Music therapy for dementia

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MUSIC THERAPY FOR DEMENTIA

The effect of music therapy in reducing behavioural problems in elderly people with dementia

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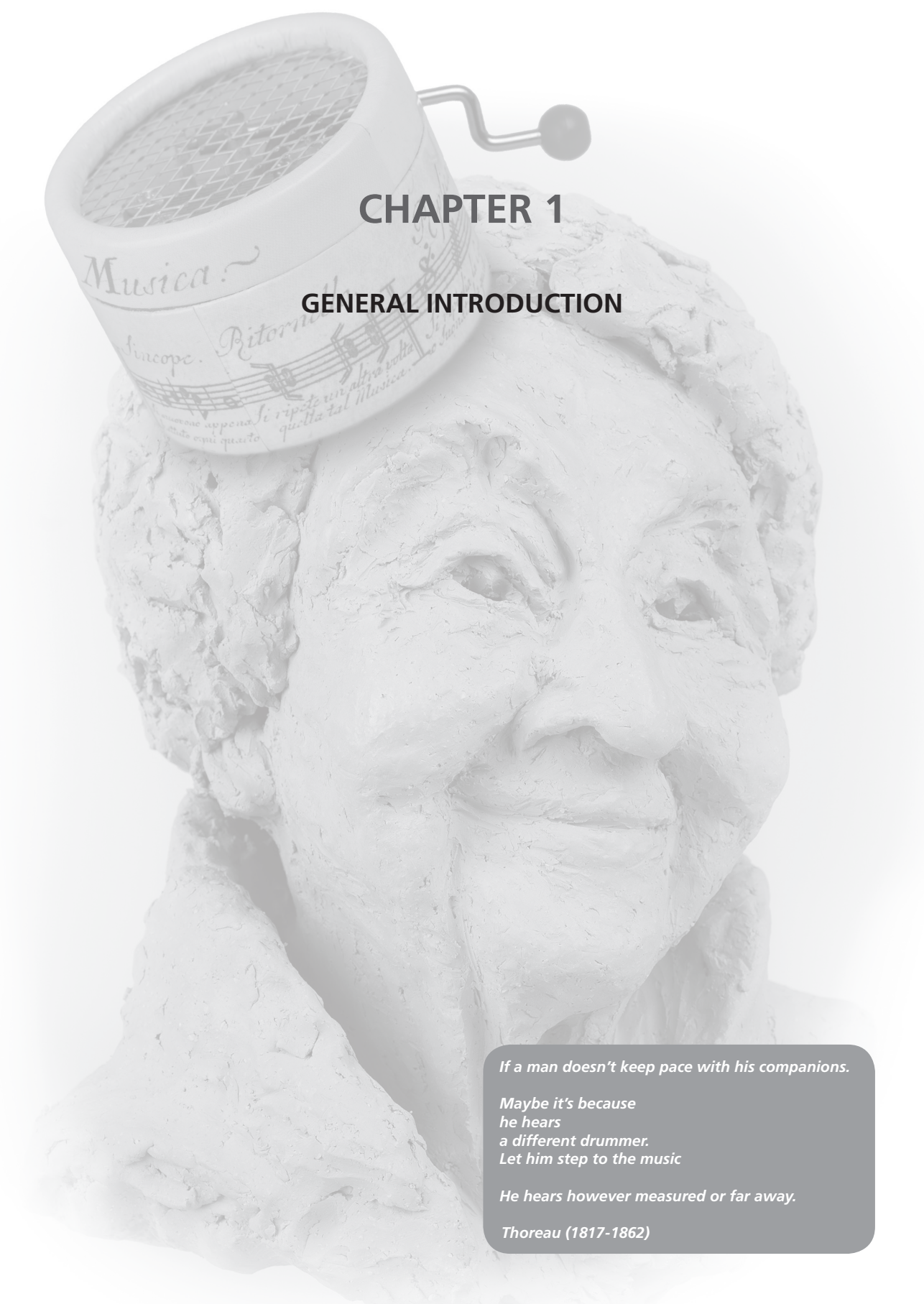

CHAPTER 1

GENERAL INTRODUCTION

If a man doesn't keep pace with his companions.

Maybe it's because
he hears
a different drummer.
Let him step to the music

He hears however measured or far away.

Thoreau (1817-1862)

1. General introduction

Sometimes you can be confronted with a particular tune and it suddenly brings you back in time. You relive all sorts of memories and feel the emotions as you experienced them before. When hearing a particular tune you can find yourself walking in Paris again, but also further back in time, at your grandmother's kitchen table. At the same time, while you experience the pleasant childhood memories such as the kitchen smells, your grandmother herself may have well forgotten what her own house looked like as a result of dementia.

Dementia is a progressive decline of cognitive functions in which people will gradually lose memories of their past. Bender et al. (1997) describe demented people aptly as 'the inhabitants of a lost kingdom'. Many approaches have been developed to preserve or stimulate recollection of important life events with demented elderly people in order to improve their quality of life. Many of these approaches depend on verbal communication. One of the most powerful cues to regain access to 'forgotten memories' is music (Vink, 2001a).

Music has many things to offer for people with dementia. In the earlier stages of dementia, music helps to recall important life events. Musical memories are generally often longer preserved than non-musical memories (Broersen et al., 1995). A couple may have pleasant memories listening to the music which was played at their wedding day, whereas talking about the wedding or watching pictures does not always incite responses.

Elderly people with dementia in the more advantaged stages of dementia will start to become restless and will often start to wander around the ward. Music therapy in the more advanced stages of dementia will bring rest for the demented person. Like a lullaby which is sung to soothe babies sleep, music with slow tempi helps to bring rest for demented people who are often anxious at this stage.

In the last phases of dementia, when people have become bedridden, music is one of the last cues which can be perceived (Norberg and Melin, 1986). Music therapists sing or play music for the patient while he or she lies in bed, and observe parameters such as respiration and heartbeat to see how the client is responding to music and observe how they can bring relaxation and rest for the patient.

General overview of the introduction

As the reader may not be familiar with music therapy, this chapter will start with an overview in which perspectives on effects of music listening, music psychology and music therapy are highlighted.

What does music do with us in general as a listener? What is music psychology? The next sections in particular will describe how music is implemented in music therapy.

What is music therapy and how is it applied in the context of dementia care? A short introduction will be provided to illustrate the effcts of music psychology and the work of the music therapist working on improving social and emotional well-being, stimulating reminiscence in the earlier phases of dementia and their work on goals such as reducing behavioural problems. While in chapter 5 outcomes from randomised controlled trials are reported, in this introduction other research study outcomes are included to provide a broad overview of current music therapy research outcomes in dementia care.

Most studies have been conducted in the area of music therapy that seeks to reduce behavioural problems. Based on the most important research outcomes, the chapter will end with an outline of a randomised trial in which the effects of music therapy and general activities on reducing general agitation and neuropsychiatric symptoms in people with dementia are studied.

Lastly, the outline of the thesis will be described, introducing each chapter of this thesis.

1.1 Historical perspectives on music

The idea that music has a healing effect has a long history. One of the first descriptions of the therapeutic effect of music was found on ancient Egyptian papyrus roles, dating to 1500 BC (Benenzon, 1981). In historical descriptions, 'music as medicine' has often been described. Music itself was considered to be a healing component when suffering from diseases, as we can read for instance in Hippocrates' texts (5th century BC).

He discussed the therapeutic effects of music on bodily fluids such as blood and gall. The Roman physician Galen (2nd century AD) was one of the first to describe the 'body-mind'-principle in relation to music. He formulated that music influences the 'affect' and as such music had a therapeutic function on the body, or its bodily fluids (Pratt & Jones, 1985). The most detailed theoretical ideas on the effects of music are by Pythagoras and his well-known follower Plato. According to Pythagoras (ca. 582 BC), musical vibrations brought about healing in our body. Classical literature is full of anecdotes mentioning the healing, 'medicinal' capacities of music. The following is told in the biography of Pythagoras by Iamlichus, a student of Porphyry's (James, 1993, p. 32):

"…A young man from Taormina had been up all night partying with friends and listening to songs in the Phrygian mode, a key well known for its ability to incite violence. When the aggravated lad saw the girl he loved sneaking away in the wee hours of the morning from the home of his rival, he determined to burn her house down. Pythagoras happened to be out late himself, stargazing, and he walked into this violent scene. He convinced the piper to change his tune from the Phrygian mode to a song in spondees, a tranquillizing meter. The young man's madness instantly cooled, and he was restored to reason. Although he had stupidly insulted the great philosopher hours before, he now addressed him mildly and went home in orderly fashion…".

This example describes one of the most known qualities of music: its ability to activate or to find relaxation. Joggers walk in the same pace as the music they listen to on their headphones. In supermarkets too we adjust to the music played for us. Did you ever notice that it always seems to be slow music? This helps us to walk in slower pace between all the products the supermarket wants to show us. When French music is played, this will stimulate us to buy French wine and cheese instead of German products or vice versa (North, Hargreaves, & McKendrick, 1997).

Often, it has been described how music influences our heart rate, respiration rate and even blood pressure or hormonal levels. Already in the 18th century an effort was made to study the effect of music in relation to physiological changes. One of the best known studies of that time is from Gétry, who published in 1741 about the influence of music on the frequency of heart rate (in Dainow, 1977).
The average beat in music approaches the average heartbeat, with 72 to 80 beats per minute. The precise relationship between musical rhythm and heartbeat is still unclear, although support can be found that the heartbeat generally follows musical rhythms. Stimulating music tends to increase the heart rate and sedative music reduces the heart rate. Each type of music increases the heart rate when the listener starts to listen to music. This increase is higher when listening to stimulating music than to sedative music. There is also a difference in heart rate when playing music yourself or listening to music on the couch.
An illustrative example was provided by Harrer (1977) who compared the heart rate of the famous conductor Herbert von Karajan while he was directing Leonora Overture No.3, to his heart rate while flying a sports aircraft. During flight-time, the heart rate peaked at 115 beats per minute, while during conducting a maximum was achieved of 150 beats per minute. The maximum increase of pulse frequency, telemetrically recorded from Herbert von Karajan while conducting the Leonora Overture No.3, was obtained during those passages with the greatest emotional impact upon the conductor. These were the same passages that he singled out in subsequent conversations as being the ones he found most profoundly touching. At these moments his pulse increased for a short while, to twice the level of the initial value. When the tape was played back to him and a further pulse measurement was

made, the same peaks were found. Changes were much greater, however, while he was actually conducting.

Next to changes in heart rate, changes in breathing can be perceived as a result of intense emotional experiences. Ries (1969) found clear correlations between the respiration amplitude and the emotional response to music. The relationship between the breathing amplitude and the subject's affective responses were highly correlated indicating that the more a subject reported liking the selection, the deeper his or her breathing became.

Within the context of music psychology an important focus is the question how music induces emotions in the listener. Are there certain elements in music, which may invoke emotional experiences in the listener? Examining the literature, we will find the impressive line of studies that Hevner has conducted. Hevner (1935, 1936, and 1937) is one of the first researchers who systematically studied which musical parameters are related to the experience of emotion. She adapted various short existing piano pieces and played them for the subjects, both the original version and an adapted version. In the adapted version, she constantly manipulated only one musical element, such as the mode (major or minor), the harmony (simple-complex), rhythm (steady-fluent), tempo (fast-slow) and the melody line (increasing-decreasing). Other musical parameters were held as constant as possible. After playing, she asked the subjects to indicate on the `Hevner's adjective circle', which emotion verb best described the emotional content of the piece. Tempo and mode had the strongest impact on the listener, when describing the experienced emotion in the music. Piano music played fast in major is cheerful and, in contrast, the slow piece in minor is considered dreamful and sensitive. After Hevner, it has been shown repeatedly that various musical elements, with a particular mode and tempo, are expressive of emotion in music.

The last few decades there has been a renewed interest in the functions of music within a medical setting from a variety of specializations. This interest can be found from fields such as medicine, musicology, (music) psychology and music therapy. The specific area where music influences our thought processes and emotional experiences in the general listener, has become the study object for music psychologists and where specific patient groups are involved, the research area for the music therapist (Vink, 2001b).

1.2 What is music therapy?

In the last century many instances have been described where music was used in a therapeutic manner. In many hospitals music is provided for the patients for relaxation purposes or for pain relief nowadays (see for instance Bradt & Dileo, 2009). This idea dates from 1891, when Canon Harford started to broadcast relaxing music through a phone network in a general hospital in Great Britain (Davis, 1891 in Bunt 1995).

The origins of music therapy as a profession go back to World War II. Musicians were asked to play for the wounded in the many often crowded and warm hospitals. They were asked to play for recreational purposes. Many of the victims were however severely traumatized, and musicians noted that music induced many profound emotions in them. Since that time, they started to use music therapeutically. The first formal training programme for music therapy started shortly after the ending of World War II: in Kansas, Texas, USA in 1946. In the UK, Juliette Alvin, cellist and pupil of Pablo Casals, started the British Society of Music Therapy in 1958 (Bunt, 1995).

In The Netherlands in 1957, psychiatrist Van der Drift commissioned the development of a music therapy position within the setting of a psychiatric hospital in Wolfheze. He played an important role in the development of music therapy as it is known today. At the moment, there are 4 full-time training programmes (in Amersfoort, Enschede, Heerlen and Nijmegen) for music therapy with a length of 4 years within the regular educational system in the Netherlands, in which both national and international students follow training in music therapy. Three programs offer a diploma in creative therapy, and at the ArtEZ School of Music in Enschede, students obtain a bachelor diploma in Music Therapy. Further training can be followed in a Master's programme in Arts Therapies, to which music therapists can apply. The Master of Arts Therapies at Zuyd UAS was established by Henk Smeijsters in 2004, and is affiliated to the Research Centre for the Arts Therapies KenVaK. KenVaK is a joint venture of UAS Zuyd Heerlen, UAS Utrecht, UAS ArtEZ School of Music Enschede, and UAS Stenden Leeuwarden (Smeijsters and Vink, 2003; 2010).

Music therapy today is a form of therapy in which a qualified music therapist uses music within a therapeutic relationship to improve physical, psychological, cognitive, and social functioning. A music therapist needs skills both as a musician and as therapist to achieve these goals. The music therapist may choose active or receptive approaches during therapy. Active music therapy implies that residents are actively involved in the music making, such as playing on musical instruments in a musical improvisation. The music therapist may introduce tasks, such as singing along with familiar tunes. The use of live music stimulates participation, expression and use of preserved skills. In groups, active music therapy techniques stimulate social interaction.
In receptive music therapy, the music therapist plays or sings for the client or selects music for the client to listen to. The music therapist adjusts various musical parameters, such as tempo, to either activate the client or for relaxation purposes.

Music therapy in the Netherlands is widely implemented in general healthcare, varying from job positions in general psychiatry, forensic psychiatry, work with mentally and physically handicapped, in elderly care settings to private practice. Music therapy has been gaining more and more leeway in general healthcare since its first development in the late fifties. Over a thousand creative therapists are currently employed and the number continues to grow. Over 300 music therapists are employed in general healthcare, from which an estimated 60 music therapists work in a nursing home setting (Smeijsters and Vink, 2003, 2010).

1.3 Music therapy for elderly people with dementia

When dementia was first diagnosed by German physician Alois Alzheimer in 1906, only a century ago, Alzheimer's disease was considered a rare disorder. Today, Alzheimer's disease is the most common cause of dementia and the disease is afflicting more and more people as a result of the increase in life expectancy. Other causes or types of dementia which have been distinguished are: vascular dementia, frontotemporal dementia, dementia of the Lewy Body's type, Parkinsonian dementia and so on.

Many medicines have been tested in the process to reduce major behavioural problems associated with this disease. In comparison, less research has been directed towards non-pharmacological approaches, such as music therapy. Prinsley (1986) recommended music therapy for geriatric care as it may possibly reduce the individual prescriptions of tranquilizing medication. While most research offers solutions for future patients, it is also necessary to look for effective methods to improve the quality of life for those who are patients today. This means enhancing autonomy for the patients, but also improving the contact between the patient and other patients and caretakers e.g. nursing staff, family and friends. Music therapy is believed to be an effective intervention which can improve the quality of life and can relieve the major behavioural symptoms associated with this disease.

While language and cognitive functions deteriorate during the course of the disease, many musical abilities appear to be preserved (Aldridge, 1996). The responsiveness of patients with Alzheimer to music is a remarkable phenomenon (Swartz et al., 1989). Even in the last latst stage of the disease, patients remain responsive to music where other stimuli can no longer provoke a reaction (Norberg et. al, 1986). Alzheimer's patients, despite aphasia and memory loss, continue to sing old songs and dance to tunes from long ago, when given the chance. Explanations for this phenomenon are difficult to find. It can be assumed, as is seen with early infant-caretaker interactions, that melodic intonations are an essential component of communication. The fundamentals of language are possibly musical, and prior to lexical functions in language development (Aldridge, 1996). Yet, many aspects of the effect of music on demented elderly people are unknown.

What is known, is that music therapy has many benefits for elderly people with dementia. Musical rhythm seems to help Alzheimer's patients to organize time and space. People with dementia lose their verbal skills first, but both general musical and rhythmic skills remain for a long time (Cowles, 2003; Swartz et al., 1989, Norberg et. al, 1986.) In the following, overviews of studies in the area of music therapy in relation to cognition, social and emotional functioning and behavioural disorders will be described.

1.3.1 Music Therapy and Cognition: Musical Mind Gym

How are musical memories stored in our brain and why does music have such a profound effect on demented elderly people? Making music and listening to music involves almost all cognitive functions of our brain.

One area of research aiming to understand more about the effect of music on our brain is brain research on how music is processed in professional musicians. In the general music psychology literature, it is has been described that in professional musicians the corpus callosum, which connects the left to the right brain hemisphere, has more strengthened pathways in comparison to non-musicians (Lee et al., 2003). The corpus callosum serves as the physical and functional connection between these two cerebral hemispheres. Each hemisphere receives sensory information and controls movement on the side of the body opposite its location. Both language and music are complex cognitive processes that are affected by dementia. Remarkably, musical skills are often preserved and others note that music seems to stimulate verbal functioning. Many people with aphasia who have difficulties speaking do still have the capacities to sing-along. While language is primarily located in the left hemisphere, during singing, both hemispheres are active. Rhythm is considered to be processed in the left hemisphere. Currently, lateralization of most music functions to the right hemisphere is considered in terms of more efficient processing in contrast to the specialization of the left hemisphere for language (Polk et al. 1993).

Some researchers have studied the effect of music in relation to cognition, for instance in younger children. This effect has been become known as the Mozart-effect, in which listening to Mozart leads to cognitive enhancement. Similarly, it has been studied if music listening and therapy can help to retain or stimulate cognitive capacities in elderly dementia patients.

Van de Winckel et al. (2002) evaluated the effect of a music based exercise programme on cognitive functioning and mood state in demented elderly women (n=15), compared to a control group (n=10), who followed daily conversation sessions for three months. Music based exercise training over three months had a slight effect

on cognitive functioning in patients with moderate to severe dementia, based on subscales scores on the 'fluency' cluster on the Mini Mental State Examination (MMSE). This was documented by an increased MMSE mean score of 12.87-/15.53, and by a higher median score, rising from 10 to 14 points, on the 'fluency' subset. The control group showed no significant improvement, neither on the MMSE (mean score of 10.80 -/11.00) nor on the fluency subtest of the ADS 6 (median scores were 6.5-7 points).

Cuddy et al. (2005) presented a case study of an 84-year old woman with severe cognitive impairment, for whom music recognition and memory, according to her caregivers, appeared to have been spared. In order to assess her music recognition abilities, various tests were conducted. Two tests involved the discrimination of familiar melodies from unfamiliar melodies. The third involved the detection of distortions ("wrong" notes) in familiar melodies and discrimination of distorted melodies from melodies reproduced correctly. The woman responded to familiar melodies by singing along. To distorted melodies she responded mostly with facial expressions. The contrast between her adequate responses to music and her mini-mental status test scores (8 out of 30) is remarkable, according to the authors. Aldridge (1996) suggests that including musical parameters in the Mini Mental State Examination assessment may provide a more sensitive tool for assessing cognitive functioning in demented people.

Hevele (1988) studied whether memory for language and melody is indeed spared in 52 elderly people with Alzheimer's disease. Eight well-known songs were selected. The first line of the song was spoken to the patients with the task to complete the text. Then, the line was sung to them in la, la, la with the question to complete the melody line with la, la, la. Finally, the first line was sung to them with the question to complete the line singing the lyrics. The results were that patients recalled more when language and melody were combined in comparison to offering only the text or only the melody. In comparison, the recall of the melody was spared longer than recall of language in relation to the various phases of dementia, especially in the earliest phases. In the latest phases of dementia, it was found that both the recall of

melody and language was diminished. Similar findings have been found by Pickett and Moore (1991) who described that patients remembered the words of songs they had sung better than spoken words. The recall of songs was better when the songs were relatively old in comparison to more recently learned songs.
Foster and Valentine (2001) looked at the effect of auditory stimulation on recall of personal facts in 23 older adults with mild-to moderate dementia. Participants participated in four conditions: a) background/cafetaria noise; b) familiar music (first movement of Vivaldi's "The Four Seasons"), and c) modern music (Fitkin's "Hook") and d) silence. Performance was significantly better with music compared to silence or cafeteria noise. There was no difference between familiar and novel music. Recall was best for questions asked about the time when the patients were young. Similar effects were found by Irish et al. (2006) who studied the effect of music on autobiographical memory recall in mild Alzheimer's disease individuals (n = 10) and healthy elderly matched individuals (n = 10). A music condition (Vivaldi's 'Spring' movement from 'The Four Seasons') was compared to a silence condition. Considerable improvement was found for Alzheimer individuals' recall on the Autobiographical Memory Interview in the music condition ($p < 0.005$). They further found a significant reduction in state anxiety (State Trait Anxiety Inventory) for the patients in the music condition ($p < 0.001$), suggesting anxiety reduction as a potential mechanism underlying the enhancing effect of music on autobiographical memory recall.

Hailstone (2009) describes a client with a relatively well-preserved knowledge of music who was musically untrained patient and suffered from semantic dementia, in which musical memory was assessed five years after clinical onset. The client was asked to sing or hum to familiar tunes and was successful in completing the melodies for 25 of the 40 presented tunes. For instance, she completed the pop songs with an average accurate text of 5.3 words. The performance formed a great contrast to her impaired verbal skills on other tests. The authors conclude that knowledge of music may be preserved in semantic dementia compared to other sources of knowledge as it does not depend on episodic memory.

Overall, studies focusing on the effects of music and music therapy in relation to cognition show that information presented in songs are recalled more easily than verbal information alone. Further, music seems to facilitate general recall of important life events in mildly to moderately demented elderly patients. It should be noted that the evidence is not strong and is mostly described within case studies. Baird et al. (2009) reviewed the findings of eight case studies and three group studies studying musical memory in Alzheimer's disease patients and also state that musical memory in dementia becomes typically impaired during the dementing process. Specifically, memory for familiar music, engaging semantic and/or episodic musical memory, is impaired in the majority of reported cases.

1.3.2 Music Therapy and social/emotional functioning

Dementia care used to consist primarily of fulfilling the physical needs of people with dementia. Do they have clean sheets or are wounds properly taken care of? In recent years, more focus has been given to the general atmosphere in the nursing home and how the nursing home can be a pleasant environment for both patients and (nurse) carers. As a result of the progressing phases of dementia, it becomes increasingly difficult for carers to engage patients in meaningful social activities or interaction. How can isolation of these clients be prevented? To stimulate the overall atmosphere and to stimulate social interaction for especially the more advanced demented patients, music can be of help. Music provides an opportunity for people to engage socially, from which persons who are not able to speak any more can benefit too.

Lord (1993) studied the improvement of social, cognitive and emotional functioning in dementia, in which 60 patients were randomized, stratified by sex, to three groups of 20. One group listened to six 30-minute sessions of 'Big Band' music and were given children's musical instruments so that they could actively participate. A second group was given wooden jigsaws and other puzzles, and a third group was given no special activities except the usual pastimes of drawing, painting and watching television. Using an in-house unvalidated outcome measure, music therapy was found to be more effective than the control interventions: patients were happier, more alert and had higher recall of past personal history after music therapy than patients in the control groups (puzzle activities and general activities).

Sheratt and Thornton (2004) studied whether social interaction in moderately to severely demented people (n=24) can be improved by introducing music in the nursing home. Half of the people were listening to music, live as well as recorded, and they were compared to a no-music condition. Live music was significantly more effective in increasing levels of engagement and well-being, regardless of the level of cognitive impairment. No significant differences across conditions were found for the presence of challenging behaviours.

Patients who have lost the ability to talk coherently often retain the ability to sing (Novick, 1982). Olderog Millard and Smith (1989) studied the therapeutic effect of singing familiar songs and in particular if social interaction differed between singing sessions and discussion sessions. In this study, ten patients with Alzheimer's disease participated. Sessions were held twice weekly for 30 minutes for 5 weeks. A reversal design (ABABA) was implemented in which the patients both followed discussion sessions (A) and sessions with therapeutic singing (B). Both types of sessions seemed to have an effect rather than singing alone. Staff members expressed surprise at seeing the patients singing, especially those patients who were severely regressed and who rarely spoke. Pollack and Namazi (1992) noticed an increase (24%) in social behaviours such as smiling, talking and touching from before to after attending music therapy sessions (n=8).

Clair and Ebbert (1997) report that activities like singing and rhythm playing are beneficial and stimulate the social contact between the patient and his or her family member. Results were non-significant between pre- and post-measurements in relation to perceived caregiver burden and feelings of depression, but offering music did significantly increase their satisfaction about the visit.

Overall, it can be concluded that music therapy has a positive effect on emotional well-being and participating in music therapy increases social response. Music therapy provides stimulation and may help to prevent social isolation for the more advanced demented elderly.

1.3.3 Music Therapy and Behavioural Problems

One of the most reported behavioural symptoms in demented elderly patients is agitation, which causes great distress both for the patients themselves and their caretakers. An estimated 70 to 90 per cent of the people inflicted with dementia, will eventually develop behavioural symptoms during the course of the disease (Zuidema et al., 2007). The literature concerning agitation is diverse. Agitation is a broad term that includes a variety of behaviours. Agitation is most often defined as an inappropriate verbal, vocal, or motor activity which is not explained by needs or confusion per se. It includes behaviours such as aimless wandering, pacing, cursing and screaming (Cohen-Mansfield; 1986). Although the definitions vary from time to time, they all include behaviours such as anxiety, tension, irritability, restlessness, wandering, physical and verbal aggression, confusion and disturbed sleep (Brotons and Pickett-Cooper, 1996).

On several occasions it has been shown that feelings of agitation in demented patients can be relieved through music and music therapy (see music therapy reviews on dementia: Brotons, 2000; Sheratt, 2004; Vink 2000a; Vink et al, 2011)

Wandering behaviour

One of the behaviours that can typically be found in demented elderly is wandering behaviour. Often, patients are seen in the nursing homes restlessly pacing up and down the corridor. Doors have to be locked constantly, as it happens all too often that the wanderer falls and injures himself when he enters unknown areas. Wandering behaviour is part of the cluster of problem behaviours that make up anxious or agitated behaviour. Lucero et al. (1993) tried to describe wandering behaviour of institutionalized patients with Alzheimer's disease in their natural environment. It occurs mostly with patients in middle and late stage dementia. The need for intervention is, according to Lucero, greatest during unstructured periods of the day. Often, physical restraints are used to prevent wandering behaviour, but rather than preventing agitation, the use of physical restraints actually increases the amount of agitation (Werner, Cohen-Mansfield, Braun and Marx 1989).

Groene (1993) studied the effect of music therapy in reducing wandering behaviour with thirty Alzheimer's disease patients (aged 60-91) in the late and severe stages of dementia. For the baseline measurements, the wandering behaviour of each participant was recorded for a minimum of three days, between 2.00 p.m. and 5.30 p.m. The subjects were randomly assigned to either a mostly musical condition (e.g. five music sessions and two reading sessions) or to mostly reading sessions (e.g. five reading sessions and two music sessions). Each subject received, alternate sessions of individual reading sessions and individualized music therapy each day of the week, for a maximum of 15 minutes.

Music therapy sessions consisted of listening to music, playing instruments, singing, and movement or dance. Live music activities were incorporated into each session. Reading sessions consisted of the therapist reading aloud to the client or the patients themselves reading aloud. Both activities were, when possible, adjusted to personal preferences. Seating proximity behaviour, the amount the patient remained seated or stayed in the room, was recorded on video tape and was used as an estimate for a possible decrease in wandering. The Mini-Mental Status Exam was also administered before and after the sessions to record changes in cognitive functioning. There were no significant changes in MMSE scores for either group, from pre to post treatment measurements. The amount of time wandering subjects remained seated was longer for music sessions, regardless whether they participated in the mostly music or in the reading sessions. Wandering in general outside the sessions did not decrease.

Fitzgerald Cloutier (1993) also compared the effect of music therapy to reading sessions in their respective success in decreasing wandering behaviour in a female Alzheimer's patient (aged 81 yrs.). The subject showed highly frustrated behaviour and the music therapist tried singing with her to help her remain seated. After twenty singing sessions, the therapist read to the patient in effort to compare the degree of attentiveness. Reading and singing sessions were timed according to length of time the patient stayed seated. Both music therapy and reading sessions redirected her from wandering, but the total time she remained seated for the music therapy sessions was twice as long as in the reading sessions (214.3 min versus 99.1 min). It

was noted that the length of time she remained seated for music therapy increased consistently, whereas the time she sat during reading was more sporadic. Several studies have shown that wandering behaviour decreases due to music therapeutic intervention (Clendaniel and Fleishell 1989; Fitzgerald Cloutier 1993; Groene 1993; Olderog Millard and Smith 1989).

Agitation during bathing

Behavioural problems are very time-consuming in the care for these patients. A simple task, such as bathing or toileting, can take hours due to aggression and non-co-operation. Although many results have been reported about the burden on caregivers of demented elderly, relatively little research has been directed towards effective methods of managing behavioural symptoms of demented patients. Management of behavioural symptoms in patients with dementia is essential to improve the quality of life for the patients and their caregivers.

Two studies describe how music can contribute to a decrease in aggressive behaviour during bathing. Clark, Lipe and Bilbrey (1998) studied the effect of tape-recorded music during bathing episodes with 18 residents with severe Alzheimer's disease. For a period of ten weeks, the residents' preferred music was played for them, and this was alternated with a period of ten weeks when no music was played. Results indicated that during the music period, decreases occurred for 12 of the 15 observed agitated behaviours. The five most frequently recorded behaviours were yelling, abusive language, hitting, verbal resistance and physical resistance. Decreases were significant for the total number of aggressive behaviours and for hitting as a separate behaviour. In these studies, a direct effect of music was found as well as an indirect effect on the caretakers. Caregivers noted that during the music episodes, the mood of the residents was improved: they were smiling more and were more co-operative, making the bathing task more pleasurable for the caregivers.

A similar study has been conducted by Thomas, Heitman and Alexander (1997). A total of fourteen patients with Alzheimer's disease were observed during bathing times. All were diagnosed as middle stage dementia. A music tape was recorded with

the help of family members. Typical musical selections included music of Glenn Miller and Beethoven's Moonlight Sonata. Regretfully, the study design did not involve an extended intervention period. Music was only played on three occasions for each resident, where in contrast caregivers received a three-week training programme on observing and selecting music. No significant reductions were found for verbally agitated behaviours, physically non-aggressive behaviours and hiding/hoarding behaviour. Significant reductions were found for aggressive behaviours, as was the case in the previous described study.

Agitation during bathing is often the result of sudden changes of environment, such as going to the bathing room or to the dining room. Any major environmental changes may cause agitation as the place looks unfamiliar. Even such small changes as moving a chair can cause agitated behaviours like aggression.

Mealtime agitation

An environmental change is also apparent when residents are brought to the dining room, and residents often become highly agitated. Typical for the community rooms in a nursing home is the large amount of background noise. Several researchers have studied if background music can contribute to a less disturbing nursing environment. Goddaer and Abraham (1994) investigated if playing tape recorded music in the dining room could reduce the general noise level. Decreasing the noise level was expected to decrease agitated behaviours. Twenty-nine demented residents participated in a four-week music programme. In the first week, no music was played in the dining room and baseline observations of the prevalence of agitated behaviours were made. In the second week, relaxing music was introduced in the dining room. The music was selected on basis of slow tempi, and additional music was selected from New Age recordings. In the third week, no music was played, but music was reintroduced in the fourth week. Subjects were observed with a dichotomous version of the Cohen-Mansfield Agitation Inventory (see table 5.1). Significant reductions were observed in the cumulative incidence of the total observed agitated behaviours (63.4%), as well as the incidence of physically non-aggressive behaviours (56.3 %) and verbally agitated behaviours (74.5%). No reductions were observed in hiding/

hoarding behaviours and aggressive behaviours. The presence of agitation followed the distinct pattern of the study design. Agitation decreased from week one to the second week when the relaxing music was introduced (54%), increased in week 3 (38.4%=control period) and decreased in week 4 (43%=music period) when music was played again during dinner. From this study it can be concluded that music indirectly affects feelings of agitation by reducing the general noise level.
Similar results have been reported by Denney (1997). She replicated Goddaer and Abraham's study with a few modifications. In this study, nine demented residents participated and instead of daily observations, weekly recordings were made of the presence of agitated behaviours. The residents were studied during mealtime lunches, while light classical music was played with a tempo between 50 and 70 beats per minute. In this study the presence of agitation also followed the typical pattern of the study design. In the first and third week, no background music was presented. In the second week, agitated behaviours decreased by 46% compared to the first week. During the third week, agitated behaviours increased, but were still 8% below the baseline measurements. In the fourth week, agitated behaviours decreased by 37% compared to the baseline. Verbally agitated behaviours were affected the most through the music intervention.

