodium valproate) and benzodiazepines (lorazepam and temazepam). The frequency of administration was either once or twice a day.

There were more participants with regular psychotropic medications in RACF2 compared to RACF1 at both data collection points. Thirteen participants from RACF2 were prescribed with regular psychotropic medication at pre-implementation. Of these thirteen participants, nine had 1 and four had 2-4 psychotropic medications. From RACF1 there were eight participants; five with 1 and three with 2-4 psychotropic medications. At post-implementation there were eight participants from RACF2; five with 1 and three with 2-4 psychotropic medications, and five from RACF1; three with 1 and two with 2-4 psychotropic medications regularly prescribed. Differences between the regular psychotropic medication prescriptions between implementation sites during the four-week period prior to the start of the implementation and the four-week period prior to the end of implementation were not statistically significant. The numbers of participants with regular psychotropic medication prescription from both implementation sites are shown in Table 6.5.

In contrast to RACF1, the use of PRN psychotropic medications was less likely in RACF2. The PRN psychotropic medications prescribed were antipsychotics (quetiapine, risperidone, and neulactil) and benzodiazepines (midazolam). The indications for the administration of

PRN psychotropic medications included signs of aggression and agitation in an older person. At pre-implementation there were eight participants from RACF1; seven with 1, and one with 2, psychotropic medications prescribed PRN; and two from RACF 2 with 1 and 2 psychotropic PRN medications prescribed respectively. Towards the end of the implementation period there were six participants from RACF1 with psychotropic medications prescribed PRN; five with 1 and one with 2 medications. In RACF2 there was one person with 2 psychotropic medications prescribed PRN. The differences in the number of participants with PRN psychotropic medication prescription between implementation sites were statistically significant both at pre-implementation ($p=0.049$) and post-implementation ($p=0.050$). The numbers of participants with PRN psychotropic medication prescription from both implementation sites are shown in Table 6.5.

Table 6.5. Comparison of the number of people living with dementia with psychotropic medication prescriptions between implementation sites

Psychotropic Medications	Pre Implementation (n=32)				Post Implementation (n=22)			
	RACF1 n (%)	RACF2 n (%)	Total n (%)	p-value	RACF1 n (%)	RACF2 n (%)	Total n (%)	p-value
Regular prescription								
None	9 (52.9)	2 (13.3)	11 (34.4)	0.075	7 (58.3)	2 (20.0)	9 (40.9)	0.195
1	5 (29.4)	9 (60.0)	14 (43.8)		3 (25.0)	5 (50.0)	8 (36.4)	
2-4	3 (17.7)	4 (26.7)	7 (21.9)		2 (16.7)	3 (30.0)	5 (22.7)	
PRN prescription								
None	9 (52.9)	13 (86.7)	22 (68.8)	0.049	6 (50.0)	9 (90.0)	15 (68.2)	0.050
1	7 (41.2)	1 (6.7)	8 (25.0)		5 (41.7)	0	5 (22.7)	
2	1 (5.9)	1 (6.7)	2 (6.3)		1 (8.3)	1 (10.0)	2 (9.1)	

p-value calculated using Fisher's exact test.

RACF=residential aged care facility

Only participants from RACF1 had PRN psychotropic medications administered during the two data collection points as shown in Table 6.6. There were 13 psychotropic medications administered across all RACF1 participants at pre-implementation and 10 psychotropic medications administered towards the end of the implementation period.

Table 6.6. Number of PRN (as needed) psychotropic medications administered

Number of PRN administered	Pre Implementation			Post Implementation		
	RACF1	RACF2	Total	RACF1	RACF2	Total
	13	0	13	10	0	10

6.3.3.2. Comparison between data collection points

Within each implementation site

The number of participants with regular and PRN psychotropic medications prescription decreased towards the end of the implementation period for both implementation sites. For the regular psychotropic medications, there was a decrease from eight participants with prescription at pre-implementation to five at post implementation in RACF1. In RACF2, the number of participants with regular psychotropic medication decreased from thirteen at pre-implementation to eight at post implementation.

For the PRN psychotropic medication, the number of participants with a prescription decreased from eight at pre-implementation to six at post implementation in RACF1 and from two at pre-implementation to one at post implementation in RACF2. However, the proportion of participants with no psychotropic medication prescription, both regular and PRN psychotropic also decreased from pre-implementation to post implementation for both sites. Results of the statistical analysis on the proportion of participants with and without

regular and PRN psychotropic medication prescription revealed no significant differences between pre-implementation and post-implementation for both RACF1 and RACF2. The proportion of participants with and without psychotropic medication prescription during the two data collection points are shown in Table 6.7.

Table 6.7. Comparison of the pre-implementation and post-implementation psychotropic medication prescription within each implementation site

Psychotropic Medication Prescriptions	RACF1			RACF2		
	Pre	Post	p-value	Pre	Post	p-value
	n (%)	n (%)		n (%)	n (%)	
With regular psychotropic	8 (47.1)	5 (41.7)	1.000	13 (86.7)	8 (80.0)	1.000
No regular psychotropic	9 (52.9)	7 (58.3)		2 (13.3)	2 (20.0)	
With PRN psychotropic	8 (47.1)	6 (50.0)	1.000	2 (13.3)	1 (10.0)	1.000
No PRN psychotropic	9 (52.9)	6 (50.0)		13 (86.7)	9 (90.0)	

p-value calculated using McNemar's test.

RACF=residential aged care facility

Pooled sample

Comparison of the pre-implementation and post-implementation psychotropic medication prescription of the pooled sample of participating older people living with dementia revealed a similar pattern of analysis to each implementation site. A decrease in the proportion of participants with regular and PRN psychotropic medication prescription was noted at the end of the implementation period as presented in Table 6.8. Specifically, the number of participants with regular psychotropic medication decreased from 21 at pre-implementation to 13 at post implementation across implementation sites. For PRN psychotropic medication, the number decreased from 10 participants prescribed at pre-implementation to 7 at post implementation. Similarly, the proportion of participants without regular and PRN psychotropic medication also decreased from pre-implementation to post implementation.

Analysis of the pooled sample showed no significant differences between the proportion of participants with and without regular and PRN psychotropic medications prescriptions at pre-implementation and post-implementation based on McNemar's test (Table 6.8).

Table 6.8. Comparison of the pre-implementation and post-implementation psychotropic medication prescription across both implementation sites (pooled sample)

Psychotropic Medication Prescriptions	Pre-Implementation n=32 n (%)	Post-Implementation n=22 n (%)	p-value
Regular prescription			
With psychotropic	21 (65.6)	13 (59.1)	1.000
No psychotropic	11 (34.4)	9 (40.9)	
PRN prescription			
With psychotropic	10 (31.3)	7 (31.8)	1.000
No psychotropic	22 (68.8)	15 (68.2)	

p-value calculated using McNemar's test.

6.4. Discussion

The results presented in this chapter address the secondary outcomes of the study which evaluated the impact of the individualised music listening intervention on older people living with dementia on agitation, quality of life, level of engagement during the intervention, and psychotropic medication prescription and use. Findings reveal the significant effect of the music intervention on quality of life and a subsequent increase in the engagement scores throughout the implementation period of the pooled sample of older people living with dementia. Significant improvement in agitation scores was noted from RACF1 participants only. There were no significant changes on psychotropic medication use and prescription among participants from both implementation sites.

6.4.1. Agitation

While the effectiveness of individualised music listening on agitation has been widely demonstrated in randomised controlled trials (RCT) (Hicks-Moore & Robinson, 2008; Sanchez et al., 2016) and non-RCT (Gerdner, 2005; Park, 2013; Park & Pringle Specht, 2009; Raglio et al., 2013; Sung et al., 2006), its promising impact on people living with dementia was not totally supported in this study. Contrasting results were noted from each implementation site. The median agitation scores significantly decreased from pre-implementation to post-implementation among RACF1 participants but increased non-significantly among RACF2 participants. In the pooled sample analysis, increased median agitation score was noted from baseline to post implementation, however this increase was non-significant.

In a previous study (Raglio et al., 2015) participants in the individualised music listening group demonstrated improvement in other outcomes except for agitation while in another study (Kwak, Anderson, & O'Connell Valuch, 2018), the individualised music listening intervention did not have significant effects in all outcomes evaluated including agitation scores. Raglio et al. (2015) argued that the limited efficacy of music listening in their study when compared to music therapy could be attributed to the lack of a direct relationship and interaction between the person with dementia and the therapist; an important element of music therapy. In the present study, although evidence regarding the benefits of individualised music listening on agitation was inconsistent, there was limited statistical power and the dosage and frequency of administration varied considerably between sites as reported in Chapter 5. There was evidence of more frequent and longer duration of implementation in RACF1 compared to RACF2 as previously reported in Chapter 5.

6.4.2. Quality of life

Significant improvement in quality of life (QoL) as assessed using the proxy version of the dementia quality of life questionnaire (DEMQOL-proxy) was noted among the pooled sample of older people living with dementia. Subgroup analysis revealed an increase in DEMQOL-proxy scores from both implementation sites although only the DEMQOL proxy scores from RACF1 participants reached statistical significance. The results of the few studies that evaluated the effect of individualised or preferred music listening on the QoL of people living with dementia varied (Raglio et al., 2013; Raglio et al., 2015; Sarkamo et al., 2014). However, there is consistent evidence demonstrating its promising impact (Raglio et al., 2015; Sarkamo et al., 2014). While the crossover study of Raglio et al. (2013) revealed worsened QoL, two randomised controlled studies supported the efficacy of individualised or

preferred music listening for people living with dementia with significant improvement in QoL scores (Raglio et al., 2015; Sarkamo et al., 2014).

With the progressive nature and the distressing impact of dementia symptoms (Banerjee et al., 2009; Banerjee et al., 2006), quality of life has been recognised as an important outcome for people living with dementia, especially for those living in residential aged care facilities (Beerens, Zwakhalen, Verbeek, Ruwaard, & Hamers, 2013; Jing, Willis, & Feng, 2016; Moyle, Fetherstonhaugh, Greben, Beattie, & group, 2015). However, measuring and evaluating quality of life of people living with dementia is an ongoing challenge for researchers (Bowling et al., 2015). While it is recognised that quality of life is subjective and its assessment should take into account the person's self-report (Bowling et al., 2015), the proxy version was used in this study as the participants had severe to very severe cognitive impairment and difficulty with verbal expression or comprehension.

From their preliminary field test, Smith, Lamping, et al. (2005) highlighted that the correlation between DEMQOL and DEMQOL-proxy is low especially for people with severe dementia. People living with dementia perceived their QoL to be more positive compared to the perception of their carers. The lower QoL proxy ratings from carers were attributed to the carer's emphasis on the person with dementia's limitations (Smith, Lamping, et al., 2005). This is in agreement with other literature which argues that caregivers tend to provide lower QoL ratings compared to the patients' self-report (Conde-Sala, Turro-Garriga, Garre-Olmo, Vilalta-Franch, & Lopez-Pousa, 2014; Ettema et al., 2005). Caregiver's negative ratings are associated with the burden of the impact of the diagnosis and the functional and behavioural changes in the person with dementia (Conde-Sala et al., 2014). Ettema et al. (2005) argued that while the presence of an illness may account for a low QoL, proxies might overlook the

fact that the person with dementia might find new meaning in life. Notably, severe cognitive impairment is not tantamount to lower QoL (Banerjee et al., 2009; Banerjee et al., 2006). Drawing on the aforementioned literature, the proxy ratings of the QoL of the older people living with dementia in this study may be lower than the person with dementia's self-rated QoL. Thus, the increase in the DEMQOL proxy scores is a positive indication of the music intervention's potential effectiveness.

Despite the reliability and validity issues of proxy measures of QoL, the DEMQOL proxy used in the present study demonstrated good psychometric properties (Lucas-Carrasco et al., 2010; Smith, Lamping, et al., 2005; Smith et al., 2007) as detailed in Chapter 4.

Self-measures, however, are not without limitations. The person with dementia's perception of their QoL may be impacted by a number of factors including impairment in intellectual function and cognitive function that are likely to affect responses (Ettema et al., 2005; Hendriks, Smith, Chrysanthaki, Cano, & Black, 2017; Smith, Lamping, et al., 2005). Thus, Smith, Lamping, et al. (2005) stressed that the DEMQOL and DEMQOL proxy should be used together. Only the DEMQOL self-report version was administered to the four people living with dementia with mild to moderate cognitive decline and able to participate in the DEMQOL interview. Although the score of one participant's self-report rating of the DEMQOL remained the same from pre to post-test, generalisations cannot be made as three out of four participants who completed the self-report version dropped out of the study.

6.4.3. Level of engagement during the intervention

Cohen-Mansfield, Dakheel-Ali, and Marx (2009) define engagement as “the act of being occupied or involved with an external stimulus” (p.2). Cohen-Mansfield et al. (2009) argued that the study of engagement is fundamental in the development of non-pharmacologic

interventions for people living with dementia. In their systematic review, Han et al. (2016) found that individualised leisure and social activities promotes engagement among people living with dementia. Engagement in meaningful activities enhances a person with dementia's daily functioning, prevents feelings of boredom and loneliness, and promotes quality of life (Cahill & Diaz-Ponce, 2011; Cohen-Mansfield et al., 2009; Edvardsson, Peterson, Sjogren, Lindkvist, & Sandman, 2014; Moyle et al., 2015). In their study exploring the relationship between engagement and affect among people living with dementia, Cohen-Mansfield, Dakheel-Ali, Jensen, Marx, and Thein (2012) revealed that engagement was positively related to pleasure.

While the presence of cognitive impairment negatively affects engagement (Kolanowski, Buettner, Litaker, & Yu, 2006), findings from one study suggested that people living with dementia can be effectively engaged by some stimulus including those with low levels of cognitive functioning (Cohen-Mansfield, Marx, Dakheel-Ali, Regier, & Thein, 2010). This is supported by the results from the present study which shows an improvement in the older people living with dementia's level of engagement during the implementation period. As noted previously in this chapter, most of the participants in this study had severe to very severe cognitive impairment. However, the participants' HoME-S assessment scores for engagement were above 3 (from a range of 1.0 to 6.0) across the data collection points during the music intervention, indicating the potential of the individualised music to promote engagement among people living with dementia including those with severe cognitive impairment and late stage dementia.

While the music intervention was highly acceptable for the majority of participants, the three participants with mild dementia and the highest level of cognitive function, frequently

refused the music intervention. Two of them did not have any entries from the HoME-S assessments as they refused the music intervention from the start of implementation while one had one HoME-S assessment that revealed that the acceptance of the music intervention was low. These participants showed interest in the music intervention during the recruitment period and provided music preferences however, once implementation of the intervention started they regularly refused the music intervention. Results from an earlier study demonstrated that stimulus refusal was higher among people living with dementia with higher cognitive function (Cohen-Mansfield, Marx, Dakheel-Ali, et al., 2010). Participants of the earlier study were 193 people living with dementia from seven residential aged care facilities in the United States, presented with 25 engagement stimuli based on information about their preferred past and present activities. Their engagement during the presentation of each stimuli was measured using the Observational Measure of Engagement (OME) (Cohen-Mansfield, Marx, Dakheel-Ali, et al., 2010). Results showed that people with mild dementia were engaged longer in active, work-related tasks (e.g. sorting envelopes, folding towels) while those with lower levels of cognitive functioning were better engaged with simulated social stimuli (e.g. lifelike doll, respite video) wherein active responses were not required (Cohen-Mansfield, Marx, Dakheel-Ali, et al., 2010). As music listening itself does not require active responses and participation, this may account for its acceptance among the majority of the participants.

6.4.4. Psychotropic medication use

There was a small decrease in the prescription and use of regular and PRN psychotropic medication among the older people living with dementia in this study however, the differences were not statistically significant. The proportion of participants without regular psychotropic medication prescriptions increased at the end of the implementation period,

however the proportion with PRN prescriptions were similar. Some participants declined the music intervention and some were deceased before completing the 3-month implementation period (details in Chapter 5 section [5.3](#)). Thus, the overall decrease in the proportion of study participants with and without psychotropic medication prescription could be attributed to the overall decrease in the total number of participants who completed the research implementation period.

Results from recent studies evaluating the effects of individualised or preferred music listening on psychotropic medication use among people living with dementia were mixed. Thomas et al. (2017) found a significant reduction in the use of antipsychotic and anxiolytic medications among people living with dementia in facilities employing a personalised music listening program. Conversely, results from two studies demonstrated no significant effects on psychotropic medication use (Kwak et al., 2018; Schroeder et al., 2018). Although Schroeder et al. (2018) noted improvements in other outcomes (e.g. agitation and mood) among people living with dementia in a geriatric inpatient unit, they found no significant differences in the rate of PRN medication administration between participants in the individualised music intervention and the usual treatment group (e.g. receiving usual medical and psychosocial evaluations). Similarly, results from a prospective RCT conducted in ten nursing homes over a 14-week period showed that the personalised music listening intervention had little or no effect on the outcomes evaluated including psychotropic medication use (Kwak et al., 2018). The lack of significant differences in psychotropic medication prescription and use in the present study may be attributed to factors mentioned in previous studies such as small sample size, limited statistical power and varying dosage and frequency of the music intervention implementation (Kwak et al., 2018; Schroeder et al., 2018). Schroeder et al. (2018) argues that the improvements in agitation and mood as a result

of the intervention might not be enough to positively impact the number of PRN medications administered.

6.4.5. Limitations

Several methodological limitations must be considered when interpreting the findings from this study including the study design and small sample size, limiting statistical power to identify differences. Although sample size and power calculations were performed prior to the start of the study, the target sample size was not reached at recruitment and a number of participants did not complete the 3-month implementation period. Non-parametric tests were used in the analysis of continuous variables in this study as the data were not normally distributed. Non-parametric tests require a larger sample to reject the null hypothesis if it is false compared to a parametric test (Pagano & Gauvreau, 2000). Additionally, non-parametric tests rely on ranks rather than the actual values. A third limitation was that the evaluation of the majority of the outcomes (e.g. agitation, quality of life, level of engagement) relied heavily on staff which may affect the reliability and validity of the evaluated outcomes (Kwak et al., 2018). Issues with data collection involving formal caregivers are further discussed in Chapter 8 section [8.8.2](#). Missing entries was another problem for some of the sections in the measure of engagement assessment (HoME-S) especially in RACF2 where the assessments were completed by one staff for all participants for the three data collection points. In line with the findings by Kwak et al. (2018), the varying dosage of implementation could have influenced the outcomes. In this study there was evidence of ongoing and sustained implementation in RACF1 however in RACF2 implementation was less frequent. Finally, the positive effects on most outcomes were higher in RACF1 compared to RACF2.

6.5. Conclusion

Overall, the individualised music intervention showed promising impact on quality of life and engagement among participating older people living with dementia in this study. However, the effectiveness of the music intervention on agitation and psychotropic medication prescription and use was not clearly demonstrated. While previous studies on individualised music listening showing favourable outcomes for people living with dementia prescribed the dosage and frequency of administration of the music intervention, in this study the dosage received by the participants was varied and was not prescribed due to the voluntary nature of the staff and family or guardian's participation. Future studies could explore whether a regularly prescribed dosage of the music intervention would be more beneficial for the older people living with dementia.

Notwithstanding the methodological limitations, the level of engagement of older people living with dementia during the music intervention supports the value of individualised music listening as a meaningful activity. Findings suggest that individualised music is an easily implemented intervention that could be valuable for people living with dementia who have limited opportunities to engage in meaningful activities, especially those with more severe cognitive impairment. From a nursing perspective, it is important to have an inexpensive and easily administered intervention for people with mild and severe dementia that might provide a diversion from episodes of confusion and distress.

The outcomes evaluated in this study assessed longer-term improvements (e.g. agitation, quality of life, psychotropic medications prescription) however, future studies could further explore the shorter-term improvements resulting from the music intervention such as mood

and emotion. This is particularly important considering the progressive nature of dementia (AIHW, 2012; Sherrell et al., 2011) wherein long-term improvements may not be evident especially if people living with dementia are in the severe stage of cognitive impairment.

In this chapter, the findings from the quantitative component of the study addressing the secondary outcomes of the study were presented. The impact of the individualised music listening intervention on older people living with dementia in terms of agitation, quality of life, level of engagement, and psychotropic medication use were discussed in the light of relevant literature. In the following chapter, the findings from the qualitative component of the study, which explore the staff and family or guardian's experiences and perceptions regarding the implementation of the individualised music listening intervention are presented.

Chapter 7 The perceptions and experiences of staff and family or guardians of the individualised music intervention

7.1. Introduction

A parallel mixed methods design was used in this study as detailed in Chapter 4. The findings of the quantitative components of this study, the music implementation outcomes, were presented in Chapter 5 and the impact of the music intervention on the participating older people living with dementia were presented in Chapter 6. This chapter presents the findings from the analysis of the qualitative data sets which involved the qualitative responses from the implementation outcomes questionnaire (previously described in Chapter 4), the participating older people living with dementia's progress notes documentation, and a focus group and individual interviews with staff and a guardian about perceptions and experiences of the music intervention.

7.2. Overview of the study objectives and methods

As described in Chapter 4 the objective of this part of the study was to explore strategies that promote acceptability, adoption, appropriateness, feasibility, fidelity and sustainability of implementing the individualised music listening intervention. The research questions for this part of the study were:

1. What are the experiences and perceptions of family and staff regarding the use of an individualised music listening with older people living with dementia?, and
2. What are the facilitators and barriers to the implementation of an individualised music listening intervention in a residential care setting for older people living with dementia?

Details of the methods for this part of the study were presented in Chapter 4. As noted previously in Chapter 4 section [4.8.6.2](#), the focus group and individual face-to-face interviews explored the participants' experiences and perceptions about the music intervention; in particular the training, the music intervention itself, and the processes involved in the administration of the music intervention. An interview guide was used during the focus group and individual face-to-face interviews. The candidate used a conversational approach guided by open-ended questions as outlined in Table 7.1. The focus group and individual interviews were conducted over a 3-month period from November 2018 in RACF1 and January to February 2018 in RACF2. Entries from the open-ended section of the implementation questionnaire at pre implementation and post implementation, as well as the progress notes entries that relate to the implementation of the music intervention and the music intervention's effects on the participating people living with dementia throughout the 3-month implementation were also analysed as part of the qualitative data. As noted in Chapter 4 section [4.8.6.2](#), a music intervention care plan was to be created for each participating older person and the evaluation of this care plan was to be included in the study's qualitative data. However, creation of a music intervention care plan was not realised due to the short duration of the implementation period (see Chapter 5 section [5.4.7.5](#) for details).

Table 7.1. Interview guide questions for focus group and individual interviews

1. Since commencing the implementation of the music intervention program, can you tell me about your experiences or what it has been like providing music to the residents with dementia?
2. Thinking about your experiences, what advice might you give us? Or to the facility management?
- Thinking about the training you had for the implementation of the intervention, what was good or not good about it? Was it enough?
3. How often do you put the music on?
- When do you find the best time to put the music on or when do you think about using the music on the residents?
4. Before you enrolled in the music intervention program, what did you expect?
5. After having implemented the music intervention, what are your current thoughts and perceptions?

Six staff members from RACF1 participated in the focus group interview. The focus group interview lasted for 34 minutes. In RACF1 individual interviews were held with one staff member and one guardian. Three staff members were interviewed in RACF2. Details of the setting for the individual and focus group interviews were reported in Chapter 4. Interviews with staff were conducted at the start or the end of a shift and lasted 6 to 18 minutes. As per ethics approval, staff were reimbursed for their time with a gift card but were not informed of this prior to the interview. The interview with the guardian lasted 34 minutes and was conducted during her visit to the facility. The guardian declined the reimbursement offered at the end of the interview. An outline of the participants is presented in Table 7.2. The majority of the staff members participating in the interviews were assistants in nursing (AIN) and had worked in the aged care for the past 5 years.

Table 7.2. Outline of participants participating in interviews

Pseudonym and type of interview participated	Type of interview	Designation (Staff)/Relationship to the person with dementia (Guardian)
Anne	Individual	Assistant in Nursing (AIN)
Fern	Individual	AIN
Therese	Individual	AIN, Team Leader
Kara	Individual	Leisure and Lifestyle
Sara	Focus group	Leisure and Lifestyle Coordinator
Suzie	Focus group	AIN
Emma	Focus group	AIN
Kat	Focus group	AIN
Courtney	Focus group	AIN
Gemma	Focus group	AIN, Part-time Leisure and Lifestyle
Deborah	Individual	Guardian

Details of the participating staff members who completed the implementation outcomes questionnaire at baseline (n=4) and at post implementation (n=7) were presented in Chapter 5 section [5.4.2](#). The majority of the respondents have been employed in aged care for more than five years. Two AIN and two leisure and lifestyle staff completed the implementation questionnaire at baseline. At post implementation, six AIN and one leisure and lifestyle staff completed the implementation questionnaire. For the older people living with dementia's progress notes, the entries/documentation about the music intervention included were from AIN, registered nurses, clinical manager, and medical officers.

7.3. Results from the qualitative data sets: interviews, implementation questionnaire, and progress notes

Four themes emerged during analysis of the interview, implementation questionnaire, and progress notes data: 'Transcendental reminisces, the calm, the joy, and the elation';

‘optimism, enthusiasm, and the snowball effect’; ‘pitching in for the older person, it’s not rocket science, and the hurdles’; and ‘music beyond the intervention’.

The first theme depicts how the older participants enjoyed transcendental reminisces where they experienced calm, joy and elation associated with the music. The staff and family or guardian responses and reactions to the music intervention are depicted in the theme ‘optimism, enthusiasm, and the snowball effect’. The routine uptake of the music intervention by staff and family in the daily care of the participating older people is captured by the theme ‘pitching in for the older person, it’s not rocket science, and the hurdles’. This theme depicts the staff’s involvement, the practices and considerations involved in implementing the music intervention, and the challenges they encountered. The theme: ‘music beyond the intervention’ captured the staff’s suggestions for alternative ways of delivering the music used in this study.

7.3.1. Transcendental reminisces, the calm, the joy and the elation

‘Transcendental reminisces, the calm, the joy and the elation depicts the older participants’ responses to the music intervention. The music prompted unsolicited memories by reminding the older person of the people they loved and held dear to them: their loved ones, family and friends from their past life. Listening to their preferred music seemed to calm those who were restless, distressed and confused. For others, their music heightened their mood evoking what appeared to be a sense of joy, particularly for those who were often quiet and withdrawn.

7.3.1.1. Transcendental reminisces

Older people seemingly transcended to times past when they were listening to their favourite music. As Therese described:

You can just see the facial expressions are a lot different when they've got the music on. I think it's probably a bit of reminiscing. They go back to their era. A lot of dancing, that kind of stuff, went on back then,

Therese (Assistant in Nursing (AIN), Team Leader, Individual Interview)

Music also evoked shared memories of the people dear to the residents. One participant, Daphne, whose husband passed away some time ago, talked fondly and lovingly about her husband; she wished he was present, that he was with her to listen to the music and enjoy it with her. There was agreement among focus group participants and Courtney was moved by what she witnessed.

One resident was looking for her husband and she's like, oh, can John hear this, and [it] took her back to... just the love on her face, it was beautiful. I've never seen it before.

Courtney (AIN, Focus Group)

She was going back in time.

Gemma (AIN, Leisure and Lifestyle, Focus Group)

Oh, it's gorgeous.

Courtney (AIN, Focus Group)

Because she hasn't mentioned John in a long time. Until then.

Kat (AIN, Focus Group)

Another older person, Gregory, danced spontaneously and vigorously to his favourite music. Gregory had a collection of his favourite music and a compact disc (CD) player, however, he no longer remembered how to use the CD player. During the music intervention, and using the assistance of a walker and staff to turn the iPod music on, Gregory jiggled and danced his way around the facility. Using the iPod attached to his clothing, he could dance and wander around the facility listening to his music. He danced and jiggled with youthful vigour; at times he abandoned his walker to jig. A number of staff witnessed him dancing in the hallways as he listened to his favourite music.

[Referring to Gregory] you do have the people who think they've gone back in time themselves...and can walk [without the aid of his walking frame].

Courtney (AIN, Focus Group)

[with reference to Gregory] Or can dance without walkers!

Kat (AIN, Focus Group)

[with reference to Gregory] He's gone back... he's lost 40 years of ageing.

Courtney (AIN, Focus Group)

While some of the participating older people reminisced joyfully with the music there were those who were touched by the music in a different way. Some older people became teary upon hearing their favourite music; tears of remembering, happiness, joy and sadness at the same time. Anne described the moment she played Daisy's music choices for the first time. Daisy had lost her communication skills; staff believed she lacked the ability to show emotion but as Anne said:

One of the first times I popped [the headphones] on Daisy, she reacted really well, and then a certain song came on and she started to cry. So we took it off her and I spoke to her, and put another song on, and she was okay. I can't even remember what song it was, but yeah, she started to cry, she was really emotional.

Anne (AIN, Individual Interview)

So do you think it was in a negative way that she cried?

The Candidate

No, I think it was just it might've reminded her of something. Yeah, she wasn't aggressive or yelling or anything, she just looked like it reminded her of something.

Anne (AIN, Individual Interview)

There were some older people with severe cognitive impairment who recalled many of the melodies and lyrics of their favourite songs when using the music intervention. Deena for example could not recall details of her life prior to the onset of her dementia and yet she recalled the words of her favourite songs. Apart from her sister who often visited her, she had no memory of the rest of her family including her husband who passed away already or their children.