From studies described above it is clear that agitation decreases as a result of slow relaxing music. Is this the type of music that should be used to obtain the best results? Ragneskog et al. (1996) studied whether the observed effects depended on the type of music played and if food intake increased as a result of music listening. Three types of music were used. First, soothing music, then old popular Swedish songs from the 1920s and 30s (songs the patients would typically know from their youth) and last, contemporary pop music. Each type of music was played in the dining room for two weeks, while patients were coming in to have their dinner. Between the musical periods there were one week intervals in which no music was played. The reactions of the patients to the three different types of music were videotaped. Four out of five patients spent more time at dinner during the music periods than in the control periods. The study showed that all the patients who were having dinner were affected by music, particularly by soothing music. Individual responses that were

observed during the study were that one of the typically restless patients became unusually calm, whereas another ate more than usual. Significant improvements in symptoms of irritability, fear and depressed mood were seen when music was played at meals compared to the control period without music. Soothing music was found to have the most beneficial effect. These benefits appeared to persist right through the control period. The study concluded that slow, relaxing music can indeed improve symptoms associated with dementia and stimulate elderly residents to eat more.
Results were also replicated in a study by Chang et al. (2010) in which a decrease in agitation was found when music is presented at lunch/mealtime.

To conclude, most studies indicate a decrease in agitated or related behaviours through a music intervention and suggest that music therapy might be a viable non-pharmacological intervention to reduce agitation in demented elderly people. Specific behaviours that are part of the cluster of agitated behaviours that have been found to decrease are vocally disruptive behaviour, hitting, wandering, crying and pacing and an increase in hours of sleep (see Table 1).

Table 1 Examples of specific agitation-related behaviour changes brought about by musical interventions (based on Vink, 2000a)

vocally disruptive behaviour	Casby and Holm 1994; Denny 1997; Thomas, Heitman and Alexander 1997
hitting	Clark, Lipe and Bilbrey 1998
wandering	Clendaniel and Fleishell 1989; Fitzgerald-Cloutier 1993; Groene 1993; Olderog Millard and Smith 1989
crying and pacing	Brotons and Pickett-Cooper 1996
increase in hours of sleep	Hanser 1990, Lindenmuth et al. 1992, Lai and Good, 2005

1.4 Focus of the research

The current state of music therapy research in relation to dementia is promising, as has been described in the previous sections. From the studies reviewed above, most studies have been conducted in the area of reducing behavioural problems and indicate a decrease in agitated or related behaviours through music (therapy) interventions (Brotons, 2000; Sheratt, 2004; Vink 2000a; Vink et al, 2011). For this reason, this study will focus on this specific area of music therapy research to try to

replicate findings from small clinical studies in a larger randomised controlled trial. Also, from a clinical perspective, it has been shown that behavioural problems have a large impact on the quality of life of the demented person and their caretaker residing in nursing home settings (Wetzels, 2010).

Music therapy might be a viable approach to alleviate some of the problems.
Gerdner and Swanson (1993) indicated in more detail the amount of time it takes before agitation decreases. Shortly after the session, there was a little increase in agitation, which was substantially decreased after 35 minutes, an effect which lasted for at least an hour.
Regretfully, most studies studying the effect of music therapy are small-scale. The effect of music therapy on behavioural problems has not often been subject of a large randomized controlled trial and has not often been compared to an enhanced other activity to control for extra attention (as main effect rather than the therapeutic effect of music itself), which is the aim of the current study. This study expects to find that both approaches will reduce agitation in people with dementia, with the largest effects to be expected in the music therapy intervention. Possible confounding variables which are thought to influence the presence of agitation will be monitored such as type of dementia, sex and disease stage (early, middle, late stage dementia).

In this study, the effect of music therapy is compared to general activities to study its effect in reducing agitation and general neuropsychiatric symptoms. Both interventions are offered for four months, twice weekly as a small group intervention for demented elderly people who are severely agitated.

Research questions

The aim of this study is to provide insight in the following questions:

1. Is music part of common nursing home practice and if so, how is music offered in Dutch nursing homes for patients with both dementia and verbal/vocal agitation?
2. What are the general effects of music therapy in the care for people with dementia, described in the general literature?
3. How do music therapists work in practice with dementia clients in nursing homes settings?
4. What is the effect of music therapy on reducing agitation in agitated patients with dementia, compared to general recreational activities?
5. What is the effect of music therapy on neuropsychiatric symptoms in dementia clients, compared to general recreational activities?
6. If music therapy is effective, how long does this effect persist?

Outline of the research

The study started with sending out a questionnaire to Dutch nursing homes (n=247) to see if a music therapist working with demented elderly people specifically was contracted within the facility. The questionnaire was returned by 153 homes (61.9%). In 32 (22.9%) of the general nursing homes a music therapist was employed.

It was estimated that a total of 60 music therapists, combined with other data, was employed in a nursing home setting. A questionnaire was sent out to these music therapists to gain insight in the methods employed when working with elderly people with dementia (see chapter 3 and chapter 4 for a clinical case example). Further, it was studied how music in general has a position within offered care in Dutch nursing homes (see chapter 2).

Subsequently, a total of twenty nursing homes were contacted to participate in the actual intervention study on agitation and neuropsychiatric symptoms, of which six nursing homes agreed. After formal consent of the respective nursing home, the following procedure was followed in each home:

1) Nurses, staff members, physicians, psychologists, activity therapists, music therapists and all other participants were informed on the outline of the study
2) Nurses were trained in scoring the screening instruments: the Cohen -Mansfield Agitation Inventory (CMAI) and the Neuropsychiatric Inventory (NPI)
3) Screening and recruiting participants for the study
4) The nursing home physician confirmed the diagnosis dementia and assessed the severity of dementia on the Global Deterioration Scale (GDS)
5) Informed consent (family member, 1st contact person) was collected
6) Participants were randomized to either a music therapy condition or a general recreational activities condition
7) Start of the baseline measures (one month): type and number of psychotropic medication and the Neuropsychiatric Inventory (NPI) and Cohen-Mansfield Agitation Inventory (CMAI))
8) Intervention period: participants followed twice weekly, for a period of four months, either music therapy or general activities. During this time, the type and total of psychotropic medicines were registered, the NPI every fortnight and the CMAI (dichotomous version) four times each intervention day
9) Post measurements: the type and total of psychotropic medicines were registered for the last month, as the NPI and CMAI (full version)
10) Results of the study were presented at each nursing home site

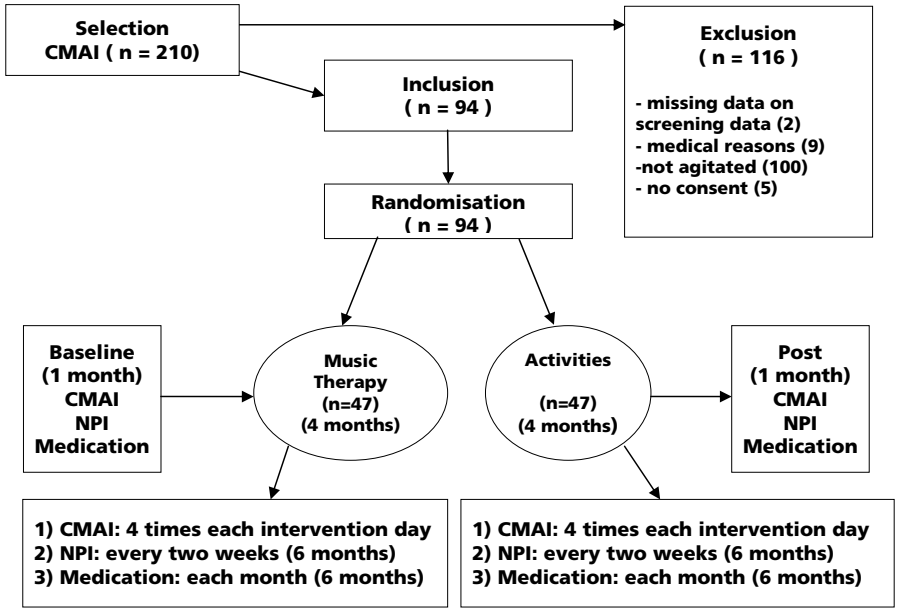

Figure 1 Outline of the study

Outcomes measures

To test hypothesis 4, the Cohen Mansfield Agitation Inventory (1989) was administered on each intervention day. The CMAI is a general checklist for reporting 29 of the most common behavioural problems, such as wandering and verbal agitation (see table 2).

Table 2 Agitation related behaviours in dementia: Cohen-Mansfield Agitation Inventory (Cohen-Mansfield, Marx and Rosenthal 1989); The first row indicating the items of a factor-analysis of the CMAI in 1,437 Dutch nursing home residents (Zuidema et al.; 2011)

Physically aggressive behaviours	***Physically non-aggressive behaviours***	***Verbally agitated behaviours***
Spitting Cursing or verbal aggression Hitting Grabbing Pushing Throwing things Making strange noises Screaming Scratching	Pacing Inappropriate robbing/ disrobing Get to different place Handling things inappropriately Hiding things Hoarding things General restlessness	Constant request for attention Repetitious sentences/questions Complaining Negativism
Kicking Biting Intentional falling Hurting oneself or others	Eating inappropriate substances Tearing things Physical sexual advances Performing repetitious mannerisms	Verbal sexual advances

Each intervention day, the CMAI was registered one hour prior to the intervention. After the intervention the CMAI was administered again at one, two and four hours after the intervention to establish a day profile. To decrease the workload for the nurse-raters, a dichotomous version of the CMAI was used for this purpose. The results of the interventions on reducing agitation as measured with the CMAI are presented in chapter 6.

To test if neuropsychiatric symptoms are influenced by music therapy and recreational activities, scores were evaluated on the Neuropsychiatric Inventory Questionnaire (NPI-Q), developed by Cummings et al. (1994) (see table 3). On this checklist, nurses rated if a neuropsychiatric symptom is present and how severe this behaviour is for both the patient (three-point scale) and for the caregiver (six- point scale).

Table 3 NPI-Q Scoring Items; Cummings (1994)

Symptom:
Delusions
Hallucinations
Agitation/Aggression
Dysphoria/Depression
Anxiety
Euphoria/Elation
Apathy/Indifference
Disinhibition
Irritability/Lability
Aberrant Motor Behaviours
Night-time Disturbances
Appetite and Eating Disorders

The NPI-Q was rated by a nurse every two weeks, starting a month before the intervention period started. Measurements continued for another month, after the last day of the intervention period (see figure 1).

The CMAI and the NPI were selected as outcome measures in this study as they are frequently used in a nursing home setting are easy to administer and are also frequently used rating instruments in studies involving music therapy, making comparisons between studies useful. The results of both interventions on reducing neuropsychiatric symptoms are presented in chapter 7.

Recruitment of participants

In the first phase of the study, nurses were asked to screen all residents in their unit who they perceived to be typical "problematic patients" in terms of agitated behaviour.

Residents were screened with the Cohen-Mansfield Agitation Inventory (CMAI) to obtain information and to see if the residents were indeed agitated, and severity scores were calculated.

The Cohen-Mansfield Agitation Inventory is a general checklist, which reports 29 of the most common behavioural problems, such as wandering and verbal agitation. The nurse registered if each of the behaviours was present on a seven point scale varying from 1 (the behaviour is not present) to 7 (the behaviour is displayed several times an hour).
The minimum score on this scale is 29 and indicates that the person is not agitated. The maximum score on the Cohen-Mansfield Agitation Inventory is 203. This score is not realistic, however. It would imply that all 29 behaviours are present at least several times for an hour each day.

Residents were included in the study based on a cut-off score on the CMAI of 45 and higher. In a large prevalence study in the Netherlands, the WAALBED-study, amongst 1322 demented patients a median score of 44 was found on the CMAI (Zuidema, 2008). Further, residents were included only when they were formally diagnosed as having a form of dementia by the nursing home physician.
When the consent form was signed by a family member, residents could finally participate in the study. Patients were randomized on site level and were allocated following blinding procedures to the music therapy condition or to the condition in which they participated in general recreational group activities.

Interventions: music therapy and general activities
Both music therapy and general activities were offered to small groups (maximum of 6 residents) twice weekly. Each session was provided for 40 minutes, based on the average time for a general music therapy session for psycho geriatric residents (see chapter 3). Music therapists were instructed to make use of both active and receptive music therapy methods. 78.6% of Dutch music therapists working with demented elderly employ methods like these within a group approach. Active music therapy implies that residents are invited to make music actively,, if possible. Patients in the more advanced stages are often not able to play instruments. The general procedure within music therapy is to start with a welcome song in which the residents are addressed by their name, after which the music therapists proceeds with the group with a variety of methods and techniques to engage the residents. Within receptive

approaches, the music is specifically selected for the residents' needs. The therapist either plays or sings for the group, or music is listened to via audio equipment. Music is selected for reminiscence purposes, through for instance specific regional music or music to stimulate pleasant memories. Music therapists further choose music for therapy based on specific goals they want to achieve. For instance: for relaxation purposes, a music therapist will choose music with slow tempi and little instrumentation. It was specifically decided not to further protocol the therapy outline. An essential part of therapy is that the therapist can adjust to each individual need if the moment requires this. A standardized protocol would resemble a music activity instead of music therapy.
In the control condition, general activities were provided such as knitting, handcrafts, playing games, coffee gatherings, movement activities and reading.
Both interventions were held in a separate therapy or activity room to which the residents were brought in the late morning hours. If the client refused to participate further, he or she was free to leave or the nurse was asked to bring the resident back to the ward. After the activities and therapy, both disciplines registered the precise contents of the intervention, the precise duration of the intervention, if all residents were present and who had left before the formal ending of the intervention. The amount of engagement of each resident was also described during the intervention.

Structure of the thesis

Chapter 1 gives the reader a general introduction on music therapy and the effects of music therapy on elderly people with dementia. The chapter presents the outline of the study.

Chapter 2 offers the reader an introduction to the general provision of music within Dutch nursing home settings for dementia patients coping with verbal and vocal agitation.

In *Chapter 3* the work of the music therapist in the Netherlands is described, based on a survey study: what methods do music therapists use in various stages of dementia and in particular with dementia of the Alzheimer's type?

Chapter 4 provides a case description of music therapy work with a dementia client to introduce the reader to an example of music therapy practice in the Netherlands.

Chapter 5 describes a Cochrane review, summarizing the effect of music therapy in the context of dementia care, related to social, emotional, cognitive and behavioural functioning.

Chapter 6 describes the results of the study of the effect of music therapy and general recreational activities in reducing agitation.

Chapter 7 describes the results of the study on the effect of music therapy and general recreational activities in reducing neuropsychiatric symptoms.

Chapter 8 is the general discussion and provides a general overview of the results and recommendations will be presented for new research involving music therapy and dementia and recommendations for practice.

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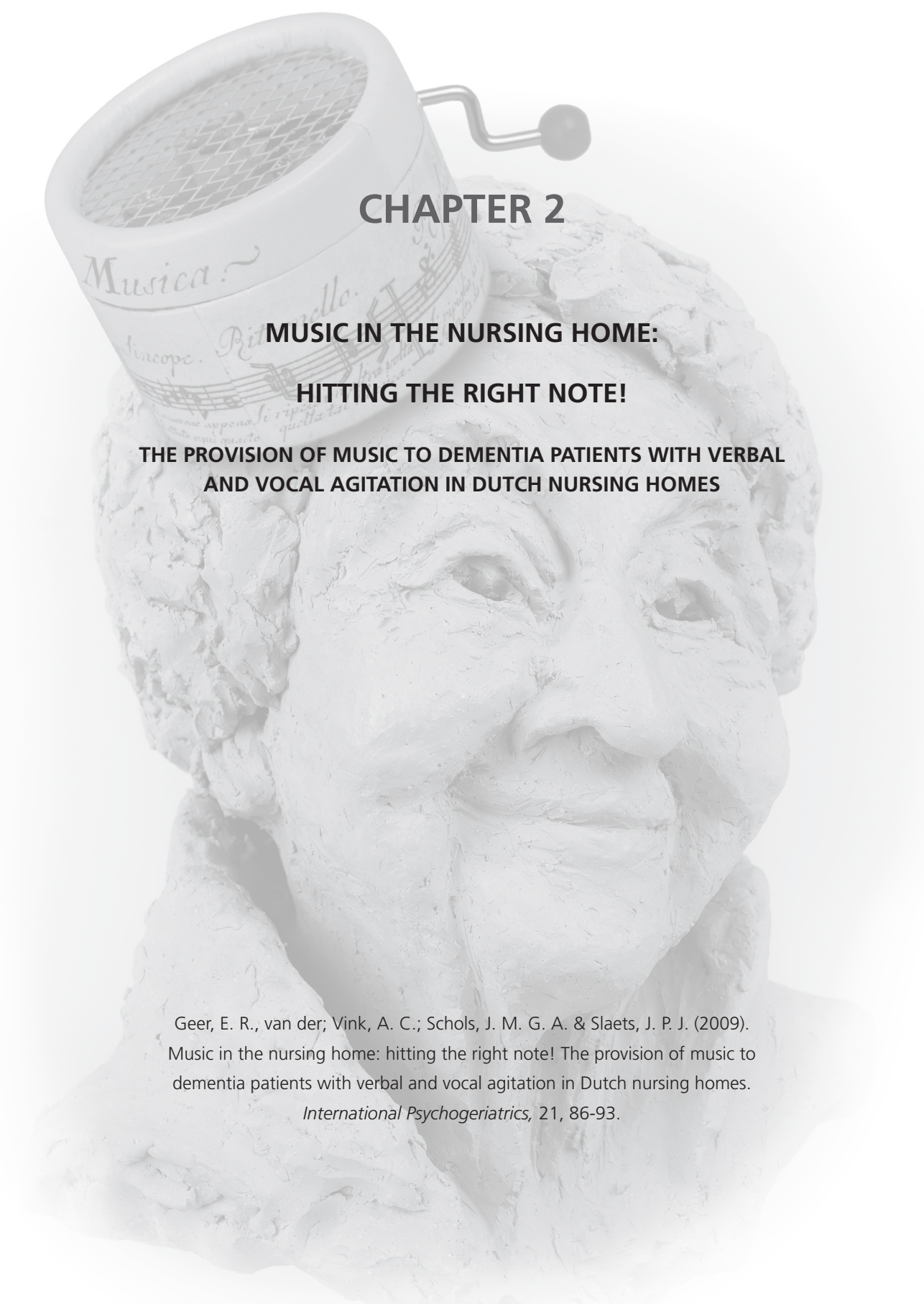

CHAPTER 2

MUSIC IN THE NURSING HOME:

HITTING THE RIGHT NOTE!

THE PROVISION OF MUSIC TO DEMENTIA PATIENTS WITH VERBAL AND VOCAL AGITATION IN DUTCH NURSING HOMES

Geer, E. R., van der; Vink, A. C.; Schols, J. M. G. A. & Slaets, J. P. J. (2009). Music in the nursing home: hitting the right note! The provision of music to dementia patients with verbal and vocal agitation in Dutch nursing homes. *International Psychogeriatrics,* 21, 86-93.

Abstract

Background: The study aims to provide insight into the type of music being offered in Dutch nursing homes to patients with both dementia and verbal and vocal agitation. It also investigates the degree to which the music offered corresponds to the musical preferences of the nursing home residents.

Method: Using random sampling, 20 nursing homes were selected to participate in this study. Within these homes, semi-structured interviews were conducted with nursing home physicians (n = 17) and other nursing home care providers (n = 20). Each interview focused on up to three psychogeriatric residents with verbal and vocal agitation. In total, 51 residents were discussed in the interviews.

Results: For each resident, the frequency of music, the type of music being offered, and the degree of correspondence between the music being offered and the resident's preferences varied. In almost all cases, music was being offered in the communal living room during the mid-morning coffee and the afternoon tea, while music was only infrequently offered to residents during meals. However, this music was not tailored to the preferences of the residents. During patient-centered care activities in the early morning and before sleep, when offered, the music was generally tailored to the preferences of the resident(s).

Conclusion: Music is frequently played in nursing homes to patients with dementia who have verbal and vocal agitation. When offered to a group of residents, the music tends not to be tailored to the preferences of the residents. However, when offered individually, musical preferences are generally taken into account.

Introduction

Patients with dementia living in Dutch nursing homes are generally housed in a ward with approximately 30 other patients. In each ward, there are two to three living rooms where about 10 to 15 psychogeriatric patients spend their days together. The nursing home staff endeavor to create a pleasant living environment: the radio and the television are often on, CDs are occasionally played, and activities are frequently organized which take account of the psychological and physical capacities of the patients. Unfortunately, limitations in terms of space and personnel inhibit an individually tailored approach. Today, with the wide-scale implementation of more experience-driven care, most nursing homes seek to provide activities that are attuned to the needs of their psychogeriatric patients (Kooij, 1998; Lange et al., 1999; Droës et al., 2001).

Dementia is often accompanied by behavioral disturbances, such as wandering, compulsive walking, verbal and vocal agitation, aggression, irritability and sleep disturbances (Zuidema et al., 2006; 2007). Wandering and agitation (verbal and vocal) are common among patients with dementia living in nursing homes, with prevalence rates ranging between 17% and 71% for wandering and between 10% and 39% for agitation. These disturbances can be taxing for both the patients and their carers. Except for physical aggression, healthcare providers report that wandering, compulsive shouting and verbal aggression are the most stressful incidents experienced in working with psychogeriatric patients (Bright, 1986). Shouting appears to be associated with the experience of physical pain and depression, as well as with loneliness and the absence of structured activity (Cohen-Mansfield et al., 1989; 1990). Verbal and vocal agitation is characterized by repeated shouting, screaming, complaining, moaning, negativity, and constantly demanding attention. Agitation occurs in the absence of justifiable circumstances and is highly disruptive to the patient's environment (Cohen-Mansfield and Werner, 1997; Vink, 2000).

By carefully taking stock of the behavioral problems of patients with dementia, it is possible to improve our ability to provide tailored care. The physical and psychological causes of behavioral problems, as well as the environmental factors that exacerbate such problems, must be considered. The underlying determinants of and factors influencing behavioral problems are diverse. Consequently, interventions should endeavor to tackle those factors and determinants that are most relevant and most applicable to the patient in question (Cohen-Mansfield, 2001; 2003; Camp et al., 2002). If the nature of the behavioral problem and the capacity of the team allow it, a non-pharmacological intervention is preferred as this can limit the use of pharmaceutical drugs and their corresponding side effects (Kok and Verhey, 2001). In fact, recent research has demonstrated that psychopharmaceutical drugs have only a limited effect on the above mentioned behavioral problems (Sink et al., 2005). At the same time, studies investigating the effects of non-pharmacological interventions tend to be anecdotal (Cohen-Mansfield, 2001). To date, there is still little evidence regarding the influence of non-pharmaceutical interventions on the behavior of patients with dementia (Ayalon et al., 2006; Spira and Edelstein, 2006). Nonetheless, given that non-pharmaceutical interventions do not appear to be detrimental to patients with dementia, and given that limiting the use of pharmaceutical interventions – and especially the use of antipsychotic drugs – has clear advantages, we contend that non-pharmaceutical interventions should continue to be applied in clinical settings while we await more extensive research on the effects of such interventions (Kunik et al., 2007).

Like frequent interpersonal contact (proximity), music appears to have a calming effect on the behavior of patients with dementia (Koger and Brotons, 2000). In many Dutch nursing homes music is frequently offered, both in passive listening form (e.g. radio and CDs in the communal living room), and as 'live' music in the form of song and dance, small orchestras, bands, and singing during church services and celebrations. These latter forms can be considered recreational music. Most often, however, music is provided with little consideration given to the preferences of the individual patients. In short, music is rarely tailored to the individual needs, wants and preferences of psychogeriatric nursing home residents.

In addition to the provision of music in the ways illustrated above, music is used by musical therapists intentionally to influence the behavior of patients with dementia (Vink, 2000; Gerdner and Swanson, 1993; Gerdner, 2000). In this study, we limited our analyses to the general provision of music (radio and CDs) and thus did not explore the effects of music therapy or 'live' music.

The research questions in this study were as follows:

1. What is the current supply of music, both nonspecific and tailored, to patients with dementia and verbal and vocal agitation (VVA) living in Dutch nursing homes during various care activities?
2. Are the musical preferences of the residents known and are these preferences taken into account when determining the kind of music to be played?

Method

Research design

In this descriptive study, which was conducted in 2002, data on dementia patients with VVA in Dutch nursing homes were collected using interviews. Because this explorative study did not endeavor to establish causal relationships, such as the effect of music on the behavior of these patients, we chose to employ a survey design (Baarda and Goede, 1995).

In order to gain insight regarding the music being offered to patients, a large number of interviews were conducted. We opted for face-to-face interviews with a semi-structured survey as this tends to generate relatively high response rates. It also allows the researcher to take into account the care context as well. With face-to-face interviews, the researcher knows who answered the questions and from which position or perspective those answers were offered (Baarda and Goede, 1995).

Selecting nursing homes

Twenty nursing homes, selected at random, were included in this study. All nursing homes, regardless of their clinical capacity, had an equal chance of being included in the study. Once selected, a recruitment letter was sent to the head of medical and paramedical services to ask for willingness to participate. The head of medical and paramedical services determined the psychogeriatric ward that would be included in the study.

Interviews

In each participating nursing home, we interviewed a nursing home physician and a staff member (team leader, primary care provider, care attendant, or activity facilitator) working in care provision, both of whom were working on the ward in the study. The first author (EvdG) conducted the interviews.

At the start of the interview, the interviewer explained the definition of verbal and vocal agitation (VVA) – residents who show irritability, make lewd remarks, swear and show verbal aggression, demand for attention continuously and excessively, repeat sentences or questions, make unusual noises, shout, scream and shriek, complain and show negativity (Cohen-Mansfield and Werner, 1997; Vink, 2000). The respondent then selected the patient records of up to three residents who displayed symptoms of VVA. Following this, the interviewer read survey questions aloud to the respondent and asked him or her to provide an answer that reflected the selected residents' situation. The nursing home physicians contributed to the study by providing medical data while the staff members working in care provision answered questions regarding the provision of music to the residents.

The order of questions was kept consistent throughout all interviews. If the respondents discussed fewer than three residents, the number of interviews conducted was adjusted accordingly.

Survey

The survey used in the interview was pretested in the nursing home where the primary researcher (EvdG) works and included the following items:

a. Characteristics of the resident, including age, sex, cognitive impairment(s) diagnoses, time since being admitted to the nursing home, score on the Global Deterioration Scale (Reisberg et al., 1982) and the nature and intensity of VVA;
b. The role music plays in the life of the resident, including the resident's musical preferences;
c. The kinds of music (genre) and the frequency of music provided during all care activities over the seven days prior to the interview, either directed to the individual or to a group;
d. Alternatively, the genre and frequency of music that is chosen in accordance with the preferences of the individual and/or group.

Care activities included: being woken up, helping the resident get ready for the day, breakfast, midmorning coffee, lunch, the "rest" hour, afternoon tea, dinner, getting ready for bed, and going to sleep. These care activities can be tailored to the individual (i.e. being woken, getting ready for the day) or can be done as a group (i.e. morning coffee, afternoon tea).
The interview questions covered the music being offered during the seven days prior to the interview. Seven days was considered sufficient to get a clear idea of the kind (genre) and frequency of music being offered as most activities occur either daily or weekly.

Data analyses
The data gathered from the closed questions were analyzed using SPSS 10. As the number of participating nursing home was relatively small (n = 20), the results are primarily descriptive.

Results

In 17 of the 20 selected nursing homes, both the nursing home physician and the staff member working in care provision participated in an interview. In three institutions, only a staff member was available for an interview.

The physicians interviewed had been employed as nursing home physicians for an average of 9.6 years (range 0.5–28 years) and in their current job for an average of 3.7 years (range 1–12 years). The staff members had been working in their field for an average of 9 years (range 1–28 years) and in their current job for an average of 5 years (range 0.5–17 years). The number of psychogeriatric residents in each ward ranged from 22 to 43, with an average of 30.5.

The resident population with VVA

Of the 51 residents included in this study, 12 were male (24%) and 39 were female (76%). The average age of the residents was 84.5 years (range 58–99 years). The average time since being admitted to the ward was 1.8 years and ranged from 1 month to more than 8 years.

With respect to the Global Deterioration Scale (GDS), two residents (4%) were classified in phase 4, eight (16%) in phase 5, 29 (57%) in phase 6, and 12 (23%) in phase 7.

The nature and extent of VVA

The various forms of VVA manifested by the 51 participating residents are presented in Table 1. In all participating residents, the VVA behavior had been present for at least three months. In most cases, the behavior had been present since admission to the ward. The number of times the residents displayed VVA behavior varied from occasionally (n = 8, 16%) to more than once a day (n = 33; 65%) and almost the entire day (n = 10; 19%). The displays of behavior varied from less than half an hour (n = 13; 25%) to between half an hour and two hours (n = 18; 35%) and more than two hours (n = 8; 16%). For 12 residents (24%), the amount of time this behavior was displayed varied significantly from one incident to the next.

Table 1 Manifestations of verbal and vocal agitation present in psychogeriatric residents (n = 51)

MANIFESTATION [a]	NUMBER (%)	
Irritability	4	(8%)
Lewd remarks	1	(2%)
Swearing and verbal aggression	10	(20%)
Continuous and excessive demands for attention	14	(28%)
Repeating sentences or questions	9	(18%)
Making unusual noises	5	(10%)
Shouting	11	(22%)
Screaming and shrieking	16	(31%)
Complaining	1	(2%)
Negativity	1	(2%)
Other	0	(0%)

Note: [a] More than one manifestation is possible.

Musical preferences

The respondents indicated that 38 of the 51 (75%) selected residents enjoyed listening to music. For ten residents (20%), the respondents did not know if the resident in question enjoyed listening to music. For 28 residents (55%), the respondents reported that the resident in question enjoyed singing or had sung in the past. Six (12%) of the selected residents had sung in a choir in the past. Six (12%) residents had played an instrument, namely piano (4), organ (1), and violin (1). The violinist mentioned above had played in an orchestra. For 41 residents (80%), respondents reported knowing their musical preferences. Most often, this preference was provided to the care providers or activity facilitator during the admission and intake or shortly thereafter. The preferences of the residents varied from classical music (49%), traditional folk (44%), religious (29%) and children's (10%), with pop and new age being only incidental preferences.

In 24 of the 41 cases where the musical preference was known, this was reported in the patient's records.

Music offered during care activities over the seven days prior to interview

Figure 1 shows the number of psychogeriatric patients who were offered music during care activities in the seven days prior to the interview. While the music supply was relatively limited during patient centered morning and evening care activities, as well as during meals, music was offered to the residents almost daily during the midmorning coffee and the afternoon tea.

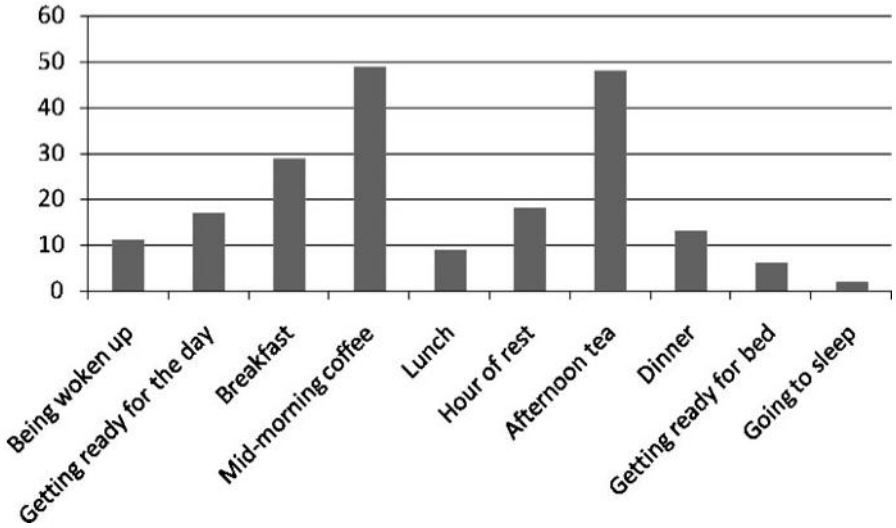

Figure 1 The number of psychogeriatric residents with verbal and vocal agitation who were offered music during care activities (n=51)

Musical preferences in relation to provision: individually tailored or geared to the group

Figure 2 shows the degree to which the music offered during the various care activities corresponded with the musical preferences of the residents. In general, the music that was played when residents were getting ready for the day or getting ready to go to sleep corresponded with the residents' preferences. However, during the midmorning coffee and the afternoon tea, the music offered did not often correspond with the residents' preferences.

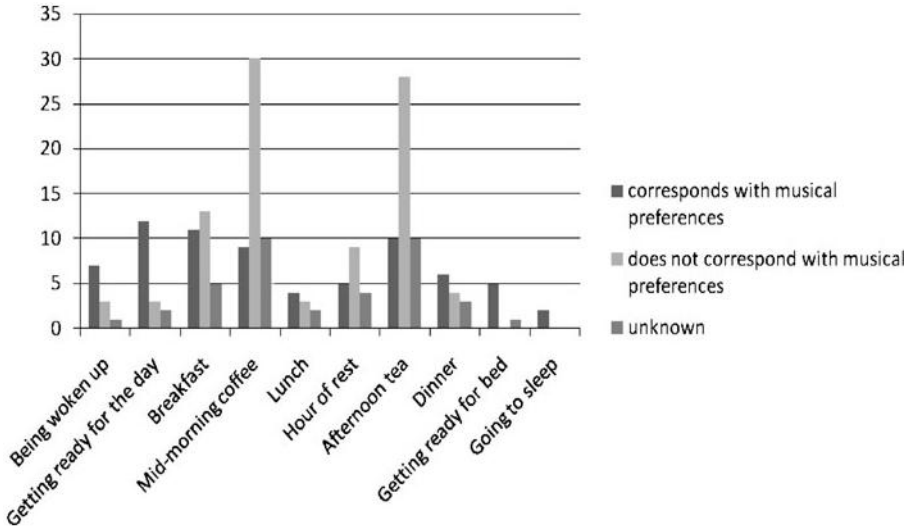

Figure 2 Correspondence between the music offered to psychogeriatric residents with verbal and vocal agitation (n = 51) during care activities and their musical preferences

Figure 3 shows to whom the music was oriented, namely the resident in question or more than one resident. Music played while residents got ready for the day and ready to go to sleep was generally geared to the individual resident whereas, during breakfast, the mid-morning coffee and the afternoon tea, music was usually geared to the group of residents.

It is interesting to note that when the music was tailored to the individual, it usually corresponded with that individual's music preferences. When music was offered to a group of residents, it tended not to correspond with those residents' musical preferences.

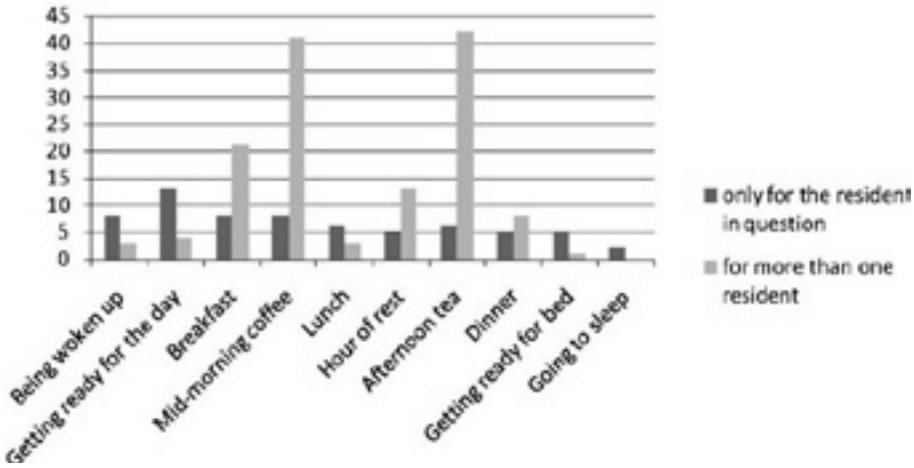

Figure 3 The degree to which music was tailored to individuals or groups during care activities for psychogeriatric residents (n = 51) of the residents, the care providers knew if the resident in question enjoyed listening to music or singing.

Discussion

This modest exploratory inventory has endeavored to provide some insight into the extent to which music is offered to dementia patients with verbal and vocal agitation in Dutch nursing homes. It has also sought to reveal the degree to which this provision corresponds with the musical preferences of the patients.

The musical preferences of residents

This study has shown that the musical preferences of most residents were either known or approximated by care providers. In fact, musical preferences were described in half of the patients' care records. Further, this study has also shown that care providers generally know something about the patient's relationship to music. In fact, for 80% of the residents, the care providers knew if the resident in question enjoyed listening to music or singing.

Music provision

Our study also demonstrates that a significant amount of music is offered to nursing

home residents through the loudspeaker system. Although not included in our inventory, we were informed that nursing homes also have frequent gatherings with live music. So, it is quite possible that nursing home residents are actually exposed to more music and sound in the nursing home than they were before being admitted. Given this potential increase in exposure, along with our finding that much of the music offered did not correspond with residents' musical preferences, it is quite possible that, in some cases, music actually may exacerbate residents' agitation. This possibility has been suggested by others and needs further scientific investigation (Ragneskog and Kihlgren, 1997; Cohen-Mansfield, 2001). The volume of the music should also be carefully monitored by the staff.

We found that music is almost always played in the nursing home living rooms during the mid-morning coffee break and at afternoon tea. During these times, in which music is offered to a group of residents, the music supply rarely corresponded with the musical preferences of the residents. However, when music was offered to individual residents during more patient-centered care activities, it was generally in accordance with the resident's musical preferences. Literature has shown that music that is tailored to the preferences of an individual resident may have a positive effect on the shouting behavior that is characteristic of patients with dementia and VVA (Gerdner and Swanson, 1993; Gerdner, 2000).

Furthermore, if residents display agitation, well-chosen music may have a positive effect on patients' behavior during meals and while bathing (Ragneskog et al., 1996; Clark et al., 1998). Music could therefore be used during these care activities to calm VVA behavior. Again, more studies are necessary to confirm this.

In this rather limited study, we have seen that, when offered to an individual, music is generally in line with that individual's preferences. When offered to a group, this is often not the case. In a living room where 10 to 15 residents spend their time, it is very difficult to tailor music to the preferences of each and every resident present. Whether music that does not correspond with preferences is experienced as unpleasant is something that this study did not explore. However, if this is the case, we recommend adjusting the type of music where possible. Alternatively, the amount of music played should be limited or even discontinued altogether.

Nevertheless, in daily practice, individual tailoring will demand ingenuity,

resourcefulness and flexibility from care providers and other members of staff.

Comments on the methods employed

The number of nursing homes included in this study was 20. In every participating nursing home, three psychogeriatric residents with VVA were chosen from one psychogeriatric ward. This generated a sample size of 51 residents. Clearly, both the number of nursing homes and the number of residents included in the study were limited. Additionally, when forming the sample, no special consideration was given to the size of the nursing homes or to their potential specializations regarding their approach to caring for psychogeriatric patients with VVA. Furthermore, the participating residents were not selected at random – the nursing home physician and/or the nursing staff were asked to choose up to three residents in their ward. It is possible that those residents with the most pronounced VVA behaviors were selected and it is also possible that, because of their VVA behavior, these residents were offered more tailored music than other residents. It is unlikely that knowledge of the musical preferences of the residents played an important role at the time of their selection. After having been given the definition of verbal and vocal agitation by the interviewer, the nursing home physician and/or nursing staff selected the patient records. In most cases (17/20) they discussed which of the resident had the most appropriate behavior for this research. The attention was focused on the resident's behavior rather than on musical preferences or the music offered. The music directed at group settings tended to be standardized. It is therefore unlikely that the method of selecting residents influenced the results relating to music offered to groups.

Despite the above limitations, the results reported here provide some useful preliminary insights. This study is, as far as we know, the first to compile an inventory on music provision to dementia patients with VVA in nursing homes.

The amount of time that the interviewed care provider had been working in the health care sector and on that ward was sufficient enough to assume that the respondent was acquainted with the ward and its residents. All staff members interviewed were directly involved in caring for residents. One potential limitation or bias that results from conducting face-to-face interviews is that respondents are occasionally inclined to provide socially desirable answers. However, given the topics discussed in the interviews, we contend that, in this study, this was unlikely.

In conclusion, music is frequently offered to psychogeriatric patients with verbal and vocal agitation living in Dutch nursing homes. When offered to a group of patients, the music tends not to be tailored to their general preferences. In contrast, when music is made available on an individual basis, it tends to meet specific tastes. Because care providers have access to information regarding their patients' musical preferences, tailoring available music to individual tastes should not be difficult. It appears that many professionals caring for residents with dementia underestimate the positive effect music may have on them despite the fact that a number of case studies have demonstrated this positive effect (Koger and Brotons, 2000; Clark et al., 1998; Vink et al., 2003). Unfortunately, the evidence for the use of music in targeting challenging behavior in residents with dementia is still limited. We therefore recommend further research in this field by executing a well-designed randomized control trial.

Keywords
verbal and vocal agitation, dementia, music, nursing home.

Conflict of interest
None.

Description of authors' roles
E. van der Geer designed the study, collected the data and wrote the paper; A. Vink, J. Schols and J. Slaets assisted with the study design and with writing the paper.

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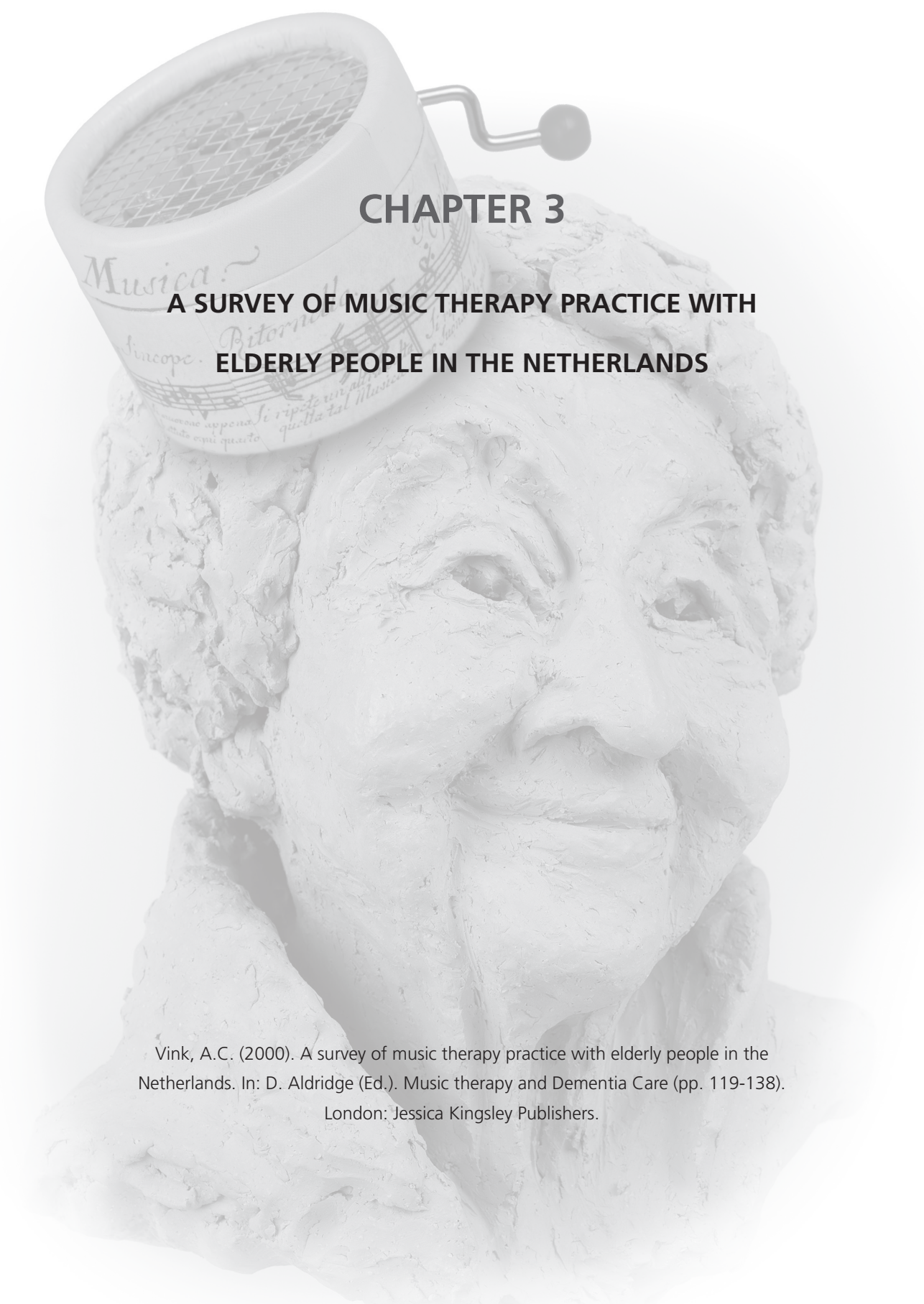

CHAPTER 3

A SURVEY OF MUSIC THERAPY PRACTICE WITH ELDERLY PEOPLE IN THE NETHERLANDS

Vink, A.C. (2000). A survey of music therapy practice with elderly people in the Netherlands. In: D. Aldridge (Ed.). Music therapy and Dementia Care (pp. 119-138). London: Jessica Kingsley Publishers.

A Survey of Music Therapy Practice with Elderly People in The Netherlands

Music therapy as a profession is relatively new in general health care. In the Netherlands, since the 1950s and 1960s, the first music therapists started out to work with psychiatric and mentally retarded clients. Today, most music therapists in the Netherlands are still working with these client populations. The introduction of the music therapist in the nursing home is of more recent date, although especially with this client population the positive effect of music has been long recognized.

Many studies have described the beneficial effects of music therapy upon dementia. Music therapy has been found to improve social and cognitive skills and as a result of music therapy intervention problematic behaviours as wandering and repetitive vocal outlets, have been found to decrease (Casby & Holme 1994; Groene 1993; Olderog Millard & Smith 1989; Pollack & Namazi 1992; Pickett & Moore 1991).

A large proportion of the music therapy literature involves the scientific study of the effect of music therapy with elderly people. In most studies, the intervention consisted of individualized receptive music therapy whereas in practice generally music therapists use of a varied range of methods, such as improvisational music. To what extent active music therapy is used in psychogeriatric care is unknown from the literature. Relatively few studies give insight in the actual practice of music therapists working with demented elderly people. Questions are asked regarding what choices does a music therapist make when for instance working with demented patients? Which goals are set when working in psychogeriatric practice and does one work indeed mostly with individual patients as the literature suggests? With these questions in mind a survey study has been held among Dutch music therapists working in psychogeriatric care.

How many music therapists work in psychogeriatric practice?

Survey studies conducted in Canada and the United States show that the number of jobs increases in all sectors in healthcare on a yearly basis. The Canadian Association of Music Therapy (CAMT 1996) reported that in 1996, 31 new positions were created compared to 7 positions lost. Results were based on the analysis of 114 questionnaires; 52 music therapists (46%) indicated that they were working with Alzheimer's disease patients.

The American Music Therapy Association (AMTA 1998) reported similar results based on 2.034 surveys. In 1998 68 new positions were created versus 20 positions lost. It was indicated by 697 music therapists that they were working in a geriatric facility, a geriatric psychiatric unit or in a nursing home. Unfortunately, few statements were made about the respective increase for each specialization on a yearly basis. Allison (1992) interviewed all (!) 45 music therapists in Australia and stated that most music therapists (43,1%) were working with elderly people.

To learn more about the current proportion of music therapists working in psychogeriatric care in Europe, several music therapy associations were contacted. Music therapy associations in Germany, Britain, Denmark and Finland were asked if they also had similar survey results. Although all indicated the usefulness of these statistics, none of the associations knew how many music therapists were working in their respective countries.

In the Netherlands, is has been estimated that in total 291 music therapists are currently employed in general healthcare (Neijmeijer et al. 1996). The total number of creative therapists has been estimated at 1.040. In all, it was expected that 49 music therapists were working in psychogeriatric care, the third largest clinical population after the mentally handicapped and psychiatric populations. Estimates in this report were based on membership of the Dutch Association for Creative Therapy (Nederlandse Vereniging voor Kreatieve Therapie[1]). Not all music therapists are actually member of this association, so it was expected that the actual number of music therapists working in psychogeriatric care would be higher.

To answer the question how many music therapists are currently employed in geriatric care, a questionnaire was sent out to 247 nursing homes in the Netherlands. Of the 247 nursing homes 153 returned the questionnaire (61,9%). Analysis revealed that

[1] Nowaydays known as the Federatie Vaktherapeutische Beroepen (FVB)

over 95 per cent of the residents on the psychogeriatric care unit of the nursing home are demented. In 32 (22,9%) of the psychogeriatric nursing homes, music therapy is offered to demented residents and in total 33 music therapists are employed in these nursing homes. In 39 (25,5%) nursing homes where no music therapist is employed, the use of music in other activities was mentioned, mostly during activity therapy and recreational activities. The number of nursing homes has increased to 300. When the data are extrapolated to this number of 300 homes, the estimated number of music therapists working in psychogeriatrics would amount to 60 in total. This corresponded to the number found when the names reported in this survey were combined with several other existing address lists. In total the addresses of 60 music therapists working in psychogeriatric care in the Netherlands were collected. When it was known how many music therapists were working in psychogeriatrics in the Netherlands, a survey was sent out to learn more of the work carried out in practice.

Description of the instrument and subjects

A 57-item questionnaire was developed for the purpose of gaining more insight in music therapy practice in psychogeriatric care in the Netherlands. The first section of the questionnaire started with general aspects of the profession, such as training and job-related experience. Also questions were included to learn which sources music therapists use to educate themselves further on recent developments in music therapy. An extensive body of the literature music therapy students in the Netherlands read are Dutch or German language publications. To what extent professional therapists also use foreign literature and theories developed abroad is relatively unknown.

In the second and third section of the questionnaire, mostly open-ended questions were used, since this was the first attempt to survey music therapists in psychogeriatrics and no information was available to define fixed categories. The second section included questions about music therapy in psychogeriatric care in general. As most of the residents are demented and an estimated 60- 70% per cent of demented elderly patients suffer from Alzheimer's disease, the third section of the questionnaire involved the work of the music therapist working with Alzheimer's disease patients.

Aspects addressed in the second and third sections were:
-Whether therapists worked with group or with individual treatment?
-What is the average duration of the intervention?
-Whether therapists worked with active or receptive music therapy?
-How are active and receptive music therapy used in practice in terms of content, instruments used and musical repertoire used?

The questionnaire was reviewed by two music therapists to see if all questions were easily understood and to see if all questions were unambiguously stated. A pilot study was held among 5 music therapists, to see if items needed to be adjusted.

Subjects

The revised questionnaire was mailed to 55 music therapists and one reminderletter has been sent out to increase the responsrate. A total of 33 (60%) questionnaires were returned and 32 (58%) were suitable for data-analysis. Of these responders 7 were male (21,9%) and 25 female (78,1%). The average age of the responders was 38 (age range: 26-57). The music therapist in psychogeriatrics has on an average 6,5 years of experience (range: 0.5 to 25 years) and works an average of 76 hours per month (range: 10-160 hours per month). Twenty music therapists indicated that they were employed in one nursing home, five in two nursing homes and two music therapist were employed in three homes at the same time. In the next sections of this chapter, the most important survey outcomes will be reported.

Theoretical background of the music therapists

In the Netherlands, there are several music therapy training programs lasting four years, which are placed within the regular educational system in the Netherlands (Smeijsters 1993). Of the responders, nineteen (59%) were educated at one of the four music therapy training programs which are allied with the colleges of higher vocational education (Hogeschool) in Enschede, Utrecht, Nijmegen and Sittard[2]. Four music therapists (13%) graduated from one of the two ortho(ped)agogic music training programs available in the Netherlands, in Alkmaar and Maastricht. Two

[2] Nowadays located in Heerlen, UAS Zuyd.

music therapists (0,6%) were trained at the 'Wervel' in Zeist[3], a music therapy school where music therapy is thought on an anthroposophic basis. The other seven (22%) responders were trained elsewhere, for example at a conservatoire and following courses in music therapy. None was trained abroad or had followed advance courses in a foreign country.

In the Netherlands there are no postgraduate studies for music therapy. In the survey, questions were included to learn more of the ways music therapists educate themselves, after they have graduated from music therapy training. Table 6.1 lists the several sources, ranging from reading music therapy journals to talking with other colleagues. In separate questions the therapists were asked if they knew the source of information and how often they used the source of information which was answered on a six-point scale ranging from never (1) to always (6).

Table 1 Use of sources providing information on recent developments in music therapy.

Do you know this source of information? / How often do you use this source of information?	**% Yes**	**% No**	**Mean**	**Sd**
Talking with other colleagues	31 (96,9%)	1 (3,1%)	4,06	1,24
The Dutch Magazine for Creative Therapies (Tijdschrift voor Kreatieve Therapie) [1]	30 (93,8%)	2 (6,3%)	3,38	1,70
Attending music therapy conferences	30 (93,8%)	2 (6,3%)	2,59	0,91
Internet	24 (75%)	8 (25%)	1,62	0,91
Professional meetings	23 (71,9%)	9 (27,3%)	2,25	0,98
Music Therapy	16 (50%)	16 (50%)	1,56	0,88
Musiktherapeutische Umschau	15 (46,9%)	17 (53,1%)	1,53	0,76
The Journal of Music Therapy	9 (28,1%)	23 (71,9%)	1,31	0,69
Journal of British Music Therapy	8 (25%)	24 (75%)	1,38	0,87
Arts in Psychotherapy	8 (25%)	24 (75%)	1,28	0,68
Zeitschrift fur Musik-, Tanz, und Kunsttherapie	5 (15,6%)	27 (81,8%)	1,12	0,42
The Soloist (De Solist, a Dutch journal for self-employed music therapists)[2]	2 (6,3%)	30 (93,8%)	1,03	0,18
Music Therapy Perspectives	1 (3,1%)	31 (96,9%)	1,09	0,39
n-32				

[1] Nowadays known as the Tijdschrift voor Vaktherapie
[2] The Soloist does not exist anymore.

[3] Nowaydays located in Leiden, UAS Leiden

Talking with other colleagues is the option which was most known to the responders and is most frequently used when informing themselves on recent developments in music therapy. The Dutch magazine for Creative Therapies is the second most popular source to refer to. This magazine is received automatically by registered members of the Dutch Association for Creative Therapies (NVKT). Relatively unknown and read sources are the Soloist, the Dutch journal for self-employed music therapists, and the journal Music Therapy Perspectives. A possible reason is that the Soloist is relatively new in the Netherlands and also in psycho geriatrics there are no music therapists working on a self-employed basis. Music Therapy Perspectives is not easily available through the Dutch libraries which could explain the low score.

The largest proportion of the responders reported that they seldom made use of any of the mentioned sources. The main reason is probably that most journals are hard to find in libraries; however, easily accessible sources, like the Internet, are seldom used too. More surprising is that most foreign journals, like the Journal of Music Therapy, are also relatively unknown, which seems to confirm that mostly local information is used. Possibly, responders have confused the Journal of Music Therapy with Music Therapy, which is not available in the Dutch libraries. In general, the possible variety of resources mentioned are not used on a regular basis.

Questions were also asked about which theoretical views the clinician uses in practice. During music therapy training in the Netherlands, various theoretical approaches are thought to the students. A typical theoretical orientation that has been developed in the Netherlands is the analogous process model by Smeijsters (1995), in which it is assumed that pathological processes are reflected in musical processes. The following short descriptions of the various theoretical approaches were given to the music therapists and they were asked to indicate according to which background(s) they work with in psychogeriatric care (see Table 2).

Table 2 Theoretical Orientations in music therapy work (Derived from the original Dutch version of N. van Nieuwenhuizen and M. Broersen 1998)

Psychoanalytic music therapy Through the unconscious exploring of music, by listening to music or through improvisation, associations can be stimulated. The transference relationship, in which the client in a symbolic way experiences suppressed situations again, can help someone to release tensions and can provide in new insights.
Behavioristic music therapy Through the use music as a stimulus, relaxation is induced in the listener, as a counterbalance for ones fears. Also can music be used as a reinforcer for positive behaviours.
Humanistic music therapy Through unconditional acceptance of the clients' (musical) expression and through a warm and honest approach, the client opens up in progressive steps. He discovers his true personality and he can make more realistic choices for a more desired future life.
Communicative music therapy During an musical improvisation is studied how the client interacts with others and how this is expressed in music. The analogy between the concrete musical, the desired social behaviour and the clients experiences become apparent in a playful situation and this gives the client the opportunity to experiment with himself and in the interaction with others.
Analogous process model In this model it is assumed that musical behaviours are in a sense a reflection of the clients daily life, including his psychopathology. Through the use of musical methods it is possible to (positively) influence the clients' overall behaviours and his experiences.
Creative process model A process, in which the client can use creative processes (such as music) to release himself from rigid patterns in relation to his direct environment by searching for his own personal composition, which is adjusted to his own desires.

In general it was expected that in line with other specializations in healthcare, most music therapists would be eclectic in their approach depending on the clients' characteristics. This was indeed the case. Only two of the music therapists surveyed followed one theoretical orientation in their work in psychogeriatrics following the creative process model. On average, music therapists selected three alternatives to describe their theoretical orientation in their work. In table 3 the frequencies are reported for each of the theoretical orientations. The least used option was

psychoanalytical music therapy and the most popular orientation was humanistic therapy. There was no consistent pattern to be found in the way combinations of theoretical orientations were reported. Further is seemed that age was a predictor of theoretical orientation. The modal age of the sample was 35. Although there were not many changes related to age, music therapists older than 35 more often reported that they worked according to psychoanalytical music therapy.

Table 3 Theoretical orientations in the work in psychogeriatrics

Theoretical orientation	Age<35	Age >35	Total N	
Psychoanalytical music therapy	2	7	9	(29,0%)
Behavioristic music therapy	6	8	14	(45,2%)
Humanistic music therapy	11	7	19	(61,3%)
Communicative music therapy	6	9	15	(48,4%)
Analogous process model	8	6	14	(45,2%)
Creative process model	5	9	14	(45,2%)
n-31				

Furthermore, it was asked how theoretical orientations were translated to music therapy practice. Music therapists indicated in behaviouristic music therapy that music is used to structure the clients' experiences, which releases fear. Other music therapists stated that music stimulated memories which influence the clients' behaviour. Also it was stated that through the use of music, positive behaviours can be stimulated, such as relaxation.

Most reactions were given in relation to humanistic music therapy: unconditional acceptance of clients and their musical expressions serves to provide a sense of safety and comfort basic to human well-being. Others indicated that the chosen orientations did best reflect their own ideas on music therapy or that were trained as such. In respect to the analogous process model it was stated that with demented elderly people with declining verbal abilities, the musical expression is indicative of the client's feelings. In regard to the creative process model, music therapists stated that clients are stimulated to get close to their own experiences and learn to express their innerselves. About communicative music therapy it was mentioned that through musical improvisation non-verbal communication patterns can be stimulated, especially when the verbal abilities are gone.

In general the following music therapy techniques were reported in the work in psychogeriatrics but were generally unrelated to the theoretical orientation: musical improvisation, singing and or playing along with familiar music, interactive musical games, using themes from daily life in musical play, reminiscence activities, following or leading in musical play and imitating musical behaviours. It seemed too difficult for the respondents to describe the music therapy methods according to theoretical orientations as most music therapists work intuitively and are eclectic in their approach.

Drieschner and Pioch (1998) questioned if this implicit knowledge can be explicated. They questioned if there are implicit rules in the choices music therapists make when adapting music therapy methods to certain clinical populations. Music therapists from four health-care sectors were interviewed in this study ranging from adult psychiatry, child psychiatry, care for elderly people and care for mentally handicapped people. The data of thirty music therapists were analysed. Therapists provided significantly more structure in music therapy with elderly people and children compared to music therapy with adults. The music itself and the interaction between the patient and the musical material was considered most important by the music therapists working with elderly people. Drieschner and Pioch (1998) write that music therapists found it very difficult to distinguish between different methods in their practice. Many music therapists seem implicitly to develop a personal style based on intuition.

Music therapy with psychogeriatric residents

Most nursing homes have separate somatic and psychogeriatric wards, where respectively residents reside who have primarily physical or psychiatric problems. Most (over 95 per cent) of the residents who stay on a psychogeriatric unit are demented. Music therapists indicated in the survey that patients are primarily referred to music therapy when they have social problems, when they are agitated or display passive behaviour. Further indications are emotional problems and the residents affinity' with music. Most of the residents who are referred to music therapy are demented. The following disease groups were reported in order of significance: Alzheimer's disease patients, multi-infarct dementia or vascular dementia, Parkinsonian dementia and Huntington disease. Other major diseases that were reported included CVA, Korsakoff, acquired brain damage and depression.

In the literature is has been stated that the best time for music therapy intervention is in the late afternoon before the peak level of agitation is reached (Gerdner and Swanson 1993). Other researchers (Goddaer & Abraham 1994; Ragneskog et al. 1996b) mentioned that at lunchtime the residents are often restless, which indicates that this would be the best time of day for music therapy. It was questioned in the survey if the music therapist also had a preference for a time of day to conduct music therapy. Most indicated that they had no special preference for a time of day at which they believed music therapy would have any other additional effects. When a preference was indicated it was for the morning hours, when residents are more awake or in the beginning of the afternoon (see Table 4).

Table 4 Music therapists preferences for a time of day for music therapy services in psychogeriatrics

Time of day	*F*	*%*
In the morning	8	(26,7%)
In the afternoon	1	(3,3%)
Morning and in the afternoon	7	(23,3%)
In the afternoon and evening	1	(3,3%)
No preference	13	(43,3%)
n-30		

Questions asked about music therapy practice with psychogeriatric patients were divided in two sections: receptive and active music therapy. For both receptive and active music therapy it was asked if the therapist preferred an individual or group approach. Most of the music therapists indicated that they worked worked equally often with groups as with individual therapy. Three music therapists indicated that they worked either solely with groups or solely with individual patients. When working in groups, on average the group consists of 6 clients (range two to fifteen clients). Both within individual therapy and during group therapy, a combination is preferred of receptive and active music therapy (Table 5). Most often a session starts with music listening that changes later in the session to an active form of music therapy.

Table 5 The use of active and receptive music therapy in individual and group therapy with psychogeriatric residents

	Individual therapy	*Group therapy*
I use mostly receptive music therapy	1 (3,6%)	1 (3,6%)
I use mostly active music therapy	1 (3,6%)	5 (17,9%)
both receptive and active music therapy	26 (92,9%)	22 (78,6%)
n-28		

This corresponds with the study of Drieschner and Pioch (1998) in which it was concluded that active and receptive music therapy was equally often used with group or individual therapy. In comparison to other clinical populations, receptive music therapy was used far more often with elderly people.

Receptive music therapy with psychogeriatric patients

In the literature, the process of a client listening to music is often described as 'passive music therapy'. In the Netherlands, the preferred term is 'receptive music therapy' as music listening involves active processes on part of the listener. Receptive music not only includes the residents listening to music played on audio equipment but also implies that the residents listen to the music the music therapist plays or sings. Most music therapists (25 therapists or 89.3%) use both forms of receptive music therapy. On average, a receptive music therapy session takes 38 minutes (minimum15 minutes -maximum 90 minutes). It is often stated in the literature that preferably familiar music is chosen for music for the residents.

In this survey it was asked which musical repertoire is used during receptive music therapy with psychogeriatric residents (Table 6).

Table 6 Musical repertoire used in receptive music therapy

Musical repertoire	*F*	*%*
I do not use existent musical repertoire	5	(17,9%)
music based on musical preferences of the patient	25	(89,3%)
music from the time that the patient was a young adult	24	(85,7%)
classical music	28	(100,0%)
folk music	20	(71,4%)
popular music	18	(64,35)
new-age music	13	(46,4%)
nature sounds	15	(53,6%)
n-28		

The option most often selected was classical music whereas New Age music was the least preferred. Other types of music that were reported included one's own musical repertoire, improvised music, music from the time when the resident was a child and religious music.

In the music psychology literature, specific instruments are seen as being more suitable than others to convey a particular emotion. Gabrielson and Juslin (1996) instructed nine professional musicians to sing or play -on violin, flute or electrical guitar-particular emotional expressions such as happiness, sadness and anger as well as without expression. In general, the listener easily understood which emotional expression was played or sung. The researchers concluded that the effect is influenced by the type of musical instrument or whether one sings an emotional expression. Behrens and Green (1993) stated in their research that the violin and singing were more suitable to express sadness.

If there is such an effect of instruments during music therapy, it is as yet unstated, although it can be assumed that there is a clear relation between the type of music played and the feelings it induces in the client. Table 7 lists which instruments are present in both receptive and active approaches. Singing is also included.