[On Deena] I find the music on, she doesn't remember an awful lot, but she remembers every word to those songs.

Courtney (AIN, Focus Group)

Yes. It isn't it amazing? Yeah. Deena is amazing with music in general. She goes to the concerts⁸. She just sits there and sings all the words. She knows them all. So, yeah. It's amazing how she can remember all that.

Sara (AIN, Lifestyle Coordinator, Focus Group)

7.3.1.2. The Calm

One of the purposes for the use for the individualised music intervention was in situations where older people living with dementia were agitated. Apart from the stressful impact of agitation on the person with dementia, managing behaviour when people are agitated is a challenging task for family and staff. As staff said:

It just calmed them down. They might have been agitated, verbally agitated beforehand and listening to the music just - because they are listening to the music they are not doing other things.

Fern (AIN, Individual Interview)

Well, with Veronica, when she's cranky, it does calm her.

Suzie (AIN, Focus Group)

Therese, used the word "settle" to describe the effect of the music intervention. Therese was actively involved in the implementation. As the team leader during the days when she worked and the program champion for the implementation, Therese directed other staff in the implementation of the music intervention. Having witnessed the music intervention with all

⁸ Referring to the live music performance by singers or entertainers who get invited on some occasions to perform at the facility for the residents.

of the participants in the facility where she worked, she said most of them settled when they had the music on. As Therese noted:

The music therapy⁹, I feel is very good for the dementia, for agitation.

When the residents will actually leave the headphones on - which is the majority of them - I find that they settle quite well.

Therese (AIN, Team Leader, Individual Interview)

In a response to the open-ended section of the questionnaire, the calming effect of music was also noted:

I have seen the effects of the music intervention and the ways it settles the residents.

S05, Implementation questionnaire

Kara directed the leisure and lifestyle activities for older people in the dementia specific unit in RACF2 where the study was implemented. She described the calming effect of music as follows:

We've some residents, as soon as you put the headphones on will just sit quietly and go to sleep.

Kara (Leisure and Lifestyle Staff, Individual Interview)

⁹ Notably, the term music therapy (MT) was sometimes used to describe the individualised music listening intervention.

7.3.1.3. The joy and the elation

Music evoked a sense of joy and elation for most of the older participants. They seemed to be in a pleasant mood, which they expressed in various ways: they smiled; their face and eyes “lit up”, and they moved and danced as the music played. Deena, who was often agitated, settled, and became calm with the music. She happily listened to the music, and sang and hummed to the tunes. Her elation was captivating not only for the staff who regularly put the music on for her but also for other staff, participants and non-participants in the study. With reference to Deena’s response, some of the staff said:

Singing. She’s singing away. She hums.

Emma (AIN, Focus Group)

She’s often got her hands out when the music’s on and she’ll grab you as you past...

Deena seems to smile a lot while she’s got it on.

Sara (AIN, Lifestyle Coordinator, Focus Group)

She’ll make eye contact.

Kat (AIN, Focus Group)

The progress notes recorded by medical and nursing staff during the study also captured the positive impact of the individualised music on Deena. Some of the documentation from the progress notes are detailed below:

Deena is enjoying listening to her MT [Music Therapy] this morning, singing out loud at times.

Registered Nurse (RN) weekly notes (19/08/18)

She is having MT and this is helping her a lot and she attempted walking and her behaviour has improved as well.

Doctor's notes (07/09/17)

One of the older participants, Mary, was bedridden and unable to communicate coherently. She indicated “yes” or “no” using facial and eye expressions, however she did not speak words, phrases or sentences. Deborah, Mary’s guardian, used the music intervention at each visit. Music was very important to Mary throughout her life; she regularly played the piano and was a church organist. Deborah was stunned when Mary demonstrated interest and excitement in the music intervention.

Now when I was here on Sunday and I said to her would you like me to read to you she said no. I said, oh, well would you like me to put the music on and she said yes. Now it's not just the word but her face lit up you see. It's the facial and her eyes. She says a lot with her eyes. The eyes lit up and she said yes...

She put her hands up to sort of, you know, [say] come on, it's my turn you see [to conduct].

She was sort of mimicking, once I put it on her, she mimicked [using her hands] what I did with the beat, with the movement.

Deborah (Guardian, Individual Interview)

Other staff described how the older persons' faces and movements spoke of the joy filled expressions they observed while listening to their favourite music. Emma and Therese said:

Watching their face light up brings joy when they hear the music. Their expressions on their faces changing.

Emma (AIN, Focus Group)

They tap along to the music, often singing.

Therese (AIN, Team Leader, Individual Interview)

Some of the focus group participants described how they were moved upon witnessing the person with dementia traverse from a distressed state to a happy state, enjoying listening to their music.

It's good because we see them all the time in such a...distressed state.

Courtney (AIN, Focus Group)

Confused, distressed state and then to see them...

Gemma (AIN, Focus Group)

Go back to a happy time. Yeah. It's beautiful.

Courtney and Gemma (AINs, Focus Group)

I feel good for them because it brings a joy to them that they used to once enjoy... and they don't have a lot of that anymore, enjoyment wise.

Sara (AIN, Lifestyle Coordinator, Focus Group)

7.3.2. Optimism, excitement, and the snowball effect

The theme ‘optimism, excitement, and the snowball effect’ illustrates the perceptions and experiences of staff about the music intervention prior to, and after its implementation. As the staff and family witnessed the positive responses of the person with dementia to the music intervention, they became enthusiastic about the ongoing implementation of the music intervention.

7.3.2.1. Optimism and excitement

The growing popularity of individualised music listening for people living with dementia as highlighted in Chapters 2 and 3 was evident from the responses of the interview participants. The RACF1 staff’s optimism for individualised music listening was prompted following their viewing of a number of documentaries on the topic. None of them had implemented the music intervention or seen it implemented in the real-world setting.

I’d done a little bit at uni [University] about it, and I found it really interesting. I’d watched a lot of documentaries.

Anne (AIN, Individual Interview)

Courtney revealed her enthusiasm and excitement for the music intervention when she said the facility had “jackpotted” when it was funded for the implementation of the individualised music listening intervention.

They're doing it in North Sydney. I watched a documentary on it, and they're trying to get funding, and they've just been given another grant just for music diversion, they've jackpotted.

Courtney (AIN, Focus Group)

Mary's guardian Deborah, a retired health professional was very positive about the idea of the individualised music intervention. Like most staff, she had also seen a number of documentaries about its effectiveness. She was optimistic about the music intervention, as Mary's situation hindered her engagement in the activities that she enjoyed such as reading and watching television. She specifically referred to the music intervention as an important "stimulus". Below are some of the quotes from Deborah:

There has been a bit of publicity about the use of music in aged care facilities.

So the therapeutic benefits I think, I mean, that's been already proven...

Deborah (Guardian, Individual Interview)

In response to the candidate's question about her expectations for the music intervention

Deborah said:

Well it [expectation] was very positive because I would expect any stimulus like that would help her mental activity, help her depression, her emotional stage and so on. It would be helpful.

Deborah (Guardian, Individual Interview)

While none of the RACF1 staff had used individualised music prior to the study, one staff member from RACF2 had. She was very optimistic about the program because it was to be implemented by the leisure and lifestyle staff as well as the nursing staff.

When I heard about the music intervention I was quite excited because I was like, yay, finally, this is hopefully going to take off. For me it was pretty exciting really.

Therese (AIN, Team Leader, Individual Interview)

Locating the participating older people's music preferences was easily done with the use of the iTunes application, discussed in Chapter 4. During the focus group interview, some staff highlighted the advantage of music over other interventions, specifically the ease of finding music and its ready availability via the internet. As Kat said:

See, another thing I've seen too is they're thinking about bringing in old toys and stuff, but the thing with that is it's hard to find. Whereas music, with iTunes and things... you will always find it - it doesn't matter how old the music is...and music is just amazing on its own.

Kat (AIN, Focus Group)

As generations change, there'll be music still there...from their generation and so on.

Sara (AIN, Lifestyle Coordinator, Focus Group)

Staff noted that most people related to music and believed that the majority of older people have a connection with and appreciation for music thus making the music intervention acceptable. As Kat said;

I don't think there's too many people in the world that don't like music. So, it's something that you're going to touch base with on with everyone.

Kat (AIN, Focus Group)

While Fern had never used music with the residents, she loved music herself and believed it improved her mood. Thus, she felt that it would do the same to the residents.

I love music myself, so I know it works for me. If something is annoying me, I play the piano, it actually calms me down. So I'm really very enthusiastic about using the music.

Fern (AIN, Individual Interview)

After having administered the individualised music listening to the older participants several times and witnessing its effects, staff became enthusiastic about its ongoing implementation. A number of responses during the focus group interview illustrate this.

Music's great.

Focus group (FG) participant (speaker unclear)

It's amazing. A good idea.

FG participant (speaker unclear)

The use of psychotropic medications for the management of challenging behaviours among people living with dementia in residential care settings was discussed in Chapter 2. All staff were acutely aware of the undesirable effects of psychotropic medications which were administered regularly. Anne said she would use the music intervention before seeking the RN for the administration of a psychotropic medication.

I think unfortunately there's a big emphasis on just medicating people when they have challenging behaviours, and I think this [the music intervention] has opened up another avenue. So if people are unsettled or upset, or wandering, instead of going straight for medication, we're now using the music therapy. So I think that's the biggest impact that it's had on me...

My thoughts now are my first choice would be to go for music more so than just going and getting the RN and getting the PRN [as needed medication].

Anne (AIN, Individual Interview)

7.3.2.2. The snow ball effect

The positive responses of the participating older people living with dementia to the music intervention impacted other staff. It made their workdays more pleasurable because the older

people were happy and calm when listening to their own music and staff were happy. Staff therefore happily adopted the music intervention. Courtney referred to this as the “snowball effect”.

Let’s face it, at the end of the day, if you have a happy resident, you’ve got a better day...

It’s not all about the residents because it starts a snowball effect. We’ll do anything to make our day easier.

Courtney (AIN, Focus Group)

And the residents are happier.

Sara (AIN, Lifestyle Coordinator, Focus Group)

If they’re happy, we’re happy.

Emma (AIN, Focus Group)

Lifestyle coordinator Sara and nursing staff Courtney indicated the benefits that they have witnessed inspired them to continue implementing the music intervention.

All of us see it. So, that’s why they’re inclined to put it on the majority of the time.

Sara (AIN, Lifestyle Coordinator, Focus Group)

Once you see the joy on their faces...and you’re like, look at Deena and the calming you’re more inclined to do it [put the music intervention on].

Courtney (AIN, Focus Group)

The positive effects of the music intervention on the participating older people living with dementia impacted not only the staff who implemented the intervention but also to family and the guardian of the participants. Most family members or guardian were aware of the difference the music intervention made from what they heard from the staff or witnessed themselves. As some staff stated:

I've spoken to the family members of Daisy, Valerie and Tom, and they're all really happy.

Anne (AIN, Individual Interview)

The ones that have been involved or have seen the effects of it have been really happy with it.

Therese (AIN, Team Leader, Individual Interview)

Some of the family members felt that the individualised music listening was so beneficial they wanted to make sure that their loved ones received the music intervention regularly.

Like Daphne's daughter, she saw someone else with theirs on [referring to the iPod shuffle] and so she went and got Daphne's [iPod shuffle].

Anne (AIN, Individual Interview)

I've actually been asked by the family, have they been wearing their headphones?

Sara (Lifestyle Coordinator, Focus Group)

Mellissa feels that the MT has been very beneficial for her mother [Veronica] so this is to continue please.

Progress Notes (20/10/17)

Deborah was very happy about the impact that it had on her friend. She asked and encouraged her other friends to use the music intervention during their visits.

So I've emailed her [referring to her friend]; she emailed back and said, yes, that music sounds like a good idea.

Deborah (Guardian, Individual Interview)

Reflecting on the positive effects of the music intervention, staff suggested that training and implementation should be extended to all staff, family and guardian of people living with dementia. As Fern said:

It [the music training] should be available to all staff

Fern (AIN, Individual Interview)

If we encourage more people to do it [implement the music intervention]... and they can pass it on [to other staff].

Emma (AIN, Focus Group)

[We should] teach the families [how to apply the music intervention]... it saves the nurses.

Sara (AIN, Lifestyle Coordinator, Focus Group)

7.3.3. Pitching in for the older person, it's not rocket science, and the hurdles

The theme 'pitching in for the older person, it's not rocket science and the hurdles' captures the staff members' commitment and involvement with the regular implementation of the music intervention. As previously noted in Chapter 4, the specifications in the individualised music listening intervention protocol included administration of the intervention for various purposes such as prior to nursing care tasks and expected agitation, and as a leisure activity. The specific time, frequency and dosage of implementation was not prescribed as it was meant for the staff to decide depending on the needs or desire of the older person. 'Pitching in for the older person' captures the involvement of staff and their decisions regarding implementing the music intervention. That 'it's not rocket science' illustrates the ease and simplicity of implementation as described by the staff and the guardian. There were however, some hurdles encountered when applying the music intervention.

7.3.3.1. Pitching in for the older person

Although it was expected that only trained staff would apply the music intervention, it was soon discovered that other non-trained staff particularly from RACF1 were also implementing the music for the older residents. This was confirmed by several staff participants during the focus group and individual interviews. Some of the nursing staff members described their observation as follows:

I think everyone's [referring to trained and non-trained staff] involved.

Yeah. Even the afternoon and the night girls, they've been using it too.

Anne (AIN, Individual Interview)

A few of them have been using the music intervention. So yeah. I don't know if there's any particular ones, but I just notice when I come on, next day, that I can - I have seen that they have been used or that they have signed for it [referring to the music intervention logbook documentation]. So, because we don't actually sign our name on those things, we don't actually know who it is that's using them. So there would - I'm sure there are afternoon people that will be interested.

Kat (AIN, Focus Group)

Many of the staff indicated that the optimal time for the music intervention depended largely on the needs and preferences of the older person, which meant they received the music intervention at different times for different reasons. Anne referred to a number of reasons for implementing the music including prior to attending to a wound dressing, promoting food intake, and in accordance with a resident's level of alertness and interest. For the older people who needed encouragement to take meals, the music intervention seemed to provide stimulation and kept them awake at mealtime. As Anne said:

For Daisy it was before she got her wounds dressed, before lunch if she wasn't eating. Tom was usually once he got up because he's been

going through a period where he's quite sleepy and uninterested in things. So his was normally around morning tea. Then Valerie's been unwell so hers has just been depending on her mood.

Anne (AIN, Individual Interview)

So you have in mind the best time when you use it for a resident?

The Candidate

Yeah, and that's different for all of them.

Anne (AIN, Individual Interview)

Yeah. Last night Valerie came back and we were told she's palliative, she's probably not going to eat or anything like that, and she wasn't eating so the first thing they [nursing staff] did was put the music on, and she had a glass of milkshake.

Anne (AIN, Individual Interview)

An older person's designated rest period was also used for implementation of the music intervention. For Mary, the music intervention was implemented after lunch. In RACF1, there was often a group activity such as bingo after lunch. Some of the residents were taken back to their rooms after lunch so they could have some quiet rest period.

It's after lunch when I've put the music on and that leads into her rest period.

Deborah (Guardian, Individual Interview)

From the staff's responses it was evident that agitation prompted the implementation of the music intervention on an as needed basis. This corresponds to one of the reasons for implementation enumerated in the music intervention logbook. As Therese stated:

If I'm noticing somebody that's a bit agitated I'll put it [music] on them and just try it out.

Therese (AIN, Team Leader, Individual Interview)

When to implement the music intervention also depended on the older person and his or her mood, state of agitation and responses to previous attempts. For some older people the music intervention was applied before care events such as bathing and grooming and for other residents, it was after care when they were likely to be settled. Timing the removal of the music intervention is equally important:

Sometimes, it depends on the resident. You might need to get their daily care needs attended to before they have the music because they love it so much. It's another physical agitation before you take it [music intervention equipment] off.

Courtney (AIN, Focus Group)

7.3.3.2. It's not rocket science

Of the six focus group participants from RACF1, half received the full one-hour training while half received the short 15-minute version (details in Chapter 5 section [5.4.7.1](#)). For the RACF2 staff, all three of them received the short version of training. All of the staff underscored the simplicity of the music intervention. As one staff described "it's not rocket

science”. It was gleaned from the staff’s responses that the training sessions didn’t have to be onerous. Even those who received the short version of the training were satisfied with its content. What was important for them was knowing how to use the equipment and implement the music intervention.

[Referring to the short version of the training] It was really basic.

Suzie (AIN, Focus Group)

[Referring to the short version of the training] They’re self-explanatory how to turn it on [iPod shuffle], how to pause it how to recharge it.

Courtney (AIN, Focus Group)

The study participants found that applying or putting the music on for the older person was easy.

...it's not rocket science. I reckon you could use it and anyone could do it...

Fern (AIN, Individual Interview)

Let's be honest, it can't be hard for anybody...really. It's very easy.

Kara (AIN, Individual Interview)

Once you realise what it’s for and the benefits of it, it’s pretty self-explanatory.

Gemma (AIN, Focus Group)

The simplicity of the music intervention was emphasised by a guardian when she described the equipment as “self-explanatory”. By the time the candidate was in touch with Deborah for training, she was already implementing the music intervention. Deborah knew how to operate the equipment including how to charge it. She had two other friends who regularly visited Mary; in an e-mail to them, she detailed the simple steps involved in using the equipment.

Yeah, I mean I... just looked at it [iPod shuffle] and I thought oh well. I put them on and I thought, oh, that's volume, oh, that's track...

In my email I said to her [another friend who visited Mary], the little device [iPod shuffle] is sort of self-explanatory with the volume and whatever but I said there is a button at the bottom to turn it on and it will show green.

Deborah (Guardian, Individual Interview)

7.3.3.3. The hurdles

Applying the music using the iPod shuffle and headphones, or keeping the equipment in place for the older person was not always easy. Among the challenges for the older person was the apparent discomfort of the headphones noted by all staff from both facilities. Some older people either refused the headphones or would not leave them on for long. Although the headphones were padded, the pressure and size appeared to be a potential source of discomfort. Some of the RACF2 staff said:

And then you've got the challenging - where you put it [headphones] on and they just do not like the feeling of it on their head, or they don't like the music so close to their ears.

Kara (AIN, Individual Interview)

Sometimes having the headphone is also - they don't like having them on their ears. But the music itself I think is working.

Fern (AIN, Individual Interview)

Margery, an older person participant, had a long history of physical and verbal agitation. It was hoped that the music intervention would help her settle for she was known to love music. Margery's daughter confirmed that she used to enjoy listening to music with her husband. Her daughter brought a CD player for her with a few CDs of her preferred music. During the assessment of her music preferences, Margery happily recalled with her daughter some of her favourite music artists; music that she and her husband enjoyed. However, Margery had some issues with the music intervention. One of which was that she didn't like the headphones on her ears.

And only because she doesn't like the headphones. It's not that she doesn't like music because she does.

Gemma (AIN, Focus Group)

Margery's was just an irritation...of the headphones, not the music.

Sara (AIN, Lifestyle Coordinator, Focus Group)

Another resident from RACF1, Veronica, took the headphones off right away. The staff noted this especially when she was irritable or agitated.

Sometimes Veronica doesn't like it. Not often.

Suzie (AIN, Focus Group)

That may not be the music. It might be the fact that the headphones - if she's irritated.

Sara (AIN, Lifestyle Coordinator, Focus Group)

Issues with headphones were also conveyed in the open-ended response section of the implementation questionnaire:

With some of the residents it takes them a little time to get used to the headphones but the reaction when they hear the music is wonderful, both for them and staff.

(S01, Implementation Questionnaire)

Some of the music, although preferred by the older person, appeared to elicit a negative response. Margery was known to love gospel music. She has CDs of gospel music and gospel music was also included in her music playlist. However, staff mentioned that a particular gospel music with the lyrics "take me home" apparently triggered agitation. When she's agitated, Margery wants to go home.

[Referring to Margery] She has a lot of gospel ones I find. I find sometimes they set her off [causing agitation]. She believes in God and she's - so she tends to want God to take me home.

Sara (AIN, Lifestyle Coordinator, Focus Group)

The responses of a few staff suggest that some residents did not want to engage with the music intervention. Patrice's niece, told the candidate that Patrice loved Scottish Bagpipes music, however she refused the music intervention and other activities.

Patrice would be really interested [in the music], but I mean she's quite; [she's] just agitated about everything really. It doesn't really matter what you do.

Therese (AIN, Team Leader, Individual Interview)

But someone like Patrice, I could never ever get it [headphones] on her and she won't participate in any activity either. She doesn't want to touch anything either, so she's got different reasons [for her refusal].

Kara (Leisure and Lifestyle, Individual Interview)

Because the music intervention involved a set of headphones attached to an iPod shuffle clipped onto the older person's clothing, there was a chance for it to disconnect with movement and agitation. Thus, leaving the equipment on is a potential challenge for some of these participants. Anne compared the implementation of the music intervention on a participating chair-bound older person versus a participating mobile older person who is able

to remove the equipment on his or her own. Anne regularly implemented the music intervention to the chair-bound and withdrawn older participants, which she found easy to do. As Anne described:

But if I was walking through the West Wing I would put it on Daphne [referring to a mobile resident] or I'd put it on somebody else, and some of them would pull it off. I think Gregory [a mobile resident], you'd put it on and he would walk around without his walker and dance, and that sort of thing. But not with the people that I had because they're chair bound ...

...the people that I have are quite easy. They're not the type that rip it off or anything like that, they just easily accept it every time.

Anne (AIN, Individual Interview)

Margery, who was mobile, was able to take the headphones off when she became agitated.

[Referring to Margery] Because she's so mobile, once she gets agitated, it's very hard to have them [music intervention equipment] on her, because she's walking around with them hanging off her or on the floor, dragging them along behind her, or things like that, when she takes them off.'

Sara (AIN, Lifestyle Coordinator, Focus Group)

Storage and care of the equipment affected the regular implementation of the music intervention in RACF1. Focus group participants expressed frustration about the equipment not being stored appropriately, or not turned off or charged. At times, they did not have the time to find the equipment or wait for it to be charged. This contributed to missed opportunities for its use or implementation.

Sometimes you go to find them and who knows where they've put it?

Courtney (AIN, Focus Group)

It [referring to the iPod shuffle] is not that hard to turn off.

Emma (AIN, Focus Group)

If staff are not going to charge it [the iPod shuffle], then they need to turn it off.

Gemma (AIN, Focus Group)

Visibility of the equipment or ready access was crucial for its utilisation as seeing the equipment helped as a reminder to provide it to the residents. Fern was concerned that the storage of the music equipment in the medication area at the nursing station meant it was not visible and easily accessed.

So because they [referring to the iPod shuffle and headphones] are put away you don't [see them]- so unless I see them I have to remind myself it's there, [that] I have to use them. So maybe if there were more, like on the desk ... but maybe in the station in an area more where we can see them. At the moment it's kind of hidden at the back.

Fern (AIN, Individual Interview)

7.3.4. Music beyond the intervention

During the implementation period many suggestions were made by participating staff for alternative approaches to music selection, in place of the headphones and iPod shuffle, including group music listening. For this study, the music preferences of the older participants were determined by family or guardians as only a few participants were able to recall their preferred/favourite music. While this approach worked for the majority of the participants, staff noted that some of the older people didn't respond positively to the music selection. Fern warned that the music preferences may have changed.

Sometimes they do change, the family think that's what they [referring to the older person] used to like 20 years ago and now they - maybe they don't know.

Fern (AIN, Individual Interview)

Taking into consideration the memories evoked by music was another aspect of music selection. Music provided a vehicle for the recollection of both pleasant and unpleasant memories. Kat believed that music should be associated with "happy" memories.

Obviously, it's a good idea to ask the family, [for music] like happy memories, obviously. You're not going to put music onto someone that's going to be... bad.

Kat (AIN, Focus Group)

Some music can bring back bad memories so it is important to make sure you have talked to family, friends of the person undertaking the music therapy and also if possible the person themselves.

(S03, Implementation Questionnaire)

To ascertain the older people's responses to the music, some staff suggested trying the music first with the headphones on. However, Gemma recommended that older people be given the opportunity to listen to various types of music to determine which music they positively respond to apart from their music preferences.

Maybe just a bit different variety of type of music.

Gemma (AIN, Focus Group)

See how they react.

Sara (AIN, Lifestyle Coordinator, Focus Group)

Just to see what their reaction is. Yeah. Mainly with the headphones on.

Gemma (AIN, Focus Group)

Staff wanted to play music when older people are in a communal area such as in the lounge area or in the dining room during meals. In RACF2, several residents usually in the lounge area where the leisure and lifestyle staff implemented the group leisure activities for the residents. When there were no activities, the majority of the residents usually watched television programs or movies. Fern and Therese suggested putting the music on the television.

Well, what we do sometimes, it doesn't involve the headphone, we put the music on the TV.

Fern (AIN, Individual Interview)

I think if we had either a TV with the music playing through it or a DVD or something with music

Therese (AIN, Team Leader, Individual Interview)

Other staff suggested the use of an intercom where music could be played in various areas within the facility using a loudspeaker system.

I would love to see an intercom, where the music gets played through it.
... Like every different section, or just the dining areas.

Courtney (AIN, Focus Group)

[On the intercom] Instead of having the TV on. To have some music playing at night instead of looking at the TV. It's not good

Emma (AIN, Focus Group)

Staff suggested a universal approach to music selection if the music was to be played in the communal area for all residents to listen. Although each person's specific preferences may not be considered, the staff underscored the importance of music and that it is liked by the majority of the residents. As Courtney said:

It's not an individual thing, but because the management would like us to have music on. Sometimes the music isn't suitable [for the residents] and sometimes the staff choose the music...You can't please everybody,

Courtney (AIN, Focus Group)

Interestingly, most staff from both facilities suggested instrumental music. Fern from RACF2 described this type of music as “music without too many words” which she thought would have a calming effect on people living with dementia.

I think music - a lot of music without too many words, because of their condition (dementia). Jazz, something more instrumental. Instrumental, yeah, more than the - too much voices. Something not too - where you don't have the music going up and down. Just something that would calm.

Fern (AIN, Individual Interview)

Similarly, RACF1 staff suggested music that doesn't involve singing would be good for people living with dementia. Lifestyle coordinator Sara further elaborated that the problem with having the lyrics including the different voice tones and pitch of the singers, which the residents may not like even if they like the music itself.

It doesn't always have to be the singing as well, just the music.

Gemma (AIN, Focus Group)

Sometimes just music though can just do your head in.

Courtney (AIN, Focus Group)

We talked to them about just having the music. No words to it because I find that singers have obviously different voice tones. So it might be a nice song, but it can be a high pitch sort of sound to them.

Sara (AIN, Lifestyle Coordinator, Focus Group)

7.4. Discussion of qualitative findings

The results from the qualitative data set presented in this chapter address the experiences and perceptions of the family and staff regarding the use of the music intervention for older people living with dementia. When implementing the music intervention, the staff members noted some barriers and facilitators and delineated recommendations to address the barriers to implementation.

7.4.1. Effects of the music intervention on the participating older people, staff, and family or guardian

The positive effects of the music intervention on the older people and the staff and family or guardian was the highlight of the staff and a guardian's experiences. All of the staff who participated in the qualitative interviews as well as a guardian of an older person conveyed how they witnessed the change in mood and demeanour among the older people while they listened to their music. Analysis of the qualitative data revealed the memory-evoking, calming, and mood-enhancing effects of the music intervention on the person with dementia, which are captured in the theme 'transcendental reminisces, the calm, the joy, and the

elation'. Some of the people living with dementia's responses that they described are widely documented in the literature. These include the calming (Gerdner, 2005; Hicks-Moore & Robinson, 2008; Murphy et al., 2018; Sanchez et al., 2016) , mood enhancing (Maseda et al., 2018; Sakamoto et al., 2013), and memory and emotion evoking (Baird & Samson, 2015) effects of music on people living with dementia. Interestingly, most of those who responded well to the music intervention in terms of mood, were the older participants who had severe to very severe cognitive impairment or were severely withdrawn.

Analysis of the qualitative data suggests that implementing the individualised music listening intervention was a positive experience not only for the person with dementia but also for the family or guardian of the person with dementia, and the staff as illustrated in the theme 'optimism, excitement, and the snowball effect'. Owing to the music intervention's increasing media popularity over the recent years (Barclay, 2018; Rossato-Bennett, 2014 #12912; Newby, 2016), most of the focus group and interview participants had positive perceptions about individualised music listening prior to the conduct of the study. The staff and a guardian's positive expectation regarding the benefits of the music intervention prior to their participation in the study was reinforced by witnessing the older people living with dementia's positive responses during the music intervention.

7.4.2. Implementing the individualised music intervention

7.4.2.1. Timing and reasons for implementation

The staff members' involvement and experience in implementing the music intervention and the circumstances surrounding their decisions regarding the optimal time for putting the music on the participating people living with dementia was depicted in the theme 'pitching in for the older person, it's not rocket science, and the hurdles'. 'Pitching in for the older

person' depicts the considerations made by staff and family or guardian for the older person with dementia's needs, preferences, and status in their decision regarding the timing and implementation of the music intervention. Thus, the timing and reasons for the implementation of the music intervention varied among participating older people. Some of the older people received the music intervention prior to care, during meals, during their relaxation time, when they were agitated, among others.