Table 7 Instruments present in receptive and active music therapy

Type of instrument	*Frequency of use In receptive music therapy*	*Frequency of use In active music therapy*
keyboard instruments piano, accordion, keyboard, organ	*32*	*29*
string instruments guitar, violin, zither, lute, psaltery, chrotta	*27*	*19*
singing	*19*	*20*
percussion instruments : claves, vibraphone, chimes, xylophone, timpani drums, gongs, rattles	*18*	*80*
wind instruments flute, mouth organ	*11*	*4*
	n-27	n-30

Table 8 Goals in receptive individual and group music therapy with psychogeriatric residents

Goals in individual receptive music therapy	*F*	*Goals in receptive group music therapy*	*F*
relaxation	19	sense of group and social contact	11
stimulating communication and contact	15	reminiscence: adjusting to personal memories and experiences	10
reminiscence: adjusting to personal memories and experiences	8	relaxation	8
activation	6	pleasure and experience of positive feelings	5
acceptance and grief	6	establishing contact and communication	5
stimulating expression of feelings	6	stimulating expression of feelings	4
influencing moodstates	6	working on self-esteem and autonomy	3
	n-27		*n-25*

Next an open-ended question was asked according to which goals music therapist work within receptive music therapy, in both individual as group therapy. On average three goals were reported for both individual as group therapy.

Active music therapy with geriatric residents

During active music therapy the residents are actively involved in the process of music-making in various musical activities. Overall twenty-six (92,9%) therapists reported that they used a combination of active and receptive music therapy in individual

therapy and twenty-two (78,6%) when conducting group therapy. The use of mostly active music therapy was reported by one music therapist who solely worked with individual therapy. Five music therapists reported a mostly active music therapy approach when they worked with groups. The average time spent in active music therapy is similar to receptive music therapy. On average an active music therapy session takes 40 minutes (minimum 20 minutes - maximum 60 minutes).

Whereas in receptive music therapy, an existing musical repertoire is used, active music therapy prefers predominantly musical improvisation. Fifteen music therapists (48,4%) indicated that they do not use existent musical repertoire during active music therapy, where the most reported option was the use of music based on the musical preferences of the residents. The least preferred musical repertoire within active music therapy was New Age music and sounds of nature (see Table 9).

Table 9 Musical repertoire used in active music therapy

Musical repertoire	*F*
I do not use existent musical repertoire	15 (48,4)
music based on musical preferences of the patient	28 (90,3)
music from the time that the patients was a young adult	21 (67,7)
classical music	18 (58,1)
folk music	21 (67,7)
popular music	16 (51,6)
new-age music	6 (19,4)
nature sounds	7 (22,6)
n-31	

While goals in receptive individual music therapy are primarily related to relaxation, in individual active music therapy the most reported goals are strengthening self-esteem and stimulating expression. Within active group therapy the focus is on improving social contact and letting the clients experience that they belong to a group. The most frequent reported goals are listed in Table 6.10. On average four goals were reported, both for individual as group therapy.

Table 10 Goals in active individual and group music therapy with psychogeriatric residents

Individual therapy	*F*	*Group Therapy*	*F*
Strengthening sense of self-esteem and self-confidence	15	Establishing a sense of belonging to a group, improving social contact and social awareness	17
Stimulating expression	14	Improving communication and sparing current social abilities	15
Establishing contact	13	Improving sense of self-esteem and autonomy	10
Regulating fear, aggression and anxiety	10	Expression of emotion and sharing of emotion	9
Providing pleasure and comfort	5	Providing pleasure and comfort	6
Influencing affect and reinforcing positive emotions	5	Relaxation	5
Relaxation	4	Acceptation of losses and grief	4
Acceptation of losses and grief	3	Improving concentration	4

While in receptive music therapy melodic instruments were most frequently mentioned, in active music therapy percussion and rhythm instruments are preferred (see table 6.7). As the level of communication in music therapy is predominantly non-verbal, music therapy is one of the few approaches in which residents of varying levels of functioning can participate without the higher functioning residents dominating. One resident can still sing along with the well-known songs from the past whereas another can move along to the beat of the music or play a small rhythm instrument, such as claves.

While often stated that music therapy has a beneficial effect with demented elderly people, relatively unknown is why music has such a strong effect. Psychogeriatric residents still continue to sing despite aphasia. While language deterioration is a feature of cognitive deficit, musical abilities appear to be preserved (Aldridge 1996). It has been stated by various researchers that language processing is dominant in one hemisphere and music production involves an understanding of the interaction of both hemispheres (Altenmüller 1986; Brust, 1980; Gates and Bradshaw, 1977), which could explain why aphasic patients can still sing and that musical skills remain preserved.

It can be assumed, as it is seen with early infant caretaker interactions, that melodic intonations are an essential component in communication with demented elderly people. Possibly, the fundamentals of language are musical, and prior to lexical functions in language development (Aldridge, 1996). Others have referred to the Progressively Lowered Stress Threshold Model (Hall and Buckwalter 1987) in the context of dementia. Following this model, the threshold for experiencing stress lowers as a result of declining cognitive and social skills. According to Hall and Buckwalter (1987), maximum functional levels can be achieved not by challenging to regain lost functions but by supporting those losses. As musical abilities are longer preserved the losses can be compensated. Following this model the music activities should fit the abilities of the individual to obtain optimal participation.

It was questioned how music therapist themselves explain the effect of music with psychogeriatric residents. The most often mentioned option was that music directly appeals to feelings and emotions. It was also frequently mentioned that music ís communication and music, therefore, has such a strong effect, especially with the elderly people with whom verbal communication is no longer possible. Music is also considered as a strong cue to evoke memories and pleasant associations.

Music therapy and Alzheimer's disease patients

The last section of the questionnaire involved music therapy practice with a particular patient group: Alzheimer's disease patients. In the literature the effect of music therapy with Alzheimer's disease patients has often been the focus of research. Social behaviour has been found to increase through the use of music (Pollack & Namazi,1992). Negative behaviours such as wandering decrease (Groene 1993) and even cognitive skills have been found to improve (Pickett and Moore 1991). Music therapists indicated that they had an average of five years' experience in working with this client group. Most music therapists agreed with the statements that music therapy decreases physical aggressive behaviour and that music therapy improves social skills. The statement they most often disagreed with was that music therapy can improve memory skills in Alzheimer's patients.

In an open ended-question music therapists were asked which goals they adhere to in their work with Alzheimer's disease patients (see Table 11).

The goal most frequently mentioned was establishing contact and improving social skills. There were no typical goals that were especially mentioned for working with Alzheimer's disease patients in comparison with psychogeriatrics in general.

Table 11 Goals in working with Alzheimer's disease patients

Goals	*F*
establishing contact and improving social skills	17
relaxation	13
self-esteem, strengthening self-confidence	11
providing in a sense a safety and trust	6
grief and acceptance of lost abilities	5
n=27	

Dementia is typically characterized by a progressive decline in functions which is often described in three sequential stages: the early, middle and last stage of dementia. Most of the questions involving specific musictherapeutic techniques related to Alzheimer's disease patient were related to three disease phases. A description of these stages was provided based on Reisberg et al. (1982). The first stage of the disease is characterised by a decrease in memory functions, disorientation, and the first changes in personality. The middle stage of the disease is often longer in duration and is described as the stage in which memory functions further decrease associated with an increase in major psychiatric disorders such as hallucinations and psychoses and an increase in behavioural disorders such as verbal and physical aggression. The last stage of the disease is characterised by a continuing decrease in overall functioning: the inability to speak, incontinence, family members are no longer recognized, and the loss of psychomotor skills. The patient becomes bedridden and will eventually die.

Music therapists were asked if they worked with mostly individual or group therapy during each of these three phases (see Table 12). In the first phase, therapists prefer group therapy or indicated a preference for both group as individual therapy. As can be seen from this table there is a transition to be seen for the choice of individual therapy to group therapy, depending on the level of functioning of the patients. Music therapists opted more frequently for individual therapy for residents in the last phase of dementia. Where a group approach is used, on average the group consists of five to seven participants.

Table 12 Preference for individual and group therapy related to disease progression

	First stage	Second stage	Third stage
Individual therapy	1	3	15
Group therapy	10	3	0
Both	12	20	10
	n-23	n-26	n-25

That the choice of active versus receptive music therapy depended on the level of functioning of the resident was also questioned (see Table 13). A combination of receptive and active music therapy is mostly used for residents in the first and middle stage of dementia, whereas in the third stage music therapists prefer receptive music therapy, when functioning levels of the residents are minimal. On average the active music therapy sessions take about 42 minutes whereas receptive music therapy sessions take about 39 minutes.

Table 13 Preference for receptive or active music therapy related to disease progression

	First stage	Second Stage	Third Stage
Active music therapy	5	6	0
Receptive music therapy	1	1	19
Both	17	19	6
	n-23	n-26	n-25

Discussion

This survey revealed that there is currently a well-qualified group of music therapists working in psychogeriatrics. Most music therapists work eclectically and refer to their colleagues for further information on recent developments in music therapy. Active and receptive music therapy is equally applied in practice and depends on the level of functioning of the client. When the level of functioning of the client decreases, more therapists opt for an individualistic approach and use receptive approaches.

This study is limited in the scope of work-related aspects that it addresses. Further questions that can be asked are: How does a music therapist decide which techniques to use with a specific client population? How do ways of working differ between different client populations and with what effect? These questions are essential to

learn more of the effect of music therapy and to argue for referral to music therapy. More descriptive in-depth research of specific areas of music therapy practice would be welcome.

Engelman (1995) describes that there are currently more psychiatric institutions in Germany with a music therapist than without. Unfortunately, this is still not the case for psychogeriatric care in the Netherlands. An important reason is that music activities in psychogeriatrics are often conducted by 'occupational therapists'. In most cases, Dutch nursing homes do know about the beneficial effects of music but they often do not know about the beneficial effects of music therapy. A lack of information about music therapy contributes to this situation as little is published on the topic of music therapy in the general health-care journals.

In reference to the use of receptive versus active music therapy, it should be underlined that receptive music therapy is highly undervalued in the Netherlands. During training and in the literature often the emphasis is on active musical improvisation. With this client population, the use of receptive music therapy is very useful. Hand co-ordination often fails when the elderly residents becomes increasingly frail, and receptive music techniques are the only option to let the resident benefit from music's potential.

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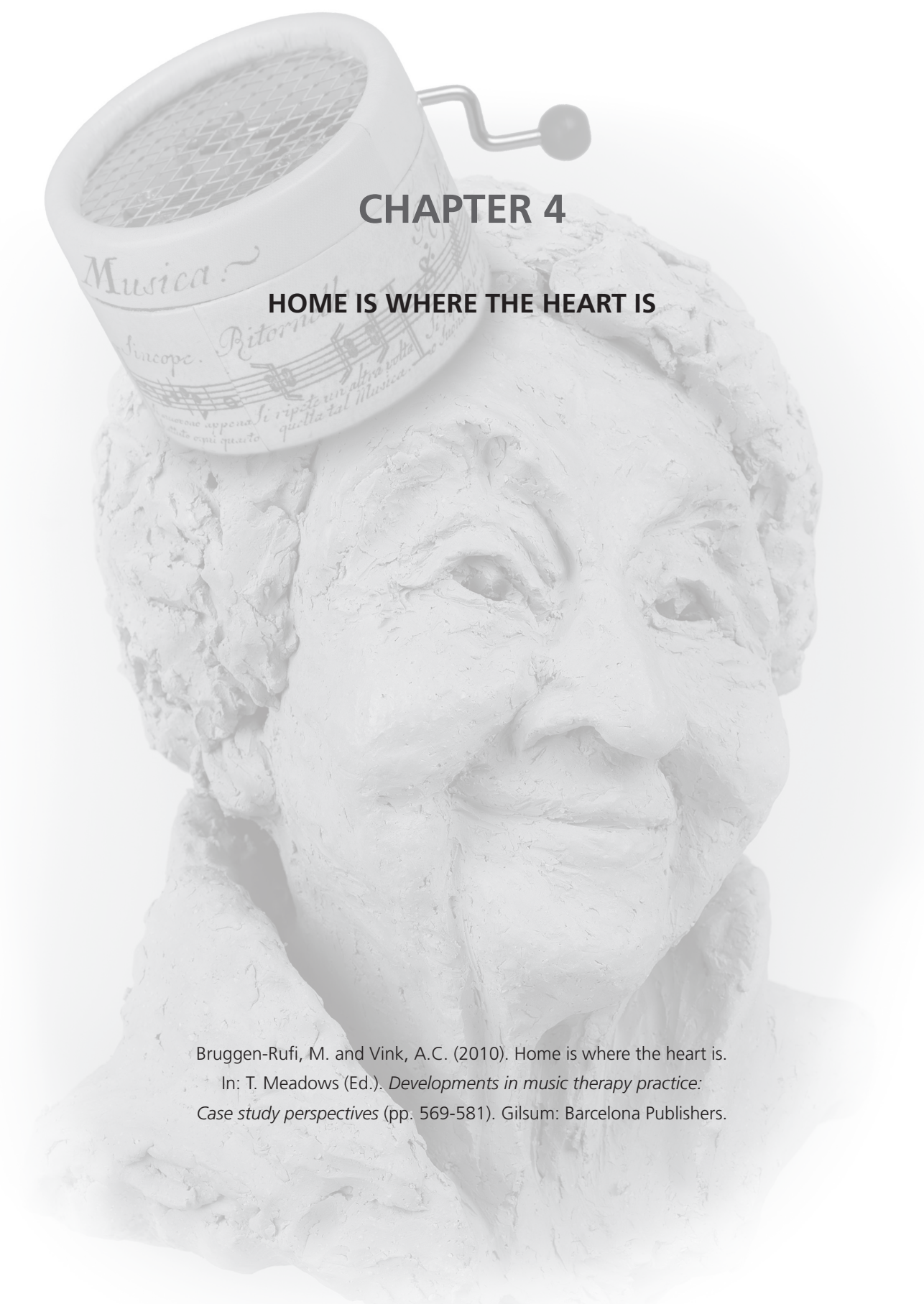

CHAPTER 4

HOME IS WHERE THE HEART IS

Bruggen-Rufi, M. and Vink, A.C. (2010). Home is where the heart is. In: T. Meadows (Ed.). *Developments in music therapy practice: Case study perspectives* (pp. 569-581). Gilsum: Barcelona Publishers.

Introduction

With an increase in age expectancy worldwide, dementia and other age-related illnesses are increasing in prevalence (Ferri et al, 2005). Recent estimates have suggested that over 24 million people are currently suffering from dementia worldwide, with an expected increase of 4.6 million new patients every year (WHO, 2008). In each nursing home population, an increasing number of these residents are migrants, bringing their own customs, language and music. The number of persons who have moved to another country has risen to over 125 million migrants today from 75 million in 1965 (U.N., 1999,2009). More than ever before, people are migrating to new countries, in search of a better life. Some move by choice, but many are required to because of conflicts that force displacement (e.g. war, genocide, etc.).

The current situation of worldwide migration has raised new demands for the care of the elderly with dementia. This has presented many care challenges, not the least being how to address their needs in music therapy. It is not unusual that bilingual residents, having developed dementia, will begin reverting back to their first language, and may even lose their "adopted" language altogether. In so doing, they may become unable to understand their own children's language, or share the language of their caretakers. As such, they can become 'lost inhabitants' in nursing homes, isolated culturally and linguistically.

Music therapy is seen as one of the few approaches able to reach these clients. Singing songs of the native country and improvising on known rhythms provides a context of safety and recognition through the musical language of the clients childhood culture.

This case study will describe the experiences of Vonnie, who was born in the Dutch East Indies[4] (now Indonesia), but spent her adult life in the Netherlands. Her story resembles that of many elderly people with dementia currently living in their new, non-native country.

Foundational concepts

Culture-centered Music Therapy

Music therapy has a strong positive effect on elderly people with dementia (Brotons, 2000; Vink 2000). Music therapy can decrease agitation and has a positive effect on enhancing communication and emotional wellbeing (Brotons, 2000; Vink, 2000). Music therapy enables the recall of life experiences and the experience of pleasant emotions. Through music, contact can be established, especially as language deteriorates during the later stages of the dementing process. Music serves as a powerful catalyst for reminiscence, both joyful and sad (Bright, 2000). Many important life events are accompanied by music. Most of the time these 'musical memories' are stored for a longer time than the ones from the same period that were not accompanied by music (Broersen, 1995). If words are not recognized any longer, familiar music may provide a sense of safety and well-being, which in turn may decrease anxiety (Brotons, 2000). By making use of this quality of music to directly appeal to memories and feelings, it may be possible for an individual with dementia to come into contact once more with 'lost' elements of his/her identity. For these elderly people, who are slowly losing their identities, this is very important. By offering music from the client's cultural heritage, the therapist recognizes and acknowledges the problems that the person has dealt with. In this way, the client may experience acceptance and relevant aspects of his/her identity may be validated. A culture-centred music therapy practice asks for a dedication and willingness to explore alternative musical forms in order to contact the inner world of the client.

[4] The country was called "Dutch Indie" while it was still a Dutch colony. The inhabitants were called "Indische people" or short, "Indo", mostly referring to a native mother and a European/Dutch father. After its independence in 1949, the country was called Indonesia. All the people that decided to stay in Indonesia were called Indonesians; the people that moved to the Netherlands were referred to as "Indische" people.

For the music therapist who works with clients from different ethnic and cultural backgrounds, this means that he/she might have to readjust his/her own musical knowledge and abilities. It requires great awareness and knowledge of the role that music plays in both the personal life and culture of a client (Ruud, 2002).
If the music therapist knows the traditional songs of a given culture, the meaning of the lyrics, and is able to play them for the client, the client feels accepted and understood. Gerdner (1997, 2000) describes this need to individualize music for elderly patients with dementia, in which the music functions as a bridge between the past and the present.

Identity and Individual repertoire

Within this larger cultural context, the client's musical preferences are like a mirror - a representation of the client. They fit the client like a "tailor-made suite" (Poismans, 2005), so that by recognizing the client's music, you recognize his/her identity. This is especially so when working with elderly migrants, war victims, refugees and asylum seekers. All these clients have one very important thing in common: they are all "rootless", in search of their identities.
Music thereby serves as a strong catalyst for reminiscing and life-review. In order to gain positive effect, the music offered to the clients will have to be individualized (Gerdner, 1997) and have specific meaning in the life of a person. Most elderly from the former Dutch East Indies have been raised with traditional Indonesian music. By offering this music, their long term memories can be stimulated and clients can relive their childhood or adolescence in a safe way. The music needs to be carefully selected by the music therapist as it can also be associated with negative feelings, which may lead to the reliving of traumatic experiences.
For example, a music therapist once played an ethnic song for a client from an African country. He thought he had selected a very appropriate song, one that sounded very pleasant, with rich and vivid harmonies. However, he did not know that this was a song that was often used during mourning ceremonies, especially funerals. So, instead of offering his client a joyful song, the woman became very upset. The music therapist lacked cultural sensitivity by offering music that didn't fit the therapy situation.

In the case study that follows, the music therapist (the first author) drew of her knowledge and experiences of Indonesian cultural life. Born of Indonesian parents in the Netherlands, she had first hand experience of the music, instruments, and cultural traditions of the Indonesian people. Using this knowledge as a starting point, she was able to meet Vonnie within her own cultural life, acting as a bridge between her "old life" and her life in the Netherlands.

The client

Vonnie's Cultural Background

Vonnie was an 83 year old woman who was in the early phases of dementia (probable Alzheimer's type). She was born in the former Dutch East Indies. During the Second World War, the Indies was occupied by the Japanese (from 1942 to 1945). Japan's strategy was to liberate Indonesia from all western influences and encouraged the Indonesian people to sell or destroy their Dutch belongings. After the defeat of the Japanese, Indonesian nationalists, under the leadership of Sukarno and Hatta, sought independence from their colonial administrators and declared the existence of the Republic of Indonesia. What followed was a confusing time period known as the Bersiap, in which Indonesians fought for independence from the Netherlands. For thousands of Indonesian-Dutch people, this was the beginning of a life-threatening time period. During the first year of the independence struggle, approximately 3,500 Dutch and Indonesian-Dutch lost their lives fighting against, or fleeing from, the Indonesian nationalists.

During this period of upheaval, some 300,000 men, women and children of Dutch nationality had to decide whether to become Indonesian citizens, or remain Dutch nationals and travel to the Netherlands. For many Dutch citizens who were of Indonesian origin, this was a heart wrenching decision: whether to stay in Indonesia and risk their safely and financial security, or travel to a small, unknown country in Europe. For those who decided to leave, travel was long and costly, with the ever present possibility of never being able to return "home" again.

Right from the beginning, these Dutch-Indonesians did not feel welcomed when they arrived in the Netherlands. The Dutch authorities didn't know how to properly

advise them how to find adequate housing, as they had never experienced such a large migration. The Dutch people did not know anything about the cultural and historical background of these "foreigners", and were also suffering from their own traumas related to World War II, which had only just ended. These new migrants felt abandoned and isolated. They had come with insufficient clothing and lacked financial resources and adequate housing to start their new lives.

This is, in short, was the historic context in which Vonnie moved to the Netherlands with her husband. Although she was then 30 years of age, she had never travelled more than a few miles outside her home village in Indonesia. Although they had no children of their own, they adopted a child of five who had lost his parents in Indonesia. They arrived together in the Netherlands, bewildered, alone and with little government support to begin rebuilding their lives.

Vonnie

When Vonnie began music therapy, she had already been widowed 10 years. Her son still lived close by, but did not visit his mother on a regular basis. This caused Vonnie great grief. In recent years, Vonnie had become more and more disoriented, and demonstrated symptoms of a severe cognitive disorder, which finally led to nursing home placement. After psychological evaluation, it was found that Vonnie was in the early stages of dementia. She also suffered from symptoms of depression, confusion, social isolation, hoarding behaviour and delusional paranoia.

Vonnie's caregivers noticed that she tended to isolate herself on the ward, being the only person of Indonesian origin. They also felt that she tended to isolate herself because she didn't trust the people around her. She was convinced that everybody was after her belongings. She was often awake at night, suffering from confusion and anxiety. Nobody understood her "Indonesian" dialect, further compounding the problems she was experiencing as her dementia progressed.

The therapeutic process

The first time that I met Vonnie she was sitting in a group with other residents in an activity room. She was sitting at the far side of the table, not participating in a conversation or engaging in any way with the others in the room. I could see that she was busy coloring a big bird. She used bright colours and was very focused. I decided to sit next to her and without introducing myself, started to sing. I sang an old children's song from Indonesia, a song that I was almost certain she would know. The song was about a big bird, a Kakatoe, similar to the bird she was coloring. When she heard me sing the words, in her own language, she straightened her back and looked at me with a big smile on her face. She was surprised to hear a song from her past. She had never seen me before, but by singing this song, I found a way of connecting with her immediately. The song seemed to give her energy and joy.

Immediately following this, I told Vonnie who I was and I asked her to come with me. She stood up and we walked to the music room. Once again, I told her who I was and what I do, as repetition was very important for her, especially in music. I started singing the same song again and she showed the same recognition. It was as if she felt safe right away, even though the room was foreign to her. I told her that I was from Indonesia myself, or at least my parents were, and that I would do my best to talk in her own language. She was thrilled, so much so that she started crying. Just hearing these familiar sounds again made her very happy. It had been such a long time since she last heard her native language and songs from her own cultural heritage that I could tell she trusted me right away.

In the music room I re-created an atmosphere to remind Vonnie of Indonesia. Soft Indonesian music played on the stereo, Indonesian memorabilia lay on a table and a wide variety of Indonesian instruments were also available (bamboo percussion instruments, a bamboo flute and a ukulele). I even burned an incense stick with the scent of an Indonesian flower. By offering her authentic sounds and instruments, Vonnie was surrounded by experiences that came very close to her inner feelings. These specific sounds and visual cues made the reminiscing process easier for her.

Vonnie told me that nobody in the residence seemed to understand her or listen to her. I asked her if she knew why. She told me that she felt like "a nobody" because

of her background - being "a brownie". She also told me that it was alright with her anyway, because everybody was after her belongings. By recognizing and offering her music from her cultural heritage, I was able to confirm Vonnie's identity. This was especially important to her because she felt isolated culturally and was feeling the losses associated with the advancement of her dementia.

When we started to talk about her youth in Indonesia, Vonnie's eyes began to sparkle, as if this was one of the first times anyone had asked her about it. She began telling stories about her youth and I was able to tell her that my parents were also from Indonesia, so that I had some understanding of her experiences and struggles.

When I started to play the ukulele, Vonnie began to cry again. After the song I asked her what associations she had while listening to the music. She told me that the sounds reminded her of her mother and her youth in Indonesia. I let her talk, listening carefully, without interrupting her once. When she started talking about how she lived by a river, I started singing a song about a river back in Indonesia. Once again, she looked happy because her words and her thoughts were translated into music right away. The lyrics of the song helped connect her to her deepest memories.

As I got to know her, I saw that Vonnie still had a good memory. Each week I came and visited her, she remembered me clearly. Without hesitation she came with me. After a few weeks, I asked her if I could see her room. By doing this I hoped to find out even more about her. Vonnie was more than happy to show me her room, her pictures and her belongings. I saw a very nice painting hanging on the wall, picturing the sawas, or Indonesian rice-fields. There were mountains in the background and a volcano, tropical trees and working people. This was the same kind of painting that hung on my parent's and grandparent's walls. I also felt at home, looking at the painting. I asked her what she felt when she looked at the picture. She started crying, telling me that she longs to see her homeland again. But she recognised that she cannot anymore, as she is too sick for that. I encouraged her to keep her memories alive by talking and singing about her time there and by listening to music that takes her back. I let her know that this was exactly the reason I came to see her. She was very happy.

We looked at a lot of pictures from her family. She talked about everybody in the pictures. In the meantime I kept strumming the ukulele or playing one of the bamboo

percussion instruments. By doing so, I gave sound to her story right there in the moment. This was good for her self-confidence, and it also gave her the feeling that she was understood. After a while I noticed that she stopped talking, and that she was looking at me to see what I was doing. I gave her some instruments too and placed the ukulele in her hands. At first she started copying me, doing what I did. I challenged her to reproduce these sounds, and after she felt safe enough (which I could tell by the way she was playing), I gave her space to fill in sounds so she really felt listened to. After a while, we were engaged in a non-verbal conversation, in which I gave Vonnie all the time and space she needed to express herself musically. From this session onwards, we had a lot of non-verbal, instrumental conversations like this one, each with its own character and emotional focus.

Keeping her music therapy goals in mind, I work on several of her problems each session. One of the most important goals I addressed was Vonnie's sense of self. By recognizing her own feelings in the sound and lyrics, I sensed she felt understood. The lyrics helped her to express herself again more easily, in her native language. It seemed to me that through the music offered to her, Vonnie found herself accepted and recognized. At first she continued to think that people were stealing her belongings, but I found out form the nursing staff that this topic was not a big issue anymore. Now that she had found herself, a lot of her earlier problems no longer seem an issue.

I kept bringing musical instruments from the East to each session, and I invited her to play along. She was initially shy, but I let her know that it was okay, and after a while, she started playing right away, without me having to ask her to play along. In the meantime, we still sang songs from her youth. She still remembered every word of these songs, which gives her a positive and strong sense of self. After each song I asked her what she was thinking and what the songs meant to her. Despite her decline, Vonnie couldn't stop talking about the first 30 years of her life!

The Japanese Occupation of Indonesia

After 6 sessions, in which I had focused primarily on positive memories, I tried to access more difficult experiences, such as the Japanese occupation of Indonesia. I knew Vonnie's background, so I could imagine what she must have been through.

I didn't ask her directly about her feelings or memories, but introduced a song and told her about the story behind it. It was an old Dutch tune titled *"Zonnetje gaat van ons scheiden"* ("*The sun is saying goodbye for the day"*). This song was sung in the Japanese concentration camps by the women and children before they went to sleep. The song was about the sun that says goodbye to us all every night. The sun was symbolic for the rising sun in the Japanese flag. For them, this particular song was also a song of hope, because one day the red Japanese sun (and thus the Japanese soldiers) would also say goodbye to them. After telling her this little story behind the song, I ask her about her own memories during Japanese imprisonment..

Vonnie had been in a women's camp during the Japanese occupation. As with many of the (young) women, she was used as a "comfort woman" to entertain the Japanese soldiers. She was very ashamed to tell me this. I just responded by telling her that I understood what she had been through and that I heard what she was saying beyond the spoken words. Soft traditional music was playing in the background and I was holding her hands while she talked and cried. After this long session, I sensed that Vonnie felt very much accepted and understood, but most important of all, she felt relieved.

The Past Lives with the Present

After this important session, I found out that Vonnie didn't feel ashamed talking about sex any longer. On the contrary, she couldn't stop talking about it! It was as if she was finally able to talk about something she has never been able to before. Back in her youth, sexuality was a topic that you just did not talk about. She told me that she now had a boyfriend living in the same nursing home. She told me that she did have sex with him, even though they were both rather old. I was not sure if this was true, but these conversations added a level of intimacy to our work that allowed her to be even more expressive, giving her the feeling that she could talk to me about everything, no matter what the subject was. I also made sure that the talking part of each session doesn't take all our time, so after a while I started making music and invited her to play or sing along with me.

Talking about her boyfriend naturally lead to a discussion of Vonnie's deceased husband. Although her husband died 10 years ago, she still missed him a great

deal. Vonnie told me about how they met and of their youth together back in Indonesia. She lovingly spoke about her marriage and of the many things she and her husband did together. Once again traditional music showed its power within the therapeutic process. While reminiscing, I played songs from her youth. We listened to music that she and her husband danced to; music that was popular in those days. It was as if more and more memories emerged as we listened to the music together. I also brought along a lot of picture books from Indonesia, and memorabilia, to help ground and enrich these experiences.

As we continued working together, I discovered that Vonnie sometimes felt frustrated because she didn't know all the words to the different songs we sang. She even got angry at herself, which of course was not good. I assured her that it was quite all right not to remember all the lyrics by heart anymore. I told her that it was not important what words were sung, as long as the feeling and meaning of the song was expressed. From that moment on, I decided to start improvising the lyrics. I continued to use the original lyrics, but also added lyrics about recent events, the weather, the nursing home, the food and her boyfriend. I also improvised about her past and stories from her youth. I challenge her to do the same, assuring her that anything she wanted to sing about was possible. I also told her that it didn't matter how she sounded, since we were the only two people who heard it!

After a few sessions getting used to this "new" method, I was surprised to see that Vonnie was actually getting better at improvising lyrics. She even started to sing about things that happened in her youth, during the Japanese occupation. Things that she had never spoken about before became songs, the lyrics developing spontaneously and creatively. Vonnie told me how much release she found in singing about her past. Over time, Vonnie showed very good improvement in her social behaviour. Every time I went to pick her up she was sitting next to the other ladies and taking part in their conversations. She didn't seem to exclude herself any longer. The occupational therapist told me that on many occasions Vonnie told her about her youth in Indonesia. Every time she saw me, she told the other ladies how much she enjoyed her music therapy sessions. I sometimes found her sitting at a table showing the other ladies a picture book of Indonesia.

Another Ending

After 3 months of work together, I had to talk to Vonnie about an upcoming ending. I told her that in a couple of weeks I wouldn't be able to visit her any longer. I told her that I was going on a long trip, and that afterwards I wouldn't be working in her nursing home any more. Of course, at first she was sad to hear this, but I told her that I was so happy that she has made new friends; after all she was no longer alone. She nodded her head and told me that she was happy about this as well.

In our last four sessions we talked about farewells. Vonnie seemed to deal with this in a very positive way. She knew that this was a goodbye, but that it didn't have to be a definitive one like moving from Indonesia for good, or losing her husband. I thought carefully about a farewell-present for her - since my trip was going to be to Indonesia, I promised to bring back the ground that she was born on. I passed the little village where she was born and dug a spoonful of dirt from the ground. I brought it home with me, and after my return, I put it in a delicate silk sack. When I visited Vonnie for the last time, I give her this small present. She was very moved, not only because of its symbolism, but also because somebody had gone to the trouble of doing this especially for her.

Summary

Vonnie's story is typical of many nursing home residents who were born in one country and had to move to another country because of reasons beyond their control. At a young age, people have less problems adjusting to their new life, to their new home. However, when they get older, and especially when they develop dementia, they have increasing difficulties adapting to their environment.

With an aging population worldwide, dementia and other age-related illnesses are increasing in prevalence. In each nursing home population, an increasing number of residents are non-native in respective to their country of residence. The current situation of worldwide migration is raising new demands for the future care provided for elderly people with dementia. How best can the needs of these patients be met through music therapy, in particular those who are migrants?

A multicultural practice asks for a devotion and willingness to explore alternative ways of being together in order to discover the client's world. It was through music that Vonnie's world opened to her, and in so doing, she was able to find a way of being in contact with the people around her, even though her own cultural background different so greatly from those she lived with.