7.4.2.2. Facilitators and barriers to implementation

Facilitators: Positive effects and simplicity of the music intervention

Facilitators to the implementation of the music intervention that emerged from the qualitative data set include the positive effects of the music intervention on the older people living with dementia, which resonated with the staff and a guardian. The theme 'optimism, excitement and the snowball effect' illustrates how the positive responses of the participating older people promoted the uptake of the music intervention. Congruent with previous studies, the older people's positive responses motivated the staff to regularly implement the music intervention (Gallagher, 2011; Gerdner, 2005; Murphy et al., 2018). The staff participants from this study were moved, amazed, and relieved to see the older people in a joyous state. Additionally, they felt that the older people's positive mood made their workdays more pleasurable.

Apart from the positive effects, the use of the music intervention was facilitated by the ease that the staff and a guardian experienced during implementation as depicted by the theme 'pitching in for the older person, it's not rocket science, and the hurdles'. Applying or administering the music intervention was reportedly easy regardless of the extent of training received by the participating staff. Three out of the six staff who participated in the focus

group discussion received the short version but were content with the training content and described the administration of the music intervention as “basic” and “self-explanatory”. A guardian who implemented the music intervention without the training also described the music intervention as “self-explanatory”. This reflects the music intervention’s simplicity and reflects that special musical abilities are not required for its implementation (Dimopoulos-Bick et al., 2019; Gerdner, 2012). The simplicity and ease of administering the music intervention contributed to its uptake not only by the staff who received the training but also by those who were not participants of the study and did not receive the training for the implementation of the music intervention.

Barriers relating to the older person and the staff

There were a few barriers encountered by the participating staff and a guardian, which affected the routine implementation of the music intervention. Some of these barriers to implementation were resident-related such as the discomfort from the headphones and the responses to some of the music in the older person’s playlist. These led to refusal of the music intervention or removal of the music intervention equipment. The issues with headphones is particularly noteworthy. While the staff mentioned a number of negative responses to the music intervention, the majority attributed these to the discomfort from the headphones. Despite the popularity of headphones in studies that involved individualised or personalised music listening (Garland et al., 2007; Guetin et al., 2009; Schroeder et al., 2018) issues with the use headphones as well as its relative advantage over other music delivery equipment are not extensively explored (Garrido et al., 2017).

Other barriers were staff-related such as not properly turning off and not charging the equipment. These staff-related barriers were experienced by RACF1 staff and were attributed

to the involvement of staff members who were not participants to the study but implemented the music intervention. The involvement of RACF1 staff who did not receive the training for implementation is documented in Chapter 5 section [5.4.7.1](#). To ensure that they implemented the music intervention in accordance to the protocol, educational material was designed by the candidate for all staff (see [Appendix 19](#)). However, the focus of the educational material was on the music intervention protocol. Although these staff related barriers could be attitude related, it is worth exploring if training and education on the music intervention could facilitate the proper use of the music intervention equipment. The staff related issues relating to the maintenance of the music delivery equipment are documented in the literature (Dimopoulos-Bick et al., 2019; Murphy et al., 2018). Barriers relating to the headphones and equipment use and maintenance are further discussed in Chapter 8.

7.4.3. Considerations and recommendations for music delivery and music selection

While the responses from the interviews, progress notes documentation, and the open –ended section of the implementation questionnaire captured the positive impact of the individualised music listening intervention, staff suggested alternatives for implementation beyond the features of the music intervention such as alternative forms of music delivery and equipment, music selection, and group administration of music. This is depicted in the theme ‘music beyond the intervention’. The alternative forms of music delivery equipment were suggested by staff to address the discomfort from the headphones experienced by some participating older people and to be able to deliver the music to a group of residents. Akin to the findings of another study involving personalised music listening (Murphy et al., 2018), the staff participants from both implementation sites showed interest in group-based music administration when the residents are in a communal area such as in the lounge area or in the

dining room during meals. Consistent with Li et al. (2015), the staff confidently recommended the type of music that would be suitable for the majority of the residents, specifically instrumental type music or music without words that might have a calming effect on the older people living with dementia. While this study is built on theoretical underpinning of individualised music listening and its positive effects on older people living with dementia as reported in Chapters 2 and 3, facilities could utilise the residents' common music preferences for group-based administration. Cheung et al. (2018) for instance administered a group music listening program using the older people's preferred music suggested by their family. Alternatively, with the staff's suggestions regarding instrumental music, soft music with slow tempo and no lyrics has been shown to be generally calming or relaxing for the people living with dementia (Remington, Gerdner, & Buckwalter, 2011). Thus, either type of music has the potential to work with group-based music listening for people living with dementia.

Even though the music selection in this study was based on the older person's preferences, a few staff conveyed that it is important to ascertain the specific effect that the music will have on the older person such as the memories that it can evoke (e.g. pleasant, sad). This is supported by findings from previous studies which highlight the different types of emotions and responses evoked by different types of music (Garrido, Stevens, et al., 2018b; Meilan Garcia et al., 2012). This is another consideration for future studies.

7.4.4. Limitations

The main limitation of the qualitative component of the study is the limited data gathered from the qualitative interviews. Although ten out of fourteen staff members from both implementation sites participated in the qualitative interviews, the interviews were short in

duration therefore limiting the quantity of data. While the focus group interview and the individual interview with a guardian lasted 34 minutes, the individual interviews with staff members were short, ranging from 6 to 18 minutes. Organising a suitable time with the staff was difficult considering their preferences were mainly either prior to the start of the shift or the end of the shift. Either way, interviews were short as the staff either hurried to get to work or to go home. Although the staff mostly responded to the questions asked, most of them did not ask further questions or make additional comments despite the candidate's prompting.

Of the seven family or guardian who implemented the music intervention, only one guardian participated in the interview. Thus, it is not possible to differentiate the guardian's insights from those of the staff. Another limitation was the candidate's position in RACF1. The candidate was employed as a registered nurse in RACF1 prior to and throughout the research implementation period. The candidate has worked with the participating staff in RACF1 and established rapport with the family or guardians of participating people living with dementia prior to the study. The candidate was aware that her work experience in aged care, her experience in implementing the individualised music intervention to the participating older people living with dementia, and the observations that she undertook during the implementation of the music intervention by staff and family or guardian may have influenced the way that she facilitated the interviews. However an interview guide was developed prior to the conduct of the study to help ensure that the interview was focused. Participants were also encouraged to share their thoughts freely. As detailed in Chapter 4 section [4.8.6.2](#), apart from encouraging participants to provide additional comments about the questions asked or the discussion, the candidate checked before ending the focus group and each interview if there was anything further that the participants wanted to share that was not covered during the discussion.

7.5. Conclusion

In this chapter, the results from the analysis of the qualitative data comprising a focus group interview with six staff and individual interviews with four staff and one guardian, the open-ended section of the implementation questionnaire, and the participating older people's progress notes' entries, and are presented. Overall, the results of the analysis showed that the individualised music listening positively affected the majority of the participating older people living with dementia and its implementation was a positive experience for staff members and a guardian. The music intervention was simple and embedding the intervention in the routine care of older people living with dementia was feasible.

In the following Chapter, the findings from the quantitative and qualitative components of this study are integrated and discussed. The findings from the qualitative analysis in this chapter will be used to explain, supplement, and clarify the findings from the quantitative data analysis in Chapter 8.

Chapter 8 Integration of findings, discussion, and conclusion

8.1. Introduction

This chapter integrates the findings from the quantitative and qualitative components of this study and provides a discussion and conclusion to the thesis.

Chapter 1 of this thesis briefly outlines the research and how the thesis is organised. The objectives for the study and research questions, methodology, design and methods were also outlined in this chapter. Chapter 2, the background to the study, highlights the challenges associated with an ageing population, concerns about the prevalence of dementia and the impact of dementia on quality of life, and challenges with the management of dementia including the use of psychotropic medications. The literature relating to memory and dementia, music as therapy and the impact of music on the person with dementia were also discussed. The implementation of music as an individualised intervention and implementation research conclude this chapter. Chapter 3 provides a systematic review of randomised controlled trials (RCTs) designed to measure the impact of individualised music listening interventions on people living with dementia. The review supports the promising impact of individualised music listening on a number of outcomes for people living with dementia especially BPSDs. Limitations of the review highlighted including the small number of studies and the need for research that focuses on the implementation of individualised music listening for people living with dementia in various settings. Chapter 4 provides detailed discussion on the methodology, design, methods and plan for this implementation study. A discussion on the mixed methods approach for the study and a rationale for this, the setting for the study, study procedures including the music intervention, training for the music intervention, recruitment, measures and tools, data collection and analyses, and ethical considerations are included.

Chapter 5 provides results of the effects of the individualised music implementation strategies on a range of implementation outcomes using a pre-post-test study design. Analysis and findings of the study addressed primary implementation outcomes including; adoption, acceptability, appropriateness, feasibility, fidelity, sustainability, and implementation costs. Limitations for this part of the study were also highlighted in this chapter. Chapter 6 presents the effectiveness of the individualised music listening on secondary outcomes including agitation, quality of life, level of engagement and psychotropic medications use among participating older people living with dementia. In Chapter 7, analyses the findings from the qualitative data sets from individual and focus group interviews, the open-ended section of the implementation questionnaire, and the progress notes documentation for the participating older people and reveals several themes exploring the perceptions of staff, family and a guardian relating to implementation of the music intervention.

This chapter recaps the study aims, objectives, design and methods, and implementation strategies used. This is followed by an integration of quantitative and qualitative findings addressing the primary implementation outcomes, barriers and facilitators to implementation of the music intervention, and the secondary outcomes addressing impact of the music intervention on the older people living with dementia. Details on the process involved in the integration of quantitative and qualitative data are reported in Chapter 4 section [4.9.3](#). For research questions answered using a quantitative approach, quantitative inferences are presented first followed by qualitative inferences. Qualitative inferences in this instance are used to explain, supplement, or clarify the quantitative inferences. For research questions answered using a qualitative approach, qualitative inferences are presented first followed by quantitative inferences. Quantitative inferences in this instance are used to supplement or compare with the qualitative inferences.

8.2. Revisiting the study aim, objectives and research questions, research design and methods

8.2.1. Study objectives

As stated in Chapters 1 and 4 of this thesis, the aim of this study was to evaluate the implementation of an individualised music listening intervention for older people living with dementia living in a residential aged care facility. The three objectives and associated research questions were as follows:

Objective 1: To explore strategies that promote adoption, acceptability, appropriateness, feasibility, fidelity and sustainability of implementing an individualised music listening intervention within a residential aged care facility. The research questions were;

1. What are the effects of the implementation strategies on the adoption, acceptability, appropriateness, feasibility and sustainability of an individualised music listening intervention in a residential aged care facility for older people living with dementia?
2. What are the actual financial costs associated with the implementation of an individualised music listening intervention for the residential aged care service provider?
3. What are the experiences and perceptions of family and staff regarding the use of an individualised music listening for older people living with dementia in a residential aged care facility?

4. What are the facilitators and barriers to the implementation of an individualised music listening intervention in a residential aged care facility for older people living with dementia?

Objective 2: To determine the impact of an individualised music listening intervention on older people living with dementia. The research question was:

5. Does the use of an individualised music listening intervention for older people living with dementia impact levels of agitation, quality of life, their engagement during the intervention, and prescription and use of psychotropic medications.

Objective 3: To determine the extent to which qualitative results explain the quantitative results. The research question was:

6. To what extent do the experiences and perceptions of family/guardian and staff explain the impact of the implementation strategies and an individualised music intervention in a residential care facility for older people living with dementia?

8.2.2. Study design, outcomes, and methods

To address the objectives of this study, a parallel mixed methods design (Teddlie & Tashakkori, 2009) was used involving a pre-test post-test design for the quantitative component and focus group, individual interviews, open-ended section of the implementation questionnaire, and progress notes documentation of the participating older people for the qualitative component.

The primary outcomes of this study were the implementation outcomes of adoption, acceptability, appropriateness, feasibility, fidelity, sustainability, and implementation costs. These implementation outcomes are defined in Chapters 1 and 4 and will be recapped in

section [8.3](#) below. The measurement tools for the implementation outcomes include the implementation outcomes questionnaire designed for the participating staff, the music intervention logbook, and the costs involved with the music intervention and its implementation (see Chapter 4 section [4.8.5](#)). The secondary outcomes of this study addressed the impact of the individualised music intervention on the older people living with dementia's levels of agitation, quality of life, level of engagement, and prescription or use of psychotropic medications. Measures used were the Cohen Mansfield Agitation Inventory (CMAI), Dementia Quality of Life Questionnaire (DEMQOL), the Homecare Measure of Engagement Staff Version (HoME-S), and a record of the participating older people living with dementia's prescription and use of psychotropic medications (see Chapter 4 section [4.8.5.2](#)). The implementation questionnaire and the older people living with dementia's assessments were administered at baseline and at the end of the 3-month implementation. The music intervention logbook was completed by participating staff and family or guardian after each episode of music intervention implementation throughout the 3-month implementation period. The implementation costs were determined at the end of the research implementation period.

The focus group and individual interviews were conducted during the third month of implementation with participating staff members and a guardian. The entries from the open-ended section of the implementation questionnaire as well as the progress notes entries throughout the 3-month implementation that relate to the implementation of the music intervention and the music intervention's effects on the participating people living with dementia were analysed as part of the qualitative data. The qualitative data were intended to provide a broader understanding of the study findings with a focus on an explanation of the

impact of the implementation strategies used and the individualised music intervention. A brief outline of the implementation strategies used is provided in the following section.

8.2.3. Implementation strategies used

As described in Chapter 2 section [2.12.2](#), an implementation strategy is a “systematic intervention process to adopt and integrate evidence-based health innovations into usual care” (Powell et al., 2012) (p.2). Implementation strategies could be a single strategy which involve one process or multifaceted which involves a combination of two or more single strategies (Grol & Grimshaw, 2003; Powell et al., 2012). This study utilises multiple implementation strategies delineated in Chapter 4 section [4.8.2](#). The implementation strategies used comprised several elements including training and education for staff members and family or guardian of participating older people, appointment of a program leader, providing and obtaining feedback to participating staff and family or guardian, and providing reminders to staff for the implementation of the music intervention.

As described in Chapter 4 section [4.8.3](#), a one-hour training session was conducted to help standardise the implementation of the music intervention. The training involved a didactic presentation, interactive demonstration, and a take away laminated card containing information about the music intervention protocol. As reported in Chapter 5 section [5.4.7.1](#), a modification to the protocol include the design of a shortened 15-minute version for one-on-one training session to accommodate the staff member’s and family or guardian’s preferences. The shortened (15 minutes) one-on-one version contributed to the recruitment of a further six staff and six family or guardian participants across implementation sites. One guardian successfully implemented the music intervention without the training. Also reported in Chapter 5 section [5.4.7.2](#) is another modification to the protocol involving the

identification of program champions. Instead of formally appointing a program leader, program champions were identified among the participating staff from both facilities based on their demonstrated passion and extent of involvement. The program champion from each implementation site were the immediate point of contact for the candidate and were instrumental in the care and maintenance of the music intervention equipment.

To ensure that the participating staff and family or guardian were not having any issues or difficulties with the implementation of the music intervention, the candidate provided and sought regular feedback through informal discussions and conversations throughout the 3-month implementation as described in Chapters 4 and 5. To regularly remind the participating staff about the implementation of the music intervention, the candidate suggested to the facility management of both implementation sites that the music intervention be included in the daily appointments of the participating older people. However, the inclusion of the music intervention in the daily appointments was only realised in RACF1 due to the different system used in RACF2. RACF1 used computer and paper based reminders through the appointments, while the reminder system used in RACF2 was the list of the older people living with dementia receiving the music intervention.

The following discussion addresses the impact of the implementation strategies and the music intervention in the settings for the study. Findings from the quantitative and qualitative components of the study addressing each implementation outcome are summarised.

8.3 Impact of the strategies used for the implementation of the music intervention on the implementation outcomes

Impact for the purpose of this thesis includes the effects of the strategies used for the implementation of the music intervention on the implementation outcomes. Implementation outcomes are defined in Chapters 2 and 4 as the effects of purposive actions to implement new treatments, practices or services (Proctor et al., 2011). The implementation outcomes serve as indicators of implementation success (Proctor et al., 2011). The main areas of impact were on adoption, acceptability, appropriateness, feasibility, fidelity, sustainability, and implementation cost. A description of these implementation outcomes are provided in Chapters 2 and 4 and briefly reiterated below.

8.3.1. Adoption

In this study, adoption is defined as the intention, initial decision, or action to try to employ the music intervention in the care of older people living with dementia (Proctor et al., 2011). Adoption was measured by the number of staff and family or guardian who participated in the training and implemented the intervention. Out of 94 staff and 63 family or guardian of people living with dementia who were eligible to participate across implementation sites, a total of fourteen staff and seven family or guardian participated in the study. The majority of the participants were from RACF1 (11 staff and 6 family or guardian).

Data from the qualitative interviews supported the involvement of the study participants in the implementation of the music intervention. The theme ‘pitching in for the older person, it’s not rocket science, and the hurdles’ depicted the staff and guardian’s involvement and commitment in the routine implementation of the music intervention. Ten staff members and a guardian who participated in the qualitative interviews indicated that they have employed

the music intervention in the care of older people living with dementia for various purposes including prior to care, agitation, and relaxation. The staff's positive expectations and level of enthusiasm about the music intervention prior to the research implementation period was depicted in the theme 'optimism, excitement, and the snowball effect'. The popularity of the music intervention contributed to the staff's optimism and excitement in employing the music intervention in the care of older people living with dementia.

8.3.2. Acceptability

In this study, acceptability is defined as the perception among nursing and allied health staff and family or guardian of older people living with dementia that the intervention is agreeable (Proctor et al., 2011). While some of the terms used in the literature relating to acceptability overlap with appropriateness, this study takes into consideration the complexity or comfort in implementing the music intervention in relation to acceptability (Proctor et al., 2011).

Acceptability was assessed using an implementation questionnaire administered after the training session. Findings showed that the majority of the participants conveyed satisfaction with the training and comfort with the music intervention. However, owing to the small number of staff participants who completed the questionnaire administered at pre-implementation (4 out of 14), definitive conclusions cannot be drawn based on this data. The Measure of Disseminability (MOD) is mainly classified as a measure of feasibility. The MOD has an item on the staff's perception about the music intervention's acceptability. While there was some doubt around the acceptability of the music intervention at pre-implementation, the ratings at post implementation showed that the majority of the respondents perceived that the music intervention was acceptable.

The theme ‘pitching in for the older person, it’s not rocket science and the hurdles’ illustrated the acceptability of the music intervention in relation to the comfort and ease of administration. The staff and a guardian who participated in the qualitative interviews conveyed that the implementation of the music intervention was “easy” and “self-explanatory”.

8.3.3. Appropriateness

Appropriateness in this study is defined as the perceived fit or relevance of the music intervention for the care providers and the older people living with dementia living in the residential aged care facility (Proctor et al., 2011). While appropriateness is conceptually similar to acceptability, Proctor et al. (2011) argued that they are distinct because a treatment or intervention’s appropriateness does not guarantee its acceptability and vice versa. The music intervention’s appropriateness from the staff’s perspective was assessed using the implementation questionnaire. Definitive conclusions cannot be drawn based on these findings as only 4 out of 14 staff responded to this questionnaire, however findings revealed that the respondents perceived that the information from the training session was relevant to the client population. The participants also perceived that the music intervention was compatible with the service’s mission or mandate, fits with the staff’s current skills and is compatible with the staff’s workflow timing.

The theme ‘pitching in for the older person, it’s not rocket science and the hurdles’ depicted the appropriateness of the music intervention in relation to the staff’s current skills. The staff who received the long and the short version of the training conveyed that the training session did not have to be onerous as what was important for them was knowing how to use the equipment and how to implement the music intervention.

The fit or relevance of the music intervention for the older people living with dementia was evidenced by some of the older people's responses during the music intervention. These were depicted in the theme 'transcendental reminisces, the calm, the joy, and the elation'. The participating staff and the guardian noted how the music intervention positively prompted a recollection of people and events from the older person's past life, calmed those who were restless, distressed and confused, and evoked a positive mood.

However, some older people living with dementia did not respond well to the music intervention. For example, as reported in Chapter 5 page [352](#) and Chapter 7 pages [323 to 325](#) some people living with dementia did not want the headphones on; others refused the music equipment or removed the equipment after placement. The theme 'pitching in for the older person, it's not rocket science and the hurdles' depicted some of the negative responses from the older people as observed by the staff. Discomfort from the headphones accounted for the majority of the negative responses. Other negative responses from older people conveyed in 'the hurdles' (see Chapter 7 pages [325 to 327](#)) were related to the older person's ability to remove the equipment, the older person's mood, and some of the music included in their playlist.

8.3.4. Feasibility

For this study, feasibility is defined as the extent to which the music intervention was successfully used or carried out in a residential aged care facility (Proctor et al., 2011). Another term that relates to feasibility is suitability for everyday use (Proctor et al., 2011). The feasibility of integrating the music intervention in the daily care of the older people living with dementia was evaluated from the staff's perspectives through the implementation

questionnaire (see Chapter 5 section [5.4.2](#)) and the extent of regular implementation as documented in the music intervention logbook (see Chapter 6 section [6.4.3](#)). Responses from the Training/Practice Acceptability, Feasibility and Appropriateness Scale section of the implementation questionnaire showed that most of the respondents perceived that the information from the training session was useful in everyday clinical practice and that the music intervention was compatible with the practical realities and resources in the service setting. In the Measure of Disseminability (MOD) section of the implementation questionnaire, the staff's positive responses about the music intervention increased from pre-implementation to post implementation. The responses from the MOD denotes the music intervention's potential success when carried out in a residential aged care setting. However, as previously highlighted, only a few staff completed the questionnaire, with four at pre-implementation and six at post implementation out of the fourteen staff participants, limiting the conclusions that can be drawn.

The music intervention logbook revealed the extent to which the intervention was used on a regular basis. The majority of the documented entries were from RACF1. The implementation of the music intervention varied between implementation sites in terms of duration (longer in RACF1 compared to RACF2). However, the time of day implemented (AM shift) and the main reason for implementation (leisure activity) were similar across implementation sites (see Chapter 5 sections [5.4.3.2](#) and [5.4.3.4](#)). From the candidate's account reported in Chapter 5 section [5.4.7.5](#), the feedback sought from participants revealed some issues with documentation, indicating that the number of entries in the logbook could be an underrepresentation of the actual episodes of implementation.

Findings from the qualitative data analysis supported the routine use of the music intervention in the care of participating older people living with dementia. The theme ‘pitching in for the older person, it’s not rocket science, and the hurdles’ depicted the staff and guardian’s decisions around the use of the music intervention such as the timing of implementation. When deciding the timing of implementation, the staff and a guardian conveyed during the interviews that they took into consideration the person with dementia’s needs, preferences and mood or behaviour. The reasons for implementation mentioned during the interviews complemented the reasons indicated in the music intervention logbook such as during the person with dementia’s relaxation time, when the person with dementia was agitated, prior to care, and to promote food intake.

8.3.5. Fidelity

In this study, fidelity is defined as the degree to which the music intervention was implemented as it was designed (Proctor et al., 2011). The data from the music intervention logbook reported in Chapter 5 section [5.4.4](#) revealed some information about fidelity in terms of the duration of the implementation and the monitoring of the person with dementia’s responses. The majority of the older people living with dementia from RACF1 who participated received the music intervention for the duration suggested in the protocol. Negative responses prompted staff to stop the music intervention. Some of the participating older people living with dementia from RACF2 received the music intervention for a shorter duration (e.g. less than 15 minutes). Although there were some mention of the person with dementia’s negative responses, (e.g. refusal, agitation), the qualitative data did not explicitly provide information around fidelity.

8.3.6. Sustainability

Sustainability is defined in this study as the extent to which the music intervention program was maintained within the residential aged care facility's ongoing operations (Proctor et al., 2011). Sustainability of the music intervention was limited to the timeframe available for the research, which was three months. Of note, the candidate was enrolled full time so the capacity to evaluate sustainability for a longer period was not possible. While both the quantitative and qualitative data provided promising information about the successful use of the music intervention for older people living with dementia throughout the research implementation period, it is not known whether this would be maintained beyond the 3-month implementation period when the candidate is no longer involved.

After the 3-month implementation period was completed, the program champion from RACF1 contacted the candidate regarding her plan to recruit some residents into the program. She asked for support in determining the appropriateness of the music intervention to these residents and creation of their music playlist. Despite the informal training provided, it is evident that this program champion needs further guidance and support.

8.3.7. Implementation cost

As previously discussed in Chapter 5 section [5.5.3](#), this is the first study that included the evaluation of the cost of the individualised music listening intervention and the various aspects of its implementation by trained staff. The financial costing was taken from the perspective of the residential aged care facility and the residents. Actual costs included the cost of the equipment and the labour costs based on the staff's minimum pay rate including the overhead costs. Overall, the total annual cost across implementations sites for 32 participating older people was AU\$6,623.76 or approximately AU\$3.98 per older person per

week. The total cost comprised the music intervention equipment, the training and education provided to staff members, the estimated time spent for the creation of an individualised music playlist by a designated staff member, and the time spent in the implementation of the music intervention.

8.4. Facilitators to the implementation of the music intervention

There were many facilitators to implementation of the music intervention in this study some of which have been reported in other studies (Dimopoulos-Bick et al., 2019; Gallagher, 2011; Gerdner, 2005; Murphy et al., 2018). However, what was new in this study is the findings relating to the simplicity of the music intervention that the staff members who received the short and the long version of the training were equally competent and involved in the implementation of the music intervention. Another novel finding was the positive association between the number of staff and family or guardian who were involved in implementation of the music intervention and the frequency of music intervention received by participating older people throughout the 3-month implementation.

8.4.1. Positive responses of the people living with dementia

There was considerable evidence of the positive responses to the music intervention from the older people. For example, from the qualitative data analysis, older people responded enthusiastically while listening to their preferred music.

The theme ‘optimism, excitement, and the snowball effect’ conveyed the staff and guardian’s positive expectation of the music intervention’s benefits. The positive effects of the music

intervention on the participating people living with dementia that staff and guardian witnessed were among the facilitators to the implementation of the music intervention. The positive experience of the person with dementia during the music intervention resonated with the staff and their family or guardian. Some staff described this as the “snowball effect” which made them more “inclined” to implement the music intervention.

The quantitative data from the music intervention logbook indicated that the positive responders received the music intervention more often. It is noteworthy that the older person with dementia who stood out during the focus group discussion with RACF1 staff in terms of mood enhancement was the one with the most documented entries (70 entries) in the music intervention logbook. For the older person with dementia with 47 logbook entries, one of the exemplars was a progress notes entry encouraging staff to continue implementing the music intervention as the older person’s daughter felt that it was beneficial for her mother.

8.4.2. Flexibility in the implementation of the music intervention

For this study, the voluntary nature of participation with no reimbursement involved in the implementation was taken into consideration regarding the decision to leave to the participating staff and family or guardian about when and how often to implement the music intervention. Flexibility in implementing the music intervention was found to work in this study as demonstrated by the responses from the qualitative interviews. As the staff were the ones who decided the timing of implementation, they had the opportunity to put the music on as needed for the person with dementia as depicted in the theme ‘pitching in for the older person, it’s not rocket science, and the hurdles’. Data from the music intervention logbook complemented the reasons and timing of implementing the music intervention mentioned by

the staff and a guardian during the qualitative interviews as reported in section [8.3.4](#) of this chapter.

8.4.3. Simplicity of the music intervention

Simplicity of the music intervention also appeared to facilitate its uptake as depicted by some exemplars in the theme ‘pitching in for the older person, it’s not rocket science, and the hurdles’. The staff who received the short and the full/comprehensive version of the training both indicated that implementation of the music intervention was “easy”. Even the guardian who implemented the music intervention without the training described it as “self-explanatory”. In addition, some of the staff from RACF1 who did not receive the training were administering the music intervention without consulting the candidate or the study participants. It was particularly interesting that the wing in RACF1 where all of the staff participants received the shortened version had the most number of logbook documentation.

8.4.4. Number of people involved with implementation of the music intervention

Findings from the qualitative and quantitative components of this study further elaborated the positive association between the number of staff and family or guardian involved and the extent of implementation. The responses of the participating staff and a guardian during the qualitative interviews and the progress notes documentation of the participating older people revealed the extent of the staff and family or guardian’s involvement in the implementation of the music intervention. This involvement is depicted in the themes ‘optimism, excitement, and the snowball effect’ and ‘pitching in for the older person, it’s not rocket science and the hurdles’. In RACF1 where there were more people involved (e.g. trained and non-trained

staff, trained family or guardian), there was more evidence of implementation as documented in the music intervention logbook.

8.5. Barriers to the routine implementation of the music intervention

Most of the barriers to the routine implementation of the music intervention identified from the study findings are previously documented in the literature on the use of personalised or individualised music for older people and people living with dementia in residential aged care and other healthcare settings (Dimopoulos-Bick et al., 2019; Murphy et al., 2018). What was new in this study is the data relating to the discomfort from the headphones.

8.5.1. Barriers relating to the older person

The theme ‘pitching in for the older person, it’s not rocket science, and the hurdles’ captured some of the implementation barriers relating to the older person. One was the person with dementia’s refusal or negative response to the music intervention, which hampered routine implementation. As noted in Chapter 7 and reiterated in section [8.3.3](#) of this chapter, discomfort from the headphones accounted for most of the refusals and negative responses from participating older people. Other issues identified were related to the older person’s ability to remove the equipment, the older person’s mood, and some of the music selection. These qualitative data shed light on the circumstances surrounding some of the people living with dementia’s negative responses, refusal of the music intervention or the shorter duration of implementation (e.g. less than 15 minutes) documented in the music intervention logbook.