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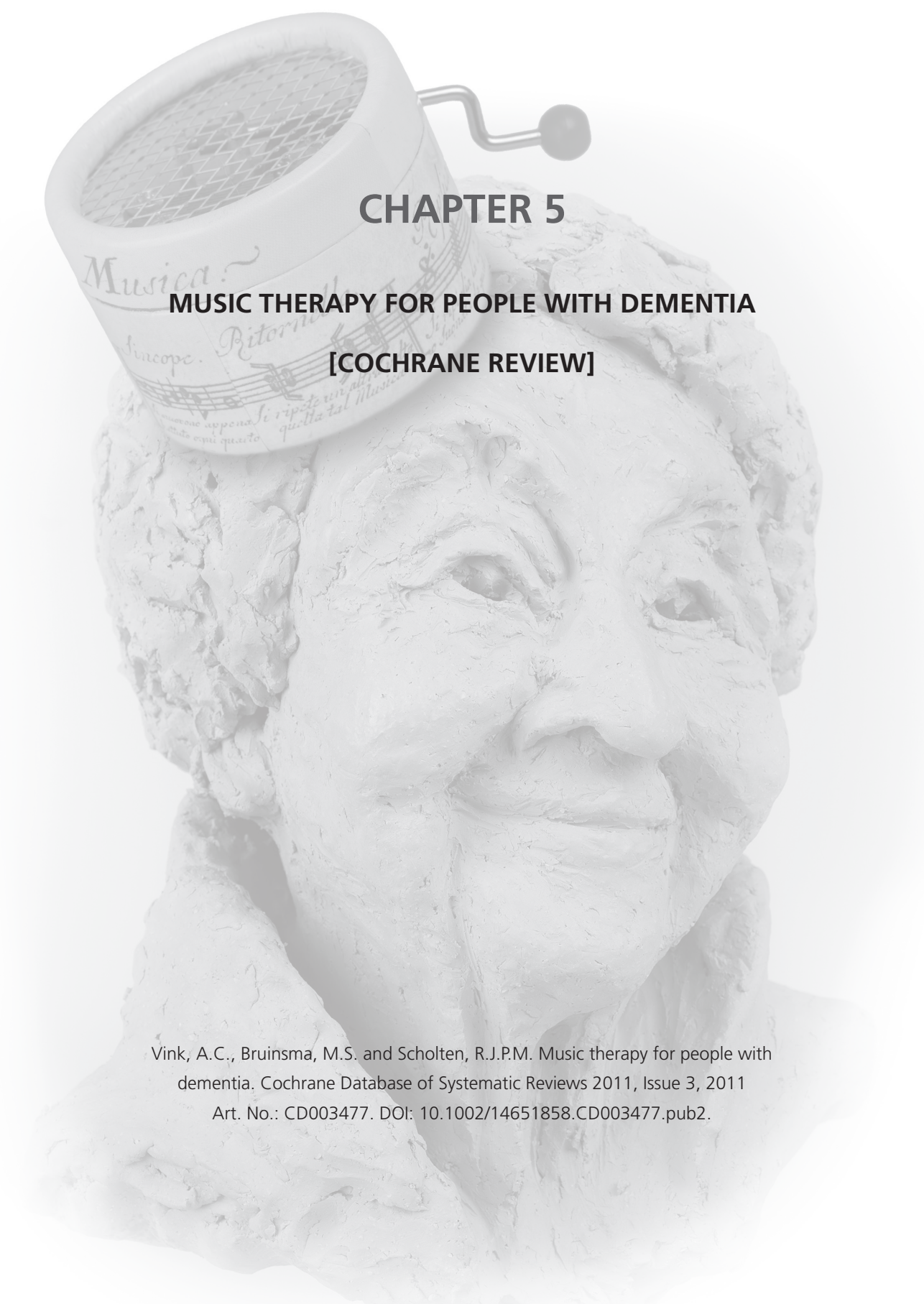

CHAPTER 5

MUSIC THERAPY FOR PEOPLE WITH DEMENTIA

[COCHRANE REVIEW]

Vink, A.C., Bruinsma, M.S. and Scholten, R.J.P.M. Music therapy for people with dementia. Cochrane Database of Systematic Reviews 2011, Issue 3, 2011 Art. No.: CD003477. DOI: 10.1002/14651858.CD003477.pub2.

Abstract

Background: Dementia is a clinical syndrome with a number of different causes which is characterised by deterioration in cognitive functions. Research is pursuing a variety of promising findings for the treatment of dementia. Pharmacological interventions are available but have limited ability to treat many of the syndrome's features. Little research has been directed towards non-pharmacological treatments. In this review the evidence for music therapy as a treatment is examined.

Objectives: To assess the effects of music therapy in the treatment of behavioural, social, cognitive and emotional problems of older people with dementia, in relation to the type of music therapy intervention

Search strategy: ALOIS, the Specialized Register of the Cochrane Dementia and Cognitive Improvement Group (CDCIG) was searched on 14 April 2010 using the terms: music therapy, music, singing, sing, auditory stimulation. Additional searches were also carried out on 14 April 2010 in the major healthcare databases MEDLINE, EMBASE, PSYCinfo, CINAHL and LILACS, trial registers and grey literature sources to ensure the search was as up-to-date and as comprehensive as possible.

Selection criteria: Randomised controlled trials that reported clinically relevant outcomes associated with music therapy in treatment of behavioural, social, cognitive and emotional problems of older people with dementia.

Data collection and analysis: Two reviewers screened the retrieved studies independently for methodological quality. Data from accepted studies were independently extracted by the reviewers.

Main results: Ten studies were included. The methodological quality of the studies was generally poor and the study results could not be validated or pooled for further analyses.

Authors' conclusions: The methodological quality and the reporting of the included studies were too poor to draw any useful conclusions.

Plain language summary

There is no substantial evidence to support nor discourage the use of music therapy in the care of older people with dementia.
The specific focus was to assess whether music therapy can diminish behavioural and cognitive problems or improve social and emotional functioning. Ten studies have been included in this review which state that music therapy is beneficial for treating older people with dementia. However, the methodological quality of these small, short-term studies was generally poor, as was the presentation of results. No useful conclusions can be drawn.

Background

Description of the condition

Dementia is a clinical syndrome characterised by the progressive decline in cognitive functions. Dementia of the Alzheimer's type is the most common form of dementia, next to vascular dementia, dementia of the Lewy Bodies type and frontotemporal dementia (ADI 2010).
Dementia is a collective name for progressive degenerative brain syndromes which affect memory, thinking, behaviour and emotion (ADI 2010). Symptoms may include: loss of memory difficulty in finding the right words or understanding what people are saying difficulty in performing previously routine tasks personality and mood changes Alzheimer's Disease International (ADI 2010) estimates that worldwide currently 35.6 million people are suffering from dementia, increasing to 65.7 million by 2030 and 115.4 million people by 2050.

Research is pursuing a variety of promising findings related to describing the causes of dementia and for the treatment of dementia. Pharmacological interventions are available but have limited ability to treat many of the syndrome's features. Little research has been directed towards non-pharmacological treatments.
As dementia is due to damage to the brain, one approach is to limit the extent and rate of progression of the pathological processes producing this damage. At

present the scope of this approach is limited and an equally important approach is to help people with dementia and their carers to cope with the syndrome's social and psychological manifestations. As well as trying to slow cognitive deterioration, care should aim to stimulate abilities, improve quality of life, and reduce problematic behaviours associated with dementia. Music therapy might achieve these aims.

Description of the intervention

Many treatments of dementia depend on the client's ability to communicate verbally. When one is no longer able to speak or understand language, music therapy might offer alternative opportunities for communication. People who can not speak any more are still able to hum or play along with music.

Music therapy is defined by the World Federation of Music Therapy as the use of music and/or its musical elements (sound, rhythm, melody and harmony) by a qualified music therapist, with a client or group, in a process designed to facilitate and promote communication, relationships, learning, mobilisation, expression, organisation and other relevant therapeutic objectives in order to meet physical, emotional, mental, social and cognitive needs (WFMT, 2010).

Two main types of music therapy can be distinguished: receptive and active music therapy. Receptive music therapy consists of listening to music by the therapist who sings or selects recorded music for the recipients. In active music therapy, recipients are actively involved in the music-making by playing for instance on small instruments. The participants may be encouraged to participate in musical improvisation with instruments or voice, with dance, movement activities or singing. Music therapists need the skills of both musicians and therapists if they are to benefit demented people. Music therapists must be trained to select and apply musical parameters adequately, tailored to a patient's needs and goals.

How the intervention might work

Music therapy mostly consists of singing, listening or playing musical instruments. Music and singing may stimulate hemispheric specialization. Clinical observations indicate that singing critically depends upon right-hemisphere structures. By contrast, patients suffering from aphasia subsequent to left-hemisphere lesions often show

strikingly preserved vocal music capabilities. Singing may be exploited to facilitate speech reconstruction when suffering from aphasia (Riecker 2000). Singing can further help the development of articulation, rhythm, and breath control. Singing in a group setting can improve social skills and foster a greater awareness of others. For those with dementia, singing may encourage reminiscence and discussions of the past, while reducing anxiety and fear. For individuals with compromised breathing, singing can improve oxygen saturation rates. For individuals who have difficulty speaking following a stroke, music may stimulate the language centers in the brain promoting the ability to sing. Playing instruments may improve gross and fine motor coordination in individuals with motor impairments or neurological trauma related to a stroke, head injury or a disease process (WFMT, 2010).

Whereas cognitive functions decline during disease progression, receptivity to music may remain until the late phases of dementia (Adridge 1996). Listening to music itself may decrease stress hormones such as cortisol, and helps patients to cope with for instance pre-operative stress (Spintge 2000). Music therapy can bring relaxation and has a positive effect on enhancing communication and emotional wellbeing (Brotons 2000). Music therapy enables the recall of life experiences and the experience of emotions. Many important life events are accompanied by music. Most of the time these musical memories" are stored for a longer time than the ones from the same period that were not accompanied by music (Broersen 1995;Baird 2009). If words are not recognized any longer, familiar music may provide a sense of safety and wellbeing, which in turn may decrease anxiety.

While language and cognitive functions deteriorate during the course of the disease, many musical abilities appear to be preserved for a longer period (Adridge 1996;Baird 2009). The responsiveness of patients with dementia is a remarkable phenomenon. Even in the latest stage of the disease, patients may remain responsive to music where other stimuli may no longer evoke a reaction (Norberg 1986). Explanations are difficult to find for this phenomenon. Possibly, the fundamentals of language are musical, and prior to lexical functions in language development (Adridge 1996). Musical rhythm may help Alzheimer's patients to organize time and space. People with dementia may lose their verbal skills first but both general musical and rhythmic skills remain for a long time (Cowles 2003). Patients are able to experience group

contact through musical communication with other participants, without having to speak. Through music, contact can be established, especially as language deteriorates during the later stages of the dementing process. Owing to its non-verbal qualities, music therapy might help people with dementia at all levels of severity to cope with the effects of their illness.

Why it is important to do this review

In this review we examine current research literature to assess whether music therapy is established as an efficacious non-pharmacological approach in the treatment of behavioural, social, cognitive and emotional problems in older people with dementia.

Objectives

To assess the effect of music therapy in the treatment of behavioural, social, cognitive and emotional problems of older people with dementia.

Methods

Criteria for considering studies for this review:

Types of studies

We included both parallel and cross-over RCTs.

Types of participants

Older people who were formally diagnosed as having a type of dementia, according to DSM-IV, ICD-10 or other accepted diagnostic criteria. We included patients living either in the community or in hospitals or care homes and all severities of dementia.

Types of interventions

Any type of music therapy (individual or group therapy, either active or receptive) with a minimum of five sessions compared with any other type of therapy or no therapy. A minimum of five sessions was chosen in order to ensure that a therapeutic intervention could have taken place.

Types of outcome measures

Changes in the presence of problematic behaviours (e.g. wandering, verbal agitation, general restlessness), cognition, emotional well-being and social behaviours. We accepted all behavioural and psychological tools reported by the authors of the identified primary studies.

Search methods for identification of studies

We searched ALOIS - the Cochrane Dementia and Cognitive Improvement Group's Specialized Register. The search terms used were: music therapy, music, singing, sing, auditory stimulation ALOIS is maintained by the Trials Search Co-ordinator for CDCIG and contains studies in the areas of dementia prevention, dementia treatment and cognitive enhancement in healthy. Details of the search strategies used for the retrieval of reports of trials from the healthcare databases, CENTRAL and conference proceedings can be viewed in the 'methods used in reviews' section within the editorial information about the Dementia and Cognitive Improvement Group. To view a list of all sources searched for ALOIS see About ALOIS on the ALOIS website. Additional searches in each of the sources listed above to cover the timeframe from the last searches performed for the ALOIS to 14 April 2010 to ensure that the search for the review was as up-to-date as possible. The search strategies for the above described databases are presented in Appendix 1.

In addition, Geronlit/Dimdi, Research Index, Carl Uncover/ Ingenta, Musica and Cairss were searched by the reviewers in January 2006 and June 2010, with the following search terms: music therapy, music, singing, dance, dementia, alzheimer. Specific music therapy databases, as made available by the University of Witten-Herdecke on www.musictherapyworld.de, based in Germany, were also searched on these dates. The reference lists of all relevant articles were checked and a clinical librarian conducted a forward search from key articles using Scisearch. In addition, conference proceedings of European and World Music Therapy conferences on www.musictherapyworld.de and European music therapy journals, such as the Nordic Journal of Music Therapy, the British Journal of Music Therapy the Musiktherapeutische Umschau and the Dutch Tijdschrift voor Vaktherapie were hand searched to find music therapy studies (RCT) with dementia patients, in January 2006 and June 2010.

Data collection and analysis

Selection of studies

Two review authors independently assessed publications for eligibility by checking the title, or abstract, or both. If any doubt existed as to an article's relevance they obtained hard copies and assessed the full article.

Data extraction and management

Two reviewers extracted and cross-checked outcome data independently of each other. Any discrepancies or difficulties were discussed with the third reviewer. Of each study the following characteristics were recorded.

- Type of study: RCT; parallel group or cross-over.
- *Patient characteristics*: age, sex, severity and duration of the dementia, other prescribed treatments, setting (primary, secondary, or tertiary care setting, inpatient, outpatient, day hospital).
- *Type and duration of interventions and control interventions.*
- General: frequency of the therapy, time-frame of the therapy, inclusion of follow-up-measurement, inclusion of validated outcome measure(s), outcomes.
- Music therapy: time of the intervention, materials used, theoretical orientation of the therapist, years' experience of the therapist, types of instruments and repertoire used both in receptive and active music therapy (including singing), therapeutic goals, group size, characteristics of the group (e.g. heterogeneous or homogeneous group).
- Type of outcome measures in relation to changes in the presence of problematic behaviours (e.g. wandering, verbal agitation, general restlessness), cognition, emotional well-being and social behaviours.

For each study, relevant outcome data were extracted, i.e. means, standard deviations and number of participants in each group for continuous data and numbers with each outcome in each group for dichotomous data. For crossover trials, where possible we extracted data for the first period only because of the likelihood of carryover.

Assessment of risk of bias in included studies

Included studies were assessed for risk of bias by two reviewers independently of each other by the use of the Risk of Bias assessment tool. The following elements of study quality were assessed: sequence generation, allocation concealment, blinding of participants, personnel and outcome assessors, incomplete outcome data, selective outcome reporting and other potential threats to validity (Higgins 2008).

Data synthesis

We pooled the study results when studies were similar with respect to participants, interventions, outcomes and timing of the outcome measurement. We discriminated between short-term (1- 4 months), medium term (5-8 months) and long-term follow-up (8-> months). We used the risk ratio to summarize dichotomous variables and the weighted mean difference was used or, in case of different instruments or scales, the weighted standardised mean difference for continuous variables. Results of clinically homogeneous studies were combined using a fixed effect model. In case of statistical heterogeneity (assessed by visual inspection of the forest plots) and the availability of at least five studies, a random effects model was used. In any other case, no pooling of data was performed.

Results

Results of the search

For the first version of this review in 2003, we identified 354 references related to music therapy and dementia. Of those, 254 were discarded as they did not refer to a research study, were identified as anecdotal or reports of case studies on the basis of their abstracts. Hard copies were obtained for the remaining 100 studies. We then discarded a further 74 studies as they involved patient series or case studies. A total of 26 studies remained in 2003 of which five met the criteria for inclusion in this review (Groene 1993; Lord 1993; Clark 1998; Brotons 2000 & Gerdner 2000). In 2008, an additional eighteen studies were reviewed of which three studies met the criteria for this review (Sung 2006; Svansdottir 2006 & Raglio 2008). For the update of 2010 we retrieved a total of 188 references of possible relevance. After a

first assessment 16 references remained which were further assessed, of which two studies met the criteria of this review (Raglio n.d. & Guétin 2009). In total, 10 studies were included in the current update.

Included studies

Details of the included studies are presented in the Characteristics of included studies table. We identified ten RCTs of which seven were parallel (Groene 1993; Guétin 2009; Lord 1993; Raglio 2008; Raglio n.d.; Sung 2006; Svansdottir 2006) and three crossover (Brotons 2000; Clark 1998; Gerdner 2000). In three studies patients listened individually to pre-recorded music (Clark 1998; Gerdner 2000; Guétin 2009) and active group music therapy was studied in seven studies (Brotons 2000; Groene 1993; Lord 1993; Raglio 2008; Raglio n.d.; Sung 2006; Svansdottir 2006).

Seven studies compared music therapy with a control intervention to reduce behavioural problems (Clark 1998; Gerdner 2000; Groene 1993,Raglio 2008, Raglio n.d..Sung 2006; Svansdottir 2006), one study addressed cognitive functioning (Brotons 2000) and two studies social and emotional functioning (Lord 1993; Guétin 2009).

Individually based receptive music therapy interventions

In three studies of Clark 1998; Gerdner 2000 and Guétin 2009 an individual approach was studied, in which patients listened to pre-recorded music, to see if behavioural problems can be reduced. Clark 1998 investigated whether the playing of a patient's preferred music during bathing time could decrease occurrences of aggressive behaviour in a comparison with no music. Eighteen people with Alzheimer's-type dementia were randomly assigned to either a music or non-music condition. Following a two week phase of 10 bathing sessions, the patients were changed to the other intervention for another two weeks. A trained research assistant observed each bathing session and counted each occurrence of a behaviour in the list of behaviours of interest. These behaviours included hitting, biting, screaming, crying, abusive language, wandering, spitting, refusal to cooperate, pinching, scratching and throwing objects.

The second study investigated whether the playing of the patients' preferred music can reduce agitation in comparison with the playing of classical music. The investigators tested the hypothesis that music must have specific meaning for each individual to be effective, rather than that music of any kind is effective (Gerdner 2000). In this study, 39 older people with dementia were randomly assigned either to a preferred music condition or to a music condition in which the residents listened to standard classical relaxation music, both treatments were offered for a period of six weeks. The randomisation was stratified by age, sex, and severity of dementia. After a wash-out period of two weeks, the conditions were reversed. Examples of preferred music included Glenn Miller's "In the digital mood" or Perry Como's "Pure Gold". Family members indicated preferences on the Hartsock Music Preference Questionnaire. For the standard classical music condition the study used "Meditation: classical relaxation Vol 3", an anthology of a variety of classical composers such as Grieg, Beethoven and Schubert. One person was given a different selection of music for the control phase as the investigators deemed that this person liked classical music. The study assessed the immediate effect and the effect 30 minutes after listening to the music on agitated behaviours. At the baseline assessment the raters estimated the time of day that each patient displayed the greatest number of agitated behaviours. The 30 minutes before this time was then selected as the patient's intervention time. Outcome assessments were made using the Temporal Patterning Assessment of Agitation scale (TPAA) which is a modification of the Cohen-Mansfield Agitation Inventory (CMAI, Cohen-Mansfield 1986). The CMAI is designed to assess the frequency of 29 agitated behaviours over a two week period. The modified version assesses the patient over a 60-minute period including the intervention time and the post-intervention time for 30 minutes.

The last study examined if listening to music individually can reduce anxiety and depression levels in Alzheimer's disease patients (Guétin 2009). In this study, in total thirty patients were randomised to two groups. The experimental group received receptive music therapy for sixteen weeks. Here, the music was chosen based on the patients' personal tastes, as indicated on a questionnaire. A computer program was designed to select musical sequences suited to the patient's preferences from different musical styles (classical music, jazz, world music, various). Music was

selected for relaxation purposes and was offered one a week, by headphone. The standard musical sequence, lasting 20 min, consisted of several phases, ranging from activation to relaxation. For this purpose he musical rhythm, orchestral formation, frequency and volume was manipulated. In the second group, patients took part in rest and reading sessions.
Levels of anxiety were measured with the Hamilton Scale (Hamilton 1967)at baseline and at week 4 (start of the intervention), 8, 16 (end of the intervention) and 24 (follow up). Changes in depression levels were measured with the Geriatric Depression Scale (Sheikh 1991) and changes in cognitive functioning were measured with the Mini Mental State Examination (MMSE) (Folstein 1975).

Active group music therapy

In seven studies (Groene 1993,Lord 1993; Brotons 2000; Sung 2006; Svansdottir 2006; Raglio 2008, Raglio n.d.) the effect of active group music therapy was studied. Groene 1993 compared music therapy with reading sessions in reducing wandering behaviour. Thirty demented older people with wandering behaviour were assigned to either a predominantly reading or a predominantly music group. Participants received daily one-to-one sessions from the music therapist for seven days: either five music and two reading sessions, or five reading and two music sessions. Each session lasted no more than 15 minutes. Seating/proximity duration was recorded on videotape. A total of 210 sessions were held for the 30 participants over the course of 15 weeks. The music sessions invited participants to respond to music therapy activities such as listening, playing percussion instruments, singing, and movement and dance. Live music was incorporated in each session. Reading sessions consisted of reading aloud to the patient or sometimes being read aloud to by the patient. In both conditions the investigators paid attention to the individual preference of the participants. The patients were assessed before and after each intervention day session using the Mini-Mental State Exam (MMSE) (Folstein 1975). The time a patient spent in the room or was seated during a session was also measured to provide an estimate of the time spent wandering. Finally, the distance travelled by each patient during a session was measured and divided by the time spent wandering to provide estimates of speed.

A second study involved a active music therapy group approach and studied the improvement of social, cognitive and emotional functioning (Lord 1993). Sixty patients were randomised, stratified by sex, to three groups of 20. One group were played six 30 minute sessions of 'Big Band' music and given children's musical instruments so that they could actively participate. A second group were given wooden jigsaws and other puzzles, and a third group were given no special activities except the usual pastimes of drawing, painting and watching television. All groups were evaluated by a questionnaire developed in-house. The patients were asked a series of simple questions about themselves. The patients were also observed for short spells of time during the activity sessions and points were awarded which measured whether they were engaged in the activity. These methods had not been validated.

A third study investigated whether active group music therapy affected language functioning (Brotons 2000). The study compared the effect of music therapy with the effect of verbal interventions on improving cognitive skills. The participants were 26 residents of a nursing home specialising in Alzheimer's disease and related disorders. The participants were described as "dementia patients" (mean MMSE=10) but no details of diagnostic criteria were given.

Music therapy was compared with conversation sessions for their efforts to improve language skills. The music sessions started with a "hello" song, in which everyone was given a chance to introduce themselves. It was followed by a topical song and then questions were asked to prompt conversation or discussion. The same procedure was followed for each of the songs (topics included flowers, animals, spring, St. Patrick's day and the United States), and all songs were sung twice. Each song was accompanied by pictures of the items named in the song. The session concluded with a "goodbye" song. In the conversation sessions pictures and photographs were used to stimulate discussion and reminiscence. Residents participated in small groups of 2-4 members, twice a week for a total of eight sessions. Participants were randomised to the two therapies, and crossed over to the other therapy after four sessions.

The outcomes were cognitive functioning as assessed by the MMSE and language performance as assessed by the four sub-scales (spontaneous speech, auditory verbal comprehension, repetition and naming) of the Western Aphasia Battery (WAB) (Kertesz 1980). Evaluation occurred one week prior to the start of the randomised intervention first phase, and during each intervention phase.

The fourth study compared group music sessions with the focus to stimulate movement to standard care as usual (Sung 2006). Thirty-six demented older people, with moderate to severe dementia were randomly assigned to a group music intervention or to a control condition with standard care as usual. The group music sessions were offered twice a week for 4 weeks, for 30 minutes in the afternoon. The sessions consisted of listening to a 30 minute CD, with recordings arranged with familiar melodies for the participants and with moderate rhythm and tempo with the focus to help older people to move their body and extremities in a slow manner, with consideration of their safety. The 18 participants in the experimental condition received a total of eight group music sessions. In order to evaluate a possible change in agitation levels, a modified Cohen-Mansfield Agitation Inventory (CMAI; Cohen-Mansfield 1986) was used, with the purpose of time observation for 60 minutes with 10-minutes intervals.

A fifth study compared music therapy to standard care as usual (Svansdottir 2006). Thirty-eight patients, all diagnosed with Alzheimer's disease were randomised to a music therapy condition or to a control condition, with standard care as usual. The therapy group received 18 sessions of music therapy, each lasting for 30 minutes, offered three times a week for a period of 6 weeks in total. The music therapist had selected a collection of songs, which were familiar to the residents. The group could choose a song and each song was sung twice. The therapist accompanied with voice and guitar. The patients could sing and play along with various kinds of instruments. The instruments were also used for improvisation with and without a theme. BPSD was assessed with the BEHAVE-AD (Reisberg 1987). The patients were assessed at three times: at baseline, after 6 weeks and a follow-up assessment after 10 weeks.

In the sixth study (Raglio 2008), 59 patients with dementia were enrolled, of which 30 were assigned to a music therapy condition and 29 to a control group, with personalized care (lunch, bath, cognitive stimulation) and entertainment activities

(reading a newspaper, playing cards and occupational activities) The experimental group received music therapy for 16 weeks, which amounted to 30 music therapy sessions of 30 minutes. During music therapy, both rhythmic and melodic instruments were used to enhance communication. To assess changes in manifestations of BPSD a multidimensional assessment battery was used, including the Neuropsychiatric Inventory (NPI) (Cummings 1994), the Mini-Mental State Exam (MMSE) (Folstein 1975) and the Barthel Index (Mahoney 1965). Assessment was conducted at the start of the study and was repeated after 8 weeks (halfway treatment); after 16 weeks (end of treatment) and after 20 weeks. A music therapy coding scheme was used for video-analysis empathic behaviour, non-empathic behaviour and the level of acceptance of the music therapy approach.

In the last study (Raglio n.d.) on the effect of music therapy on behavioral problems, sixty persons with severe dementia (30 in the experimental and 30 in the control group) were enrolled. The main focus here was to see what the effects are of music therapy on behavioural disturbances if it is offered in cycles:3 working cycles of 1 month music therapy (three times a week) spaced out by 1 month of no treatment. All patients in this study received standard care (educational and entertainment activities). In addition, the experimental group received 3 cycles of 12 active MT sessions each, 3 times a week for 30 minutes with a maximum group size of three. Music therapy was based on sound-music improvisation. The total study duration was six months. At baseline (T0), a multidimensional assessment was conducted (the Mini Mental State Examination (MMSE) (Folstein 1975), Barthel Index (Mahoney 1965) and Neuropsychiatric Inventory (NPI) (Cummings 1994). Further evaluation occurred at T1 (at the end of MT treatment) and at T2 (1 month after the last wash out).

Excluded studies

In total eighteen studies were excluded (see Characteristics of excluded studies Table). One article could not be retrieved, six studies did not involve a music therapy intervention but studied interventions such as piano instruction or combined approaches such as hand massage and music. In six studies the study duration involved less then five music therapy sessions and in five studies patients were not demented or it was not clearly described in the article.

Risk of bias in included studies

The results of the assessment of risk of bias are presented in Figure 1, Figure 2 and the Risk of bias in included studies Tables.

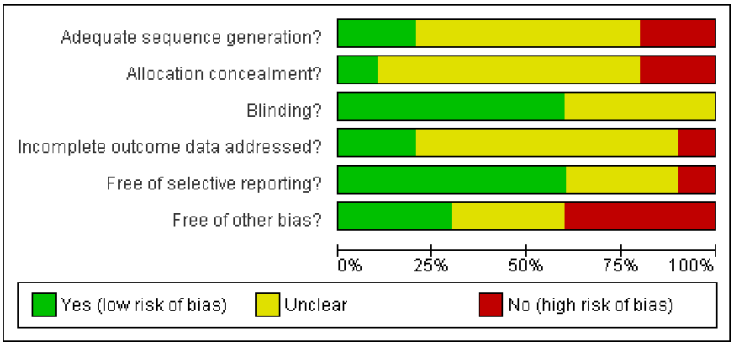

Figure 1. Methodological quality graph: review authors' judgements about each methodological quality item presented as percentages across all included studies.

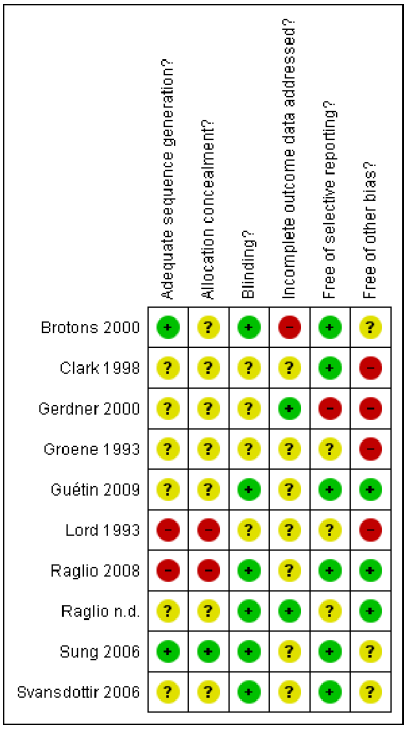

Figure 2. Methodological quality summary: review authors' judgements about each methodological quality item for each included study.

Most studies were poorly reported in terms of interventions, rationale and chosen procedures. The methods of randomisation were only adequately described in two studies (Brotons 2000 & Sung 2006) and concealed allocation in one study (Sung 2006). No study provided adequate information on blinding of the care provider and only one study explicitly mentioned blinding of the raters. In general, all studies scored unclear on most of the validity items as most items could not be assessed from the articles (see: Figure 1 and Figure 2). Therefore, we are unsure about the methodological quality of most studies.

For the crossover trials, first period data were not available so the results may be affected by carry-over. Furthermore, the analysis of all three crossover trials ignored the crossover design. Both factors reduce the reliance which can be placed on the results.

Effects of interventions

No attempt was made to pool study results because the studies were too heterogeneous, of low to very low quality and poorly reported. A complicating factor was that studies could not be properly compared as different behavioural, psychological, and functional scales were used to assess outcomes. The results as reported by the original authors are presented in separate tables (Music Therapy versus other treatment: behavioural problems: Table 1; Music therapy versus other treatment: cognitive skills: Table 2; Music Therapy versus other treatment: social/ emotional functioning: Table 3; Active group music therapy versus receptive individual music intervention Table 4).

Behavioural problems (table 1)

Seven studies compared music therapy with a control intervention or no intervention to reduce behavioural problems (Clark 1998; Gerdner 2000; Groene 1993; Raglio 2008; Raglio n.d.; Sung 2006; Svansdottir 2006). According to the studies, both individualised music listening (Clark 1998; Gerdner 2000) as active group music therapy (Groene 1993; Raglio 2008; Raglio n.d.; Svansdottir 2006; Sung 2006) was more effective than control or no intervention.

Individually based receptive music therapy interventions

Individually based music interventions for reducing agitation were studied by Clark 1998 and Gerdner 2000. When bathing was accompanied by listening to the participants' preferred music (as compared with no music) residents demonstrated significantly less aggressive behaviours (Clark 1998), but there is almost no evidence of statistical analysis of the data. There are no details of how the count data were analysed or how the cross-over design was handled. Gerdner 2000 reported that agitation was significantly less both during and after music therapy when each patient listened to their preferred music compared with standard classical music. The analyses described are not the correct analyses for the data. Each individual assessment for each patient was entered into the analysis creating a file of thousands of observations, which was then analysed taking no account of the correlation between observations belonging to one patient. The cross-over nature of the design was ignored after a statistical test was said to show that order of treatment was not significant. Count data usually require a transformation before analysis but there is no evidence that this was investigated. Consequently the results cannot be accepted.

Active group music therapy

The effects of active group music therapy on behavioural problems was studied by Groene 1993; Raglio 2008; Raglio n.d.; Svansdottir 2006 and Sung 2006.