8.5.2. Barriers relating to the use, maintenance, and storage of the music intervention equipment

Another barrier identified was relating to the staff's use and maintenance of the music intervention equipment. The responses of some staff during the face-to-face interviews and the feedback sought by the candidate from the staff participants during the research implementation period captured some staff-related issues that affected the regular uptake of the music intervention. These included not turning off the iPod shuffle properly, not charging the iPod shuffle when needed, and not putting back the equipment in its storage. This specifically emerged as an issue in RACF1 where the music intervention equipment was easily accessible by everyone including the staff who did not receive the training for implementation. The study participants were trained on how to properly turn off the iPod shuffle and determine when it needs charging. The RACF1 staff who participated in the focus group and interviews indicated that they were using the equipment properly. Some staff suggested that training or educating staff on the proper use of the equipment could help address this issue. This conveys that although implementing the music intervention was relatively easy, the proper use of the equipment could possibly entail reasonably detailed training. Additionally, this poses a question around the choice of storage. While easy accessibility seemingly promoted increased uptake even among non-trained staff, equipment care appeared to be jeopardised.

Apart from the problems with turning off the equipment properly and charging the equipment, there was one missing charger and one broken headphones from RACF1 during the 3-month implementation period. It is noteworthy that in RACF2 there were no issues regarding equipment care and broken or missing equipment mentioned. One staff however

commented on the choice of storage as “hidden” thus she had to remind herself about implementing the music intervention (see Chapter 7 page [320](#)).

8.6. Secondary outcomes: Impact of individualised music listening on older people living with dementia

The preceding sections of this chapter summarised the findings from the quantitative and qualitative components of this study that relate to the implementation outcomes. This section outlines the study findings that address the impact of the music intervention on the older people living with dementia’s agitation, quality of life, level of engagement during the music intervention, and their prescription and use of psychotropic medications.

Results from the pre-test post-test study component of this research reported in Chapter 6 section [6.3](#) revealed the positive effects of the intervention on the quality of life and level of engagement of the person with dementia. However, the music intervention’s efficacy on agitation was not totally supported. The significant improvement in agitation was only evident among RACF1 participants. RACF2 participants showed a non-significant increase in agitation. Interestingly, the documented effects of the music intervention from the music intervention logbook reported in Chapter 5 section [5.4.3.5](#) corresponded with the agitation assessment of older people participants from both implementation sites. Data from the music intervention logbook showed the utility of the music intervention for the management of agitation among the older people living with dementia participants in RACF1. Specifically in RACF1, decreased agitation had the second most number of entries as the reason for implementation and the effects of the music intervention on older people. Meanwhile in

RACF2, although there were seven participants who received the music intervention for agitation, there was no documentation of decreased agitation in the effects section. Regarding the number of participating people living with dementia with and without regular and PRN psychotropic medication prescription, there were no significant differences at baseline and towards the end of the implementation in the subgroup and pooled sample analysis as reported in Chapter 6 section [6.3.3](#).

The qualitative data from the focus group and interviews revealed that the positive responses of the participating older people living with dementia during the music intervention was a major highlight during the implementation. The participants who stood out were mainly in the severe to very severe stage of dementia and who were withdrawn. The staff and guardian's descriptions of the participating older people living with dementia's responses illustrated the person with dementia's engagement and improved mood during the music intervention as depicted in the theme 'transcendental reminisces, the calm, the joy and the elation'. A number of staff across implementation sites spoke of how the music intervention "calmed" or "settled" the confused or distressed older person. While the quantitative data mainly evaluated long-term outcomes, it was worth noting that the staff spoke of the person with dementia's positive responses while they were listening to their preferred music. There was no mention about the residual effects of the music intervention after the music listening episode.

8.7. Discussion

To date, to our knowledge, this is the first mixed methods implementation study exploring the use of individualised music listening intervention for people living with dementia in a residential aged care facility primarily by trained staff and family or guardians. Also, this is the first study that evaluated the effectiveness of the strategies used to promote the implementation of the music intervention in terms of its impact on the implementation outcomes. As noted in Chapter 2 section [2.11](#) there are a few studies that evaluated the implementation of an individualised or personalised music listening for older people living with dementia (Gallagher, 2011; Murphy et al., 2018; Sung et al., 2008). Of these studies, only one used a conceptual framework for implementation (Murphy et al., 2018). Findings from two studies mainly focused on the knowledge and skills of staff (Gallagher, 2011; Sung et al., 2008). Although two recent studies on individualised music listening specifically evaluated a number of implementation outcomes (Dimopoulos-Bick et al., 2019; Murphy et al., 2018), the regular implementation of the music intervention involved several volunteers who were external to the facility. In the United States, there is a pragmatic trial on the use of a personalised music listening program for people with Alzheimer's disease living in residential aged care registered to evaluate the implementation outcomes of adoption and acceptability of a music intervention as well as adherence to its implementation (ClinicalTrials.gov, 2019 May 1 -). Implementation of the music listening program also involves caregivers (e.g. staff and family members). However, as with the study of (Dimopoulos-Bick et al., 2019), the music listening program in the aforementioned ongoing trial is provided and facilitated by the Music and Memory program (Music and Memory, 2019). For this study, the protocol and the implementation strategies used were designed to be independently integrated within the residential aged care facility without requiring accreditation by an external organisation.

Guided by the concepts underlying implementation research discussed in Chapter 2 section [2.12](#) (Peters et al., 2013; Proctor et al., 2011; Proctor et al., 2009), findings from this study elucidated the impact of the strategies utilised for the implementation of an individualised music intervention on the implementation outcomes. The study findings also captured some contextual factors that either promoted or hampered the successful integration of the music intervention into the daily care of people living with dementia in a residential care facility. While there were several modifications to the protocol (e.g. training session duration, program champion in lieu of program leaders) to allow the music intervention to be tailored to the local situations and contextual issues encountered (Powell et al., 2012; Proctor et al., 2009), the findings from this study demonstrated that these modifications positively contributed to the overall implementation.

The qualitative component of the study helps to explain some of the impacts on the implementation outcomes and on the outcomes relating to the older people living with dementia. Despite the limited qualitative data, trustworthiness was addressed through a clear delineation of the steps involved in the analysis (reported in Chapter 4 section [4.8.6.2](#)) and the use of direct quotations from the participants in the reporting of the findings in Chapter 7 to enable the reader to evaluate the interpretations.

In the following sections, evaluation of the strategies used for the implementation of the music intervention, the effects of these strategies on the implementation outcomes and the barriers and facilitators to the implementation of the music intervention will be discussed in the light of the integrated quantitative and qualitative inferences and the evidence from the literature.

8.7.1. Evaluation of the strategies used to promote the implementation of the music intervention: what worked and what did not

Findings from the quantitative component of this study supported the effectiveness of training and education, identification of informal program champions, and regular feedback from participants in promoting the uptake of an intervention in a residential care setting (Ballard et al., 2018; Greenhalgh et al., 2004; Grimshaw et al., 2012; Leeman et al., 2007; Powell et al., 2012). As previously noted in Chapter 2 section [2.12.2](#), Grimshaw et al. (2006) argued that the advantage of multiple implementation strategies over single implementation strategies is not clearly demonstrated. However, congruent with other available evidence (Boersma et al., 2015; Sung et al., 2008) the use of multiple strategies in this study promoted the implementation of the individualised music listening intervention.

8.7.1.1. Training of staff and family or guardian of older people

In agreement with previous studies using personalised music listening (Dimopoulos-Bick et al., 2019; Gallagher, 2011; Gerdner, 2005; Murphy et al., 2018), both the quantitative and qualitative data supported the usefulness of the training conducted for the implementation of the individualised music listening intervention for older people living with dementia.

Studies on individualised or preferred music listening which explicitly provided details regarding the training had the training implemented in accordance to the study protocol (Gallagher, 2011; Gerdner, 2005; Murphy et al., 2018; Sarkamo et al., 2014; Sung et al., 2008). The duration of the training session for most studies was from 30 minutes to an hour

(Gallagher, 2011; Gerdner, 2005; Murphy et al., 2018; Sung et al., 2008). The version of the training received by the participants from this study did not appear to affect their extent of involvement. Findings from this study demonstrated that a simple training program focusing on the basic features of the music intervention could be equally as effective as the longer and more comprehensive version. This may be partly attributed to the simplicity of the intervention.

8.7.1.2. Identification of program champions

The appointment of program leaders did not occur as detailed in Chapter 5 section [5.4.7.2](#). Consistent with previous studies (Dimopoulos-Bick et al., 2019; Murphy et al., 2018), the identification of program champions appeared to work in this study. The difference between leaders and champions are discussed in Chapter 5 section [5.5.1.2](#). Leaders are formally appointed while champions are identified based on their commitment (Leeman et al., 2007). The program champions in this study contributed to the implementation in terms of the care and maintenance of the equipment, recruitment of older people living with dementia participants, and providing regular feedback to the candidate especially on matters that need to be addressed during the 3-month implementation period. While the responses from the program champions during the interviews reflected their involvement in the implementation, the evaluation of their contribution was mainly based on the candidate's account.

8.7.1.3. Providing and obtaining feedback to participating staff and family or guardian

The regular feedback provided by the candidate to the participating staff and family or guardian kept them updated regarding the status of the research implementation and the feedback from other staff and family or guardian about the beneficial effects of the music

intervention. The feedback sought from the participating family or guardian and staff especially the program champions enabled the candidate to act promptly on a number of implementation issues (e.g. charging the iPod shuffle, finding missing or broken equipment, implementation by non-trained staff, person with dementia's negative response to music playlist). Consistent with the findings from this study, Kaasalainen et al. (2010) found that in order to effectively engage staff in the conduct of the research, it is important for the researchers to maintain effective communication, acknowledge staff input, and keep them informed about all aspects of the study. Evaluation of the impact of the regular feedback as an implementation strategy was not captured by the qualitative data and was mainly based on the candidate's account.

8.7.1.4. Use of reminders to prompt implementation of the music intervention

While the use of reminders is among the commonly used implementation strategies (Grimshaw et al., 2006; Grimshaw et al., 2004; Grimshaw et al., 2012; Grol & Grimshaw, 2003; Leeman et al., 2007; Powell et al., 2012; Sung et al., 2008), both quantitative and qualitative data did not demonstrate the utility of using reminders as strategy to promote utilisation of the music intervention. Thus, it remains unclear whether the more formal and explicit reminder system used in RACF1 consisting of printed and computer based reminders is better compared to the informal approach used in RACF2 where a list of people living with dementia participating in the music intervention was posted where the equipment was kept. This could be partly due to the small number of participating older people living with dementia and the staff being aware of which older people were part of the music intervention.

8.7.2. Effects of implementation strategies on implementation outcomes: adoption, acceptability, appropriateness, feasibility, fidelity, sustainability, and implementation costs

8.7.2.1. Implementation of the music intervention by trained staff and family or guardian

As previously discussed in Chapter 2 section [2.12](#), the effects of the implementation strategies used on the implementation outcomes reflect the extent to which the music intervention was successfully implemented in a residential aged care facility (Peters et al., 2013). Both the quantitative and qualitative findings supported the staff and family or guardian's adoption of the music intervention as well as the acceptability of the music intervention by staff, family or guardian. The quantitative and qualitative findings also demonstrate the appropriateness of the music intervention for the staff and the older people living with dementia participants. The qualitative data explained the reasons behind some of the older people's refusal of the music intervention and some of the negative responses documented in the music intervention logbook.

Although the feasibility of implementing the music intervention as part of the daily care of older people living with dementia was demonstrated from the quantitative data analysis, there was some doubt regarding the accuracy of the music intervention logbook documentation. In line with previous studies, sustained documentation of the episodes of implementation by study participants is a challenge (Gerdner, 2005; Murphy et al., 2018). Factors that could have possibly contributed to the less contemporaneous documentation of the music intervention implementation in this study are the high care needs of older people living in residential care that relate to the Commonwealth eligibility criteria for residential aged care

entry (Commonwealth of Australia, 1997, 2018) and the lack or limited time from staff considering their pre-existing workload (Boersma et al., 2015; Chenoweth, 2015; Garcia et al., 2013; Lam et al., 2018; Lawrence et al., 2012; Murphy et al., 2018). Another possible factor was the lack of importance placed on documentation especially that staff were not seeing the documentation's benefits on themselves or on the older people living with dementia (Greenhalgh et al., 2004; Rogers, 2003). The qualitative data further shed light on staff and guardian's involvement and commitment in the regular implementation of the music intervention, some of which were not reflected in the logbook.

The quantitative and qualitative data demonstrated the sustainability of the music intervention's implementation within the 3-month implementation period. There was no follow up data collection post 3-month implementation due to considerations discussed in section [8.8.3](#) of this chapter. McCabe, Davison, and George (2007) underscored that findings from studies that fail to include a follow up evaluation of outcomes must be interpreted with caution.

8.7.2.2. Individualised music listening is a low cost intervention

The annual total cost of the music intervention and its implementation to 32 older people living with dementia from two residential aged care facilities in 2017 was AU\$6,623.76. Comparison of the costs with previous studies utilising similar intervention is not possible due to the limited cost components evaluated (see Chapter 5 section [5.5.3](#)) (Dimopoulos-Bick et al., 2019; Gallagher, 2011; Murphy et al., 2018). A small number of published papers have investigated the costs of implementing other types of non-pharmacologic interventions for people living with dementia (Ballard et al., 2018; Bellelli et al., 2012). With reference to a study involving a 12 sessions of group music therapy administered to 12 groups of 3-4 people

living with dementia, Bellelli et al. (2012) estimated that the total cost would be €3,600 which is equivalent to approximately AU\$8,690 in 2017. The involvement of a music therapist could entail additional costs.

In another study, (Ballard et al., 2018) evaluated the cost-effectiveness of person-centred care training and activities involving care staff from 69 residential aged care facilities in the United Kingdom. Each facility nominated two lead staff members (champions) who received the training and further coaching and supervision over a 9-month period. The champions were responsible for the delivery and dissemination of the intervention in their respective facilities. Findings from the study revealed that delivering the intervention cost £8,627 more per facility compared to usual care. This cost is approximately equivalent to around AU\$15,000. Findings also demonstrated that there was a cost advantage for the intervention especially in the context of a cost saving.

In Australia, Chenoweth et al. (2009) conducted a study that evaluated the effectiveness of person-centred care and dementia care mapping in 15 residential aged care facilities. The residential aged care facilities were randomly assigned to person centred care, dementia care mapping or usual care. The intervention involved training two nominated care staff from each site either on person-centred care or on dementia care mapping and provision of support in either intervention throughout the 4-month intervention period. The trained staff then facilitated the implementation of person-centred care plans with their colleagues. The costs of the intervention for each implementation site was AU\$10,034 for dementia care mapping and AU\$2,250 for person-centred care. The cost averted per Cohen Mansfield Agitation Inventory (CMAI) point after the intervention was AU\$8.01 for person centred care and AU\$48.95 for the dementia care mapping.

Taking into account the costs associated with the implementation of other types of non-pharmacologic interventions, findings from this study support the existing literature which highlight that minimal costs are involved in the use of individualised music listening for people living with dementia (Gerdner, 2005; Maseda et al., 2018; Murphy et al., 2018). The total cost of the music intervention for each older person was approximately AU\$3.98 per week. With the estimated cost of AU\$88,000 per year per person with dementia in a residential aged care setting (Gnanamanickam et al., 2018), the cost of the music intervention in this context is low. However, contrary to the studies of Chenoweth et al. (2009) and Ballard et al. (2018), the costs component evaluated in this study did not include the effectiveness of the music intervention on the outcomes relating to the older people such as quality of life, agitation, and the use of psychotropic medication. Thus, findings from this study does not allow for a generalisation of the music intervention's cost-effectiveness or whether it is good value for money (Livingston et al., 2014b). Dimopoulos-Bick et al. (2019) underscored the importance of evaluating the cost effectiveness of an intervention to increase utilisation, support, and funding for its integration into routine clinical practice.

Even if the costs associated with the use of psychotropic medication was not evaluated in this study, it is worth noting that in Australia, the estimated expenditure for the prescription of antipsychotic medications for people living with dementia from 2009 to 2010 was AU\$19.1 million (AIHW, 2012). Considering the costs and the safety and efficacy issues surrounding the use of psychotropic medications as previously noted in Chapter 2, it is worth investigating whether the integration of this low cost individually tailored intervention for people living with dementia in residential aged care could reduce the need for psychotropic medication prescribing.

8.7.3. Utility of the music intervention: an intervention and a leisure activity

While this study specifically referred to individualised music listening as an intervention as it is widely documented in the literature (Dimopoulos-Bick et al., 2019; Gallagher, 2011; Gerdner & Schoenfelder, 2010; Hicks-Moore & Robinson, 2008; Sakamoto et al., 2013), the scope of implementing the individualised music listening was not limited to its use as an intervention. In Chapter 2 section [2.6](#), apart from the use of music as a non-pharmacological intervention, a discussion on the use of music as a meaningful activity for people living with dementia was underscored. Leisure activity was among the main reasons for implementation indicated in the music intervention logbook.

Interestingly, individualised music listening in this study was predominantly used as a leisure activity for older people living with dementia. Data from the music intervention logbook revealed that leisure activity comprised more than 50% of the documented reasons for implementation across implementation sites. Staff and guardian's responses during the interviews reinforced the data from the music intervention logbook with some of the respondents conveying that they administered the music intervention during the older person's relaxation time. Findings from this study contradicts results from a previous study, which found that the staff's perception of music as an entertainment rather than an intervention for agitation impeded the adoption of the intervention (Murphy et al., 2018).

In addition to the use of individualised music listening as a leisure activity, data from the music intervention logbook and the qualitative data set demonstrated the use of individualised music as an intervention for the management of agitation and promoting food intake.

Agitation emerged as the second most common reason for implementation documented in the logbook and the calming effect of the music intervention was conveyed by the participating staff during the focus group and individual interviews. Promoting food intake was the other noteworthy reason documented in the logbook, which also came up during the interviews. A number of studies exploring the impact of familiar music on food intake demonstrated positive effects (Cohen et al., 2018; Thomas & Smith, 2009). However, the methodological considerations of these studies (e.g. sample size and power, study design) affect the interpretability of the findings. While the impact of individualised music listening on BPSDs has been established in the literature, larger and more robust studies should take into account the inexplicitly explored outcomes that could potentially make a difference in the lives of people living with dementia such as improving food intake.

A number of factors facilitated and hindered the routine uptake of the music intervention for the participating older people living with dementia. A discussion of these facilitators and barriers is presented in the following sections.

8.7.4. Factors that promote routine utilisation of the intervention

In agreement with the literature (Grimshaw et al., 2012; Grol et al., 2007), the routine utilisation of the music intervention in this study was brought about by the interplay of various factors relating to the people involved and their experiences as well as the music intervention and the protocol for its implementation. Chenoweth (2015) similarly contended that successful implementation of non-pharmacological interventions in residential aged care is influenced by a number of factors including resources to support the change, staff equipped with necessary skills, the benefits derived from the change, and the stakeholder's engagement, participation and commitment.

8.7.4.1. Involvement of various stakeholders in the implementation of the music intervention

Existing evidence demonstrates the invaluable contribution of trained staff and family or guardian of people living with dementia in the implementation of an individualised music listening intervention (Dimopoulos-Bick et al., 2019; Gallagher, 2011; Gerdner, 2005; Murphy et al., 2018; Park, 2013; Park & Pringle Specht, 2009; Sarkamo et al., 2014; Sung et al., 2008; Sung et al., 2006; Sung et al., 2010). Findings from this study further illuminated the positive association between the number of staff and family or guardian involved and the extent of implementation, which was depicted both in the quantitative and qualitative data.

During the qualitative interviews, the value of management support was mentioned by a few staff as one of the key elements towards a successful implementation of the music intervention. This was not included in the themes that emerged due to limited data. While definitive conclusions cannot be made regarding the extent of management support and its impact in the present study, it is noteworthy that in RACF1 where more staff became involved, the role and support of the management was more explicit. For example, as detailed in Chapter 4 section [4.8.1](#), RACF1 facility management was actively involved in the recruitment, provided reimbursement to those who attended the full training and provided encouragement to staff to implement the music intervention. The limited findings from this study reinforce the existing evidence on the importance of management or organisational support in the adoption and maintenance of evidenced based practices in a residential care setting (Chenoweth et al., 2018; Lawrence et al., 2012; McCabe et al., 2007; Sung et al., 2008). McCabe et al. (2007) specifically argued that management support is important not

only when training nursing staff but also in ensuring that they are provided with opportunities to engage in new practices.

8.7.4.2. Benefits of the music intervention older people living with dementia, staff, family or guardian

The beneficial effects of the music listening intervention on the older people participants, the family or guardians, and the staff were among the facilitators to implementation. Rogers (2003) and Greenhalgh et al. (2004) highlighted that an intervention that has a clear advantage is easily adopted and implemented. Consistent with previous studies (Dimopoulos-Bick et al., 2019; Gallagher, 2011; Gerdner, 2005; Murphy et al., 2018), the positive immediate responses from the participating people living with dementia which resonated with the staff and family or guardian appeared to promote regular implementation. Findings from the study of Dimopoulos-Bick et al. (2019) revealed that the emotional effect of the music intervention on the staff, which was enhanced as they observed the music's direct benefits, was an intrinsic motivator. Gerdner (2005) noted that the positive impact of the music intervention on the people living with dementia made the staff's work "easier" (p. 28). In another study, the facility personnel reported not only the ease in their workflow but also the satisfaction that they felt with their work once they began seeing the benefits of the intervention on the people living with dementia (Murphy et al., 2018).

8.7.4.3. Nature of the music intervention and scope of implementation

An innovation's level of complexity as well as flexibility and ability to adapt to the local care contexts (e.g. an organisation's norms, skill mix and ways of working) are among the facilitators for practice innovation (Greenhalgh et al., 2004; Grol & Grimshaw, 2003; Lawrence et al., 2012; Rogers, 2003). In this study, the simplicity of the music intervention

and the flexibility involved in the implementation appeared to promote its uptake by participating staff and guardian.

Simplicity of the intervention

Innovations that are simple to use, feasible and workable are easily adopted (Greenhalgh et al., 2004; Kaasalainen et al., 2010; Rogers, 2003). Conversely, an intervention that is perceived as complex or relatively difficult to understand and to use is negatively associated with its rate of adoption (Rogers, 2003). Undoubtedly, the music intervention's simplicity has proven to be instrumental in its acceptability and adoption by staff and family or guardian. Apart from the staff's description of the ease in administering the music intervention, the involvement of staff who did not receive the training for the implementation of the music intervention speaks volumes about its simplicity.

Evidence shows that trained formal or informal caregivers can successfully implement some non-pharmacologic interventions for people living with dementia. In a study comparing the creative activities (e.g. art, music) conducted by licensed therapists versus the regular activity staff, results showed that there was improvement in the person with dementia's well-being regardless of who conducted the activity (Lokon, Sauer, & Li, 2019). The advantage of therapist-led over non-therapist led music interventions (e.g., delivered by trained staff and family) is not clearly demonstrated in the literature (Blackburn & Bradshaw, 2014; Garrido et al., 2017). As the music intervention is confined to the provision of the person's favourite music, it has a potential advantage over other interventions as its implementation does not require special musical abilities (Dimopoulos-Bick et al., 2019{Schroeder, 2018 #9961; Gerdner, 2012).

Flexibility of the training sessions

One of the factors that contributed to the recruitment of the majority of the staff and family or guardian who expressed interest in participation was the flexibility of the training session schedule and the type of training delivered. Although the originally designed one-hour training session was modified into a shortened 15-minute version, this contributed to more flexibility in the delivery of the training that suited the participants' preferences and the setting where it was carried out (e.g. person with dementia's bedroom, staff room). The shortened version also contributed to the successful training of staff and family or guardian participants who were equally involved and competent in the implementation as those who received the full version of the training.

Findings from this study contribute to the evidence on the value of informal short educational sessions, which are more feasible and cost-effective in the context of residential aged care (Murphy et al., 2018; Sung et al., 2008). While previous studies utilised a formally conducted training for the implementation of the individualised music listening intervention (Gallagher, 2011; Gerdner, 2005; Sakamoto et al., 2013; Sung et al., 2008; Sung et al., 2006), a simple on-the-job training session (while staff are working) that would focus on the basic features of the music intervention and its implementation could be worth exploring. This may potentially be less resource intensive and could help in involving more staff and family or guardian in the implementation.

Flexibility in implementing the music intervention

Flexibility in the timing of music listening based on the staff's and family or guardian's discretion on when it was needed by the person with dementia appeared to work in this study.

Most studies involving individualised music listening had the timing and duration of the intervention prescribed (Gerdner, 2005; Raglio et al., 2015; Sakamoto et al., 2013; Sanchez et al., 2016; Sung et al., 2006; Sung et al., 2010). While some of these studies had the intervention delivered by trained staff (Gerdner, 2005; Sung et al., 2006; Sung et al., 2010), they mainly evaluated the impact of the music intervention on people living with dementia and did not investigate the music intervention's implementation in the real-world setting. Thus, it is not known how the prescribed timing and duration affected the staff involved in the implementation.

In another implementation study (Murphy et al., 2018) where staff participants were given the autonomy to decide the timing of music listening, there was active participation from all trained staff but the frequency of documented implementation for each resident varied considerably. In the subsequent years of the program when a primary champion emerged, scheduled time of implementation was adopted which lessened the as needed usage (Murphy et al., 2018). In line with the findings of Murphy et al. (2018), the flexibility in the staff and family or guardian's decision regarding the optimal reason for putting the music on the older person as the music listening successfully contributed to the implementation of the music intervention on an as-needed basis. While it is important to offer staff members the choices or options available in the implementation of an intervention (Kaasalainen et al., 2010), this has resulted into varying frequency of music listening episodes among participating older people across implementation sites. Scheduled implementation of the intervention versus on an as-needed basis is worth exploring to determine which would prompt a more regular uptake of the music listening intervention.

8.7.5. Barriers to the routine implementation of the intervention

As previously noted in Chapter 2 section [2.12.3](#), barriers to implementation could operate at different levels including the individual level, at a professional level, and the organisational level (Grimshaw et al., 2012; Grol & Wensing, 2004). For this study, the barriers encountered were related to the people living with dementia participants, the staff, and the residential aged care facility's decision on some aspects of implementation.

8.7.5.1. People living with dementia's refusal of the intervention

Some of the identified barriers to the regular implementation of the music listening intervention were refusal of the music intervention and negative responses during the intervention. Interestingly, during the interviews staff conveyed that the discomfort from the headphones accounted for most of the refusals and removal of the equipment prior to the intended duration of implementation. This is a novel finding from this study.

Findings from this study highlight the importance of alternative music delivery equipment to ensure continuity of administering the music intervention when the person with dementia experienced discomfort from the headphones. One relative advantage of headphones mentioned in the literature is the opportunity for a personal music listening experience wherein potential disturbance to others is avoided (Gerdner & Schoenfelder, 2010). A few authors noted the potential discomfort from the headphones and the need to allow the person with dementia to adjust to the equipment (Gerdner & Schoenfelder, 2010; Murphy et al., 2018). While Dimopoulos-Bick et al. (2019) emphasised the importance of alternative music devices and the option to play music on alternative audio devices as considerations to the future applications of personalised music listening, issues with headphones was not discussed. Despite the increasing popularity of headphones for the delivery of preferred or

individualised music listening interventions (Garrido, Stevens, Chang, Dunne, & Perz, 2018a; Murphy et al., 2018; Schroeder et al., 2018), the issues surrounding headphones use remain a grey area (Garrido, Stevens, et al., 2018a). For this study, care was taken to prevent potential discomfort with the use of padded headphones as noted in the ethical considerations section in Chapter 4. However, it was gleaned from the qualitative interviews that some of the older person participants just did not like anything on their head or anything that covers their ears.

In addition to the discomfort from the headphones, some of the music in the playlist contributed to the refusal or negative response of a few participants as described in Chapter 7 section [7.3.3](#). Thus, another lesson from this study is that apart from determining the music preferences of the person with dementia, it is important to ascertain where possible the specific effect that the music will have on the person with dementia such as the memories that it can evoke (e.g. pleasant, sad). This was gleaned from the interviews. Meilan Garcia et al. (2012) postulated that different types of emotions evoked by music activate different types of memories. For instance, they associated emotional or sad music to the recall of autobiographical information (Meilan Garcia et al., 2012). Additionally, the influence of the musical features should also be taken into considerations as some music may increase arousal (e.g. music with fast tempos) while some may increase sadness (e.g. music in minor keys) (Garrido, Stevens, et al., 2018b).

In one study (Sakamoto et al., 2013), although the people living with dementia's music preferences were considered, the authors specified that preferred music associated with special memories were chosen to evoke positive emotions and reminiscence. Although refusal or negative response to the music intervention relating to the music was only documented for two study participants, this warranted music playlist titration. Playlist

titration involves modification of the music playlist by removing songs that prompted negative responses and adding songs that the older person enjoys. Murphy et al. (2018) stressed that playlist titration should be an important component of the protocol especially because some of the music presumably preferred or previously enjoyed may not work as expected. Additionally, modifying the playlist is important if the older person becomes bored or intolerant of the repetitive music. Staff and family or guardian could be educated on identifying signs that necessitate modification of the music playlist. Playlist titration could be incorporated into the training provided, especially training of the program leaders or champions.

8.7.5.2. Music intervention equipment storage and care

Findings from this study demonstrate that equipment storage is a critical decision for facility management. In RACF1 where the equipment was readily accessible by everyone, there were more issues relating to proper equipment use however, there was more uptake, including by those who were not participants in the study. In RACF2 where the equipment was stored securely, there were no issues relating to equipment care and broken or missing equipment but evidence of implementation appeared to be less.

Equipment storage: safety versus accessibility

Two studies involving the use of individualised music listening for people living with dementia, mentioned the potential impact of equipment storage and safety on implementation (Dimopoulos-Bick et al., 2019; Murphy et al., 2018). Murphy et al. (2018) found that the prominent display of the music intervention equipment prompted more implementation. Dimopoulos-Bick et al. (2019) included equipment storage and safety among the identified barriers to the implementation of the personalised music listening intervention and

emphasised the importance of ensuring safe storage and careful tracking of equipment distribution. Among the approaches implemented by some of the sites to address this barrier include the use of purpose-built storage cupboards with hooks to secure the iPods, maintaining registers to manage and track distribution, and developing equipment handover procedures (Dimopoulos-Bick et al., 2019). While these approaches could be promising, the published paper (Dimopoulos-Bick et al., 2019) didn't specifically indicate that these worked towards addressing the challenge relating to the music intervention equipment or how these approaches affected the staff involved in the implementation.

Taken altogether, it is worth considering whether or not the risk of missing or broken equipment is worth the benefit of the person with dementia receiving the music intervention on a more regular basis. Murphy et al. (2018) underscored that when deciding on the equipment storage, a balance between security and availability needs careful deliberation on the part of the facility management.

Equipment use and care: a staff related issue

Findings from this study revealed that equipment care is an issue among the staff members who did not receive the training for the implementation of the music intervention. While the equipment care issues such as turning off the iPod shuffle or charging when needed may be attitude-related, they may also be attributed to the lack of education regarding correctly turning off the iPod shuffle and the indication when it needs charging. Increasing awareness about the intervention such as what it does and how to use it is an important step in promoting proper uptake of the intervention (Greenhalgh et al., 2004). Boersma et al. (2015) contended that influencing the level of knowledge is easier than influencing the behaviour. The challenge relating to equipment use and care could potentially be addressed by a number

of strategies that are aimed at the stakeholder's knowledge and attitude such as training and education, role modelling, and influencing behaviour (Boersma et al., 2015; Grimshaw et al., 2012; Powell et al., 2012).

8.7.6. Effects of the music intervention on older people: study findings addressing the secondary outcomes

As previously noted in Chapters 2 and 3, the majority of studies on preferred or individualised music listening evaluated its effectiveness in the management of BPSDs especially agitation (Garland et al., 2007; Gerdner, 2005; Hicks-Moore & Robinson, 2008; Park, 2013; Park & Pringle Specht, 2009; Raglio et al., 2015; Sakamoto et al., 2013; Sanchez et al., 2016; Sung et al., 2006). Interestingly, although agitation was one of the common reasons for implementation of the music intervention and the calming effect of the music intervention on the agitated older people emerged during the qualitative interviews, the beneficial effects of individualised music on agitation was partially supported from the pre-test post-test study findings. While a significant reduction in agitation was noted among older people participants from RACF1, there was a non-significant increase in agitation scores among RACF2 participants.

In agreement with existing literature (Cahill & Diaz-Ponce, 2011; Edvardsson et al., 2014; Moyle et al., 2015; Testad et al., 2014), a noteworthy finding from the quantitative and qualitative components of this study is the value of individualised music as a meaningful activity that promotes quality of life and engagement among older people living with dementia. This finding supports the impetus for this study highlighted in Chapter 1, which is the need to help people living with dementia in residential aged care live positively with dementia through engagement of meaningful activities that could improve their quality of

life. In the pre-test post-test study, there was significant improvement in the quality of life among participating older people across implementation sites and a subsequent increase in the level of engagement scores throughout the research implementation period.

Data from the qualitative component of this study described how the older people living with dementia positively responded to the music intervention in terms of mood enhancement as shown by the joy and the elation that the staff and guardian observed. The most noteworthy responses were from the older people who were in the severe stage of cognitive impairment and those who were often quiet and withdrawn. This is contrary to the findings from a study, which revealed that the pleasurable response to music decreased with increased severity of cognitive impairment (Garrido, Stevens, et al., 2018a). Nevertheless, it must be taken into account the majority of the participants from this study were in the severe to very severe cognitive impairment (see details in Chapter 5 section [5.3](#)). This aligns with the Australian context where the majority of the population in residential aged care have a diagnosis of dementia likely in the severe stage and requiring higher levels of care (Commonwealth of Australia, 1997, 2018; Joenperä, 2017).

Overall, findings relating to the effects of the music intervention on older people living with dementia suggest that individualised music listening could be valuable for people living with dementia who have limited opportunities to engage in meaningful activities (Edvardsson et al., 2014; Harmer & Orrell, 2008; Tak, Kedia, Tongumpun, & Hong, 2015) especially those who have severe cognitive impairment (Cook, Fay, & Rockwood, 2008). This supports the utility of the individualised music not only as a non-pharmacologic intervention for the management of challenging behaviours associated with dementia but also as a means of improving quality of life of people living with dementia (Murphy et al., 2018).

8.7.7. Future directions for sustainability of and individualised music program for older people living with dementia in a residential aged care facility

Despite the potential for individualised music listening as an intervention to be successfully implemented in the routine care of the older person with dementia, evaluation of the implementation's sustainability was limited to the 3-month implementation period in this study. Boersma et al. (2015) highlighted that maintenance or sustainability is the most pivotal aspect of successful long-term integration of an intervention. While the facility management could utilise the training and the music intervention protocol, it remains unclear whether the program would be sustained beyond the research implementation period. For the residential aged care facilities who wish to adopt the program, several measures must be taken into account to build and sustain the residential aged care facility's capacity in the maintenance of the program.

8.7.7.1. Maximising the availability of training and education for the implementation of the music intervention

The training conducted for the use of the music intervention successfully promoted the uptake of the intervention by the study participants even on a voluntary basis. Facility management could potentially look into offering the training to all staff and interested family or guardian in group sessions or one-one-one sessions. While compulsory training and implementation could be a challenge considering that it could demand extra work and time from staff (Boersma et al., 2015; Garcia et al., 2013; Kaasalainen et al., 2010; Lawrence et al., 2012), having more people trained could mean more opportunities for the people living

with dementia to receive the intervention in accordance to the protocol. Owing to the simplicity of the music intervention, the training could easily be incorporated as a form of informal on-the-job training for staff. Apart from scaling up the uptake, provision of training in this context could facilitate follow up education and reinforcement of skills which are valuable for a successful and sustained implementation of the music intervention (Boersma et al., 2015).

The impact of staff turnover was not explored in this study due to the short implementation period. High rates of staff turnover is predominant in residential aged care settings especially among the nursing or care staff (Ballard et al., 2018; Gao, Newcombe, Tilse, Wilson, & Tuckett, 2014; Karantzas et al., 2012; Lam et al., 2018; Tilden et al., 2013; Zapka et al., 2014). Staff-turnover is a potential issue that the facility could face in the long-term that may affect the sustained implementation of the music intervention. In this context, it is important to ensure that new employees are skilled in implementing the music intervention. As noted in Chapter 4 section [4.8.3](#), a computer-based version of the training session was part of the initial protocol to make the training available to new employees during their orientation. While this was not realised in this study as previously discussed in Chapter 5 section [5.4.7.1](#), it is worth exploring if computer-based training with ongoing support during the implementation could promote the sustainability of the music intervention program in a residential aged care setting. Alternatives to face-to-face training, such as an introduction as part of the facility's employee orientation and on the job training would potentially reduce training costs.

8.7.7.2. Building capacity in spearheading the implementation

To promote ownership of the music intervention program in the facility, involvement of designated staff in the facility who will act as implementation leads (e.g. program champions) as well as an external support person who will provide support and guidance to the staff especially in the early phase of implementation are important.

The program champions

There is some evidence of the positive impact of project or opinion leaders in promoting the implementation of non-pharmacological interventions (Boersma et al., 2015; Sung et al., 2008). Nevertheless, involving program champions as a strategy in the implementation of individualised or preferred music listening interventions is not extensively explored in the literature. In the studies where the program champions facilitated the routine uptake of the preferred music listening intervention, there were other sources of support that could have strengthened the implementation such as the facility management and the volunteers (Dimopoulos-Bick et al., 2019; Murphy et al., 2018). In these studies, the volunteers were involved in assessing music preferences, creating music playlists, and implementing the music intervention. Additionally, in the study of Murphy et al. (2018), the volunteers were involved in training the staff, soliciting feedback from staff regarding the program, and maintaining relationships with the management and staff participants (Murphy et al., 2018).

For this study, the candidate performed the aforementioned tasks throughout the 3-month implementation period. While the candidate provided informal training to the program champions from both implementation sites on downloading music through iTunes and creating music playlist as noted in Chapter 5 section [5.4.7.2](#), there was no follow up training and ongoing support provided to the program champions. Creating a music playlist is a

critical component of an individualised music listening intervention. Dimopoulos-Bick et al. (2019) found that the staff were constrained by the workflow challenges associated with the amount of time spent in developing personalised playlists and considered this as one of the main barriers to the implementation of the personalised music listening intervention. Thus, providing comprehensive training to program champions and ongoing support until they are able to successfully manage assessment of music preferences and creation of music playlists independently are important considerations.

Apart from the skills required for the creation and management of music playlists, building the program champions' leadership skills was an important component that was overlooked in this study. Thus, another consideration in the sustained integration of the program is the utilisation of a train the trainer approach (Chenoweth et al., 2018; Powell et al., 2012). Rather than the informal identification of program champions, an eligible staff member with a formally designated role could be appointed to spearhead the implementation. Eligibility could be based on the staff's perceived leadership qualities in educating or training and supervising staff (Chenoweth et al., 2018; Powell et al., 2012). In addition to the training regarding music playlist creation, program champions should receive education in terms of their leadership role in training staff on how to administer the individualised music listening intervention, supporting staff during the implementation of the intervention, eliciting and providing feedback to the stakeholders involved, and addressing music intervention or implementation related issues.

Involvement of a resource person

Evidence on the use of non-pharmacologic interventions by staff in residential aged care revealed positive outcomes when support during the implementation was provided in addition

to the training and education (Chenoweth et al., 2018; Chenoweth et al., 2009; McCabe et al., 2015; Mellor et al., 2015). In this study, the candidate served as the resource person. This highlights the importance of an external resource person or an external change agent that could help establish the program in the facility and provide ongoing support to the staff including the program champions until the program is successfully maintained (Chenoweth et al., 2018; Mellor et al., 2015; Murphy et al., 2018; Sung et al., 2008).

8.7.7.3. Inclusion of the music intervention in the older' person's care

Dimopoulos-Bick et al. (2019) underscored that linking or integrating the implementation of the personalised music listening intervention to existing initiatives and routine practices in the facility such as care planning and assessments was a key facilitator to the music intervention's sustained implementation. Murphy et al. (2018) suggested that individualised music listening intervention could be incorporated in the person with dementia's care plan to reinforce to staff that this is to be part for the older person's daily care. The idea of including the music intervention in the plan of care for the older person was taken into consideration with the proposed development of a music intervention care plan as part of the original protocol reported in Chapter 4 section [4.8.4.4](#). While this was not realised due to the considerable amount of support that was needed from the facility management and staff involved in the creation and evaluation of care plans (see Chapter 5 section [5.4.7.5](#)), creation of a music intervention care plan could play an important role in the sustained implementation of the music intervention. As care plans are evaluated on a regular basis, facility management could enforce routine checks and feedback on the music intervention equipment and the status of the music intervention's implementation during each older person's care plan evaluation.

Dimopoulos-Bick et al. (2019) found that completion of the music questionnaire during the patient's admission assessment fostered engagement and support from staff. One of the RACF1 staff who participated in the focus group discussion suggested that the assessment of specific music preferences should be included as part of the admission assessment for the new residents. While there was limited input around this matter, this is another strategy that could be used to promote the integration of individualised music in the care of the older person. Initial assessment of whether or not the person likes music and the specific music preferences could be used in the creation of a music intervention care plan and could facilitate the provision of an individualised music listening intervention to the older person once the resources are available.

8.7.7.4. Resources associated with the music intervention and its implementation

Findings from the analysis of the implementation costs in this study serve as a guide for the residential aged care facilities that wish to adopt the program. While the funds needed for the music intervention equipment and download of music preferences is among the critical elements of an individualised music listening intervention, there are other features of the music intervention that must be considered such as the choice of technology and music listening device (Dimopoulos-Bick et al., 2019; Murphy et al., 2018). Reasons for choosing 4th generation iPod shuffles in this study include the costs and the ease with music downloads via iTunes as discussed in Chapter 4 section [4.8.4.3](#). However, the iPod shuffles are no longer available. The music listening devices available from Apple Incorporated such as the iPod Nanos are more costly. While the ease of finding and downloading the older people's music preferences in this study was facilitated by the iTunes application which is compatible with any Apple Incorporated devices, facilities could look into other music listening devices such

as MP3 players. If MP3 players or other devices which are not supported by iTunes will be used, facilities should explore the use of other software for finding and downloading music (Murphy et al., 2018).

8.8. Methodological considerations

8.8.1. Study design and sample size

While the mixed methods design was appropriate for this study, the quantitative component of the study utilised a pre-test-post-test design, which has several limitations relating to lack of randomisation and absence of a control group. Another limitation was the sample size for the older people living with dementia, staff, and family or guardian, which was previously noted in Chapters 5 and 6. The small sample of older people living with dementia limits the statistical power, affecting the evaluation of the secondary outcomes of this study. This was partly due to the challenges with recruitment especially in RACF1 where the candidate was an employee. While the challenge associated with recruitment and attrition of people from a vulnerable population is well documented (Garcia et al., 2013; Garrido, Steiner, & Russo, 2018; Hall et al., 2009; Lam et al., 2018; Murfield et al., 2011; Slaughter et al., 2007; Zermansky, Alldred, Petty, & Raynor, 2007), this was further complicated by the ethical considerations surrounding the candidate's employment in RACF1 as detailed in Chapter 4 section [4.11](#). Recruitment of people living with dementia from RACF1 relied heavily on the management and the staff appointment by the management to contact the family or guardian of people living with dementia. Apart from recruitment, retention of participating older people was also a challenge as some of the participants were in the palliative stage when they were enrolled in the program and passed away prior to completing the implementation period. This is expected in this population due to the Aged Care Act eligibility criteria

(Commonwealth of Australia, 1997, 2018), the age and health conditions of the study population.

Apart from the small number of participating older people, the implementation of the intervention relied heavily on the small number of staff and family or guardian who participated in this study especially from RACF2. The smaller number of participants from RACF2 may be attributed to the limited approaches used by the facility management in encouraging staff participation and the single unit within the facility that was allocated to participate in the study. The facility management in RACF1 actively recruited the staff to participate through short message service (SMS) and during the staff meetings (as previously stated in sections [4.8.1](#) and 8.7.4.1). RACF1 facility management also informed staff that they would be paid (in accordance to their hourly rate) for their attendance in the training session. In RACF2, the candidate was primarily involved in the recruitment of study participants with limited hands-on support from other staff. Additionally, the study was conducted in the entire facility in RACF1 where all staff members working across various wings (approximately n=74) had the chance to participate. Conversely, in RACF2, the study was conducted in a 25-bed unit with approximately 20 regular nursing and allied health staff assigned during the recruitment period as previously noted in Chapter 5 section [5.4.1](#). There were similar numbers of family or guardians who expressed interest in being trained for the implementation of the music intervention in both facilities, as noted in Chapter 5 section [5.4.1](#). However, the majority of the family or guardian from RACF2 who initially expressed interest in receiving the training did not receive the training as they changed their minds over time about being involved. This may in part have been due to the busy time of year when the implementation occurred in RACF2. The challenges associated with recruitment and attrition in studies involving staff members and family members is widely documented (Garcia et al.,

2013; Higgins et al., 2009; Lam et al., 2018; McCabe et al., 2007; Murfield et al., 2011; Zapka et al., 2014).

8.8.2. Outcome measures and data collection

Staff members from both facilities were involved in the majority of the data collection for this study. Several assessments undertaken by staff (e.g. level of engagement) and episodes of implementation in the music intervention logbook were incomplete. The use of the music intervention logbook in determining the extent to which the intervention was carried out (feasibility) was not very reliable as discussed in section [8.7.2.1](#) of this chapter, especially in RACF2 where there was only one staff member who was knowingly involved in the documentation of the music intervention implementation. The implementation and documentation of the music intervention were extra work for the staff. Considering the voluntary nature of participation, it was not expected that staff would prioritise the music intervention logbook documentation over their pre-existing workload. Also, as previously noted in Chapter 5 section [5.3](#), implementation and data collection did not occur simultaneously for both sites. Implementation in RACF2 occurred during the busy holiday season between December and January where there were more activities implemented than usual and there were more visits from family members and friends of older people. Although there was a two-week break from implementation and data collection during the holiday season, this may have contributed to the less contemporaneous music logbook documentation in RACF2. Assessment data collected by the candidate from staff such as the older people's agitation and quality of life was complete. This data collection was also a challenge because the assessments were mainly undertaken during the staff's break at work or before the start or at the end of the shift, as preferred by staff.

Insight derived from the family or guardian of people living with dementia was another consideration. Of the seven family or guardian who implemented the intervention, only one participated in the interview. Thus, it is not possible to differentiate the guardian's insights from those of the staff. Furthermore, the short duration of the interviews limit the depth data for analysis. As previously reported in Chapter 7 section [7.4.4](#), the individual interviews with staff members were particularly short as they were either in a hurry to get back to work or go home and did not ask further questions or make additional comments despite the candidate's prompting. It is well documented that recruiting and engaging staff caregivers in research and data collection is often compounded by a number of challenges especially relating to time constraints (Garcia et al., 2013; Kaasalainen et al., 2010; Lam et al., 2018; Zapka et al., 2014). Garcia et al. (2013) found that one of the barriers associated with conducting research in a residential aged care setting that they encountered was not being able to capture the information from staff nurses as they did not have time to sit and complete the surveys.

Engaging staff is particularly a challenge in this study as their participation was mainly voluntary. While the facility management played a role during the recruitment of participants, involvement of the facility management during the implementation period was less explicit. Facility management's role in facilitating data collection among staff members is important. In a mixed methods study where the management took an active part in facilitating residential aged care staff's participation with data collection, researchers were able to achieve the required sample and data (Kaasalainen et al., 2010).

8.8.3. Duration of the research implementation

Considering that this is an implementation study, a significant limitation is the short duration of the research implementation period, which limits the evaluation of the sustainability of the

music listening intervention to a 3-month period. Previous studies that evaluated the implementation process of a preferred or personalised music listening program were conducted at least over a year (Dimopoulos-Bick et al., 2019; Murphy et al., 2018). Murphy et al. (2018) specifically indicated that administrative turnover in the facility was a challenge that the program faced during its fourth year of implementation. Had the duration of the research implementation been longer, there may have been additional noteworthy findings that emerged from this study such as insights relating to the sustainability of integrating the music intervention in the residential aged care setting.

8.8.4. The candidate's role and influence

The candidate's role as a researcher and as an employee at RACF1 was initially described in Chapter 1 section [1.3](#). The candidate cared for the participating older people living with dementia, worked with the participating staff and established rapport with the family or guardian of participating people living with dementia prior to the study. The candidate was the one who conducted the training, assessments and the individual and focus group interviews.

As noted in Chapter 4 sections [4.5](#) and [4.11](#), every effort was made throughout the study period to ensure the candidate's role of health care worker and researcher were independent. The candidate did not work in RACF1 during the data collection period to assist with this distinction in role. Regarding the staff's participation in any research-related activities, it was emphasised in the information statements and prior to the focus group and interviews, that any decision regarding participation was voluntary, would not negatively affect the staff's working relationship with the candidate or with facility management, and would not have any negative consequences on their employment status/condition in the organisation.

Additionally, as discussed in Chapter 4 section [4.8.6.2](#), prior to the start of the focus group and each individual interview, the candidate discussed the purpose of the interview and provided details about maintaining privacy and confidentiality as stated in the information statement. However, it cannot be disregarded that RACF1 participants' participation in the study, their extent of involvement in the implementation, and their participation and responses during the interviews may have been influenced by the fact that a working relationship had already been established with the staff and family or guardian of participants prior to the study. In RACF2, the candidate had limited opportunity to establish rapport with the potential study participants prior to the recruitment. While the candidate was present in RACF2 regularly during the research implementation, this implementation period was relatively short to be able to establish a trusting relationship with the study participants. A positive and trusting relationship developed between the researchers or volunteers and the staff caregivers has been found to positively impact the staff's recruitment and engagement in the research project (Kaasalainen et al., 2010; Murphy et al., 2018; Zapka et al., 2014).

8.9. Summary of the integrated findings

The integrated findings from the quantitative and qualitative analyses demonstrate that an individualised music listening intervention is acceptable and appropriate for older people living with dementia in a residential aged care setting and that routine implementation of the music intervention by staff and family or guardian is feasible. The integrated findings extends from the existing literature on the implementation of and individualised music listening intervention and its effects on people living with dementia:

- Training staff and family or guardian of people living with dementia contributed to the routine implementation of the music listening intervention.

- Identification of program champions worked as an implementation strategy with guidance provided by the candidate.
- Seeking regular feedback from stakeholders and relaying progress and any changes to implementation is critical in promptly addressing implementation issues.
- Implementation of the music listening intervention by staff and family or guardian of people living with dementia involved minimal costs.
- The positive responses of the people living with dementia and the positive experience of staff and family or guardian during the music intervention implementation were among the key facilitators to the routine implementation of the music intervention.
- Equipment use, storage, and maintenance was a barrier to routine implementation of the music intervention.
- The individualised music listening intervention had positive effects on the quality of life and engagement of the older people living with dementia during the music intervention.

The integrated findings from this study revealed a number of novel contributions to the existing literature especially in terms of the implementation of the individualised music listening intervention. These include the following findings:

- The type of training provided (comprehensive or shortened) did not affect the participants' involvement and competence in the implementation of the music intervention. This suggests that a simple on-the-job training program for staff members may work and may be more feasible in the residential aged care context.
- Individualised music listening intervention was primarily used as a leisure activity rather than an approach to manage behaviours of the participating people living with dementia.

- While the use of headphones for the individualised music listening intervention has become increasingly popular in the recent years, headphones were not well tolerated by a number of participating people living with dementia. This calls for the availability of alternative music listening devices.

To create impact from this research, findings from this study will be disseminated through publications in peer reviewed journals and presentations at conferences. During her candidature the candidate has presented preliminary findings at two local conferences and one international conference. The candidate has completed the draft of three papers derived from the results chapters. One paper has been submitted to a peer-reviewed journal while two papers are currently being reviewed by the supervisors and will be submitted for publication this year. A report of the findings will be provided to the participating facilities. The candidate is yet to contact the respective facilities about the planned reporting of the study findings.

8.10. Recommendations for future research

Conducting research among older people and people living with dementia in residential aged care is a challenge (Cohen-Mansfield, Thein, Marx, & Dakheel-Ali, 2012; Garcia et al., 2013; Hall et al., 2009; Lam et al., 2018; McCabe et al., 2007; Mieke Deschodt, 2017; Murfield et al., 2011; Tilden et al., 2013; Zapka et al., 2014). This is especially so where staff members and family or guardian of older people are involved. The candidate and supervisors were well aware of the challenges that would potentially arise. Thus, strategies including flexibility were built into the design. In planning the protocol for implementation, future researchers should take into consideration some of the challenges encountered in this study such as the recruitment of participants, finding time to conduct training and interviews with staff and

family or guardian, and involving staff and family or guardian in implementation and data collection (Garcia et al., 2013; Hall et al., 2009; Lam et al., 2018).

For a more rigorous evaluation of the implementation outcomes, a mixed methods study utilising a randomised controlled trial design for the quantitative component is warranted. Ideally, research should be conducted in neutral sites wherein the researchers has no connection to avoid any potential conflicts of interest or ethical issues. Additionally, data collection should not rely heavily on staff and family or guardian participants. A trained research assistant could facilitate substantial data collection in conjunction with the study participants including the documentation of the episodes of implementation. Although the use of the music intervention logbook provided a number of details regarding the implementation such as the reasons for using the intervention and the observed effects on the participating older people, future research could consider daily tracking of the music listening equipment use including the duration of the music listening administration where possible. Alternatively, future researchers could consider using simpler methods of demonstrating evidence of implementation such as a simplified checklist consisting mainly of information indicating whether or not the music intervention was implemented. Ideally, a follow up data collection period (e.g. 3 months or 6 months post implementation) should be undertaken to provide more detailed insights on the sustainability of the music intervention.

Future research could also further investigate factors or processes that may significantly influence implementation such as the quality of organisational support, the choice of equipment storage, and scheduled versus as needed implementation of the music intervention. Regarding the music intervention, future researchers could employ some modifications such as alternative music delivery equipment to address the potential discomfort from the

headphones. To determine the monetary value of the music intervention in terms of its clinical benefits to the older people living with dementia, a cost-effective analysis is recommended for future studies. Some of the noteworthy outcomes that could be evaluated include the offset of costs related to the one-on-one time that the staff spend with the older person who is agitated as well as the costs of medication and medication administration by a registered nurse.

In this study, the majority of the participants were in the severe stage of cognitive impairment. Future larger trials could consider the levels of cognitive impairment or diagnostic category in comparing the effectiveness of the music intervention to see if the music intervention is more beneficial to a particular stage of dementia severity or type of dementia, using repeated measures. However, as previously discussed in chapter 4 section [4.10](#), the progressive nature of dementia should be considered when using repeated measures or evaluating outcomes for a longer period.

8.11. Clinical practice implications

This thesis contributes knowledge on the processes involved for a successful implementation of an individualised music listening intervention for people living with dementia in a residential care setting. In the light of the recommendations from various guidelines in dementia care, (Laver et al., 2016; National Institute for Health and Care Excellence (NICE), 2018) and the recent hearing by the Royal Commission into Aged care Quality and Safety (2019), individualised music listening could be a valuable non-pharmacologic intervention and leisure activity for people living with dementia. Additionally, individualised music listening aligns with most recent aged care quality standards which underscore the importance of providing care that is tailored to the needs of the individual consumer (Aged

Care Quality and Safety Commission, 2019). Implementation of individualised music listening is relatively simple and involves minimal costs. Utilising the implementation strategies that positively worked in this study and the recommendations for future directions, this music intervention could be successfully integrated in to the daily care of people living with dementia in residential care facilities by trained staff and family or guardian of people living with dementia.

8.12. Conclusion

Overall, the findings from the integrated quantitative and qualitative analysis for this parallel mixed methods study demonstrate that an individualised music listening intervention is acceptable and appropriate for older people living with dementia in a residential aged care setting. Embedding the music intervention in the daily care of people living with dementia in a residential aged care setting by trained staff and family or guardian is feasible. The costs associated with the music intervention and its implementation in a residential aged care setting are minimal. Of the implementation strategies utilised, training predominantly contributed to the adoption of the music intervention. The positive effects of the music intervention, involvement of various stakeholders, the flexible training sessions and intervention implementation, and simplicity of the music intervention facilitated successful implementation of the music intervention in this study.

To address some of the barriers to implementation, alternative music delivery equipment, music playlist titration, comfortable headphones or alternative modes of delivery, promoting proper use and care of the equipment, and a careful deliberation regarding the choice of

equipment storage need to be taken into consideration. The protocol for implementation should be flexible for modifications to suit the setting and context of implementation.

Sustainability of regular implementation of this music listening intervention was limited to the 3-month implementation period in this study. Nevertheless, the findings contribute to the literature with the evaluation of strategies and exemplifications of contextual factors and issues that may impact successful implementation of an individualised music listening intervention for people living with dementia in residential aged care. To promote ownership and sustained integration of the music intervention in the routine care of people with living dementia, residential aged care facilities should look into a number of considerations. Included are maximising the availability of the training and education, developing the capacity of the program champions to lead the training and implementation of the music intervention, linking the implementation of the music intervention to existing practices, and evaluating availability of other resources that could be utilised for the delivery of the music intervention.

In summary, individualised music listening is a promising intervention and meaningful activity for older people living with dementia in a residential aged care setting that could be regularly implemented by trained staff and family or guardian at minimal cost. Future larger trials could consider diagnostic category and symptom severity and the use of repeated measures when comparing the effectiveness of the music intervention to people living with dementia.

Appendices

Appendix 1 – Published systematic review

Citation: Gaviola, Minah Amor & Inder, Kerry & Dilworth, Sophie & G. Holliday, Elizabeth & Higgins, Isabel. (2019). Impact of individualised music listening intervention on persons with dementia: A systematic review of randomised controlled trials. Australasian Journal on Ageing. 10.1111/ajag.12642

Appendix 1 removed for copyright reasons.