Groene 1993 reported that the amount of time a wandering subject remained seated or in close proximity to the session area was longer for music sessions than for reading sessions regardless of whether the participants received the mostly music or mostly reading sessions. Seating proximity time significantly increased for the mostly reading group when the intervention was changed to music (Groene 1993). There are benefits associated with music therapy compared with reading therapy as shown by improvement in the time (total minutes) spent not wandering during a session for the main therapy (MD 790, 95% CI 303 to 1277, p=0.001) and for the secondary therapy (MD 391, 95% CI 24 to 614, p=0.03), but not for the change of MMSE across a session. We have assumed that there were 15 patients in each group, but the group sizes were not reported. It is possible that the nature of the intervention biased the results. The music therapy appeared to be far more active as the patients

were engaged in the music therapy. The reading therapy was mostly passive as the patients listened to somebody reading aloud. Therefore there could have been a far greater opportunity for the patients to wander during the reading therapy. This was not discussed in the report. There were no differences in the change in MMSE across a session for music therapy compared with reading therapy. The speed of wandering was not reported in this review because it seemed to be an irrelevant outcome measure. Bias could also have been introduced by changing the control therapy for one patient, and by trying to implement the therapy just before each patient's supposed most agitated time of day. (Analysis 1.1;Analysis 1.2; Analysis 1.3; Analysis 1.4).

In the study of Raglio 2008, there was a significant decrease in the global NPI score in the experimental group compared to the control group. Differences between groups were significant after 8 weeks, 16 weeks and 20 weeks, in favour for the music therapy group. MMSE scores remained similar throughout the study period, as was expected. The Barthel Index scores decreased significantly over time, both in the experimental as the control group. In the study of Raglio n.d. there was a significant decrease over time in the global NPI scores in both groups with a larger reduction of behavioural disturbances in the experimental group at the end of the treatment. In analysis of single NPI item scores it shows that delusions, agitation and apathy significantly improved in the experimental group and not in the control group. In both groups depression, anxiety and irritability significantly improved. Abberant motor activity improved in the control group and not in the experimental group. Post hoc analysis showed that the main improvements were found at T1 (end of treatment) and persisted over time at the follow up (T2). No data was presented on changes in the Barthel Index of MMSE scores. The patients communicative and relational skills did not improve from baseline to the end of the treatment in the experimental group. It was not specified how changes were precisely measured except from the statement that a specific observational scheme was used. No further data was presented in this article to illustrate this conclusion.

Sung 2006 reported that the mean number of agitated behaviours significantly decreased following a group music therapy program with movement interventions, by 1.17 at week 2 (of 4 weeks) and further decreased by 0.5 at week 4, also

significantly lower in comparison to the control group. The mean decrease of the total period of 4 weeks amounted to 1.67 less agitated behaviours compared to a decrease of 0.22 for those patients receiving no intervention, other than care as usual. The timeframe of observations in this study was not clear. The CMAI was modified to make observations for 60 minutes, with a 30 minute intervention. It was not specified at what precise moment the observations were conducted or how the 10 minute intervals were handled during analysis, with respect to missing data (Analysis 2.1; Analysis 2.2).

Svansdottir 2006 reported results based on three measurements, including a follow-up after music therapy has stopped. For the total BEHAVE-AD scores no significant changes were noted after 6 weeks ($p=0.3$ for the music therapy group and $p>0.5$ for the control group). For the single subscale activity disturbances, a significant lower score was found for the experimental group ($p=.02$) in comparison to the control group ($p>.05$) There was no decrease in symptoms rated in other single subscales of the BEHAVE-AD, nor for the therapy group or the control group. For three of the seven categories combined of the BEHAVE-AD (activity disturbances, aggressiveness and anxiety), there was a significant reduction in symptoms in the therapy group ($p<.01$) in comparison to the control group ($p=0.5$). At the follow-up measurement, the benefits of music therapy had disappeared 4 weeks after the last session according to all ratings.

Table 1. Music therapy versus other treatment: behavioural problems

Author	Results	Comments
Clark et. al (1998)	A significant difference (T(2.50;p:<.05) was found between total no. of aggressive behaviours between music (M-65.6) and no music (M-121.6). For separate behaviours only for hitting (T 2.30; p:<0.5). Length of bathing: no difference between music and no music.	- please note that the risk of bias in this study is uncertain (see figure 2), so please interpret the reported results with caution. -The total number of events for each behaviour is calculated for each treatment group. This is the sum of events over 10 episodes for all 18 patients when receiving music treatment and then when receiving no music. The analysis appears to be related to the difference between these two means, but the exact analysis is not described. - This is a crossover trial and the analysis should be based on the difference between each patient's assessment on treatment and then on no treatment. The standard deviation of the differences is required. It is not stated that this has been done. -The assessment is in the form of counts and these usually need to be transformed before analysis, but this does not appear to have been done.
Gerdner (2000)	Freq. of agitated behaviours was significantly less both during and after individualised music. No significant difference between baseline and first 20 minutes of classical minutes. Significant decrease did occur in the final 10 minutes. Both types of music were more effective than baseline, with more effect for individualised music.	- please note that the risk of bias in this study is uncertain (see figure 2), so please interpret the reported results with caution. It seems that the data have not been analysed correctly: 1. The data from the two groups were analysed as though there were two independent groups of 39 patients. 2. Baseline is considered a level of the treatment factor which is incorrect 3. There are several measurements on each patient and these correlated measurements cannot be analysed as though they were independent.

Groene (1993)	Significant difference in mean seating/ proximity time in favour of music over the reading treatment (p<.001). No significant effects or interactions in seating/proximity behavior for the factors sex, age, or months on site at the facility. No significant differences in wandering behavior were revealed between the mostly music and mostly reading group. There was a significant difference between the mean wandering scores during the 5 music sessions versus the 2 reading sessions of the mostly music group in favour of the music sessions (t(14)=2.25, p<0,41. No significant difference in pre and posttest of MMSE.	- please note that the risk of bias in this study is uncertain (see figure 2), so please interpret the reported results with caution.-No washout period, which could have diluted the effect. The effect for the music sessions alone: Music therapy 3658.73 (552) reading therapy 2869.33 (789) t=3.2 p<0.002. -The intervention consisted of one session (15 minutes) per day for 7 days. The days were not consecutive and occurred over 15 weeks. The sessions were either 5 music followed by 2 reading or 5 reading followed by 2 music. -Other outcomes measures are questionable, e.g. the distance walked during the session, and assessing effects on the MMSE over a period of 15 minutes.
Raglio (2008)	There was a significant decrease in the global NPI scores in the experimental group in comparison with the control group (interaction time x group: F=5.06, p=0.002). Differences were significant at after 8 weeks (F=9.85; p=0.003); after 16 weeks (F=21.21; p=0<0.001) and after 20 weeks (F=12.65; p=0.0007). There were no changes in MMSE scores in both the experimental group and the control group. The Barthel Index score significantly decreased over time in both the experimental (59 to 52) as in the control group (51 to 46); F=8.91; p=0.001)	- the changes in the NPI scores were presented for the separate items, without standard deviation - no details were provided for the Barthel Index score, no standard deviation.

Raglio (n.d)	There was a significant decrease over time in the global NPI scores in both groups (F=9.06, p<0.001), a significant difference between groups (F=4.84, p < 0,5) with a larger reduction of behavioural disturbances in the experimental group at the end of the treatment (T1) (t=-2,58; p<0.001; Cohen's d=0,63). In analysis of single NPI item scores it shows that delusions, agitation and apathy significantly improved in the experimental group and not in the control group. In both groups depression, anxiety and irritability significantly improved. Abberant motor activity improved in the control group and not in the experimental group. Post hoc analysis showed that the main improvements were found at T1 (end of treatment) and persisted over time at the follow up (T2). The patients communicative and relational skills did not improve from baseline to the end of the treatment in the experimental group.	- please note that the risk of bias in this study is uncertain (see figure 2), so please interpret the reported results with caution. - No data is presented on the Mini Mental State Examination (MMSE) or the Barthel Index, only for the baseline scores and not T1 (end of treatment) and T2 (1 month after the last wash out). - It is not clear from the article how changes in communicative and relational skills were measured except from the statement that a specific observational scheme was used. No data is presented. - criteria for randomisation were not standardized. - baseline NPI scores differed slightly (T= - 1.49; p=0,14) between exp. (20.2) and control group (28.7), possibly affecting the comparability of the two groups.
Sung (2006)	The mean number of agitated behaviours was significantly decreased following a group music program with movement interventions, by 1.17 at week 2 (of 4 weeks) and further decreased by 0.5 at week 4, also significantly lower in comparison to the control group. The mean decrease of the total period of 4 weeks amounted to 1.67 less agitated behaviours compared to a decrease of 0.22 for those patients receiving no intervention, other than care as usual. Changes in occurrence over the 4-week time frame were significantly different between experimental and control group (ANOVA, F=15.03, p< .001)	- no t-test statistic provided for the decrease with 1.17 points at week 2 in the article; -The timeframe of observations in this study is not entirely clear from the article. The CMAI was modified to make observations for 60 minutes, with a 30 minute intervention. It was not specified at what precise moments the observations were conducted, with preceding or continuing observations for additional 30 minutes (?) or how the 10 minute intervals were handled during analysis, with respect to the intervention and missing data.

Svansdottir (2006)	For the total BEHAVE-AD scores no significant changes were noted after 6 weeks (p=0.3 for the music therapy group and p>0.5 for the control group). For the single subscale 'activity disturbances', a significant lower score was found for the experimental group (p=.02) in comparison to the control group (p>.05) There was no decrease in symptoms rated in other single subscales of the BEHAVE-AD, nor for the therapy group or the control group. For three of the seven categories combined of the BEHAVE-AD (activity disturbances, aggressiveness and anxiety), there was a significant reduction in symptoms in the therapy group (p<.01) but not for the control group (p=0.5). At the follow-up measurement, the benefits of music therapy had disappeared 4 weeks after the last session according to all ratings.	- please note that the risk of bias in this study is uncertain (see figure 2), so please interpret the reported results with caution.- no baseline characteristics are presented, unclear how many men and females participated, nor their age or their average GDS score. - not clear if groups were different or similar at baseline assessment scores on the BEHAVE-AD - insufficient details on statistical tests - only average mean scores are presented and no standard deviation scores

COGNITIVE SKILLS (Table 2)

Brotons 2000 compared active group music therapy with a verbal intervention (conversation sessions) (Brotons 2000). The outcomes were cognitive functioning as assessed by the MMSE and language performance as assessed by the Western Aphasia Battery (WAB). Music therapy was reported to be more effective than the control intervention. Language skills (speech content and fluency), as assessed by the WAB, were significantly better after music therapy than after conversation sessions. However, all quantitative results were inadequately presented.

The description of the analysis makes no mention of how the cross-over design was handled. It appears to have been ignored in the analysis and the people in each group seem to have been treated as different people. Although this casts doubts on the validity of the results, we note that it was reported that there was no significant difference between music therapy and conversation therapy for MMSE and for the auditory verbal comprehension subscale of the WAB.

Table 2. Music therapy versus other treatment: cognitive skills

Author	Results	Comments
Brotons/ Koger (2000)	Significant main effects for condition (n-20): Music versus Conversation: F(1,19)=7.4, p=0.1Speech versus fluency F(1.19)=10.581, p=.004 with performance better in music relative to conversation and fluency relative to content. No significant interaction effect: Performance during music was better than conversation for both speech content and fluency. (p=.09). No difference on subscale auditory verbal comprehension (n-19; p=>.1). No difference on MMSE before/after 2 weeks post treatment. No significance overall aphasia quotient: (n-10; p>.1).	There was no mention of how the cross-over design was dealt with during analysis. Dependency in data seems to be ignored.

SOCIAL AND EMOTIONAL FUNCTIONING (Table 3)

The effect of active group music therapy in improving social and emotional functioning was studied by Lord 1993 (Table 3;). Using an in-house unvalidated outcome measure music therapy was found to be more effective than the control interventions; patients were happier, more alert and had higher recall of past personal history after music therapy than patients in the control groups (puzzle activities and general activities). Not enough detail was reported about the outcome measure and the statistical analyses, and we were unable to reproduce the results. No statistical tests were reported for the between-group comparisons, only for the within-group.

The effect of individual receptive music therapy in reducing anxiety and depression was studied by Guétin 2009. Patients followed music therapy in the experimental group and reading/rest in the control group. Measurements were taken at baseline, week 4, week 16 (end of treatment) and week 24.

The results obtained over the entire follow-up period show a significant difference between the 2 groups regarding anxiety. At week 4, patients in the music therapy had lower anxiety scores (Hamilton Scale) compared to baseline, whereas the mean score remained constant in the control group. Also significant changes between D0 and W8 and between D0 and W16 were evidenced between the 2 groups, with lower scores for the music therapy groups which persisted also on the follow-up.

Regarding depression, similar differences were found. Patients had slightly higher depression scores at baseline in the music therapy group compared to the control group. Atweek4, 8 and 16 they had lower depression scores on the GDS. The effect of music therapy maintained for up to two months after stopping the sessions. No changes in cognition were found on the MMSE.

Table 3. Music therapy versus other treatment: social/emotional functioning

Author	Results	Comments
Lord (1993)	Analysis of variance showed that the music group was more alert, happier and had higher recall of past personal history than patients in other two groups.	- please note that the risk of bias in this study is uncertain (see figure 2), so please interpret the reported results with caution. -The article reports that the number of correct answers for each of the 3 groups was summed for baseline and post treatment, and then a one-way analysis of variance conducted. We are not told how the data were analysed, whether the baseline was used as a covariate. Table 1 analysis of variance, although showing significant differences between the 3 therapies does not make sense. The degrees of freedom within groups are not correct for a start. To interpret this table we need far more information. Even if we believe the results in table 2, the paired comparisons, all we can deduce is that the treatments were different. They may be different in the level of participation in the therapies, but that does not tell us whether the therapy brought any benefit. The article reports that the number of correct answers for each of the 3 groups was summed for baseline and post treatment, and then a one-way analysis of variance conducted. No information on how the data were analysed, whether the baseline was used as a covariate. Table 1 analysis of variance, although showing significant differences between the 3 therapies does not seem valid. For example, the degrees of freedom within groups are not correct. To interpret this table far more information is required. Even if the results in table 2 are accepted, all that can be deduced is that the treatments were different. They may be different in the level of participation in the therapies, but that does not explain whether the therapy itself brought any benefit.

Guétin (2009)	**Anxiety:** Anova with repeated measures (D0, W4, W8 and W16) showed a significant difference (p<0.001) in the Hamilton Scale score. At baseline, the anxiety level score was comparable: 22 (± 5.3) music therapy group and 21.1 (± 5.6) control group. This level decreased further in the music therapy group at W16, 8.4 (± 3.7) versus 20.8 (±6.2) for the control group. The changes between D0 and W16/ W24 were significantly different between the 2 groups (p < 0.001), with lower anxiety levels for the experimental group. **Depression:** ANOVA with repeated measures, with adjustment to the GDS score at D0, showed a significant difference between the 2 groups (p = 0.001) at W16 (end of treatment) The overall changes were not significant over time, each group progressed in a different manner during follow-up (significant time/group interaction p = 0.0095). At W16, scores improved with 7.7 (± 4.6) points, i.e. 47.1% in the music therapy group; mean depression score of 16.7 (±6.2). In the control group scores improved with 0.2 (±4.4) points, i.e. 1.7%, mean depression score of 11.8 (± 7.4). At week 24 (follow-up) the depression score was 12.5 (± 6.4) in the music therapy group and 12.1 (± 7.6) in the control group and differed significantly from D0 (p=0.03). **MMSE:** no significant differences between D0 and W16, both in experimental as control group.	- please note that the risk of bias in this study is uncertain (see figure 2), so please interpret the reported results with caution. - the precise intervention offered in the control condition is not clearly described, it is only stated that they participated in "sessions involving rest and reading".

Table 4. Active group music therapy versus individual listening

active group music therapy		individual listening	
Brotons/ Koger (2000)	**Language skills** Significant main effects for condition (n-20): Music versus Conversation: F(1,19)=7.4, p=0.1Speech versus fluency F(1.19)=10.581, p=.004 with performance better in music relative to conversation and fluency relative to content. No significant interaction effect: Performance during music was better than conversation for both speech content and fluency. (p=.09). No difference on subscale auditory verbal comprehension (n-19; p=>.1). No difference on MMSE before/after 2 weeks posttreatment. No significance overall aphasia quotient: (n-10; p>.1).	Clark et. al (1998)	**Agitation** A significant difference (T(2.50;p:<.05) was found between total no. of aggressive behaviours between music (M-65.6) and no music (M-121.6). For separate behaviours only for hitting (T 2.30; p:<0.5). Length of bathing: no difference between music and no music.
Gerdner (2000)	**Agitation** Freq. of agitated behaviours was significantly less both during and after individualised music. No significant difference between baseline and first 20 minutes of classical minutes. Significant decrease did occur in the final 10 minutes. Both types of music were more effective than baseline, with more effect for individualised music.	Gerdner (2000)	**Agitation** Freq. of agitated behaviours was significantly less both during and after individualised music. No significant difference between baseline and first 20 minutes of classical minutes. Significant decrease did occur in the final 10 minutes. Both types of music were more effective than baseline, with more effect for individualised music.

Groene (1993)	**Agitation** Significant difference in mean seating/proximity time in favor of music over the reading treatment (p<.001). No significant effects or interactions in seating/proximity behavior for the factors sex, age, or months on site at the facility. No significant differences in wandering behavior were revealed between the mostly music and mostly reading group. There was a significant difference between the mean wandering scores during the 5 music sessions versus the 2 reading sessions of the mostly music group in favour of the music sessions (t(14)=2.25, p<0,41. No significant difference in pre and posttest of MMSE.	Guétin (2009)	**Anxiety:** Anova with repeated measures (D0, W4, W8 and W16) showed a significant difference (p<0.001) in the Hamilton Scale score. At baseline, the anxiety level score was comparable: 22 (± 5.3) music therapy group and 21.1 (± 5.6) control group. This level decreased further in the music therapy group at W16, 8.4 (± 3.7) versus 20.8 (±6.2) for the control group. The changes between D0 and W16/ W24 were significantly different between the 2 groups (p < 0.001), with lower anxiety levels for the experimental group. **Depression:** ANOVA with repeated measures, with adjustment to the GDS score at D0, showed a significant difference between the 2 groups (p = 0.001) at W16 (end of treatment) The overall changes were not significant over time, each group progressed in a different manner during follow-up (significant time/ group interaction p = 0.0095). At W16, scores improved with 7.7 (± 4.6) points, i.e. 47.1% in the music therapy group; mean depression score of 16.7 (±6.2). In the control group scores improved with 0.2 (±4.4) points, i.e. 1.7%, mean depression score of 11.8 (± 7.4). At week 24 (follow-up) the depression score was 12.5 (± 6.4) in the music therapy group and 12.1 (± 7.6) in the control group and differed significantly from D0 (p=0.03). **MMSE:** no significant differences between D0 and W16, both in experimental as control group.

Raglio (2008)	**Agitation** There was a significant decrease in the global NPI scores in the experimental group in comparison with the control group (interaction time x group: F=5.06, p=0.002). Differences were significant at after 8 weeks (F=9.85; p=0.003); after 16 weeks (F=21.21; p=0<0.001) and after 20 weeks (F=12.65; p=0.0007). There were no changes in MMSE scores in both the experimental group and the control group. The Barthel Index score significantly decreased over time in both the experimental (59 to 52) as in the control group (51 to 46); F=8.91; p=0.001)
Raglio (n.d)	**Agitation** There was a significant decrease over time in the global NPI scores in both groups (F=9.06, p<0.001), a significant difference between groups (F=4.84, p < 0,5) with a larger reduction of behavioural disturbances in the experimental group at the end of the treatment (T1) (t=-2,58; p<0.001; Cohen's d=0,63). In analysis of single NPI item scores it shows that delusions, agitation and apathy significantly improved in the experimental group and not in the control group. In both groups depression, anxiety and irritability significantly improved. Aberrant motor activity improved in the control group and not in the experimental group. Post hoc analysis showed that the main improvements were found at T1 (end of treatment) and persisted over time at the follow up (T2). The patients communicative and relational skills did not improve from baseline to the end of the treatment in the experimental group.

Sung (2006)	**Agitation** The mean number of agitated behaviours was significantly decreased following a group music program with movement interventions, by 1.17 at week 2 (of 4 weeks) and further decreased by 0.5 at week 4, also significantly lower in comparison to the control group. The mean decrease of the total period of 4 weeks amounted to 1.67 less agitated behaviours compared to a decrease of 0.22 for those patients receiving no intervention, other than care as usual. Changes in occurrence over the 4-week time frame were significantly different between experimental and control group (ANOVA, F=15.03, p< .001)
Svansdottir (2006)	**Agitation** For the total BEHAVE-AD scores no significant changes were noted after 6 weeks (p=0.3 for the music therapy group and p>0.5 for the control group). For the single subscale 'activity disturbances', a significant lower score was found for the experimental group (p=.02) in comparison to the control group (p>.05) There was no decrease in symptoms rated in other single subscales of the BEHAVE-AD, nor for the therapy group or the control group. For three of the seven categories combined of the BEHAVE-AD (activity disturbances, aggressiveness and anxiety), there was a significant reduction in symptoms in the therapy group (p<.01) but not for the control group (p=0.5). At the follow-up measurement, the benefits of music therapy had disappeared 4 weeks after the last session according to all ratings.
Lord (1993)	**Social/emotional functioning** Analysis of variance showed that the music group was more alert, happier and had higher recall of past personal history than patients in other two groups.

Discussion

Summary of main results

The aim of this review was to evaluate the effect of music therapy for people with dementia. The specific focus was to assess whether music therapy can diminish behavioural and cognitive problems or improve social and emotional functioning. Ten studies have been included in this review which state music therapy being beneficial as a treatment modality of older people with dementia.

Most studies were conducted to study the effect of active group music therapy in reducing behavioural symptoms. According to the authors, moderate effects of any form of music therapy may be effective in reducing behavioural problems, stimulating language skills and enhancing social/emotional functioning. All studies were concerned with short-term therapy effects; the intervention periods were less than four months.

No overall conclusion can be made as most studies reviewed were too small, the statistical analyses in most of these trials had major flaws or were not clearly described. A complicating factor was that studies could not be properly compared as different behavioural, psychological, and functional scales were used to assess outcomes.

Overall completeness and applicability of evidence

Despite ten studies describing positive effects of music therapy, the studies reviewed demonstrated methodological limitations. The poor reporting of the results and poor statistical analysis impeded valid inferences.

Quality of the evidence

Due to poor reporting we were uncertain of the methodological quality of the included studies. Most of the studies describe positive effects which however cannot be warranted due to methodological problems making interpretation of the results difficult. Little information was provided on randomisation methods and overall the studies consisted of small sample sizes and short intervention periods, increasing the risk of bias which may have led to an overestimation of the 'true' effect of the intervention.

Potential biases in the review process

We have done an extensive literature search in the most commonly used databases and also thoroughly handsearched music therapy journals, it may however be that not all conducted RCTs were retrieved.

AUTHORS' CONCLUSIONS Implications for practice

Despite ten studies claiming a favourable effect of music therapy in reducing problems in the behavioural, social, emotional, and cognitive domains in older people with dementia we can not endorse these claims nor refute any positive effect of music therapy.

Implications for research

The statistical reporting in the reviewed studies assessing the effects of music therapy is generally poor, which hampers proper assessment of their methodological quality. More rigorous studies are needed to establish whether music therapy may play a role in the treatment of older people with dementia. Future studies should follow the CONSORT guidelines for reporting of randomised trials, use adequate methods of randomisation with adequate concealment of allocation of the participants to (parallel) treatment groups, blind the outcome assessors to treatment allocation, include reliable and validated outcome measures, and be of sufficient duration to assess medium and long-term effects.

Also more research is needed to differentiate between various music therapy approaches to see if there is a difference between receptive and active music therapy approaches. Further research is also required to compare music therapy provided by a to mere music listening. In this way it would be possible to single out the more specific effects of music therapy interventions and methods.

For future studies it is advised to use properly validated outcome measures to assess and evaluate the effects of music therapy for people with dementia.

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TABLES OF INCLUDED STUDIES

Brotons 2000

Methods	RCT (crossover 2 weeks + 2 weeks)
Participants	Country: USA N=26 (18 female, 8 male) Mean age: 81, residents of a nursing home Diagnosis of dementia: Alzheimer and related disorders; assessed with the MMSE (Mean=10)
Interventions	(1) Music therapy (group sessions, twice a week for 30 minutes) (2) Conversation sessions (group sessions, twice a week for 30 minutes)
Outcomes	Cognition: MMSE Language skills (Western Aphasia Battery)
Notes	All participants had been receiving music therapy sessions for a minimum of 3 months prior to entering the study.

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Yes	Quote: "Condition order was counterbalanced between participants, with music sessions given first to half of the subjects (selected randomly) and conversation first to the remainder."
Allocation concealment?	Unclear	No information provided.
Blinding? All outcomes	Yes	Blinding of the outcome assessors was assured. Quote: "Three independent analysts who were blind to the subjects' condition (e.g., order of treatment as well as mental status and performance during testing) listened to the tape while reading the transcription and assigned scores."
Incomplete outcome data addressed? All outcomes	No	Quote: "Twenty-six participants (18 female, 8 male, mean age 81) were recruited for this study." "Analyses were restricted to 20 participants who completed at least the first subtest of the WAB (spontaneous speech)" "Of the 20 participants in the preceding analyses, 19 also completed the first section of the auditory verbal comprehension subscale of the WAB (yes/no questions)." "A one-factor ANOVA on MMSE before and 2 weeks posttreatment on 18 subjects who were available at posttest demonstrated no significant change during the course of the study (p > .l)."

Free of selective reporting?	Yes	The study protocol is not available, however the report seems to include all expected outcomes, as is described in the methods section.
Free of other bias?	Unclear	It appears that all quantitative results were inadequately presented. The description of the analysis makes no mention of how the cross-over design was handled. It appears to have been ignored in the analysis and the people in each group seem to have been treated as different people.

Clark 1998

Methods	RCT (crossover 2 weeks + 2 weeks)
Participants	Country : USA N=18 (14 female, 4 male) Mean age: 82 (55-95), residents in a nursing home Diagnosis of dementia: presence of dementia; assessed with the MMSE (Mean=10) Inclusion criteria: History of aggressive behaviour exhibited during caregiving routines Exclusion criteria: uncorrected hearing impairment, absence of family member who could provide knowledge of patient's music preferences
Interventions	(1) Favorite music during bathing (2) No music during bathing
Outcomes	Behaviour (agitation) Frequency of aggressive behaviours.
Notes	

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Quote: "the director of social services or her assistant identified prospective participants". "After being enrolled in the study, participants were randomly scheduled for observation during bath time under either a control (no music) condition or an experimental condition". No further information is provided on the allocation sequence.

Allocation concealment?	Unclear	No information provided.
Blinding? All outcomes	Unclear	No information provided.
Incomplete outcome data addressed? All outcomes	Unclear	No information provided.
Free of selective reporting?	Yes	The study protocol is not available, however the report seems to include all expected outcomes, as is described in the methods section.
Free of other bias?	No	Note: The authors report in the article on the effects of the extreme intrasubject and intersubject variability characteristic of this population in this study, which implies a unit of analysis problem. Quote: "For example, one subject was responsible for 408 and 84 occurrences of yelling behavior in the no music and music conditions, respectively."

Gerdner 2000

Methods	RCT (crossover 6 weeks treatment + 2 weeks washout + 6 weeks treatment)
Participants	Country: USA 6 centres N=39 (30 female, 9 male) residents in long term care facilities Mean age: 82.6 (range 70-99) Inclusion criteria: exhibited agitation as defined by the Cohen-Mansfield and Billig (1986), Global Deterioration Scale (GDS) between 3 and 7, satisfactory hearing, no pain or infection, had been resident for a minimum of 6 weeks, information available about personal music preferences Diagnosis of dementia: mild to severe cognitive decline (3-7 GDS)
Interventions	(1) Individualized music (2) Classical relaxation music
Outcomes	Behaviour (agitation) as assessed with the Cohen-Mansfield Agitation Inventory (CMAI)
Notes	Groups were stratified by age, gender and degree of cognitive impairment

Risk of bias

Item	Authors judgement	Description
Adequate sequence generation?	Unclear	No information provided.
Allocation concealment?	Unclear	No information provided.
Blinding? All outcomes	Unclear	No information provided.
Incomplete outcome data addressed? All outcomes	Yes	No missing outcome data.
Free of selective reporting?	No	The study protocol is not available, however the report seems to include all expected outcomes, as is described in the methods section, although based on incorrect analyses.
Free of other bias?	No	The analyses described are not the correct analyses for the data. Each individual assessment for each patient was entered into the analysis creating a file of thousands of observations, which was then analysed taking no account of the correlation between observations belonging to one patient. The cross-over nature of the design was ignored after a statistical test was said to show that order of treatment was not significant. Count data usually require a transformation before analysis but there is no evidence that this was investigated. Consequently the results cannot be accepted.

Groene 1993

Methods	RCT 15 week parallel group trial
Participants	Country: USA N=30 (16 female, 14 male) residents in a special Alzheimer's unit Mean age: 77.5 (range 60-91 years) Diagnosis of dementia: AD, not further specified, all participants exhibited wandering behaviour
Interventions	1) Reading-Music therapy 2) Music therapy-Reading
Outcomes	Wandering behaviour assessed by seating/proximity duration. MMSE at pre and post sessions
Notes	

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Quote: "Participants were randomly assigned to either mostly music attention or mostly reading attention groups" No further information was provided on the sequence generation**.**
Allocation concealment?	Unclear	No information provided.
Blinding? All outcomes	Unclear	No information provided on blinding, the researcher and nursing staff recorded the wandering behavior.
Incomplete outcome data addressed? All outcomes	Unclear	No information provided on missing data.
Free of selective reporting?	Unclear	The speed of wandering was not reported in this review because it seemed to be an irrelevant outcome measure.
Free of other bias?	No	We have assumed that there were 15 patients in each group, but the group sizes were not reported. It is possible that the nature of the intervention biased the results. The music therapy appeared to be far more active as the patients were engaged in the music therapy, the reading therapy mostly passive as the patients listened to somebody reading aloud. Therefore there could have been a far greater opportunity for the patients to wander during the reading therapy. This was not discussed in the report. Bias could also have been introduced by changing the control therapy for one patient, and by trying to implement the therapy just before each patient's supposed most agitated time of day.

Guétin 2009

Methods	RCT parallel group trial; total duration of 18 months, with a follow-up period of 6 months.
Participants	Country: France N=30 (22 female, 8 male), 1 centre. Mean age: experimental group 85.2 (range 75-93 years); control group 86.9 (range 74-95 years) Diagnosis of dementia: mild to moderate stages of AD; Mini Mental State score between 12 and 25 and Hamilton Anxiety Scale score of at least 12.
Interventions	1) Individual receptive music therapy method 2) Reading sessions
Outcomes	1) level of anxiety (Hamilton Scale) 2) level of depression (Geriatric Depression Scale) 3) Minimal Mental State Score (MMSE)
Notes	

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Probably Yes, but no details provided. "The study design corresponded to a randomised, controlled, comparative, single-centre study, with the results evaluated under blind conditions." and "The patients were allocated to the different groups by randomisation at the end of the inclusion visit".
Allocation concealment?	Unclear	No details provided.
Blinding? All outcomes	Yes	Patients and care givers not blinded, outcome assessor blinded: "The results obtained at D0, W4, W8, W16 and W24 were collected by an independent neuropsychologist assessor (D.L.), not belonging to the care team and unaware of the type of intervention."
Incomplete outcome data addressed? All outcomes	Unclear	Unclear whether drop-outs have caused bias. "Two patients were prematurely withdrawn from the study in the intervention group: 1 between W8 and W16 owing to an intercurrent event not related to the study (life-threatening situation, hospitalisation), and the second died between W16 and W24. Four patients were withdrawn from the study in the control group: 1 between W4 and W8 due to dropping out, 1 between W4 and W8 owing to an intercurrent event not related to the study (hospitalisation), 1 patient died between W4 and W8, and the last patient dropped out between W16 and W24."

Free of selective reporting?	Yes	All outcomes were presented.
Free of other bias?	Yes	Baseline imbalances don't appear to have caused bias.

Lord 1993

Methods	RCT (parallel)
Participants	Country: USA N=60 (42 female, 18 male) residents in a home for older people age range : 72-103. Diagnosis of dementia: all diagnosed with dementia of the Alzheimer's type (method not specified)
Interventions	(1) Big band music listening and playing along (2) Jigsaw puzzle activities (3) No special treatment
Outcomes	Cognition, social skills and emotional well-being as assessed with a self made questionnaire: general impressions + patients disposition and social coaction; behavioural observation; amount of participation.
Notes	

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	No	Quote "The patients were non-systematically separated into three groups of equal size"
Allocation concealment?	No	Quote " To assure equal representation by gender, the random division was implemented first with the female and then with the male patients" Note: no further information provided on the method to conceal the allocation sequence.
Blinding? All outcomes	Unclear	No information was provided on blinding of the outcome assessors.
Incomplete outcome data addressed? All outcomes	Unclear	No information provided.
Free of selective reporting?	Unclear	Not enough detail was reported about the outcome measures.
Free of other bias?	No	We were unable to reproduce the results. No statistical tests were reported for the between-group comparisons, only for the within-group.