Appendix 2 - Systematic Reviews and Meta-analyses (PRISMA) statement

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	1
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	1-3
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	3
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	3
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	3
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	4
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Appendix 2
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	4

Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	4
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	4
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	4
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	Not applicable
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	5

Appendix 3 – Medline search details

Search terms

- alzheimer*
- body
- dementia
- lewy
- lewy body
- music
- music therapy

1. exp Music/ or exp Music Therapy/ or music.mp.

2. exp DEMENTIA/ or dementia.mp. or alzheimer*.mp. or lewy body.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]

3. 1 and 2

4. limit 3 to English language

5. editorial/ or letter/

6. 4 not 5

Appendix 4 – Research poster/advertisement

Appendix 4 removed for copyright reasons.

Appendix 5 – Information statements and consent Forms

The names of the participating residential aged care facilities were not disclosed in the information statements, consent forms, and in the approval letters from the University of Newcastle's Human Research Ethics Committee (HREC) included in the appendices to protect the privacy of the participating institutions.

5.1. Information statement for staff – RACF1



Kerry Inder
Associate Professor of Nursing
University of Newcastle
School of Nursing and Midwifery
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Tel: 02 40420522
kerry.inder@newcastle.edu.au

Information Statement for the Research Project:

Implementing Individualised Music Intervention for Older People with Dementia

Document Version 6; dated 25/10/17.

You are invited to participate in the research project identified above. The research is part of Ms Minah Amor Gaviola's doctoral studies at the University of Newcastle supervised by Associate Professor Kerry Inder and Professor Isabel Higgins from the School of Nursing and Midwifery, Dr. Sophie Dilworth and Dr. Liz Holliday from the School of Medicine and Public Health at the University of Newcastle. Minah Amor Gaviola is employed as a registered nurse in RACF1. However, the activities outlined in this information statement are those that she will be undertaking as a student researcher of the University of Newcastle. She will not be undertaking any student-researcher related activities on the days when she is active in her staff member role.

Why is the research being done?

The purpose of the research is to evaluate the implementation of an individualised music intervention in the form of preferred music listening for older people with dementia. Previous research has demonstrated the effectiveness of listening to preferred music in decreasing agitation and apathy as well as improving quality of life among older people with dementia. However, there is limited evidence regarding its successful adoption and implementation in residential aged care facilities. Thus, it is the intention of this research to evaluate the implementation process to develop successful strategies that can be utilised by the facility, staff and family in implementing and integrating the music intervention in the day to day care of older people with dementia.

Who can participate in this research?

We are seeking health and allied health staff who are part of the team that provides care to older people with dementia in residential aged care. Staff must be employed in the facility and/or part of the multidisciplinary team that provides care to the participating residents with dementia at least 8 hours per week.

What would you be asked to do?

If you agree to participate, you will be asked to participate in all of the activities listed below:

1. Attend a training session

If you agree to participate, you will be asked to attend one training session. A 1-hour training session will be conducted by the student researcher several times for 1 week to ensure that everyone will be given the opportunity to attend in their convenient time. The schedule for the training sessions will be posted in the staff room. You will be asked to list your name in your preferred session. Another schedule of training sessions will be offered to staff who are on leave during this week. Content of the training session will cover information about dementia, impact of music on older people with dementia, evidence based protocol for use of individualised music, the individualised music intervention to be implemented, implementation outcome variables and resident related outcomes that the researchers are going to evaluate. You will be provided with education materials (booklet) containing concise information about the music intervention protocol for your reference.

In addition to the training session, discussion regarding the implementation will be conducted at certain times, preferably handover time (e.g. 0630 AM for incoming morning and outgoing night staff; 0200 PM for incoming afternoon staff and 0900 AM for allied health staff) to clarify issues and provide feedback. This will be done at least 2-3 times a week in the early phase of the implementation (first two weeks) to ensure that support and guidance is provided and issues are promptly addressed. Supplementary discussion will be provided every month during the scheduled staff meetings thereafter. However, you will be encouraged to promptly report issues and concerns regarding the implementation or intervention to the program leader or facility/clinical manager.

2. Implement the Music Intervention:

You will play the music to the residents (using an iPod shuffle and headphone) for various purposes: as a leisure activity, before or during care, prior to perceived or expected agitation, management of apathy, among others. Each resident will have a log book where entries (in the form of checklist) will be made every time the music intervention is implemented including the reason and its effect if possible. In addition, a music intervention care plan will be created for each resident and will be evaluated regularly as per the facility's protocol. A progress notes entry on the implementation and impact of the music intervention will be encouraged. The leisure and lifestyle staff during their work hours or a senior staff in the shift (e.g. RN) will be appointed as the program leader, reminding and overseeing the implementation, receiving and communicating feedback to the researchers and the facility management.

3. Fill in a questionnaire

You will be asked to fill in a questionnaire containing items on agreement or disagreement in reference to your perspective regarding the training implementation of the individualised music intervention.

4. Participate in focus group or individual interviews (optional)

You will also be asked to participate in a focus group or individual interviews. This will be conducted by the student researcher in the 2nd to 3rd month of implementation to gather additional information about the implementation that may not have been addressed in the questionnaire, barriers and facilitators in the implementation process as well as your perception on the effectiveness of the music intervention for residents with dementia. Interviews will be recorded/audiotaped. The duration will be approximately 30-60 minutes. The interviews will be conducted in a private setting within the facility (e.g. meeting rooms). However, you may choose to have the interview conducted via a recorded telephone call. You will be given a gift voucher as a reimbursement for your time during the interviews.

5. Participate in the assessment of participating residents (optional)

You will be asked to fill in a measure of resident's engagement during the intervention (Homecare Measure of Engagement Staff questionnaire). The student researcher will provide you with information on how to complete this measure. Also, you will be asked to provide the researcher with information for the assessment of the residents' stage of dementia, cognitive function, levels of agitation and quality of life. You will be given a gift voucher as reimbursement for completing the measure of engagement as well as for the time spent in providing information for the residents' assessments.

6. Provide feedback through a staff feedback form (optional)

Staff feedback form will be placed in the staff room for those who want to give anonymous feedback regarding the intervention, resident's response, and implementation. Once completed, the form will be placed in the research drop box which will also be located in the staff room.

What choice do you have?

Participation in this research is entirely your choice. Only those people who give their informed consent will be included in the project. You are required to complete the training program prior to implementing the music intervention and filling in the questionnaire. You have the option of participating in an interview either as part of a focus group or as an individual interview or no interview.. Whether or not you decide to participate, your decision will not disadvantage you and will not affect your relationship with the student researcher and/or your employer.

If you do decide to participate, you may withdraw from the project at any time (e.g. up to the point of publication) without giving a reason and have the option of withdrawing any data which identifies you.

How much time will it take?

The training session will take an hour. The music intervention can be administered for as long as the participating resident likes it, by observation or by verbalisation. You don't have to stay with the resident for the duration of the intervention. It is recommended however to regularly check on the resident (monitored closely at the beginning of the intervention and then approximately every 15 minutes thereafter). As mentioned above, you will also need to document in the resident's log book every time the music intervention is implemented and also in the progress notes and care plan as appropriate. Documentation in the logbook will be in a checklist form and should only take about 1-2 minutes.

The research questionnaire should take approximately 3-5 minutes to complete. For this research, you will fill in the questionnaire twice: after the training session/prior to the implementation of the music intervention and after 3-month implementation period. You have the option to complete the questionnaire at home and place it in a drop box that will be located in the facility's staff room or post it through a reply-paid envelope.

Providing information for the assessments of participating residents' stage of dementia, cognitive function, levels of agitation and quality of life should take approximately 15 minutes per resident. For the focus group and individual interviews, it should take approximately 30-60 minutes. The measure of engagement is a 6-item questionnaire and can be completed in approximately 5 minutes per resident.

What are the risks and benefits of participating?

Participating Residents with Dementia

Risks:

May experience some discomfort with the ear phones that will be used with the intervention. Also, some music may prompt recall of unwanted or sad memories which may trigger negative emotional response from participants. However, as demonstrated in the literature, use of personalised music as an intervention is generally safe. Headphones with padding have been selected to minimise any discomfort and the participating residents' response to the intervention will be monitored. If negative responses are noted, the intervention will be stopped immediately.

Benefits:

The expected benefits include reduction in agitation and apathy, increase in quality of life, and decrease in prescription and/or use of psychotropic medications. Also, creating a personalised playlist for each resident promotes individualised care and helps maintain the personhood of older people with dementia. In addition, this music intervention will provide an opportunity for those who are unable to verbalise and initiate leisure activities to be engaged with something that is tailored to their preferences and thus could be enjoyable.

Staff

Risks:

Risk for inconvenience is a possibility considering that the research involves filling in a questionnaire and participating in a focus group or individual interview which may take up to an hour of time. Additionally, the intervention will require extra work for the staff especially when participating in the training and implementation, including completing a log book each time the music is played. We hope that the benefits of the music intervention will outweigh any inconvenience to staff. This project has been endorsed by the facility manager with the knowledge that there may be additional time required of staff to support the implementation.

Benefits:

For health and allied health staff, results of this study will increase understanding on the strategies that can be utilized to effectively implement the music intervention. As this music intervention doesn't require a music therapist, staff could easily incorporate it into the resident's daily routine activities any time that it is needed. This could be especially useful where a person is experiencing behavioural and psychological symptoms of dementia.

How will your privacy be protected?

Security of the collected data will be protected from unauthorised use by encrypting the USB/external hard drives used to store your information. A password will be created for the knowledge and use of the researchers only.

Confidentiality and anonymity will be ensured by providing each participant with a pseudonym or code to be used consistently throughout the conduct of the study, data analysis, presentation of results and publication. Information that will identify or possibly identify the research participants will be removed at the end of data analysis. The encrypted USB/external hard drive, audio recordings, hard copy questionnaires and all other data from this research will be physically stored in a locked filing cabinet in the Chief Investigator's office at the University of Newcastle, School of Nursing and Midwifery.

Should you decide to participate in a Focus Group Interview, it will be highlighted to all participants the importance of maintaining the confidentiality of the group discussion and not to divulge the content of the discussion to outside parties.

How will the information collected be used?

Information about staff's perspectives on the music intervention will be used in evaluating the implementation process in reference to the implementation outcome variables as well as the impact of the music intervention on the participating residents with dementia.

Collected data on participant-related outcomes (agitation, apathy, quality of life, prescription and/or use of psychotropic medications) as well as the implementation related outcomes from the questionnaires and interviews with staff and family/guardian will be published in a scientific journal and as part of Ms Minah Amor Gaviola's research dissertation required as part of her doctoral studies. Participants will not be identified in any reports arising from this project. For the audio recording, you will be able to review and edit or erase your contribution, including its transcripts.

At the completion of the research, you will be provided a summary of the results. Additionally, the researchers or the Facility Manager will communicate the outcomes of the study during staff meetings and post the summary of results in the staff room.

What do you need to do to participate?

Please read this Information Statement and be sure you understand its contents before you consent to participate. If there is anything you do not understand, or you have questions, contact the researcher.

If you would like to participate, please complete the attached Consent Form and return it to the Facility/Clinical Manager or in the reply paid envelope provided. You will be contacted by a member of the research team and provided with additional information regarding the research implementation.

Further information

If you would like further information, please contact student researcher [Minah Gaviola: 0422243231] or Chief Investigator [Kerry Inder: 02 40420522].

Thank you for considering this invitation.

[Signature]

[Name]

[Position]

Complaints about this research

This project has been approved by the University's Human Research Ethics Committee, Approval No. H- **[H-2017-0116]**.

Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher, or, if an independent person is preferred, to the Human Research Ethics Officer, Research Services, NIER Precinct, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia, telephone (02) 4921 6333, email Human-Ethics@newcastle.edu.au.

5.2. Information statement for older people and their family or guardian –

RACF1



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Information Statement for the Research Project:

Implementing Individualised Music Intervention for Older People with Dementia

Document Version 6; dated 25/10/17.

You and your [family member] are invited to participate in the research project identified above. The research is part of Ms Minah Amor Gaviola's doctoral studies at the University of Newcastle supervised by Associate Professor Kerry Inder and Professor Isabel Higgins from the School of Nursing and Midwifery, Dr. Sophie Dilworth and Dr. Liz Holliday from the School of Medicine and Public Health at the University of Newcastle. Minah Amor Gaviola is employed as a registered nurse in RACF1. However, the activities outlined in this information statement are those that she will be undertaking as a student researcher of the University of Newcastle. She will not be undertaking any student-researcher related activities on the days when she is active in her staff member role.

Why is the research being done?

The purpose of the research is to evaluate the implementation of individualised music intervention in the form of preferred music listening for older people with dementia. Previous research has demonstrated the effectiveness of listening to preferred music in decreasing agitation and apathy as well as improving quality of life among older people with dementia. However, there is limited evidence regarding its successful adoption and implementation in residential aged care facilities. Thus, it is the intention of this research to evaluate the implementation process to develop successful strategies that can be utilised by the facility, staff and family in implementing and integrating the music intervention in the day to day care of older people with dementia.

Who can participate in this research?

We are seeking older people with diagnosis of dementia as well as their family members/guardians to participate in this research.

What would you and your [family member] be asked to do?

If you and your [family member] agree to participate, you and your [family member] may either choose to participate in all of the activities or participate only in activities of interest. Activities included are listed below:

1. Assessments

With you and your [family member]'s consent, you will undergo a number of assessments at baseline and at the end of the research period. This will include assessments to assess the severity of dementia, cognitive function, agitation, apathy and quality of life. These will be completed by the student researcher with staff. Your response to the intervention in terms of acceptance, involvement, attitude, interaction and participation will be assessed during the first, second and third month of implementation. This will be done through a measure of engagement that will be completed by trained staff. Also, your prescription and/or use of medications to manage behaviours will be registered/recorded. The researchers will also access the following information:

- medical records to confirm diagnosis of dementia
- hearing assessment to confirm presence or absence of hearing impairment
- leisure and lifestyle assessment to determine previous or current interest in music
- care plans to determine care needs that may be considered with the implementation of the intervention
- progress notes entries
- primary medication charts and signing sheets.

2. Identification of Music Preferences

You and/or your [family member] will be asked to provide us with a list of your family member's favourite music by filling out the Assessment of Music Preference Form which is attached with this form.

3. Implementation of the Individualised Music Intervention

We will upload and create a playlist of the favourite music/songs in an iPod shuffle. Your [family member] will be provided with a set of headphones. The iPod shuffle and headphones are provided free of charge and your [family member] can continue using them as long as he/she is under the care of the facility. You and/or the staff can play the music anytime for various purposes such as prior to or during care, as a form of leisure activity, prior to expected agitation, among others.

4. Training Session (family members/guardian)

A 1-hour training session will be conducted by the student researcher several times for the staff and interested family member/guardian to ensure that everyone will be given the opportunity to attend in their convenient time. You will be informed and/or be provided with a copy of the schedule of the training sessions. You will be asked to list your name or inform the management and/or researchers of your preferred session. Content of the training session will cover information about dementia, impact of music on older people with dementia, evidence based protocol for use of individualised music, the individualised music intervention to be implemented, implementation outcome variables and resident related outcomes that the researchers are going to evaluate. You will be provided with education materials (booklet) containing concise information about the music intervention protocol for your reference. If you are interested, you may attend one of the scheduled sessions. Only those who attend the training session will be able to implement the intervention.

5. Focus group and/or individual interviews (family members/guardian)

You will also be invited to participate in focus group or individual interviews conducted by the student researcher and/or research supervisors in the 2nd to 3rd month of implementation to share your insights regarding the implementation of the music intervention and its impact on your [family member]. The interviews will be recorded/audiotaped. The interviews will be conducted in a private setting within the facility (e.g. meeting rooms). However, you may choose to have the interview conducted via a recorded telephone call.

What choice do you have?

Participation in this research is entirely your choice. Only those people who give their informed consent will be included in the project. You have the option to consent to participate in all of the activities or in activities of interest only. Whether or not you decide to participate, your decision will not disadvantage you and will not affect your relationship with the student researcher and the organisation.

If you and your [family member] do decide to participate and/or if you consent for your [family member] to participate, you and your [family member] may withdraw from the project at any time (e.g. up to the point of publication) without giving a reason and have the option of withdrawing any data which identifies you and your [family member].

How much time will it take?

Filling out the Assessment of Music Preference Form mainly depends on yours and your [family member's] memory/recall of his/her favourite music. You can take the form home so you will have plenty of time to complete it. The music intervention can be administered for as long as your [family member] likes it, by observation or by verbalisation. If you agree to participate in a focus group interviews or an individual interview, it should take approximately 30-60 minutes.

The assessments that your [family member] will undergo will take about 5-10 minutes for the cognitive assessment and 10-20 minutes for the agitation and quality of life assessments.

What are the risks and benefits of participating?

Risks:

Participating Residents with Dementia

May experience some discomfort with the ear phones that will be used with the intervention. We have selected headphones that are padded for comfort to try to minimise or remove this concern. Also, some music may prompt recall of unwanted or sad memories which may trigger negative emotional response from participants. However, as demonstrated in the literature, use of personalised music as an intervention is generally safe. These risks will be minimised by ensuring that the headphone and iPod shuffle are positioned properly, volume is adjusted appropriately and that the resident is in a comfortable position. Also, the participating resident will be monitored closely at the beginning of the intervention and then approximately every 15 minutes thereafter. If signs of discomfort are manifested or if the resident becomes agitated or distressed, the intervention will be stopped immediately.

Benefits:

The expected benefits include reduction in agitation and apathy, increase in quality of life, and decrease in prescription and/or use of psychotropic medications for residents. Creating a personalised playlist for each resident promotes individualised care and helps maintain the personhood of older people with dementia. In addition, this music intervention will provide an opportunity for those who are unable to verbalise and initiate leisure activities to be engaged with something that is tailored to their preferences and thus could be enjoyable.

Family Members/Guardian

Risks:

Risk for inconvenience is a possibility considering that the research involves attending a training session (if interested), filling in an Assessment of Music Preference Form and participating in focus group or individual interviews which could be time consuming. To address these risks, training sessions will be conducted several times so you can attend at a convenient time. For the focus group or individual interview, you will be informed in advance, at least three to four weeks prior to.

Benefits:

Playing the music to family/loved ones/friend with dementia could promote involvement in care, interaction and meaningful time spent together.

How will you and your family member's privacy be protected?

Security of the collected data will be protected from unauthorised use by encrypting the USB/external hard drives used to store your information. A password will be created for the knowledge and use of the researchers only.

Confidentiality and anonymity will be ensured by providing each participant with pseudonym or code to be used consistently throughout the conduct of the study, data analysis, presentation of results and publication. Information that will identify or possibly identify the research participants will be removed at the end of data analysis. The encrypted USB/external hard drive, audio recordings, hard copy questionnaires and all other data from this research will be physically stored in a locked filing cabinet in the Chief Investigator's office at the University of Newcastle, School of Nursing and Midwifery.

Should you decide to participate in a Focus Group Interview, it will be highlighted to all participants the importance of maintaining the confidentiality of the group discussion and not to divulge the content of the discussion to outside parties.

How will the information collected be used?

Information on the participating residents' music preferences will be used in creating a personalised music playlist which is the intervention for this study. Assessments of participants' cognitive function and severity of dementia will be used to provide a general profile of the participants. Assessments of levels of agitation, apathy, quality of life and prescription and/or use of psychotropic medications will be used to evaluate the impact of music intervention specifically on patient/resident-related outcomes as stipulated in one of the research questions (Does the use of individualised music intervention for older people with dementia impact levels of agitation, apathy, quality of life and prescription or use of psychotropic medications?).

Information regarding family/guardian's perspectives on the music intervention will be used in evaluating the implementation process in reference to the implementation outcome variables as well as the impact of the music intervention on the participating residents with dementia.

Collected data on participant-related outcomes (agitation, apathy, quality of life, prescription and/or use of psychotropic medications) as well as the implementation related outcomes from the questionnaires and interviews with staff and family/guardian will be submitted for publication in a scientific journal and included in the research dissertation of Ms Minah Amor Gaviola as part of the requirements of her doctoral studies. Participants will not be identified in any reports arising from this project. For the audio recording, you will be able to review and edit or erase your contribution, including its transcripts.

At the completion of data analysis, you will be provided with the summary of results.

What do you need to do to participate?

Please read this Information Statement and be sure you understand its contents before you consent to participate. If there is anything you do not understand, or you have questions, contact the research team.

If you would like to participate, please complete the attached Consent Form and return it to the Facility/Clinical Manager or in the reply paid envelope provided. You will be contacted and provided with additional information regarding the research implementation.

Further information

If you would like further information, please contact student researcher [Minah Gaviola: 0422243231] or Chief Investigator [Kerry Inder: 02 40420522].

Thank you for considering this invitation.

[Signature]

[Name]

[Position]

Complaints about this research

This project has been approved by the University's Human Research Ethics Committee, Approval No. H- [H-2017-0116].

Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher, or, if an independent person is preferred, to the Human Research Ethics Officer, Research Services, NIER Precinct, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia, telephone (02) 4921 6333, email Human-Ethics@newcastle.edu.au.


Information Statement for the Research Project (Additional Document for the Residents):

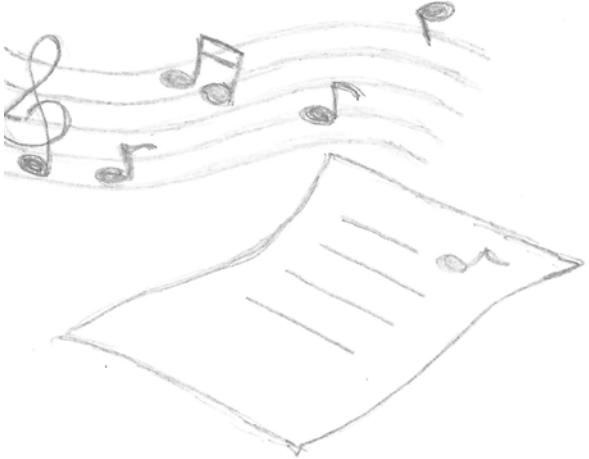
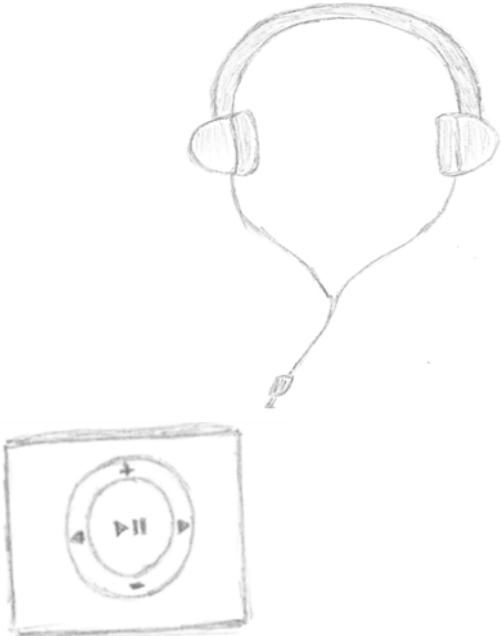

Implementing Individualised Music Intervention for Older People with Dementia

Individualised Music Intervention

- Involves listening to music based on your preferences.

Activities involved if you consent to participate:

	<p>You will undergo assessments to determine if this intervention is suitable for you, what we need to consider when implementing this intervention and to evaluate the effect of this intervention on you</p> <ul style="list-style-type: none">- Researchers will conduct an interview with you and/or your family or staff- Researchers will access medical records, care plans, assessments, progress notes, and prescription and/or use of medications
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	<p>Your music preferences will be identified and a playlist of your favorite music will be loaded to a music player (iPod shuffle)</p>
	<p>Your family/guardian and the staff will play the music to you using headphones and iPod shuffle</p>
	<p>Your family/guardian and/or the staff who plays the music will monitor your response to the music played to make sure that it is enjoyable and not causing you distress or discomfort</p>

5.3. Consent from for staff – RACF1 and RACF2

Kerry Inder
Associate Professor of Nursing
University of Newcastle
School of Nursing and Midwifery
University Drive, Callaghan NSW 2308, Australia
Tel: 02 40420522
kerry.inder@newcastle.edu.au

Consent Form for the Research Project:

**[Implementing Individualised Music Intervention for Older People with Dementia]
[Associate Professor Kerry Inder (Clinical Investigator, Primary Supervisor), Minah Amor Gaviola (Student Researcher), Professor Isabel Higgins (Co-Investigator), Dr. Sophie Dilworth (Co-Investigator) and Dr. Liz Holliday (Co-Investigator)]**

Document Version [3]; dated [25/08/17]

I agree to participate in the above research project and give my consent freely.

I understand that the project will be conducted as described in the Information Statement, a copy of which I have retained.

I understand I can withdraw from the project at any time and do not have to give any reason for withdrawing.

I consent to:

Please tick the box/boxes of the activities that you agree to participate in as part of this research project.

- ☐ Attend a training session about individualised music intervention and its benefits.
- ☐ Implement the music intervention to participating residents with dementia and document implementation in the logbook provided or in the progress notes (or Care Plans for Registered Nurses).
- ☐ Complete a questionnaire about the implementation outcomes.
- ☐ Participate in recorded/audiotaped focus group or individual interviews.
- ☐ Have direct quotes from my interview/s included in the research outcomes with the use of pseudonyms.

I understand that my personal information will remain confidential to the researchers.

I have had the opportunity to have questions answered to my satisfaction.

- ☐ I would like to receive a summary of the results at the completion of the study.

Print Name: _____

Signature: _____ **Date:** _____

Contact Details (Optional)

Phone:

Email Address:

Preferred method of contact:

5.4. Consent form for family or guardian – RACF1

Kerry Inder
Associate Professor of Nursing
University of Newcastle
School of Nursing and Midwifery
University Drive, Callaghan NSW 2308, Australia
Tel: 02 40420522
kerry.inder@newcastle.edu.au

Consent Form for the Research Project:

**[Implementing Individualised Music Intervention for Older People with Dementia]
[Associate Professor Kerry Inder (Clinical Investigator, Primary Supervisor), Minah Amor Gaviola (Student Researcher), Professor Isabel Higgins (Co-Investigator), Dr. Sophie Dilworth (Co-Investigator) and Dr. Liz Holliday (Co-Investigator)]**

Document Version [4]; dated [25/08/17]

I agree for myself as a carer and my [family member] who is a resident of [name of facility] with Dementia to participate in the above research project and give my consent freely.

I understand that the project will be conducted as described in the Information Statement, a copy of which I have retained.

I understand I and/or my [family member] can withdraw from the project at any time, and do not have to give any reason for withdrawing.

I consent for my [family member] to:

Please tick the box/boxes of the activities that you agree for you or your [family member] to participate in this research project.

- ☐ Have his/her medical records, assessments, care plans and progress notes entry stored in the facility's computer/database as well as primary medication charts and signing sheets be accessed by the researchers.
- ☐ Undergo assessments to assess severity of dementia, cognitive function, agitation, apathy, and quality of life.
- ☐ Receive the music intervention using iPod shuffle and headphone for various purposes (e.g. leisure activity, prior to cares, prior to expected agitation).

I also consent for myself to:

Please tick the box/boxes of the activities that you agree to participate in this research project.

- ☐ Fill out an Assessment of Music Preference Form.
- ☐ Participate in a training session about individualised music intervention and its benefits.
- ☐ Implement the music intervention by playing preferred music to my _____ during visits.
- ☐ Participate in recorded/audiotaped focus groups or individual interviews to share insights regarding the implementation of the music intervention and its impact.
- ☐ Have direct quotes from my interview/s included in the research outcomes, with the use of pseudonyms

I understand that my personal information will remain confidential.

I have had the opportunity to have questions answered to my satisfaction.

☐ I would like to receive a summary of the results at the completion of the study.

Print Name: ☐ **Carer:** _____

☐ **Resident:** _____

Signature: _____ **Date:** _____

Contact Details (Optional)

Phone:

Email Address:

Preferred method of contact:

5.5. Consent form for older person – RACF1

Associate Professor of Nursing
University of Newcastle
School of Nursing and Midwifery
University Drive, Callaghan NSW 2308, Australia
Tel: 02 40420522
kerry.inder@newcastle.edu.au

Consent Form for the Research Project:

**[Implementing Individualised Music Intervention for Older People with Dementia]
[Associate Professor Kerry Inder (Clinical Investigator, Primary Supervisor), Minah Amor Gaviola (Student Researcher), Professor Isabel Higgins (Co-Investigator), Dr. Sophie Dilworth (Co-Investigator) and Dr. Liz Holliday (Co-Investigator)]**

Document Version [4]; dated [25/08/17]

I [name of resident], a resident of RACF 1 agree to participate in the above research project and give my consent freely.

I understand that the project will be conducted as described in the Information Statement, a copy of which I have retained.

I understand I can withdraw from the project at any time, and do not have to give any reason for withdrawing.

I consent to:

Please tick the box/boxes of the activities that you agree to participate in as part of this research project.

- ☐ Fill out an Assessment of Music Preference Form.
- ☐ Have my medical records, assessments, care plans, and progress notes entry stored in the facility's computer/database as well as primary medication charts and signing sheets be accessed by the researchers.
- ☐ Undergo assessments of my cognitive function, agitation, apathy, quality of life, and prescription and/or use of psychotropic medications
- ☐ Receive the music intervention using an iPod shuffle and headphones for various purposes (e.g. leisure activity, prior to care, prior to expected agitation, management of agitation and/or apathy).

I understand that my personal information will remain confidential.

I have had the opportunity to have questions answered to my satisfaction.

- ☐ I would like to receive a summary of the results at the completion of the study.

Print Name: _____

Signature: _____ **Date:** _____

Contact Details (Optional)

Phone:
Email Address:
Preferred method of contact:

5.6. Consent for the residential aged care facility – RACF1

Kerry Inder
Associate Professor of Nursing
University of Newcastle
School of Nursing and Midwifery
University Drive, Callaghan NSW 2308, Australia
Tel: 02 40420522
kerry.inder@newcastle.edu.au

Consent Form for the Research Project:

**[Implementing Individualised Music Intervention for Older People with Dementia]
[Associate Professor Kerry Inder (Clinical Investigator, Primary Supervisor), Minah Amor Gaviola (Student Researcher), Professor Isabel Higgins (Co-Investigator), Dr. Sophie Dilworth (Co-Investigator) and Dr. Liz Holliday (Co-Investigator)]**

Document Version [3]; dated [25/10/17]

The management of [name of facility] agrees to participate in the above research project and give our consent freely.

The management understand that the project will be conducted as described in the Information Statements for Staff, Family and Residents, copies of which we have retained.

We understand that we can withdraw from the project at any time and do not have to give any reason for withdrawing.

We consent to:

Please tick the box/boxes of the activities that you agree to participate in as part of this research project.

- ☐ Provide a venue and needed resources (e.g. laptops, LCD projector) for use during the training sessions for staff and family members/guardian.
- ☐ Allow the researchers to access the facility's database/records and medication charts/signing sheets for the required information relating to participating residents
 - medical records to confirm diagnosis of dementia
 - hearing assessment to confirm presence or absence of hearing impairment
 - leisure and lifestyle assessment to determine previous or current interest in music
 - care plans to determine care needs that may be considered with the implementation of the intervention
 - progress notes entries on behaviours and PRN or "as needed" medications administered
 - primary medication charts and signing sheets
- ☐ Take part in the recruitment process by:
 - identifying potential participating residents based on a diagnosis of dementia and manifested behaviours
 - providing a venue and time for information sessions
 - distribute research posters/advertisement about the research and information statements
 - receive signed informed consent forms
 - answer queries about the research project
- ☐ Have the music intervention implemented by trained staff and/or family to participating residents with dementia and document implementation in the logbook provided or in the progress notes (or Care Plans for Registered Nurses).
- ☐ Have the staff provide information to the student researcher for assessment of residents' stage of dementia, cognitive function, levels of agitation and quality of life and have staff complete a measure of engagement of residents during the intervention. Staff will be given a gift voucher as reimbursement for their time.
- ☐ Having members of staff participate in recorded/audiotaped focus group or individual interviews intended for management staff about the implementation process. Staff will be given a gift voucher as reimbursement for their time.



We have had the opportunity to have questions answered to our satisfaction.

- ☐ We would like to receive a summary of the results at the completion of the study.

Print Name: _____

Position: _____

Name of the Facility: _____

Signature: _____ **Date:** _____

Contact Details (Optional)

Phone:

Email Address:

Preferred method of contact:

5.7. Information statement for staff – RACF2

Kerry Inder
Associate Professor of Nursing
University of Newcastle
School of Nursing and Midwifery
University Drive, Callaghan NSW 2308, Australia
Tel: 02 40420522
kerry.inder@newcastle.edu.au

Information Statement for the Research Project:

Implementing Individualised Music Intervention for Older People with Dementia

Document Version 7; dated 25/10/17.

You are invited to participate in the research project identified above. The research is part of Ms Minah Amor Gaviola's doctoral studies at the University of Newcastle supervised by Associate Professor Kerry Inder and Professor Isabel Higgins from the School of Nursing and Midwifery and Dr. Sophie Dilworth and Dr. Liz Holliday from the School of Medicine and Public Health at the University of Newcastle.

Why is the research being done?

The purpose of the research is to evaluate the implementation of an individualised music intervention in the form of preferred music listening for older people with dementia. Previous research has demonstrated the effectiveness of listening to preferred music in decreasing agitation and apathy as well as improving quality of life among older people with dementia. However, there is limited evidence regarding its successful adoption and implementation in residential aged care facilities. Thus, it is the intention of this research to evaluate the implementation process to develop successful strategies that can be utilised by the facility, staff and family in implementing and integrating the music intervention in the day to day care of older people with dementia.

Who can participate in this research?

We are seeking health and allied health staff who are part of the team that provides care to older people with dementia in residential aged care. Staff must be employed in the facility and/or part of the multidisciplinary team that provides care to the participating residents with dementia at least 8 hours per week.

What would you be asked to do?

If you agree to participate, you will be asked to participate in all of the activities listed below:

1. Attend a training session

If you agree to participate, you will be asked to attend one training session. A 1-hour training session will be conducted by the student researcher several times for 1 week to ensure that everyone will be given the opportunity to attend in their convenient time. The schedule for the training sessions will be posted in the staff room. You will be asked to list your name in your preferred session. Another schedule of training sessions will be offered to staff who are on leave during this week. Content of the training session will cover information about dementia, impact of music on older people with dementia, evidence based protocol for use of individualised music, the individualised music intervention to be implemented, implementation outcome variables and resident related outcomes that the researchers are going to evaluate. You will be provided with education materials (booklet) containing concise information about the music intervention protocol for your reference.

In addition to the training session, discussion regarding the implementation will be conducted at certain times, preferably handover time (e.g. 0630 AM for incoming morning and outgoing night staff; 0200 PM for incoming

afternoon staff and 0900 AM for allied health staff) to clarify issues and provide feedback. This will be done at least 2-3 times a week in the early phase of the implementation (first two weeks) to ensure that support and guidance is provided and issues are promptly addressed. Supplementary discussion will be provided every month during the scheduled staff meetings thereafter. However, you will be encouraged to promptly report issues and concerns regarding the implementation or intervention to the program leader or facility/clinical manager.

2. Implement the Music Intervention:

You will play the music to the residents (using an iPod shuffle and headphone) for various purposes: as a leisure activity, before or during care, prior to perceived or expected agitation, management of apathy, among others. Each resident will have a log book where entries (in the form of checklist) will be made every time the music intervention is implemented including the reason and its effect if possible. In addition, a music intervention care plan will be created for each resident and will be evaluated regularly as per the facility's protocol. A progress notes entry on the implementation and impact of the music intervention will be encouraged. The leisure and lifestyle staff during their work hours or a senior staff in the shift (e.g. RN) will be appointed as the program leader, reminding and overseeing the implementation, receiving and communicating feedback to the researchers and the facility management.

3. Fill in a questionnaire

You will be asked to fill in a questionnaire containing items on agreement or disagreement in reference to your perspective regarding the training implementation of the individualised music intervention.

4. Participate in focus group or individual interviews (optional)

You will also be asked to participate in a focus group or individual interviews. This will be conducted by the student researcher in the 2nd to 3rd month of implementation to gather additional information about the implementation that may not have been addressed in the questionnaire, barriers and facilitators in the implementation process as well as your perception on the effectiveness of the music intervention for residents with dementia. Interviews will be recorded/audiotaped. The duration will be approximately 30-60 minutes. The interviews will be conducted in a private setting within the facility (e.g. meeting rooms). However, you may choose to have the interview conducted via a recorded telephone call. You will be given a gift voucher as a reimbursement for your time during the interviews.

5. Participate in the assessment of participating residents (optional)

You will be asked to fill in a measure of resident's engagement during the intervention (Homecare Measure of Engagement Staff questionnaire). The student researcher will provide you with information on how to complete this measure. Also, you will be asked to provide the researcher with information for the assessment of the residents' stage of dementia, cognitive function, levels of agitation and quality of life. You will be given a gift voucher as reimbursement for completing the measure of engagement as well as for the time spent in providing information for the residents' assessments.

6. Provide feedback through a staff feedback form (optional)

Staff feedback form will be placed in the staff room for those who want to give anonymous feedback regarding the intervention, resident's response, and implementation. Once completed, the form will be placed in the research drop box which will also be located in the staff room.

What choice do you have?

Participation in this research is entirely your choice. Only those people who give their informed consent will be included in the project. You are required to complete the training program prior to implementing the music intervention and filling in the questionnaire. You have the option of participating in an interview either as part of a focus group or as an individual interview or no interview.. Whether or not you decide to participate, your decision will not disadvantage you and will not affect your relationship with your employer.

If you do decide to participate, you may withdraw from the project at any time (e.g. up to the point of publication) without giving a reason and have the option of withdrawing any data which identifies you.

How much time will it take?

The training session will take an hour. The music intervention can be administered for as long as the participating resident likes it, by observation or by verbalisation. You don't have to stay with the resident for the duration of the

intervention. It is recommended however to regularly check on the resident (monitored closely at the beginning of the intervention and then approximately every 15 minutes thereafter). As mentioned above, you will also need to document in the resident's log book every time the music intervention is implemented and also in the progress notes and care plan as appropriate. Documentation in the logbook will be in a checklist form and should only take about 1-2 minutes.

The research questionnaire should take approximately 3-5 minutes to complete. For this research, you will fill in the questionnaire twice: after the training session/prior to the implementation of the music intervention and after 3-month implementation period. You have the option to complete the questionnaire at home and place it in a drop box that will be located in the facility's staff room or post it through a reply-paid envelope.

Providing information for the assessments of participating residents' stage of dementia, cognitive function, levels of agitation and quality of life should take approximately 15 minutes per resident. For the focus group and individual interviews, it should take approximately 30-60 minutes. The measure of engagement is a 6-item questionnaire and can be completed in approximately 5 minutes per resident.

What are the risks and benefits of participating?

Participating Residents with Dementia

Risks:

May experience some discomfort with the ear phones that will be used with the intervention. Also, some music may prompt recall of unwanted or sad memories which may trigger negative emotional response from participants. However, as demonstrated in the literature, use of personalised music as an intervention is generally safe. Headphones with padding have been selected to minimise any discomfort and the participating residents' response to the intervention will be monitored. If negative responses are noted, the intervention will be stopped immediately.

Benefits:

The expected benefits include reduction in agitation and apathy, increase in quality of life, and decrease in prescription and/or use of psychotropic medications. Also, creating a personalised playlist for each resident promotes individualised care and helps maintain the personhood of older people with dementia. In addition, this music intervention will provide an opportunity for those who are unable to verbalise and initiate leisure activities to be engaged with something that is tailored to their preferences and thus could be enjoyable.

Staff

Risks:

Risk for inconvenience is a possibility considering that the research involves filling in a questionnaire and participating in a focus group or individual interview which may take up to an hour of time. Additionally, the intervention will require extra work for the staff especially when participating in the training and implementation, including completing a log book each time the music is played. We hope that the benefits of the music intervention will outweigh any inconvenience to staff. This project has been endorsed by the facility manager with the knowledge that there may be additional time required of staff to support the implementation.

Benefits:

For health and allied health staff, results of this study will increase understanding on the strategies that can be utilized to effectively implement the music intervention. As this music intervention doesn't require a music therapist, staff could easily incorporate it into the resident's daily routine activities any time that it is needed. This could be especially useful where a person is experiencing behavioural and psychological symptoms of dementia.

How will your privacy be protected?

Security of the collected data will be protected from unauthorised use by encrypting the USB/external hard drives used to store your information. A password will be created for the knowledge and use of the researchers only.

Confidentiality and anonymity will be ensured by providing each participant with a pseudonym or code to be used consistently throughout the conduct of the study, data analysis, presentation of results and publication. Information that will identify or possibly identify the research participants will be removed at the end of data analysis. The encrypted USB/external hard drive, audio recordings, hard copy questionnaires and all other data from this research

will be physically stored in a locked filing cabinet in the Chief Investigator's office at the University of Newcastle, School of Nursing and Midwifery.

Should you decide to participate in a Focus Group Interview, it will be highlighted to all participants the importance of maintaining the confidentiality of the group discussion and not to divulge the content of the discussion to outside parties.

How will the information collected be used?

Information about staff's perspectives on the music intervention will be used in evaluating the implementation process in reference to the implementation outcome variables as well as the impact of the music intervention on the participating residents with dementia.

Collected data on participant-related outcomes (agitation, apathy, quality of life, prescription and/or use of psychotropic medications) as well as the implementation related outcomes from the questionnaires and interviews with staff and family/guardian will be published in a scientific journal and as part of Ms Minah Amor Gaviola's research dissertation required as part of her doctoral studies. Participants will not be identified in any reports arising from this project. For the audio recording, you will be able to review and edit or erase your contribution, including its transcripts.

At the completion of the research, you will be provided a summary of the results. Additionally, the researchers or the Facility Manager will communicate the outcomes of the study during staff meetings and post the summary of results in the staff room.

What do you need to do to participate?

Please read this Information Statement and be sure you understand its contents before you consent to participate. If there is anything you do not understand, or you have questions, contact the researcher.

If you would like to participate, please complete the attached Consent Form and return it to the Facility/Clinical Manager or in the reply paid envelope provided. You will be contacted by a member of the research team and provided with additional information regarding the research implementation.

Further information

If you would like further information, please contact student researcher [Minah Gaviola: 0422243231] or Chief Investigator [Kerry Inder: 02 40420522].

Thank you for considering this invitation.

[Signature]

[Name]

[Position]

Complaints about this research

This project has been approved by the University's Human Research Ethics Committee, Approval No. H- [H-2017-0116].

Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher, or, if an independent person is preferred, to the Human Research Ethics Officer, Research Services, NIER Precinct, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia, telephone (02) 4921 6333, email Human-Ethics@newcastle.edu.au.

5.8. Information statement for older people and their family or guardian –

RACF2

Kerry Inder
Associate Professor of Nursing
University of Newcastle
School of Nursing and Midwifery
University Drive, Callaghan NSW 2308, Australia
Tel: 02 40420522
kerry.inder@newcastle.edu.au

Information Statement for the Research Project:

Implementing Individualised Music Intervention for Older People with Dementia

Document Version 8; dated 29/11/17.

You and your [family member] are invited to participate in the research project identified above. The research is part of Ms Minah Amor Gaviola's doctoral studies at the University of Newcastle supervised by Associate Professor Kerry Inder and Professor Isabel Higgins from the School of Nursing and Midwifery and Dr. Sophie Dilworth and Dr. Liz Holliday from the School of Medicine and Public Health at the University of Newcastle.

Why is the research being done?

The purpose of the research is to evaluate the implementation of individualised music intervention in the form of preferred music listening for older people with dementia. Previous research has demonstrated the effectiveness of listening to preferred music in decreasing agitation and apathy as well as improving quality of life among older people with dementia. However, there is limited evidence regarding its successful adoption and implementation in residential aged care facilities. Thus, it is the intention of this research to evaluate the implementation process to develop successful strategies that can be utilised by the facility, staff and family in implementing and integrating the music intervention in the day to day care of older people with dementia.

Who can participate in this research?

We are seeking older people with diagnosis of dementia as well as their family members/guardians to participate in this research.

What would you and your [family member] be asked to do?

If you and your [family member] agree to participate, you and your [family member] may either choose to participate in all of the activities or participate only in activities of interest. Activities included are listed below:

1. Assessments

With you and your [family member]'s consent, you will undergo a number of assessments at baseline and at the end of the research period. This will include assessments to assess the severity of dementia, cognitive function, agitation, and quality of life. These will be completed by the student researcher with staff. Your response to the intervention in terms of acceptance, involvement, attitude, interaction and participation will be assessed during the first, second and third month of implementation. This will be done through a measure of engagement that will be completed by trained staff. Also, your prescription and/or use of medications to manage behaviours will be recorded. After signing a privacy and confidentiality agreement, the student researcher will access/record the following information:

- Specific diagnosis of dementia, if known;
- Previous or current interest in music;
- Psychotropic medications record for the past 4 weeks collected once at the beginning of the intervention and once at the end of the 3-month intervention period.
- Progress notes entry/documentation about the music intervention

2. Identification of Music Preferences

You and/or your [family member] will be asked to provide us with a list of your family member's favourite music by filling out the Assessment of Music Preference Form which is attached with this form.

3. Implementation of the Individualised Music Intervention

We will upload and create a playlist of the favourite music/songs in an iPod shuffle. Your [family member] will be provided with a set of headphones. The iPod shuffle and headphones are provided free of charge and your [family member] can continue using them as long as he/she is under the care of the facility. You and/or the staff can play the music anytime for various purposes such as prior to or during care, as a form of leisure activity, prior to expected agitation, among others.

4. Training Session (family members/guardian)

A 1-hour training session will be conducted by the student researcher several times for the staff and interested family member/guardian to ensure that everyone will be given the opportunity to attend in their convenient time. You will be informed and/or be provided with a copy of the schedule of the training sessions. You will be asked to list your name or inform the management and/or researchers of your preferred session. Content of the training session will cover information about dementia, impact of music on older people with dementia, evidence based protocol for use of individualised music, the individualised music intervention to be implemented, implementation outcome variables and resident related outcomes that the researchers are going to evaluate. You will be provided with education materials (booklet) containing concise information about the music intervention protocol for your reference. If you are interested, you may attend one of the scheduled sessions. Only those who attend the training session will be able to implement the intervention.

5. Focus group and/or individual interviews (family members/guardian)

You will also be invited to participate in focus group or individual interviews conducted by the student researcher and/or research supervisors in the 2nd to 3rd month of implementation to share your insights regarding the implementation of the music intervention and its impact on your [family member]. The interviews will be recorded/audiotaped. The interviews will be conducted in a private setting within the facility (e.g. meeting rooms). However, you may choose to have the interview conducted via a recorded telephone call.

What choice do you have?

Participation in this research is entirely your choice. Only those people who give their informed consent will be included in the project. You have the option to consent to participate in all of the activities or in activities of interest only. Whether or not you decide to participate, your decision will not disadvantage you and will not affect your relationship with the organisation.

If you and your [family member] do decide to participate and/or if you consent for your [family member] to participate, you and your [family member] may withdraw from the project at any time (e.g. up to the point of publication) without giving a reason and have the option of withdrawing any data which identifies you and your [family member].

How much time will it take?

Filling out the Assessment of Music Preference Form mainly depends on yours and your [family member's] memory/recall of his/her favourite music. You can take the form home so you will have plenty of time to complete it. The music intervention can be administered for as long as your [family member] likes it, by observation or by verbalisation. If you agree to participate in a focus group interviews or an individual interview, it should take approximately 30-60 minutes.

The assessments that your [family member] will undergo will take about 5-10 minutes for the cognitive assessment and 10-20 minutes for the agitation and quality of life assessments.

What are the risks and benefits of participating?

Risks:

Participating Residents with Dementia

May experience some discomfort with the ear phones that will be used with the intervention. We have selected headphones that are padded for comfort to try to minimise or remove this concern. Also, some music may prompt recall of unwanted or sad memories which may trigger negative emotional response from participants. However, as demonstrated in the literature, use of personalised music as an intervention is generally safe. These risks will be minimised by ensuring that the headphone and iPod shuffle are positioned properly, volume is adjusted appropriately and that the resident is in a comfortable position. Also, the participating resident will be monitored closely at the beginning of the intervention and then approximately every 15 minutes thereafter. If signs of discomfort are manifested or if the resident becomes agitated or distressed, the intervention will be stopped immediately.

Benefits:

The expected benefits include reduction in agitation and apathy, increase in quality of life, and decrease in prescription and/or use of psychotropic medications for residents. Creating a personalised playlist for each resident promotes individualised care and helps maintain the personhood of older people with dementia. In addition, this music intervention will provide an opportunity for those who are unable to verbalise and initiate leisure activities to be engaged with something that is tailored to their preferences and thus could be enjoyable.

Family Members/Guardian

Risks:

Risk for inconvenience is a possibility considering that the research involves attending a training session (if interested), filling in an Assessment of Music Preference Form and participating in focus group or individual interviews which could be time consuming. To address these risks, training sessions will be conducted several times so you can attend at a convenient time. For the focus group or individual interview, you will be informed in advance, at least three to four weeks prior to.

Benefits:

Playing the music to family/loved ones/friend with dementia could promote involvement in care, interaction and meaningful time spent together.

How will you and your family member's privacy be protected?

Security of the collected data will be protected from unauthorised use by encrypting the USB/external hard drives used to store your information. A password will be created for the knowledge and use of the researchers only. Confidentiality and anonymity will be ensured by providing each participant with pseudonym or code to be used consistently throughout the conduct of the study, data analysis, presentation of results and publication. Information that will identify or possibly identify the research participants will be removed at the end of data analysis. The encrypted USB/external hard drive, audio recordings, hard copy questionnaires and all other data from this research will be physically stored in a locked filing cabinet in the Chief Investigator's office at the University of Newcastle, School of Nursing and Midwifery.

Should you decide to participate in a Focus Group Interview, it will be highlighted to all participants the importance of maintaining the confidentiality of the group discussion and not to divulge the content of the discussion to outside parties.

How will the information collected be used?

Information on the participating residents' music preferences will be used in creating a personalised music playlist which is the intervention for this study. Assessments of participants' cognitive function and severity of dementia will be used to provide a general profile of the participants. Assessments of levels of agitation, apathy, quality of life and prescription and/or use of psychotropic medications will be used to evaluate the impact of music intervention specifically on patient/resident-related outcomes as stipulated in one of the research questions (Does the use of individualised music intervention for older people with dementia impact levels of agitation, apathy, quality of life and prescription or use of psychotropic medications?).

Information regarding family/guardian's perspectives on the music intervention will be used in evaluating the implementation process in reference to the implementation outcome variables as well as the impact of the music intervention on the participating residents with dementia.

Collected data on participant-related outcomes (agitation, apathy, quality of life, prescription and/or use of psychotropic medications) as well as the implementation related outcomes from the questionnaires and interviews with staff and family/guardian will be submitted for publication in a scientific journal and included in the research dissertation of Ms Minah Amor Gaviola as part of the requirements of her doctoral studies. Participants will not be identified in any reports arising from this project. For the audio recording, you will be able to review and edit or erase your contribution, including its transcripts.

At the completion of data analysis, you will be provided with the summary of results.

What do you need to do to participate?

Please read this Information Statement and be sure you understand its contents before you consent to participate. If there is anything you do not understand, or you have questions, contact the research team.

If you would like to participate, please complete the attached Consent Form and return it to the Facility/Clinical Manager or in the reply paid envelope provided. You will be contacted and provided with additional information regarding the research implementation.

Further information

If you would like further information, please contact student researcher [Minah Gaviola: 0422243231] or Chief Investigator [Kerry Inder: 02 40420522].

Thank you for considering this invitation.

[Signature]

[Name]

[Position]

Complaints about this research

This project has been approved by the University's Human Research Ethics Committee, Approval No. H- [H-2017-0116].

Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher, or, if an independent person is preferred, to the Human Research Ethics Officer, Research Services, NIER Precinct, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia, telephone (02) 4921 6333, email Human-Ethics@newcastle.edu.au.


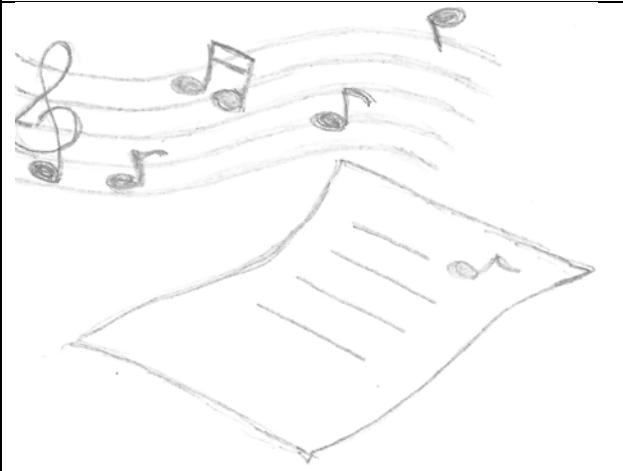
Information Statement for the Research Project (Additional Document):

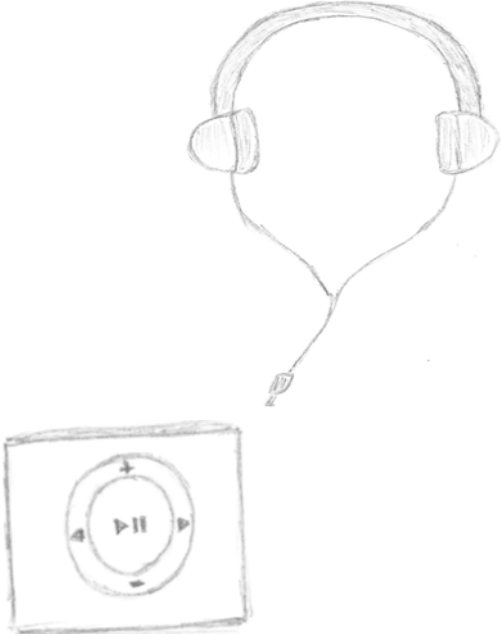

Implementing Individualised Music Intervention for Older People with Dementia

Individualised Music Intervention

- Involves listening to music based on your preferences.

Activities involved if you consent to participate:

	<p>You will undergo assessments to determine if this intervention is suitable for you, what we need to consider when implementing this intervention and to evaluate the effect of this intervention on you</p> <ul style="list-style-type: none">- Researchers will conduct an interview with you and/or your family or staff- Researchers will access medical records, care plans, assessments, progress notes, and prescription and/or use of medications
	<p>Your music preferences will be identified and a playlist of your favorite music will be loaded to a music player (iPod shuffle)</p>

	<p>Your family/guardian and the staff will play the music to you using headphones and iPod shuffle</p>
	<p>Your family/guardian and/or the staff who plays the music will monitor your response to the music played to make sure that it is enjoyable and not causing you distress or discomfort</p>

5.9. Consent form for family or guardian – RACF2

Kerry Inder
Associate Professor of Nursing
University of Newcastle
School of Nursing and Midwifery
University Drive, Callaghan NSW 2308, Australia
Tel: 02 40420522
kerry.inder@newcastle.edu.au

Consent Form for the Research Project:

[Implementing Individualised Music Intervention for Older People with Dementia]

[Associate Professor Kerry Inder (Clinical Investigator, Primary Supervisor), Minah Amor Gaviola (Student Researcher), Professor Isabel Higgins (Co-Investigator), Dr. Sophie Dilworth (Co-Investigator) and Dr. Liz Holliday (Co-Investigator)]

Document Version [6]; dated [29/11/17]

I agree for myself as a carer and my [family member] who is a resident of RACF 2 with Dementia to participate in the above research project and give my consent freely.

I understand that the project will be conducted as described in the Information Statement, a copy of which I have retained.

I understand I and/or my [family member] can withdraw from the project at any time, and do not have to give any reason for withdrawing.

I consent for my [family member] to:

Please tick the box/boxes of the activities that you agree for you or your [family member] to participate in this research project.

- ☐ Have the researchers gather information about my [family member]'s specific diagnosis of dementia, previous or current interest in music, access progress notes entry/documentation about the music intervention and record of psychotropic medication use over the past 4 weeks, after signing a privacy and confidentiality agreement the student researcher will record.
- ☐ Undergo assessments to assess severity of dementia, cognitive function, agitation, quality of life and response to the music intervention.
- ☐ Receive the music intervention using iPod shuffle and headphone for various purposes (e.g. leisure activity, prior to cares, prior to expected agitation).

I also consent for myself to:

Please tick the box/boxes of the activities that you agree to participate in this research project.

- ☐ Fill out an Assessment of Music Preference Form.
- ☐ Participate in a training session about individualised music intervention and its benefits.

- ☐ Implement the music intervention by playing preferred music to my _____ during visits.
- ☐ Participate in recorded/audiotaped focus groups or individual interviews to share insights regarding the implementation of the music intervention and its impact.
- ☐ Have direct quotes from my interview/s included in the research outcomes, with the use of pseudonyms

I understand that my personal information will remain confidential.

I have had the opportunity to have questions answered to my satisfaction.

- ☐ I would like to receive a summary of the results at the completion of the study.

Print Name:

Carer:

Resident:

Signature:

Date:

Contact Details (Optional)

Phone:

Email Address:

Preferred method of contact:

5.10. Consent form for older person – RACF2

Kerry Inder
Associate Professor of Nursing
University of Newcastle
School of Nursing and Midwifery
University Drive, Callaghan NSW 2308, Australia
Tel: 02 40420522
kerry.inder@newcastle.edu.au

Consent Form for the Research Project:

**[Implementing Individualised Music Intervention for Older People with Dementia]
[Associate Professor Kerry Inder (Clinical Investigator, Primary Supervisor), Minah Amor Gaviola (Student Researcher), Professor Isabel Higgins (Co-Investigator), Dr. Sophie Dilworth (Co-Investigator) and Dr. Liz Holliday (Co-Investigator)]**

Document Version [6]; dated [29/11/17]

I [name of resident], a resident of RACF 2, agree to participate in the above research project and give my consent freely.

I understand that the project will be conducted as described in the Information Statement, a copy of which I have retained.

I understand I can withdraw from the project at any time, and do not have to give any reason for withdrawing.

I consent to:

Please tick the box/boxes of the activities that you agree to participate in as part of this research project.

- ☐ Fill out an Assessment of Music Preference Form.
- ☐ Have the student researcher gather information about my specific diagnosis of dementia, previous or current interest in music, access progress notes entry/documentation about the music intervention and record of psychotropic medication use over the past 4 weeks, after signing a privacy and confidentiality agreement the student researcher will record.
- ☐ Undergo assessments to determine dementia severity, cognitive function, agitation, quality of life, and response to the music intervention.
- ☐ Receive the music intervention using an iPod shuffle and headphones for various purposes (e.g. leisure activity, prior to care, prior to expected agitation, management of agitation and/or apathy).