Raglio 2008

Methods	RCT (parallel)
Participants	Country: Italy N=59 (? female, ? male not described); residents from 3 nursing homes Mean age/age range experimental group: 84.4 (73-95) Mean age/age range control group: 85.8 (74-94) Diagnosis of dementia: all diagnosed with dementia (DSM-IV; MMSE ≤ 22/30; CDR ≥2/5)
Interventions	1) music therapy (30 sessions; 30 min per session) 2) personalized care and entertainment activities
Outcomes	Behavioral and psychological symptoms of dementia (BPSD); multidimensional assessment with the mini-mental state examination (MMSE); Barthel Index, Neuropsychiatric Inventory (NPI)
Notes	

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	No	The patients were assigned to experimental or control group using non-standardized randomisation criteria.
Allocation concealment?	No	The patients were assigned to experimental or control group using non-standardized randomisation criteria. Fifty-nine patients were therefore enrolled and listed in alphabetical order. The patients corresponding to odd numbers (n=30) were assigned to the experimental, whereas the others (n=29) to the control group.
Blinding? All outcomes	Yes	Outcomes assessment was blinded. Quote: "The MMSE, the Barthel Index and NPI scales were administered by a single physician, blind to the patients' membership in the control and experimental groups and unaware about the changes in cognitive, functional, and behavioral status that occurred during the survey."
Incomplete outcome data addressed? All outcomes	Unclear	No information provided in the article.
Free of selective reporting?	Yes	The study protocol is not available, however the report seems to include all expected outcomes, as is described in the methods section.
Free of other bias?	Yes	the study appears to be free of other sources of bias

Raglio n.d.

Methods	RCT (parallel);
Participants	Country: Italy N=60 (55 female, 5 male); residents from 5 nursing homes Mean age/age range experimental group: 85.4 (74-99) Mean age/age range control group: 84.6 (69-96) Diagnosis of dementia of the Alzheimer type, vascular dementia or mixed dementia (DSM-IV; MMSE ≤ 18/30; CDR ≥25)
Interventions	1) All patients in the experimental and control groups received standard care (i.e., educational and entertainment activities such as reading a newspaper, performing physical activities, etc.). 2) The experimental group received 3 cycles of 12 music therapy sessions each, 3 times a week. Each session included a group of 3 patients and lasted 30 minutes. Each cycle of treatment was followed by 1 month of wash-out period while the standard care activities continued over time. The total duration was of 6 months.
Outcomes	Mini Mental State Examination (MMSE) Barthel Index Neuropsychiatric Inventory (NPI).
Notes	

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Probably Yes, but no details provided "Sixty patients from 5 nursing homes ?.. were eligible and were randomly assigned to experimental or control group."
Allocation concealment?	Unclear	No details provided.
Blinding? All outcomes	Yes	Patients and care givers not blinded, outcome assessor blinded: "The assessments were made by NH healthcare assistants who were blinded to the aim of the study."
Incomplete outcome data addressed? All outcomes	Yes	drop-outs did not appear to have caused bias. "During the study 7 patients dropped out, 3 in the experimental and 4 in the control group. The drops-out were due to death (n=5), transfer to acute hospital because of hip fracture (n=1) and transfer to another NH (n=1)."
Free of selective reporting?	Unclear	Changes in Barthel Index scores and MMSE were not presented. In addition, "The patients' communicative and relational skills did not improve from baseline to the end of the treatment in the experimental group (data not shown)."
Free of other bias?	Yes	Baseline imbalances do not appear to have caused bias.

Sung 2006

Methods	RCT (parallel)
Participants	Country: Taiwan N=36 (10 female, 26 male); residents in a residential care facility Mean age: 77.6 (SD=8,4) Diagnosis of dementia: all diagnosed with dementia (DSM-IV); Global Deterioration Scale (GDS) score of 3-6 (moderate to severe dementia)
Interventions	1) group music with movement intervention, twice a week for 4 weeks. 2) standard care as usual
Outcomes	Agitation assessed with a modified Cohen-Mansfield Agitation Inventory (CMAI)
Notes	

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Yes	Quote: "A randomised controlled trial was used. Participants were randomly assigned to either the experimental or control group using permuted block randomization."
Allocation concealment?	Yes	Quote: "Assignments were concealed in sealed envelopes and the randomisation was performed by an external person so that the researchers were unaware of the order of assignment and block size."
Blinding? All outcomes	Yes	Review authors do not believe this will introduce bias in research studies involving dementia and music therapy.
Incomplete outcome data addressed? All outcomes	Unclear	No information provided.
Free of selective reporting?	Yes	the report includes all expected outcomes.
Free of other bias?	Unclear	The timeframe of observations in this study is not clear. The CMAI was modified to make observations for 60 minutes, with a 30 minute intervention. It was not specified at what precise moment the observations were conducted or how the 10 minute intervals were handled during analysis.

Svansdottir 2006

Methods	RCT (parallel)
Participants	Country: Iceland N=38 (? female, ? male); residents in two nursing homes and two psychogeriatric wards Age range: 71-87 (recruited sample, N=48) Diagnosis of dementia: all diagnosed with Alzheimers disease (ICD-10); Global Deterioration Scale (GDS) score of 5-7 (moderate to severe dementia)
Interventions	1) group music therapy (3-4 patients), 3 times a week (6 weeks), 30 minutes per session 2) standard care as usual
Outcomes	Behavioral and psychological symptoms of dementia (BPSD) assessed with the Behavior Pathology in Alzheimer's disease Rating Scale (BEHAVE-AD)
Notes	No clear baseline characteristics presented

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	No information provided.
Allocation concealment?	Unclear	Quote"...The 46 remaining patients were then randomised to a music therapy group or a control group, with 23 individuals in each group."
Blinding? All outcomes	Yes	The outcome assessors were blinded. Quote: "Two nurses were trained in using the BEHAVE-AD scale and they were blinded to the therapy used. The nurses were not part of the staff of the wards."
Incomplete outcome data addressed? All outcomes	Unclear	No information provided.
Free of selective reporting?	Yes	The study protocol is not available, however the report seems to include all expected outcomes, as is described in the methods section, although based on incorrect analyses.
Free of other bias?	Unclear	No clear baseline characteristics presented.

Characteristics of excluded studies [ordered by study ID]

Study	Reason for exclusion
Ballard 2009	RCT, no music therapy intervention. A small proportion of the study sample followed individualised music as an intervention (n=35). A non-significant improvement was found on the total CMAI score.
Bruer 2007	RCT, crossover, 8 weeks, comparison of group music therapy to video presentation on cognition (MMSE score). Patients participated in less than 5 music therapy sessions.
Bugos 2005	RCT, Demented patients were excluded in this study, focus on healthy older adults (effects of individualized piano instruction on executive functioning and working memory)
Clair 1996	Not clear if patients were randomised. Patients participated in less than 5 sessions.
Garland 2007	RCT, crossover, comparing audiotapes with stimulated family presence to audiotapes with preferred music and a neutral placebo tape to reduce agitation. Less than 5 sessions in each group in which was listened to preferred music.
Hanser 1994	RCT, patients were not demented but depressed older people.
Hicks 2008	RCT, comparison of favourite music and hand massage, less then five sessions
Hokkanen 2008	RCT, no music therapy, the study involved dance- and movement therapeutic methods.
Holmes 2006	RCT, comparison of live interactive music, passive pre-recorded music or silence for 30 minutes in a single session. Less than 5 sessions.
Noice 2009	RCt, no music therapy: a theatrically based intervention was given to 122 older adults who took lessons twice a week for 4 weeks.
Otto 1999	RCT, patients were not demented.
Pomeroy 1993	RCT, music was part of physiotherapy.
Remington 1999	RCT, patients participated in less than 5 sessions.
Riegler 1980	RCT, not clear whether patients were diagnosed with dementia.
Thompson 2005	RCT, single test moment, music as cue to facilitate performance on a category fluency task. No therapeutic intervention.
Van de Winckel 2004	RCT, no music therapy, but music based exercises
Vanderark 1983	RCT, not clear whether patients were diagnosed with dementia.

Data and analyses

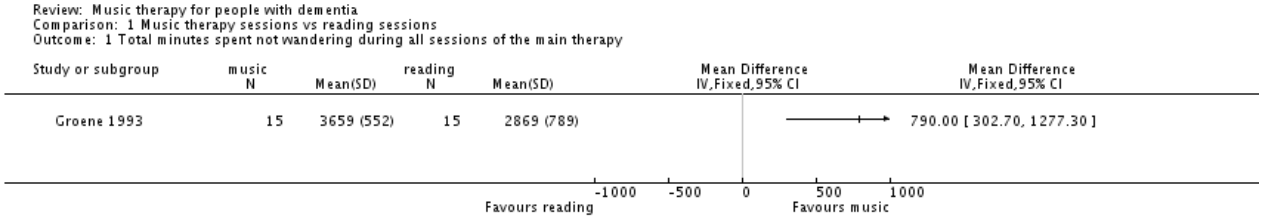
Comparison 1. Music therapy sessions vs reading sessions

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Total minutes spent not wandering during all sessions of the main therapy	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
2 Total minutes wandering during all sessions of the secondary therapy	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
3 Mean change in MMSE over a therapy session averaged over all sessions of the main therapy	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
4 Mean change in MMSE over a therapy session averaged over all sessions of the secondary therapy	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected

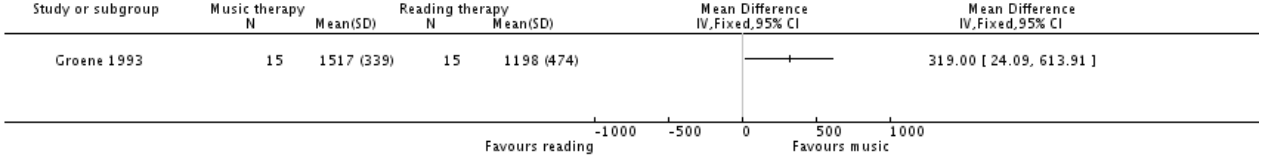
Comparison 2. Group music with movement intervention vs. usual care

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 No. of occurrences of agitated behaviours at 2 weeks	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
2 No. of occurrences of agitated behaviours at 4 weeks	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected

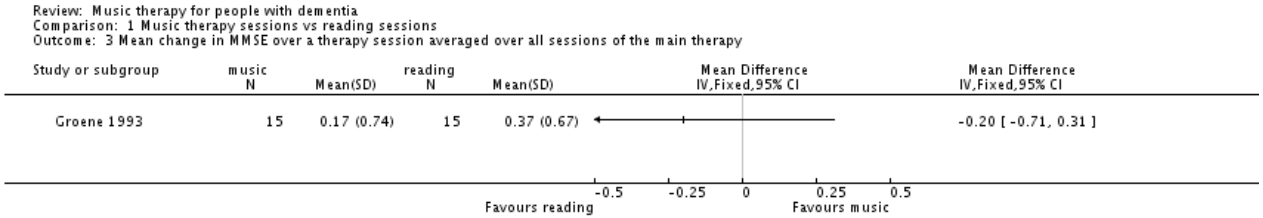
Analysis 1.1. Comparison I Music therapy sessions vs reading sessions, Outcome 1 Total minutes spent not wandering during all sessions of the main therapy



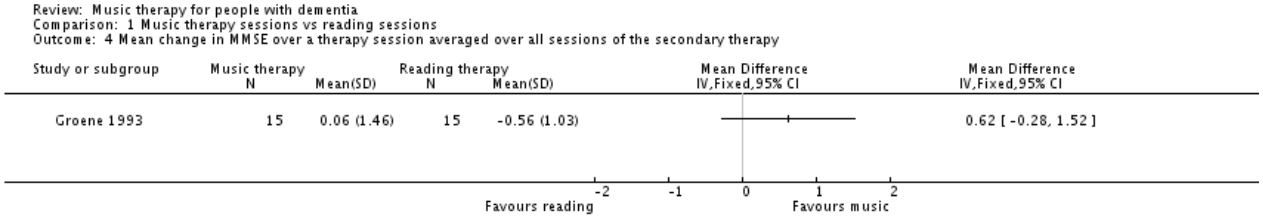
Analysis 1.2. Comparison I Music therapy sessions vs reading sessions, Outcome 2 Total minutes wandering during all sessions of the secondary therapy



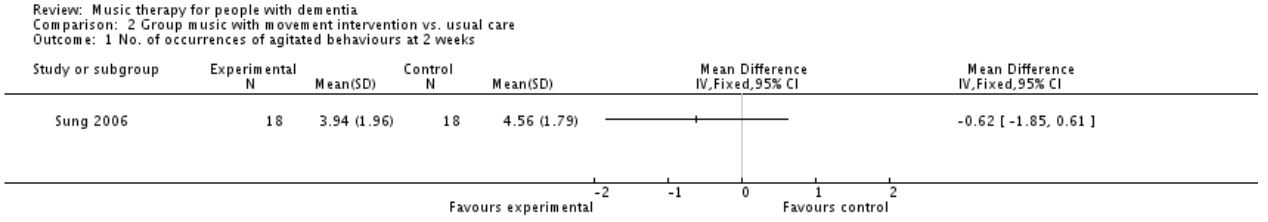
Analysis 1.3. Comparison I Music therapy sessions vs reading sessions, Outcome 3 Mean change in MMSE over a therapy session averaged over all sessions of the main therapy.



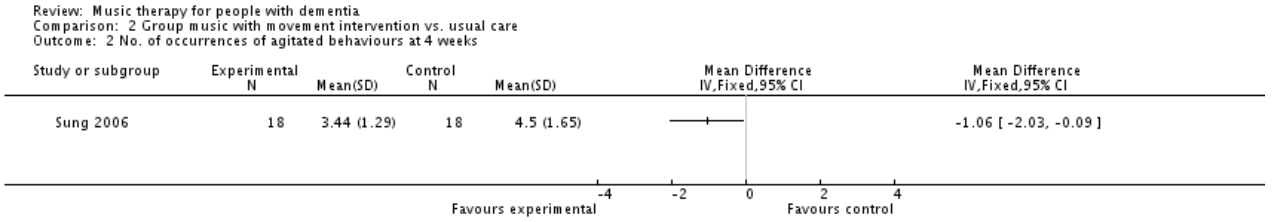
Analysis 1.4. Comparison I Music therapy sessions vs reading sessions, Outcome 4 Mean change in MMSE over a therapy session averaged over all sessions of the secondary therapy.



Analysis 2.1. Comparison 2 Group music with movement intervention vs. usual care, Outcome I No. of occurences of agitated behaviours at 2 weeks



Analysis 2.1. Comparison 2 Group music with movement intervention vs. usual care, Outcome 2 No. of occurences of agitated behaviours at 4 weeks



What's new

Last assessed as up-to-date: 12 April 2010.

Date	Event	Description
14 April 2010	New search has been performed	An update search was performed for this review on 14 April 2010. New studies were retrieved for possible inclusion or exclusion within the review. Two new studies have been included in this update

History

Protocol first published: Issue 1, 2002

Review first published: Issue 3, 2004

Date	Event	Description
26 November 2008	New search has been performed	A new update search was performed on 20 March 2008. New studies were retrieved for possible inclusion or exclusion in the review. Three new studies have been included in this update, and 15 new studies have been excluded Risk of Bias tables have been completed for all included studies
23 January 2006	New search has been performed	January 2006: The update searches of 5 December 2005 yielded 4 new trials which were not suitable for inclusion. The results and conclusions of this review remain unchanged

Contributions of authors

- Annemiek Vink contributed to all aspects of the review.
- Manon Bruinsma assisted with data-extraction and commenting on the first drafts.
- Rob Scholten and Jacqueline Birks (first two versions) assisted with data analysis and commenting on drafts, and helped with the assessment of methodological quality.

Consumer editor: Joost de Haas

Contact editor: Leon Flicker

The review has been peer reviewed anonymously

Declarations of interest

The first author is involved in music therapy research and dementia

Sources of support

Internal sources

- Rijksuniversiteit Groningen, Netherlands.
- ArtEZ School of Music, Enschede, Netherlands.

External sources

- No sources of support supplied

Differences between protocol and review

In the previous versions the Delphi List was used to assess risk of bias. In this review recommended Risk of Bias tables were completed for all included studies.

Notes

May 2004: This is a completely new review of music therapy for people with dementia written by a new and different team of reviewers (Vink et al) from the previous, now permanently withdrawn review of music therapy (Koger et al).

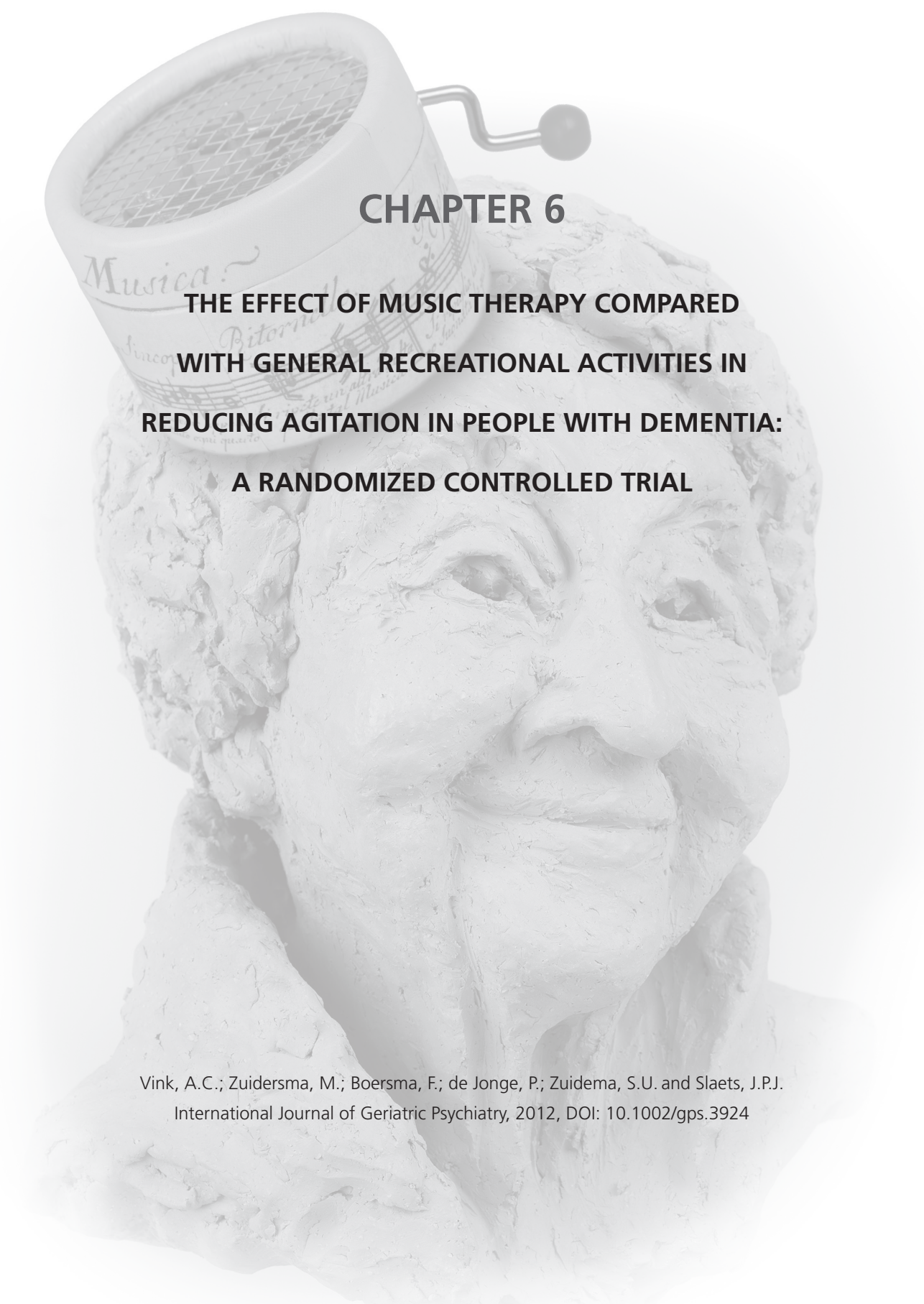
Index terms

Medical Subject Headings (MeSH)

Randomized Controlled Trials as Topic

MeSH check words

Aged; Humans



CHAPTER 6

THE EFFECT OF MUSIC THERAPY COMPARED WITH GENERAL RECREATIONAL ACTIVITIES IN REDUCING AGITATION IN PEOPLE WITH DEMENTIA: A RANDOMIZED CONTROLLED TRIAL

Vink, A.C.; Zuidersma, M.; Boersma, F.; de Jonge, P.; Zuidema, S.U. and Slaets, J.P.J.
International Journal of Geriatric Psychiatry, 2012, DOI: 10.1002/gps.3924

Abstract

Objective: To compare the effects of music therapy with general recreational day activities in reducing agitation in people with dementia, residing in nursing home facilities.

Methods: In a randomised controlled design, residents with dementia (n=94) were allocated to either music therapy or recreational activities. Both music therapy and general activities were offered twice weekly for four months. Changes in agitation were measured with a modified Cohen-Mansfield Agitation Inventory (CMAI), at four time intervals on each intervention day. A mixed model analysis was used to evaluate the effectiveness of music therapy, compared to general activities, on CMAI-scores at four hours after the intervention, controlled for CMAI scores at 1 hour before the session and session number.

Results: Data were analysed for 77 residents (43 randomised to music therapy and 34 to general activities). In both groups, the intervention resulted in a decrease in agitated behaviours from one hour before to four hours after each session. This decrease was somewhat greater in the music therapy group than in the general activities group, but this difference was statistically not significant (F= 2.885, p=0.090), and disappeared completely after adjustment for GDS-stage (F=1.500; p=0.222).

Conclusions: Both music therapy and recreational activities lead to a short-term decrease in agitation, but there was no additional beneficial effect of music therapy over general activities. More research is required to provide insight in the effects of music therapy in reducing agitation in demented elderly people.

Introduction

Elderly people with dementia commonly demonstrate disruptive behaviours, ranging from repetitive verbalisations and wandering to verbal and physical aggression towards themselves and others. In the clinical literature, problematic disruptive behaviours are often referred to as agitation (Cohen-Mansfield *et al.*, 1986). Symptoms are generally found to be present in more than 80% in people with dementia, who reside in a nursing home (Zuidema *et al.*, 2007).

In recent years, there has been more attention for the need to find pharmacological and non-pharmacological (psychosocial) interventions to reduce agitation and to provide quality of life for the person with dementia.

Since antipsychotics, benzodiazepines and antidepressants have limited effect and many side effects (Ballard *et al.*, 2009), it is advised to use nonpharmacological interventions as first line treatment (NICE guideline 42, 2006/2011). Effects of non-pharmacological approaches and patient-centered care are often similar or even larger than the effects of drug therapy (Chenoweth *et al.*, 2009, Olazarán *et al.*, 2010, Vernooij *et al*., 2010). One of the non-pharmacological approaches which is being implemented increasingly in nursing homes is music therapy (Brotons *et al*., 1997; Vink, 2000a; Lou, 2001; Vink *et al.*, 2011).

The music therapist uses music parameters, such as tempo and mode, to activate or relax, and to stimulate social and emotional well-being or reduce anxiety in demented elderly patients. Music may exert its effects on psychological symptoms and behaviours in demented patients by affecting physiological parameters, such as the autonomic nervous system (i.e. heart rate variability), and plasma cytokine and catecholamine levels (Raglio *et al.* 2010, Okada *et al*. 2009).

In the specific context of reducing agitation in demented elderly people, most studies indicate a decrease in agitated behaviours through a music listening intervention (Casby *et al*., 1994; Goddaer *et al*., 1994; Tabloski *et al.*, 1995; Clair, 1994; Denney,

1997; Ragneskog *et al*., 1996; Thomas *et al.,* 1998; Clark *et al.,* 1998 and Gerdner, 2000).
Other studies have addressed the effect of music therapy or active group music interventions on reducing agitation (Groene, 1993; Brotons *et al*., 1996; Sung *et al.*, 2006; Svansdottir *et al*., 2006; Tuet *et al*., 2006, Ledger *et al.*, 2007; Cooke *et al.*, 2010 and Lin *et al*., 2011). A decrease in agitation was found in all studies, except for the studies of Ledger *et al.* (2007) and Cooke *et al.* (2010).

To gain insight into the specific effects of music within a music therapy intervention, an active control condition is needed. In an active control condition residents receive a comparable level of attention, so any specific effects of music therapy in reducing agitation can be identified. Only two of the studies evaluating a music listening intervention or music therapy on agitated behaviours used an active control condition (Groene, 1993 and Cooke *et al.*, 2010). In the study by Groene (1993) a positive effect was found for music therapy, whereas in Cooke's study (2010), participation in group music activities did not lead to a decrease in agitation, when compared to the control group (reading sessions).

As most studies evaluated long term effects of music therapy in reducing agitation, there is limited information on the immediate effects. Gerdner (2000) evaluated the time it takes to reduce agitation. Shortly after listening to music, there was a little increase in agitation, which decreased substantially after 35 minutes, an effect which sustained in this study for at least an hour. Brotons *et al.* (1996) noted that a decrease in agitation lasted at least 20 minutes after the music therapy session, and persisted the rest of the afternoon and evening.

The present study was a randomised controlled trial including an active control condition, to evaluate immediate short-term effects of music therapy in reducing agitated behaviours over a treatment period of four months.

Methods

Study design

The study was a randomised controlled trial, comparing the effects of music therapy with general day activities on agitation in elderly nursing home residents with dementia in six Dutch nursing homes. Four nursing homes were typical Dutch general nursing homes with an average of 150 clients and providing standard care. The other two nursing homes were based on anthroposophic care. In all nursing homes a formally trained (i.e. who fulfilled a four year higher vocational training programme) music therapist was employed. Staff members of each nursing home were informed about the research procedures.

Sample

Residents were included if they had a diagnosis of any type of dementia, according to DSM-IV criteria (American Psychiatric Association, 2000) confirmed by a nursing home physician and had a high level of behavioural problems indicated by a Cohen Mansfield Agitation Inventory (CMAI) score > 44, which is the median norm score within a Dutch population of nursing home residents with dementia (De Jonghe & Zuidema, 2008). The study was approved by the ethical committee of the University Medical Centre Groningen and written informed consent for all participants was obtained through a family member.

Participants were randomised to either the music therapy condition or the recreational activity condition. To ensure randomised allocation, sealed envelopes were used, with at least two persons present to ensure appropriate randomization.

Baseline assessment

For each resident, clinical and demographical variables such as gender, age, type of dementia, stage of dementia (Global Deterioration Scale (GDS), Reisberg *et al.*, 1982) and psychotropic medication use were assessed. Psychotropic medication was assessed from medical records and included antipsychotics, antidepressants, anxiolytics, mood stabilizers and cognitive enhancers as defined in the Anatomical Therapeutic Classification (ATC).

The GDS distinguishes seven stages of cognitive deline in dementia, ranging from no cognitive decline (stage 1) to very severe cognitive decline (stage 7).

Intervention

Over a period of four months, residents participated in group interventions with a maximum of 5 residents. Each music therapy intervention lasted for 40 minutes and was provided twice weekly, up to a maximum of 34 sessions by a formally trained music therapist with at least five years working experience. The intervention was partly protocolized. We standardized the therapy without limiting the therapists in their interactions. The frequency, the average time per session and contents of the music therapy sessions were based on a survey study with 33 music therapists working with Alzheimer disease patients in The Netherlands (Vink, 2000b).

In the music therapy condition, sessions started with a welcome song after which residents listened to music selected, sung or played by the therapist (Dutch familiar songs, classical and folk music), and, if possible, actively participated in music activities by singing, dancing or playing a music instrument. Within the group session, the therapist adjusted the level of each intervention to each individual's capacities. The music was selected by the therapist to incite pleasant memories, and to reduce agitation based on musical parameters, such as a slow tempo and little instrumentation. Recreational day activities also lasted for 40 minutes and consisted of participation in general daily recreational activities, such as handwork, playing shuffleboard, cooking, and puzzle games. These activities were provided by occupational therapists. Both music therapy and the general activities were provided in separate rooms, away from the ward. The participants were allowed to leave the intervention at all times.

Assessment of agitated behaviours

The CMAI is a care-giver rated questionnaire that assesses the frequency of 29 of the most commonly found agitated behaviours on a 7-point scale from never (1) to several times an hour (7). High interrater reliability scores for the CMAI have been reported in previous use in a nursing home setting: r >=0,7 (Cohen-Mansfield *et al.*, 1986; De Jonghe *et al.*, 1996; Miller *et al.*, 1995; Zuidema *et al.*, 2011). The CMAI

was used to assess the presence of agitation at baseline, to determine the level of agitation for inclusion purposes.

For the assessment of agitated behaviours during the intervention period, a modified version of the original Cohen-Mansfield Agitation Inventory was used (Cohen-Mansfield *et al.*, 1986). Instead of rating the frequency of each symptom on a 7-point scale, only the presence or absence of each symptom was evaluated to reduce time consumption for the nurses.

Assessments of agitated behaviours on the modified-CMAI took place for every session at four time points: 1) one hour before the session, 2) one hour after the session, 3) two hours after the session, and 4) four hours after the session. During each assessment, nurses assessed the presence or absence of each of the 29 agitated behaviours of the CMAI, resulting in a possible score range of 0 to 29.

All nurse carers involved in the study were trained in scoring the relevant outcome measures a month prior to the start of the study. Some of the nurse carers who rated the modified-CMAI scores were at occassion responsible for taking the residents to either the activity or music therapy room. Complete blinding for some of the nurse carers could therefore not be guaranteed. However, the nurse carers were kept unaware about the exact study purposes.

Statistical analyses

Chi-square, independent sample t-test and Whitney *U* test were used to explore whether baseline characteristics differed between the music therapy group and the general activities group.

Mixed model analysis with repeated measures (Bryk *et al.*, 1987) was used to analyse the differential effects of music therapy versus general activities on the primary outcome measure. The primary outcome measure was the mean total modified-CMAI score at four hours after the session, which was logtransformed to achieve a normal distribution. The session number, ranging from one to 34, was used as the time variable of the repeated measures. For this analysis we included only sessions where residents showed at least one agitated behaviour at one hour before the session (i.e. total CMAI score ≥ 1), to evaluate the effects of music therapy in residents showing agitated behaviours. Because music therapy might also have a long-term beneficial

effect on disruptive behaviours compared to general activities (Raglio *et al.*, 2008), the session number was used as a covariate in the model. The log-transformed CMAI score at one hour before the session was also used as a covariate. Furthermore, an interaction effect of the intervention with session number was calculated to explore whether short-term effects of music therapy,compared to general activities, changed with increasing number of prior sessions. Likewise, an interaction effect of intervention with the CMAI score before the session was calculated to explore whether symptom severity before the session influenced short-term effects of music therapy, compared to general activities. Despite randomization, groups tended to differ in GDS stage of dementia. Therefore, additional adjustments were made for GDS stage of dementia.

As a sensitivity analysis, we evaluated the effects of music therapy in all residents using the same model as described above, but now including also residents with no agitated behaviours at one hour before the session (i.e. intention to treat).

Results

Sample

A total of 210 residents with a diagnosis of dementia from the nursing home physician were screened for behavioural problems with the CMAI. Of these, 116 residents were not included because they scored <45 on the CMAI (n=100); were too ill to participate, based on medical advice (n=9);no informed consent was given (n=5); and ratings on the screen were missing (n=2). The remaining 94 residents were randomised to music therapy (n=47) or general activities (n=47). Of those, five residents (four randomised to general activities and one to music therapy) died during the study. Seven residents (all randomised to general activities) were excluded, because of missing data at baseline. Three other residents (one randomised to music therapy and two to general activities) were excluded because CMAI data at four hours after the session were missing. Five residents demonstrated no agitated behaviours at baseline for all sessions (3 residents in the music therapy condition and 2 residents in the general activities condition). This resulted in 77 remaining residents (43 randomised to music therapy and 34 to general activities), representing a total

of 415 sessions (235 music therapy and 180 general activities). See Figure 1 for the flowchart and Table 1 for demographic and clinical characteristics of the study population at baseline. At baseline, the two groups did not differ significantly on any of the characteristics, but residents in the general activities group tended to have a higher GDS stage, indicating more severe cognitive impairment than those in the music therapy group (Chi-square: 9.004; df = 4; p = 0.061).