I understand that my personal information will remain confidential.

I have had the opportunity to have questions answered to my satisfaction.

- ☐ I would like to receive a summary of the results at the completion of the study.

Print Name: _____

Signature: _____ **Date:** _____

Contact Details (Optional)

Phone:

Email Address:

Preferred method of contact:

5.11. Consent form for the residential aged care facility – RACF2

Kerry Inder
Associate Professor of Nursing
University of Newcastle
School of Nursing and Midwifery
University Drive, Callaghan NSW 2308, Australia
Tel: 02 40420522
kerry.inder@newcastle.edu.au

Consent Form for the Research Project:

**[Implementing Individualised Music Intervention for Older People with Dementia]
[Associate Professor Kerry Inder (Clinical Investigator, Primary Supervisor), Minah Amor Gaviola (Student Researcher), Professor Isabel Higgins (Co-Investigator), Dr. Sophie Dilworth (Co-Investigator) and Dr. Liz Holliday (Co-Investigator)]**

Document Version [5]; dated [29/11/17]

The management of [name of facility] agrees to participate in the above research project and give our consent freely.

The management understand that the project will be conducted as described in the Information Statements for Staff, Family and Residents, copies of which we have retained.

We understand that we can withdraw from the project at any time and do not have to give any reason for withdrawing.

We consent to:

Please tick the box/boxes of the activities that you agree to participate in as part of this research project.

- ☐ Provide a venue and needed resources (e.g. laptops, LCD projector) for use during the training sessions for staff and family members/guardian.
- ☐ Have the student researcher access the following information about the participating residents after being registered as a volunteer in the organisation and signing the privacy and confidentiality agreement:
 - Specific diagnosis of dementia
 - Previous or current interest in music
 - Psychotropic medications record
 - Access progress notes entry/documentation about the music intervention
- ☐ Take part in the recruitment process by:
 - identifying potential participating residents based on a diagnosis of dementia
 - providing a venue and time for information sessions
 - distribute research posters/advertisement about the research and information statements
 - receive signed informed consent forms
 - answer queries about the research project
- ☐ Have the music intervention implemented by trained staff and/or family to participating residents with dementia and document implementation in the logbook provided
- ☐ Have the staff provide information to the student researcher for the assessment of residents' stage of dementia, cognitive function, levels of agitation and quality of life and complete a measure of engagement of residents during the intervention. Staff will be given a gift voucher as reimbursement for their time.

- ☐ Having members of staff participate in recorded/audiotaped focus group or individual interviews intended for management staff about the implementation process. Staff will be given a gift voucher as reimbursement for their time.

We have had the opportunity to have questions answered to our satisfaction.

- ☐ We would like to receive a summary of the results at the completion of the study.

Print Name: _____

Position: _____

Name of the Facility: _____

Signature: _____ **Date:** _____

Contact Details (Optional)

Phone:

Email Address:

Preferred method of contact:

Appendix 6 – HREC approval letters

6.1. HREC expedited approval

Appendix 6 removed for copyright reasons.

6.2. HREC expedited approval – variation 1

6.3. HREC expedited approval – variation 2

6.4. HREC expedited approval – variation 3

Appendix 7 – Laminated card

Front

INDIVIDUALISED MUSIC INTERVENTION FOR OLDER PEOPLE WITH DEMENTIA

Individualised Music Intervention—involves listening to music according to one's preferences

Benefits of individualised music listening intervention:

- Provision of care that recognises the personhood of people with dementia
- A non-pharmacologic/non-medication intervention for the management of behavioural and psychological symptoms of dementia (such as agitation, anxiety and depression)
- A form of leisure activity for people with dementia
- Can be implemented by trained staff and family caregivers anytime in any setting when needed
- Promotes meaningful interaction between staff / family and the person with dementia

For further information please contact:
Minah Amor Gaviola
M: 0422 243 231
E: minahamor.gambong@uon.edu.au



Back

PROTOCOL FOR THE IMPLEMENTATION OF INDIVIDUALISED MUSIC INTERVENTION

1. Individualise music selection.
2. Play the music to the resident for various purposes (such as before or during care, prior to perceived or expected agitation, management of agitation, as a leisure activity)
3. Suggested duration is 30 minutes, however you may play the music for as long as the resident enjoys it as assessed (by asking or observation)
4. If used for agitation, recommendation is for music to be played 30 minutes prior to expected agitation.
5. Regularly check on the resident to assess responses to the music intervention (monitor the resident closely at the beginning of the intervention and then approximately every 15 minutes thereafter)
6. If the resident shows signs of discomfort and/or distress and if the behavior warranting the intervention continues, stop the intervention and report to the registered nurse

*This protocol is guided by the Evidence Based Guideline. Individualised Music for Elders with Dementia (Gerdner, 2007)

Appendix 8 – Anonymous feedback form

Feedback Form

Implementing Individualised Music Intervention for Older People with Dementia: A Mixed Methods Study

Please share your thoughts and concerns relating to the research project and/or the implementation of the music intervention

Feedback type

- ☐ Comments/Concerns ☐ Suggestions ☐ Questions

Details of Feedback:

Please drop this form in the survey box located in the facility's staff room.

Appendix 9 – Staff training session preferences

Dear Staff,

If you are interested in participating in the **implementation of individualised music intervention for older people with dementia**, please list your name for the scheduling of training sessions. The training will cover information about **dementia, management of dementia, music and dementia, use of individualised music for people with dementia and the individualised music intervention protocol to be implemented**. Also, please ensure you have read the **participant information statement and sign the attached consent form**. Participation is voluntary and you are free to withdraw from participation at any time during the study/implementation period. Please feel free to contact me if you have questions. - Minah

Name	Preferred training date

Appendix 10 – Correspondence to authors

10.1. Gerdner

Reply Reply All Forward
Tue 27/06/2017 10:46 PM
Linda Gerdner <lgerdner@gmail.com>
Re: Evidence-Based Guideline: Individualized Music for Persons with Dementia 5th Edition
To: Minah Amor Gaviola
You replied to this message on 28/06/2017 6:35 AM.

Action Items + Get more app

The evidence-based protocol is copyright, but it is intended to be used. Yes, I am honored that you will be using the protocol in your study. Please do provide proper citation. I will also be happy to help in any way possible. Best of luck on your study. I look forward in seeing your published manuscript. Best of luck.
Linda

On Mon, Jun 26, 2017 at 9:41 PM, Minah Amor Gaviola <MinahAmor.Gambong@uon.edu.au> wrote:

Dear Dr. Gerdner,

My name is Minah Gaviola, a PhD student from the University of Newcastle Australia. I am going to do an implementation research on an individualized music intervention using your evidence-based protocol as a guide. This will be conducted in two residential aged care facilities in Australia. My research is intended for publication. I just want to confirm if there are any copyright issues involved if I use your guideline provided that I will properly cite/reference it?

Looking forward for your response.

Thank you.

Regards,

Minah

10.2. Baker

Reply Reply All Forward
Mon 17/07/2017 10:17 AM
Jess Baker <jessica.baker@unsw.edu.au>
RE: The Homecare Measurement of Engagement
o Minah Amor Gaviola
You replied to this message on 17/07/2017 10:28 AM.

Action Items + Get more app

Hi Minah,




Good to hear from you and the work you are doing. Are you wanting to record present moment engagement during music sessions, or general engagement with care staff over a week for example? The reason I ask is that the paper you have read uses a measure that asks over the last week or so, but I have also adapted the measure for present moment engagement - <http://journals.sagepub.com/doi/abs/10.1177/1533317517703477>

Let me know which you would prefer and I shall send to you.

Thanks,

Jess

Dr Jess Baker
Lecturer
Psychiatry Research and Teaching Unit
THE UNIVERSITY OF NEW SOUTH WALES
L1 Mental Health Centre | Liverpool Hospital | NSW | 2170
T +61 2 9616 4204

10.3. Lyon

From: Aaron Lyon (mailto:lyona@uw.edu)
Sent: Saturday, 22 April 2017 8:36 AM
To: Minah Amor Gaviola <MinahAmor.Gambong@uon.edu.au>
Subject: Re: Training/Practice Acceptability/Feasibility/Appropriateness Scale

Hi Minah,

Thanks for your interest. I think the best way to cite the measure would be...

Lyon, A. R. (2011). Training/Practice Acceptability, Feasibility, and Appropriateness Scale. Unpublished measure. University of Washington.

...although feel free to tweak as needed.

-Aaron

On 4/18/2017 4:08 PM, Minah Amor Gaviola wrote:

Dear Mr Lyon,

My name is Minah Gaviola, a PhD student from the University of Newcastle Australia. I am doing an implementation research for my PhD studies titled "Implementing Individualised Music Intervention for Older People with Dementia: A Mixed Methods Study" which is intended for publication. I am interested in using the Training/Practice Acceptability/Feasibility/Appropriateness Scale. I was able to find a full copy of the instrument from the Society for Implementation Research Collaboration (SIRC) website, however, there are no details regarding the appropriate referencing. Would you be able to provide me with the details as to how I reference the instrument? It would be very helpful for me.

Thank you.

Regards,

Minah

10.4. Young

Reply Reply All Forward

Fri 21/04/2017 3:30 AM



John Young <jnyoung1@olemiss.edu>
Re: Measure of Disseminability (MOD)

To: Minah Amor Gaviola

You replied to this message on 21/04/2017 6:00 AM.

MOD factors.xlsx
38 KB

MOD Final measure.docx
86 KB

Hi Minah,

Sure - measure is attached, as well as a blank table to discern factors/subscales. We still haven't managed to get this published, though, so please be aware that the only citation is currently a poster.

If you have questions or anything please feel free to ask. I'll help if I can!

John

John Young, Ph.D.
Associate Professor of Psychology
Director, SITH Lab
University of Mississippi

On Apr 18, 2017, at 5:54 PM, Minah Amor Gaviola <minahamor.gambong@uon.edu.au> wrote:

Dear Mr Young,

I am Minah Gaviola, a PhD student of the University of Newcastle Australia. I am doing an implementation research for my PhD studies. I am interested in the Measure of Disseminability (MOD). I am wondering if you would be able to give me information as to how I can access it?

Many thanks and looking forward for your response.

Kind Regards,

Appendix 11 – Assessment of music preferences: Gerdner

Appendix 11 removed for copyright reasons.

Appendix 12 – Implementation outcomes questionnaire

12.1. Pre-implementation

Staff Survey

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THE UNIVERSITY OF
NEWCASTLE
AUSTRALIA

Implementing individualised music intervention for older people with dementia: a mixed methods study

This survey will help the research team to identify changes over time that are impacting on the implementation of the individualised music listening intervention. If you are unsure about an answer, please give the best answer that you can.

Any information you give is strictly confidential. Although the questionnaire does not ask for your name, you may still be potentially identifiable to the student researcher due to that nature of the demographic questions asked. However, you have the option to respond to these questions or not.

If you have any questions or would like more information, please call our research team (Minah Gaviola: 0422243231; Kerry Inder 02 40420522).

Once complete please put this survey in the reply-paid envelope provided and post it as soon as possible.

OR return to the survey box located in the facility's staff room.

...

Thank you for completing this important survey.

Section A: General Information

The next questions ask some general information about you. Please circle the number that corresponds your response or fill in the required information as needed.

<i>About you:</i>		
A1.	What is your date of birth?	<div>_____ / _____ / _____</div> <div><input type="checkbox"/> I would prefer not to answer (please tick)</div>
A2.	Are you male or female?	<div>1 Male</div> <div>2 Female</div> <div>3 I would prefer not to answer</div>
A3.	How many years have you worked in aged care?	<div>1 Less than one year</div> <div>2 1-4 years</div> <div>3 5-9</div> <div>4 10+ years</div> <div>5 I would prefer not to answer</div>
A4.	What is your role within the service?	<div>6 Registered nurse</div> <div>7 Enrolled nurse</div> <div>8 Care assistant</div> <div>9 Allied health</div> <div>10 Leisure and lifestyle staff</div> <div>11 I would prefer not to answer</div>
A5.	What is your employment status	<div>12 Full time</div> <div>13 Permanent part time</div> <div>14 Casual</div> <div>15 I would prefer not to answer</div>
A6.	How many hours do you usually work in a week?	<div>16 At least 8 hours</div> <div>17 8 to 24 hours</div> <div>18 More than 24 hours</div> <div>19 I would prefer not to answer</div>

Section B: The training component of the intervention(Lyon, 2011)

The following questions ask about your perceptions regarding the training provided about the individualised music listening intervention. Please circle the number that represents how much you personally agree or disagree with each questions using the following scale:

		Not at all		Moderatel y		Extremel y
Training Acceptability						
B1.	To what extent are you satisfied with the training you received about the intervention covered?	0	1	2	3	4
B2.	How credible did you find the presenters?	0	1	2	3	4
B3.	How well organized and executed do you believe the training program to be?	0	1	2	3	4
B4.	How satisfied are you with the content of the training about the music listening intervention covered?	0	1	2	3	4
B5.	How satisfied are you with the complexity of the training about the music listening intervention covered?	0	1	2	3	4
B6.	How comfortable are you with the music listening intervention contained within the training?	0	1	2	3	4
Training Feasibility						
B7.	Will the information provided in the training be useful in your everyday clinical practice??	0	1	2	3	4
B8.	Will you be able to incorporate the concepts and techniques from the training in your daily work activities?	0	1	2	3	4
B9.	How compatible is the intervention with the practical realities and resources in your service setting?	0	1	2	3	4
Training Appropriateness						
B10.	How compatible is the intervention with the mission or service provision mandate in your service setting?	0	1	2	3	4
B11.	How relevant are the information and intervention to your client population?	0	1	2	3	4
B12.	How well do the information and intervention fit with your current skill set?	0	1	2	3	4
B13.	How compatible are the information and intervention with your workflow timing (e.g., when and for how long you see clients)?	0	1	2	3	4
B14.	How well do the information and intervention from the training fit with your overall approach	0	1	2	3	4

	to service delivery and the setting in which you provide care?					
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Section C. Measure of Disseminability (Trent et al., 2010)

Please read the following questions and circle the number that best reflects your opinion of the individualised music listening intervention. This is not a test and there are no right or wrong answers.

		Not at All			Some what			Very Much
C1.	Overall, how acceptable is the proposed music listening intervention?	1	2	3	4	5	6	7
C2.	How ethical is the music listening intervention?	1	2	3	4	5	6	7
C3.	How effective do you think this intervention might be?	1	2	3	4	5	6	7
C4.	How knowledgeable do you think the researchers are?	1	2	3	4	5	6	7
C5.	How successful do you think this intervention would be in symptom reduction?	1	2	3	4	5	6	7
C6.	How confident would you be in recommending this intervention to a friend who experiences similar problems?	1	2	3	4	5	6	7
C7.	How likely is it that the patient in this scenario would put forth the necessary time and effort outside of session?	1	2	3	4	5	6	7
C8.	How efficient is the proposed music listening intervention?	1	2	3	4	5	6	7
C9.	How stressful would the proposed music listening intervention be for the patient?	1	2	3	4	5	6	7
C10.	How stressful would the proposed music listening intervention be for others involved (staff, family, friends)	1	2	3	4	5	6	7
C11.	How much does this intervention fit with your personal ideas about what treatment should be?	1	2	3	4	5	6	7
C12.	How intrusive is the proposed music listening intervention?	1	2	3	4	5	6	7
C13.	How much improvement could be expected as a result of this intervention?	1	2	3	4	5	6	7
C14.	How humane is the proposed music listening intervention?	1	2	3	4	5	6	7
C15.	If this intervention was suggested to you how likely would you be to use it if: a close friend/co-worker who had never used it suggested it?	1	2	3	4	5	6	7
C16.	If this intervention was suggested to you how likely would you be to use it if: a close friend/co-worker who had used it	1	2	3	4	5	6	7

	and reported a good experience suggested it?							
C17.	Are the ultimate goals of this intervention worth the cost (time, money, etc.)?	1	2	3	4	5	6	7
C18.	How uncomfortable would the patient feel as a result of this intervention?	1	2	3	4	5	6	7
C19.	If you had dementia and no other information about the intervention other than what you just heard, how likely would you be to pursue this treatment as your first choice?	1	2	3	4	5	6	7
C20.	How fast do you feel your improvement would occur as a result of this intervention?	1	2	3	4	5	6	7
C21.	How positively would participation in this intervention affect the patient's everyday life?	1	2	3	4	5	6	7
C22.	How negatively would participation in this intervention affect the patient's everyday life?	1	2	3	4	5	6	7
C23.	How safe does the music listening intervention seem?	1	2	3	4	5	6	7
C24.	How likely would you be to seek out more information about this intervention if you were experiencing similar problems?	1	2	3	4	5	6	7
C25.	How long do you think that the effects of this intervention would last after the patient finished the music listening session?	1	2	3	4	5	6	7
C26.	How positive do you feel the long-term effects of this intervention would be?	1	2	3	4	5	6	7
C27.	How appealing do you find the proposed music listening intervention?	1	2	3	4	5	6	7
C28.	What is your emotional reaction to this music listening intervention?	1 Very Negative	2	3	4 Neutral	5	6	7 Very positive
C29.	How well does this intervention fit in with your existing outlook on life?	1	2	3	4	5	6	7
C30.	How do you think this music listening intervention would compare to other interventions/treatments you have seen or heard about?	1	2	3	4	5	6	7
C31.	How do you think this music listening intervention would compare to medication?	1 Much Worse	2	3	4 About the same	5	6	7 Much better

If there is anything more you would like the researchers to know about your experiences with the implementation of the individualised music listening intervention please write your comments below:

[illegible]

Thank you for taking the time to complete this survey. *Please put this survey in the reply-paid envelope provided and post it as soon as possible.** OR return to the survey box located in the facility's staff room.**

12.2. Post-implementation

Staff Survey

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THE UNIVERSITY OF
NEWCASTLE
AUSTRALIA

Implementing individualised music intervention for older people with dementia: a mixed methods study

This survey will help the research team to identify changes over time that are impacting on the implementation of the individualised music listening intervention. If you are unsure about an answer, please give the best answer that you can.

Any information you give is strictly confidential. Although the questionnaire does not ask for your name, you may still be potentially identifiable to the student researcher due to that nature of the demographic questions asked. However, you have the option to respond to these questions or not.

If you have any questions or would like more information, please call our research team (Minah Gaviola: 0422243231; Kerry Inder 02 40420522).

Once complete please put this survey in the reply-paid envelope provided and post it as soon as possible.

OR return to the survey box located in the facility's staff room.

...

Thank you for completing this important survey.

Section A: General Information

The next questions ask some general information about you. Please circle the number that corresponds your response or fill in the required information as needed.

About you:		
A1.	What is your date of birth?	<div>_____ / _____ / _____</div> <div><input type="checkbox"/> I would prefer not to answer (please tick)</div>
A2.	Are you male or female?	<div>4 Male</div> <div>5 Female</div> <div>6 I would prefer not to answer</div>
A3.	How many years have you worked in aged care?	<div>20 Less than one year</div> <div>21 1-4 years</div> <div>22 5-9</div> <div>23 10+ years</div> <div>24 I would prefer not to answer</div>
A4.	What is your role within the service?	<div>25 Registered nurse</div> <div>26 Enrolled nurse</div> <div>27 Care assistant</div> <div>28 Allied health</div> <div>29 Leisure and lifestyle staff</div> <div>30 I would prefer not to answer</div>
A5.	What is your employment status	<div>31 Full time</div> <div>32 Permanent part time</div> <div>33 Casual</div> <div>34 I would prefer not to answer</div>
A6.	How many hours do you usually work in a week?	<div>35 At least 8 hours</div> <div>36 8 to 24 hours</div> <div>37 More than 24 hours</div> <div>38 I would prefer not to answer</div>

Section C. Measure of Disseminability (Trent et al., 2010)

Please read the following questions and circle the number that best reflects your opinion of the individualised music listening intervention. This is not a test and there are no right or wrong answers.

		Not at All			Some what			Very Much
C1.	Overall, how acceptable is the proposed music listening intervention?	1	2	3	4	5	6	7
C2.	How ethical is the music listening intervention?	1	2	3	4	5	6	7
C3.	How effective do you think this intervention might be?	1	2	3	4	5	6	7
C4.	How knowledgeable do you think the researchers are?	1	2	3	4	5	6	7
C5.	How successful do you think this intervention would be in symptom reduction?	1	2	3	4	5	6	7
C6.	How confident would you be in recommending this intervention to a friend who experiences similar problems?	1	2	3	4	5	6	7
C7.	How likely is it that the patient in this scenario would put forth the necessary time and effort outside of session?	1	2	3	4	5	6	7
C8.	How efficient is the proposed music listening intervention?	1	2	3	4	5	6	7
C9.	How stressful would the proposed music listening intervention be for the patient?	1	2	3	4	5	6	7
C10.	How stressful would the proposed music listening intervention be for others involved (staff, family, friends)	1	2	3	4	5	6	7
C11.	How much does this intervention fit with your personal ideas about what treatment should be?	1	2	3	4	5	6	7
C12.	How intrusive is the proposed music listening intervention?	1	2	3	4	5	6	7
C13.	How much improvement could be expected as a result of this intervention?	1	2	3	4	5	6	7
C14.	How humane is the proposed music listening intervention?	1	2	3	4	5	6	7
C15.	If this intervention was suggested to you how likely would you be to use it if: a close friend/co-worker who had never used it suggested it?	1	2	3	4	5	6	7
C16.	If this intervention was suggested to you how likely would you be to use it if: a close friend/co-worker who had used it and reported a good experience suggested it?	1	2	3	4	5	6	7
C17.	Are the ultimate goals of this intervention worth the cost (time, money, etc.)?	1	2	3	4	5	6	7

C18.	How uncomfortable would the patient feel as a result of this intervention?	1	2	3	4	5	6	7
C19.	If you had dementia and no other information about the intervention other than what you just heard, how likely would you be to pursue this treatment as your first choice?	1	2	3	4	5	6	7
C20.	How fast do you feel your improvement would occur as a result of this intervention?	1	2	3	4	5	6	7
C21.	How positively would participation in this intervention affect the patient's everyday life?	1	2	3	4	5	6	7
C22.	How negatively would participation in this intervention affect the patient's everyday life?	1	2	3	4	5	6	7
C23.	How safe does the music listening intervention seem?	1	2	3	4	5	6	7
C24.	How likely would you be to seek out more information about this intervention if you were experiencing similar problems?	1	2	3	4	5	6	7
C25.	How long do you think that the effects of this intervention would last after the patient finished the music listening session?	1	2	3	4	5	6	7
C26.	How positive do you feel the long-term effects of this intervention would be?	1	2	3	4	5	6	7
C27.	How appealing do you find the proposed music listening intervention?	1	2	3	4	5	6	7
C28.	What is your emotional reaction to this music listening intervention?	1 Very Negative	2	3	4 Neutral	5	6	7 Very positive
C29.	How well does this intervention fit in with your existing outlook on life?	1	2	3	4	5	6	7
C30.	How do you think this music listening intervention would compare to other interventions/treatments you have seen or heard about?	1	2	3	4	5	6	7
C31.	How do you think this music listening intervention would compare to medication?	1 Much Worse	2	3	4 About the same	5	6	7 Much better

If there is anything more you would like the researchers to know about your experiences with the implementation of the individualised music listening intervention please write your comments below:

Thank you for taking the time to complete this survey. *Please put this survey in the reply-paid envelope provided and post it as soon as possible.** OR return to the survey box located in the facility's staff room.**

Appendix 13 – Resident’s music intervention logbook

Implementing the Individualised Music Intervention - Resident’s Logbook

Resident’s name:

Date	Shift	Duration of Music Intervention	Reasons/s for using the Intervention	Effect/s on the resident (can tick more than one)
	<input type="checkbox"/> AM <input type="checkbox"/> PM <input type="checkbox"/> Night	<input type="checkbox"/> < 5 minutes <input type="checkbox"/> 5-10 minutes <input type="checkbox"/> 11-15 minutes <input type="checkbox"/> 16-30 minutes <input type="checkbox"/> > 30 minutes	<input type="checkbox"/> Agitation <input type="checkbox"/> Apathy <input type="checkbox"/> Prior to care <input type="checkbox"/> Leisure activity <input type="checkbox"/> Others:	<input type="checkbox"/> ↓ agitation <input type="checkbox"/> ↑ agitation <input type="checkbox"/> ↓ apathy <input type="checkbox"/> ↑ apathy <input type="checkbox"/> Enjoyed the activity <input type="checkbox"/> No response or no effects observed <input type="checkbox"/> Other (please state):
	<input type="checkbox"/> AM <input type="checkbox"/> PM <input type="checkbox"/> Night	<input type="checkbox"/> < 5 minutes <input type="checkbox"/> 5-10 minutes <input type="checkbox"/> 11-15 minutes <input type="checkbox"/> 16-30 minutes <input type="checkbox"/> > 30 minutes	<input type="checkbox"/> Agitation <input type="checkbox"/> Apathy <input type="checkbox"/> Prior to care <input type="checkbox"/> Leisure activity <input type="checkbox"/> Others:	<input type="checkbox"/> ↓ agitation <input type="checkbox"/> ↑ agitation <input type="checkbox"/> ↓ apathy <input type="checkbox"/> ↑ apathy <input type="checkbox"/> Enjoyed the activity <input type="checkbox"/> No response or no effects observed <input type="checkbox"/> Other (please state):
	<input type="checkbox"/> AM <input type="checkbox"/> PM <input type="checkbox"/> Night	<input type="checkbox"/> < 5 minutes <input type="checkbox"/> 5-10 minutes <input type="checkbox"/> 11-15 minutes <input type="checkbox"/> 16-30 minutes <input type="checkbox"/> > 30 minutes	<input type="checkbox"/> Agitation <input type="checkbox"/> Apathy <input type="checkbox"/> Prior to care <input type="checkbox"/> Leisure activity <input type="checkbox"/> Others:	<input type="checkbox"/> ↓ agitation <input type="checkbox"/> ↑ agitation <input type="checkbox"/> ↓ apathy <input type="checkbox"/> ↑ apathy <input type="checkbox"/> Enjoyed the activity <input type="checkbox"/> No response or no effects observed <input type="checkbox"/> Other (please state):

Student Researcher: Minah Gaviola

Telephone: 0422243231; Email: minahamor.gambong@uon.edu.au

Appendix 14 –CMAI

Appendix 14 removed for copyright reasons.

Appendix 15 – DEMQOL

15.1. Patient version

Appendix 15 removed for copyright reasons.

15.2. Carer version

Appendix 16 – HoME-S

Appendix 16 removed for copyright reasons.

Appendix 17 – PAS

Appendix 17 removed for copyright reasons.

Appendix 18 – GDS scale

Appendix 18 removed for copyright reasons.

Appendix 19 – Educational material for all staff

Individualised Music Intervention for Older People with Dementia
Conducted by student researcher Minah Gaviola
Telephone: 0422243231; Email: minahamor.gambong@uon.edu.au

Instructions for staff:

The following information covers the basic concepts about the implementation of the individualised music intervention for people with dementia. Implementing the intervention in accordance to the protocol will help ensure its proper administration to the residents with dementia and minimise possible discomfort. If you are interested in implementing the intervention or have already implemented the intervention but has not completed the training session, please read the information below and write your name and signature at the back of this form.

Individualised music listening intervention—involves listening to music according to one's preferences

Benefits of individualised music listening:

- Provision of care that recognises the personhood of people with dementia
- A non-pharmacologic/non-medication intervention for the management of behavioural and psychological symptoms of dementia (such as agitation, anxiety and depression)
- Shown to have positive impact on memory, cognition and quality of life of people with dementia
- A form of leisure activity for people with dementia
- Can be implemented by trained staff and family caregivers anytime in any setting when needed
- Promotes meaningful interaction between staff /family and the person with dementia

Protocol for the Implementation of Individualised Music Listening Intervention

Guided by the Evidence Based Guideline. Individualised Music for Elders with Dementia (Gerdner, 2007)

1. Individualise music selection.

- Interview resident and/or family about the resident's music preferences.

2. Play the music to the resident for various purposes (such as before or during care, prior to perceived or expected agitation, management of agitation, or as a leisure activity)

3. Suggested duration is 30 minutes, however you may play the music for as long as the resident enjoys it as assessed (by asking or observation).

- Note: avoid leaving the headphone and iPod shuffle with the resident for a long period of time (e.g whole day or overnight) as this may cause too much stimulation which is not beneficial for people with dementia.

4. If used for agitation, recommendation is for preferred music to be played 30 minutes prior to expected agitation.

5. Regularly check on the resident to assess responses to the music intervention (monitor the resident closely at the beginning of the intervention and then approximately every 15 minutes thereafter)

6. If the resident shows signs of discomfort and/or distress and if the behavior warranting the intervention continues, stop the intervention and report to the registered nurse and the researcher. The resident in this situation may need another intervention to address the behavior of concern or some of the songs in the playlist may have triggered a negative response. Playlists can be modified when needed.

NOTE: Please do not forget to charge the iPod shuffle regularly and put the equipment back in the container.

Name of Staff	Position/Role	Signature	Date

Thank you!

Appendix 20 – Assessment of music preferences – modified version

MUSIC PREFERENCES

Please list your family member's favourite music (specific artists, albums, songs) or types of music (country, western, classical, spiritual/religious, jazz, rock and roll, ethnic/cultural) in the space provided below.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

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