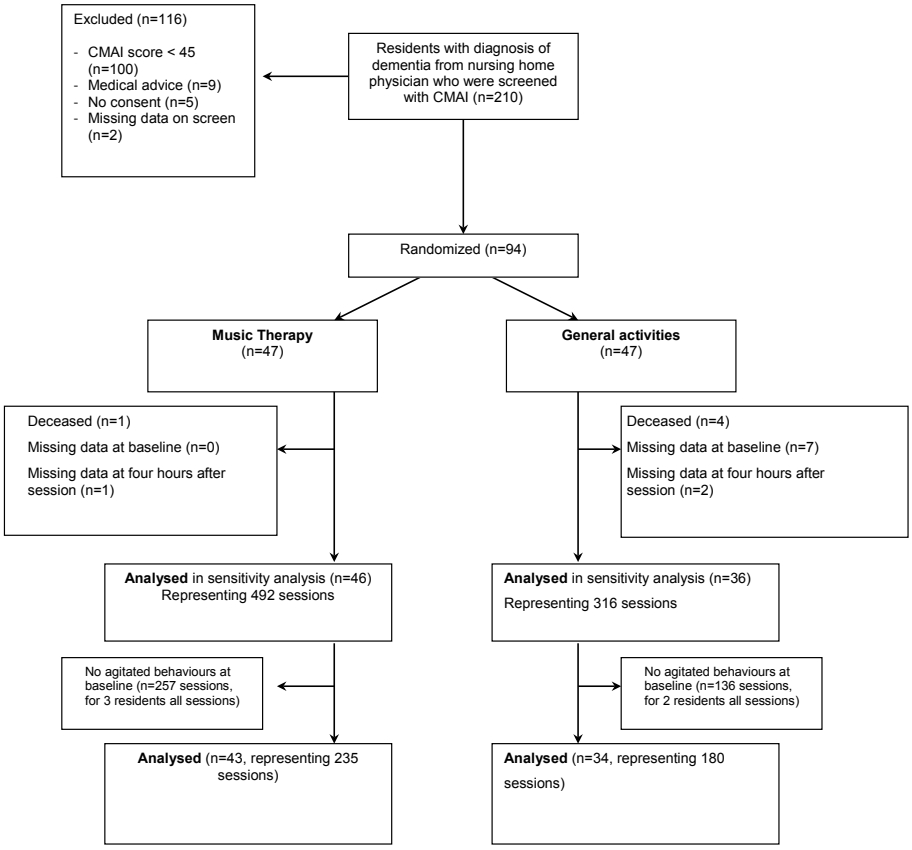


Figure 1. Flow chart

Table 1. Demographic and clinical characteristics of the study population at baseline

	Music Therapy (n = 43)	**General Activities (n = 34)**	**Total (n = 77)**	**Statistic**
Mean (SD) total number of sessions per patient				
- attended	24.3 (7.0)	22.9 (6.02)	23.7 (6.6)	t = 0.910; p = 0.366
- analysed	5.47 (4.12)	5.29 (4.09)	5.39 (4.08)	t = 0.182; p = 0.856
Mean CMAI score before start of treatment	60 (13.67)	59.95 (14.21)	59.98 (13.83)	t= 0.017; p=0.986
n women (%)	29 (67%)	25 (74%)	54 (70%)	χ^2 = 0.336; df = 1; p = 0.562
Mean age (SD)	82.42 (7.62)	81.76 (5.72)	82.16 (6.87)	t = 0.304; p = 0.763
Type of Dementia				χ^2 = 1.476; df = 2; p = 0.478
n alzheimers disease (%)	21 (49%)	13 (38%)	34 (44%)	
n vascular dementia (%)	7 (16%)	9 (26%)	16 (21%)	
n other type of dementia (%)	9 (21%)	8 (24%)	17 (22%)	
n completely missing	6 (14%)	4 (12%)	10 (13%)	
GDS-Stage of Dementia				χ^2 = 9.004; df = ; p = 0.061
n stage 3 (mild cognitive decline) (%)	0 (0%)	1 (3%)	1 (1%)	
n stage 4 (moderate cognitive decline) (%)	1 (2%)	4 (12%)	5 (6%)	
n stage 5 (moderately severe cognitive decline) (%)	15 (35%)	6 (18%)	21 (27%)	
n stage 6 (severe cognitive decline) (%)	13 (30%)	17 (50%)	30 (39%)	
n stage 7 (very severe cognitive decline) (%)	8 (19%)	3 (9%)	11 (14%)	
n missing	6 (14%)	3 (9%)?	9 (12%)	
n anthroposophical nursing home (%)	9 (21%)	6 (18%)	15 (19%)	χ^2 = 0.130; df = 1; p = 0.718
No. of patients who received psychotropic medication (period 2weeks before start/2weeks after start)	22 (61%)	21 (70%)	43 (65%)	χ^2 = 0.569; df = 1; p = 0.450
Median (25-75 interquartile range) number of agitated behaviours at baseline	2 (1 to 3)	2 (1 to 3)	2 (1 to 3)	Z = -0,483; p = 0,629

Effects of music therapy versus general activities on agitated behaviours

Figures 2 and 3 represent unadjusted mean CMAI total scores for both groups at each of the four time-points, calculated by mixed model analysis.In residents with at least one agitated behaviour one hour before the session, reductions in CMAI scores were somewhat greater in the music therapy group compared to the general activities group, but this was statistically not significant ($F = 2.885$; $p = 0.090$ after adjustment for agitated behaviours one hour before the session and session number, see figure 2). After additional adjustment for GDS stage the difference between the two groups attenuated ($F = 1.500$, $p = 0.222$).

The median (IQR, range) CMAI score in the music therapy group 1 hour before session was 2 (IQR: 1-3, range: 1-9). This was 1 (IQR: 0-2; range: 0-7) at four hours after the session. For the general activities group, the median (IQR, range) CMAI score at 1 hour before the session was 2 (IQR: 1-3; range: 1-13), which was 1 (IQR: 0-2; range: 0-7) at four hours after the session.

There was no interaction effect between type of intervention and session number for CMAI scores at four hours after the intervention ($F = 0.275$; $p = 0.603$). Neither was there an interaction effect between type of intervention and CMAI score before the session for CMAI scores at four hours after the intervention ($F = 0.225$; $p = 0.635$).

In sensitivity analyses (see figure 3) including also residents with no agitated behaviours at one hour before the session (i.e. intention to treat), there was no difference between the two groups in agitated behaviours at four hours after the session, after adjustment for agitated behaviours one hour before the session and session number ($F = 0.332$, $p = 0.565$).

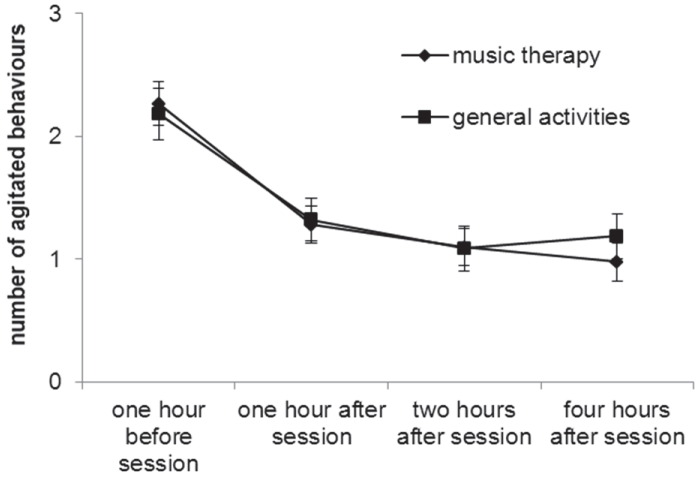


Figure 2: Mean frequency of modified CMAI scores (representing the average total number of behaviours) at the four assessments for the music therapy group and the general activities group, including 235 music therapy and 180 general activities sessions and 43 and 34 patients respectively (includes only those with at least one agitated behaviour at one hour before the session).

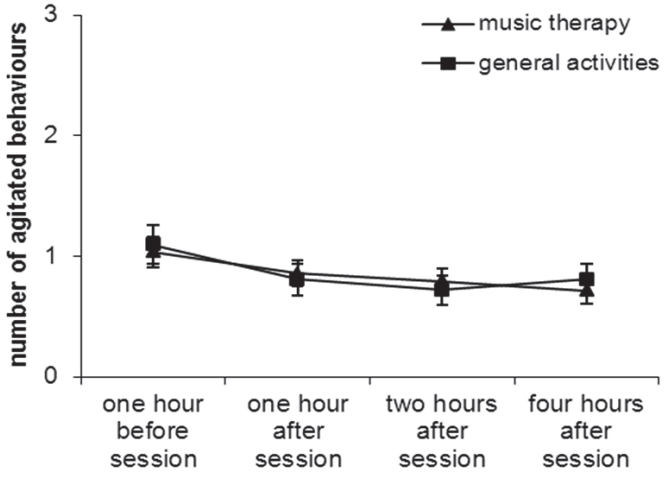


Figure 3: Mean frequency of modified CMAI scores (representing the average total number of behaviours) at the four assessments for the music therapy group and the general activities group, including 492 music therapy and 316 general activities sessions and 46 and 36 patients respectively (includes also those with no agitated behaviours at one hour before the session).

Discussion

Music therapy offered twice weekly during four months to demented elderly persons with severe cognitive decline had no additional beneficial short-term effect on reducing agitation when compared to general activities.

These results are in contrast with other studies, that found a positive effect of music therapy (Groene,1993; Brotons *et al.*, 1996; Tuet *et al.*, 2006 and Svansdottir *et al.*, 2006) or group music intervention (Sung *et al.*, 2006 and Lin *et al.*, 2011) on reducing agitation. The study result corresponds to the studies of Ledger *et al.* (2007) and Cooke *et al.* (2010) which found no effect of music therapy or a group music intervention on reducing agitation.

In all studies described above, except for the study of Brotons (1996), a controlled design was employed assessing the effects of music therapy. Below, we will compare the results from these studies with those of the present study in the light of methodological differences, including sample characteristics, control condition, and the use of a modified version of the CMAI as outcome assessment.

Sample and control intervention

In the current study, data of 77 residents with dementia were included. Most previous studies used smaller sample sizes (<40, Groene,1993; Brotons *et al.* 1996; Tuet *et al.*, 2006; Ledger *et al.*, 2007; Cooke *et al.*, 2010 and Svansdottir *et al.*, 2006). In Lin's study (2011) 100 residents completed the study in which participation in an active music intervention was studied.

Most studies that found a positive effect of music therapy used usual care as control condition. In contrast, the present study used an active control condition providing similar amounts of attention and group contact for both groups. Therefore, the positive findings from the previous studies may have been due to the extra attention or group contact rather than the music. Similar to the present study, Cooke *et al.* (2010) found active group music sessions to be equally effective in reducing agitation as active reading groups.

Using a modified CMAI as outcome assessment

In four studies the Cohen-Mansfield Agitation Inventory (CMAI) was used as primary outcome assessment to study if agitation is reduced as a result of a music therapy intervention.

Positive results were found in studies by Tuet *et al.* (2006) and Lin *et al.* (2011) and no effect was found in the studies by Ledger *et al.* (2007) and Cooke *et al.* (2010). In these four studies the standard CMAI version was used evaluating the severity of each behaviour on a 7-point scale, whereas we used a modified version in which we evaluated only the presence or absence of each behaviour and counted the numbers of behaviours present. Using a modified version of the CMAI with dichotomous scores may not have been sensitive enough to detect any reductions in agitation.

Strengths and limitations

The strength of this study was that a randomised controlled design was conducted and the large number of patients, sessions and assessments involved. Several limitations have complicated the study outcomes and findings. Although residents were allocated to the groups by randomization, unfortunately, residents in the general activities group had somewhat higher GDS-scores than those in the music therapy group, indicating a more severe dementia stage. Before adjusting for GDS-stage, there appeared to be a weak trend that music therapy would be more beneficial in reducing agitation than general activities (p=0.090). However, after adjustment for GDS-stage this trend disappeared completely (p=0.222), suggesting that reductions in agitation were due to the less severe GDS-stage of residents in the music therapy condition, instead of the music therapy intervention itself.

A second limitation of the study was that a modified version of the Cohen Mansfield Agitation Inventory was used to assess the presence of agitated behaviours, which lacks the sensitivity of the full version of the CMAI.

A third limitation of this study was that complete blinding could not be guaranteed, because nurse carers who rated the CMAI scores were also responsible for taking the residents to either the activity or the music therapy room. However, they were were kept unaware of the exact study purposes, which may have prevented them from being positively biased towards music therapy.

Furthermore, 9 residents in the general activities group versus only one in the music therapy group were excluded from analysis due to missing data. Although many residents did participate in either intervention, often the CMAI was not administered due to a great taskload for the nurses.

Implications for practice and suggestions for future research

More controlled trials are needed to establish whether music therapy may play a role in the treatment of agitation in patients with dementia. Instead of focussing on agitation in general, it is advised to further study the effect of music therapy in relation to specific symptoms such as wandering behaviour, verbal or physical aggression. For this purpose, larger sample sizes are needed. It is also advised to make use of professional raters to prevent missing data. Future studies should further evaluate whether music therapy is more effective when given in smaller groups or on an invidualbasis. The therapists who participated in this study all reported, based on clinical expertise, that the group size of five participants is far too large for the treatment of severe disruptive behaviours by one single therapist and too large to be able to achieve therapeutic goals. In addition, the preferred frequency and length of the music intervention should be addressed in future studies. The length and frequency of the music therapy intervention in the present study may have been insufficient to reduce agitation. The lack of efficacy of music therapy observed in this study may suggest that the residents were understimulated rather than that music therapy was ineffective. Furthermore, more insight is needed whether music therapy may only be effective in reducing agitation in certain subgroups of patients according to dementia stage or type. Finally, in practice and anecdotal reports, music therapists often remark on the increase of positive responses as a result of music therapy, such as an increase in social interaction and increased enjoyment. In relatively few studies a possible increase in positive behaviours is addressed. There are still few validated outcome measures available for this purpose. More research studying the effect of music therapy on aspects of positive well-being is welcomed.

In line with current ideas of evidence based medicine (Sackett *et al.*, 2000), more insight is required based both on research, the clinical expertise of the music therapist and the individual needs of the client, to be able to answer the question which specific client will benefit from music therapy in reducing agitation.

Keywords:
music therapy, recreational activities, dementia, agitation, Cohen-Mansfield Agitation Inventory, randomised controlled trial.

Key points

- Music therapy offered twice weekly during four months to demented elderly persons with severe cognitive decline has no additonal short-term effects on reducing agitation when compared to an active control condition.
- The positive effects of music therapy on agitation in previous controlled trials may be due to the lack of an active control condition
- More controlled trials are needed to establish how music therapy should be implemented in the treatment of agitation in patients with dementia.

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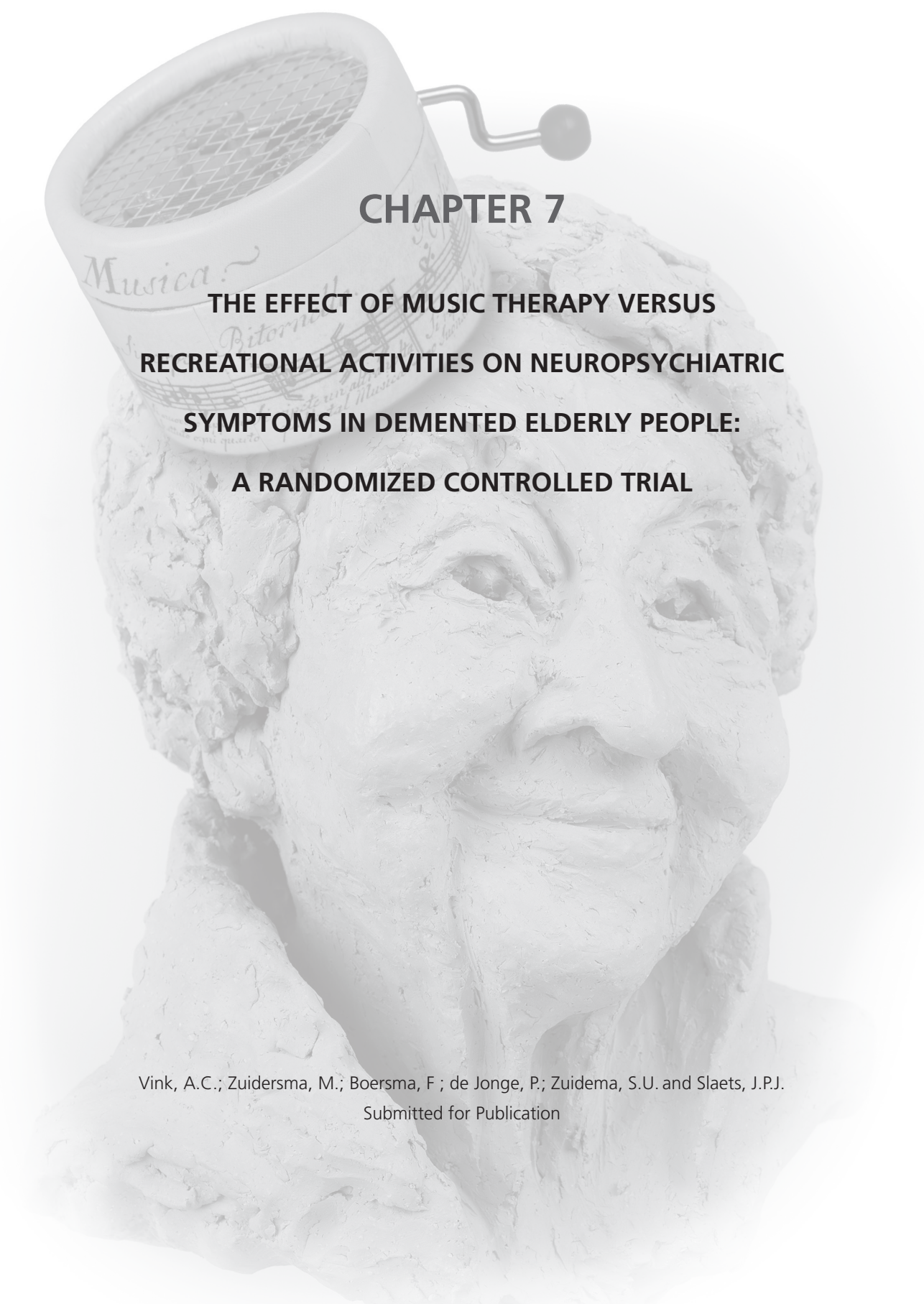

CHAPTER 7

THE EFFECT OF MUSIC THERAPY VERSUS RECREATIONAL ACTIVITIES ON NEUROPSYCHIATRIC SYMPTOMS IN DEMENTED ELDERLY PEOPLE: A RANDOMIZED CONTROLLED TRIAL

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Submitted for Publication

Summary

Objective: To compare the effects of music therapy with general recreational day activities on neuropsychiatric symptoms in people with dementia residing in nursing home facilities.

Method: Residents with dementia of six nursing homes in the Netherlands (n=94) were randomized to either music therapy or recreational activities. Both music therapy and general activities were offered twice weekly for four months, for 40 minutes. Changes in neuropsychiatric symptoms were measured with the Neuropsychiatric Inventory Questionnaire (NPI-Q), at two week intervals during the four month threatment-period. Effects of music therapy, compared to general activities on NPI-Q scores, were evaluated with a mixed model repeated measurements analysis.

Results: Seventy-four residents (with at least one post-baseline measurement) were included in the analyses (n=42 music therapy; n=32 general activities). Both groups showed reductions in NPI-Q scores, but reductions were significantly greater for residents following music therapy than for residents following general recreational activities (F=6.753; p=0.010).

Conclusion: Music therapy is more effective in reducing neuropsychiatric symptoms compared to recreational activities in people with dementia. Further research should focus on adapting music therapy to specific individual needs and to address further which specific symptoms can be targeted through music therapy.

Introduction

Neuropsychiatric symptoms including delusions, hallucinations, apathy and depression are commonly found with people suffering from dementia (Steinberg, 2008). In a population of 1322 demented nursing home residents with dementia in the Netherlands, it was found that more than 80% of them suffered from at least one neuropsychiatric symptom. Agitation/aggression, apathy and irritability were the most frequently observed behaviors in this sample (Zuidema et al. 2007). Both in the home situation as in the nursing home setting, these symptoms are known to be a considerable burden for both the demented person and the caregiver (Pinquart et al., 2006; Cohen-Mansfield et al. 2011, Okura et al, 2011). The most common difficult-to-manage behaviors in people with dementia generally include agitation and aggression, psychosis with delusions and hallucinations (Lavretsky, 2008). Improved understanding of the causes of neuropsychiatric symptoms becomes increasingly more important as well as finding appropriate treatment.

Generally, neuropsychiatric symptoms are treated using pharmacological approaches, but these are only moderately effective in persons with dementia, at the cost of having major side effects (Sink, 2005). As a result, current evidence based guidelines advise to use psychosocial interventions rather than psychotropic drugs as first line treatment to manage behavioural and neuropsychiatric problems in demented elderly people (Jeste et al., 2008; NICE guideline 42, 2006/2011).
In recent years more attention has been given to the effectiveness of non-pharmacological approaches on neuropsychiatric symptoms in dementia care. Several interventions have been found effective, such as the use of cognitive stimulation, behavioural techniques, multisensory stimulation and multicomponent interventions to decrease neuropsychiatric symptoms (Cohen-Mansfield, 2001; Sink et al., 2005; Livingston et al., 2005, Ayalon et al., 2006; Olazarán et al., 2010).

Music therapy has often been recommended as a viable non-pharmacological approach for demented elderly people. For music therapy, in recent years, more and more (randomised) controlled trials have been published in which the effect

of music (therapy) has been studied on reducing behavioural problems (see review Vink, 2000a and Vink, Bruinsma and Scholten, 2011). In music therapy, residents are actively engaged in both music making and singing or listening to the music the therapist plays or sings. Studies conducted in this area show improvements in behavioural problems as a result of a music intervention or music therapy. Seven studies compared music (therapy) with a control intervention or no intervention to reduce behavioural problems (Clark et al., 1998; Gerdner, 2000; Groene,1993; Raglio et al., 2008; Raglio et al., 2010; Sung et al., 2006; Svansdottir et al., 2006). From the studies reviewed it was found that music therapy (Groene, 1993; Raglio et al., 2008; Raglio et al., 2010; Svansdottir et al., 2006); individualised music listening (Clark et al., 1998; Gerdner, 2000) and movement intervention within music therapy (Sung et al. 2006) were more effective than control or no intervention to reduce behavioural problems.

Most studies have focussed on the effects of music therapy in reducing general agitation in demented people. In only three studies the effect of music therapy in reducing a wider array of neuropsychiatric symptoms was addressed, in which music therapy was more effective than the control condition to reduce neuropsychiatric symptoms (Tuet et al.; 2006; Raglio et al. 2008, 2010).
In the first small crossover study of 2x7 persons with dementia (by Tuet et al; 2006), significant reductions were found in total NPI score at the end of the music therapy sessions (3 weeks, 3 times a weekly) compared to the usual care group. In the second study (Raglio et al. 2008), which was a randomized controlled trial of 59 persons with dementia, a significant decrease of global NPI score was found in the experimental group that had received 30 music therapy sessions of 30 minutes in 16 weeks, compared to the control group (educational support or entertainment activities). In the third most recent study by Raglio et al. (2010) of 60 persons with dementia music therapy was compared to enhanced usual care, in which both groups received educational and entertainment activities, and the experimental group additional music therapy, 3 times a week for 30 minutes in groups of maximum 3 patients. Also in this study, a significant decrease over time in the global NPI scores in both groups was found with a larger reduction of behavioural disturbances in the experimental group at the end of the treatment.

The study from Raglio et al. 2008 may have been biased, since residents were included if they favoured music therapy beforehand. In the study of Raglio et al. 2010, music therapy was added to standard care from which cannot be ruled out if music therapy is more effective than giving extra attention.

In the present study the effects of music therapy were compared to an active control condition on neuropsychiatric symptoms in demented elderly, with multiple assessments during the treatment period. An active control condition is necessary to be able to demonstrate that any effects are not just due to extra attention. The objective of this study was to study the effect of music therapy compared to general recreational activities in reducing neuropsychiatric symptoms.

METHODS

Participants

Six specialized psychogeriatric nursing homes in the Netherlands participated in this study, of which four regular nursing homes based on regular care and two based on anthroposophic care. Residents in these settings were included if they had a diagnosis of any type of dementia (American Psychiatric Association [DSM-IV], 2000) confirmed by a nursing home physician and had a high level of behavioural problems indicated by a Cohen Mansfield Agitation Inventory (CMAI) score > 44, which is the median norm score within a Dutch population of nursing home residents with dementia (De Jonghe & Zuidema, 2008). The study was approved by the ethical committee of the University Medical Center Groningen and a written informed consent for all participants was obtained through a family member.

In each setting, all eligible residents were randomized to either music therapy or recreational activities. Residents were excluded if they demonstrated no behavioural problems or based on medical advise when the resident was too ill to participate in the interventions. To ensure randomised allocation sealed envelopes were used, with at least two persons present to ensure appropriate randomisation.

Baseline assessment

For each resident, clinical and demographical variables such as gender, age, type of dementia (DSM-IV), stage of dementia (Global Deterioration Scale, Reisberg 1982) and psychotropic medication use were assessed. The Global Deterioration scale (GDS) distinguishes seven stages of cognitive decline in dementia, ranging from no cognitive decline (stage 1) to very severe cognitive decline in stage 7. A score of 4 or higher is considered to be indicative of dementia. Prescribed psychotropic medication use for neuropsychiatric symptoms was sampled for each resident during six months from their medical records; which include antipsychotics, antidepressants, anxiolytics, mood stabilizers and cognitive enhancers as defined in the Anatomical Therapeutic Classification (ATC).

Intervention

1. Music therapy. Over a period of four months, residents participated in small group interventions with a maximum of 5 residents. Each intervention lasted for 40 minutes and was provided twice weekly, by a trained music therapist, with at least 5 years of working experience in a nursing home setting. The intervention was partly protocolized: the frequency, the average time per session and contents of the music therapy sessions were based on a survey study with 33 music therapists working with Alzheimer disease patients in the Netherlands (Vink, 2000b). In the music therapy condition, sessions started with a wellcome song after which residents both listened to music selected, sung or played by the therapist (Dutch familiar songs, classical and folk music), and, if possible, they actively participated in music activities by singing, dancing or playing along. Within the group session, the therapist adjusted the level of each intervention to each individual capacities. Music therapists played the piano, they sung, played guitar or lira for the residents while they could participate by playing simple rhythm instruments. The music was selected by the therapist to incite pleasant memories and to reduce agitation based on musical parameters, such as a slow tempo and little instrumentation.

2. Recreational activities. Recreational day activities also lasted for 40 minutes and consisted of participation in general daily recreational activities, such as handwork, playing shuffleboard, making flower bouquets and playing games. Both music

therapy as the general recreational activities were provided in separate rooms, apart from the ward. The residents were at all times allowed to leave the intervention and were not obliged to participate if at occasion they did not wanted to go.

Assessment of Neuropsychiatric Symptoms

To study the effects of the interventions offered, the Neuropsychiatric Inventory (NPI-Q) was administered. The NPI-Q is a brief questionnaire form of the NPI which assesses the presence of twelve behavioural disturbances commonly encountered in persons with dementia, including delusions, hallucinations, agitation, depression, anxiety, euphoria, apathy, disinhibition, irritability, aberrant motor behaviour, night time behaviour and eating disturbances (Cummings et al., 1994; Kaufer et al., 2000). The presence of each symptom is indicated on this list with yes or no. If present, the severity of the behaviour as it is perceived for the client himself (scale 1-3) was assessed by the caregiver. The total score of the NPI-Q can range between 0 (no symptoms) and 36 (all twelve symptoms present, most severely).

The NPI-Q was administered by trained nurses each two weeks during the treatment period of four months. The first assessment was at the start of the treatment, the last assessment was at the end of treatment-period, comprising a total of eight assessments. Due to a copying error, the apathy item was assessed separately. Because nurses brought residents from the ward to the room where the intervention took place, complete blinding could not be guaranteed. However, the nurses were unaware of the study purposes.

Statistical analyses

To explore differences in baseline characteristics between the music therapy group and the general activities group, a Chi-Square test was used for categorical variables, an independent samples t-test was used for normally distributed continuous variables.

Outcome measures were the mean total NPI-Q severity scores at the eight assessments (scores ranging from 0 to 36), which were logtransformed to achieve normality. Mixed model analysis for repeated measures (Bryk & Raudenbush, 1987) was used to analyse

the differential effects of music therapy versus general activities on the NPI-Q-score. The assessment number, ranging from one to eight, was used as the time variable of the repeated measures. An intention to treat analysis was conducted, including data from all residents with data on at least one NPI post treatment assessment. Finally, we plotted the mean severity of each NPI-Q symptom at assessment 1 (beginning of treatment) and assessment 8 (end of treatment) to explore which symptoms are mostly affected by music therapy, compared to general activities.

Results

Sample

A total of 210 residents with a diagnosis of dementia from the nursing home physician were screened for behavioural problems with the CMAI. Of these, 116 residents were excluded because they had no (severe) agitation (n=100), because of medical reasons (n=9), no informed consent was given (n=5) and baseline ratings of the screening assessment were missing (n=2). The remaining 94 residents were randomised to either music therapy (n=47) or general activities (n=47). Of those, five residents (four randomised to general activities and one to music therapy) died during the study, and 15 had missing data on all eight assessments (4 randomized to music therapy and 11 randomized to general activities). This left 74 residents for the intention to treat analysis (42 randomized to music therapy and 32 to general activities, see also Figure 1). The two intervention groups did not differ on baseline characteristics (before the start of the treatment) (see Table 1).

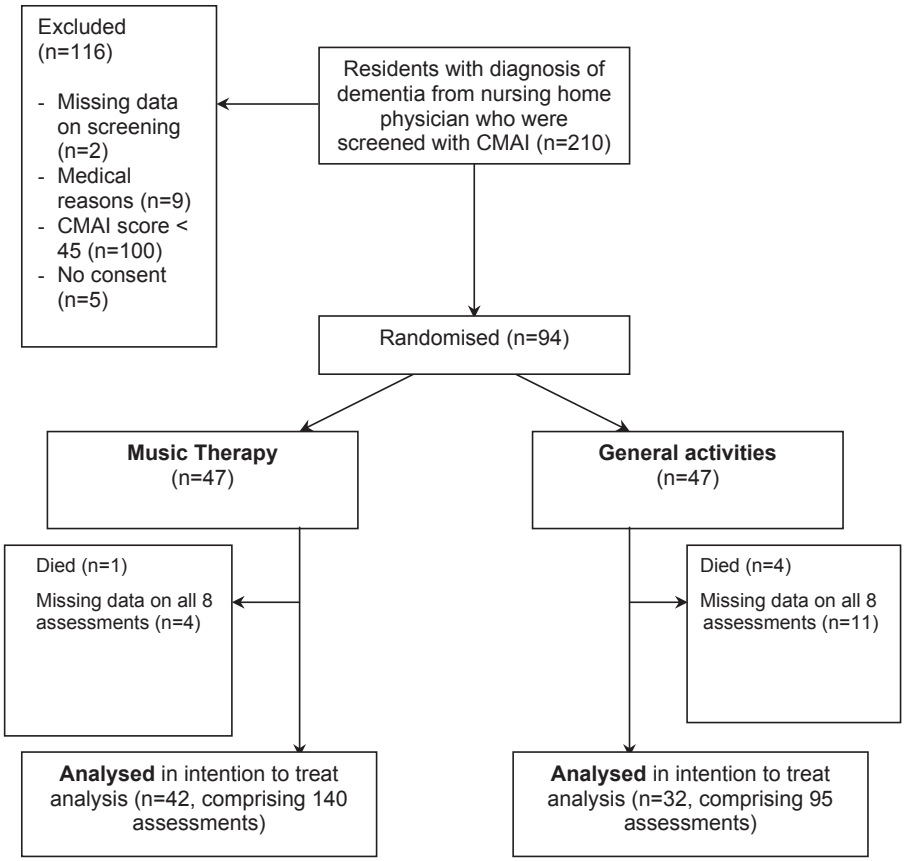

Figure 1: Flow chart

Table 1 Demographic and clinical characteristics of the study population at baseline

	Music Therapy (n = 42)	**General Recreational Activities (n = 32)**	**Total (n = 74)**	**Statistic**
Male/%	11/26%	9/28%	20/27%	χ^2 (1) = 0.034 p= 0.853
Mean age (SD)	82.61(7.89)	82.06 (6.25)	82.39(7.20)	t =0.245; p = 0.808
Type of Dementia				χ^2 = 1.466 df = 2 p= 0.480
n alzheimers disease (%)	21 (50%)	13 (41%)	34 (46%)	
n vascular dementia (%)	7 (17%)	8 (25%)	15 (20%)	
n other dementia (%)	7 (17%)	8 (25%)	15 (20%)	
n missing (%)	7 (17%)	3 (9%)	10 (14%)	
GDS-Stage of Dementia				χ^2 = 2.107 df =1; p=0.147 (linear by linear)
n stage 4 (moderate cognitive decline) (%)	1 (2%)	6 (19%)	7 (9%)	
n stage 5 (moderately severe cognitive decline) (%)	12(29%)	5 (16%)	17 (23%)	
n stage 6 (severe cognitive decline) (%)	13 (31%)	16 (50%)	29 (39%)	
n stage 7 (very severe cognitive decline) (%)	9 (21%)	3 (9%)	12 (16%)	
Unknown	7 (17%)	2 (6%)	9(12%)	
Medication				
No. of patients who received psychotropic medication (period 2weeks before start/2weeks after start)	23 (55%)	19 (59%)	42 (57%)	χ^2 = 0,079 df = 1; p=0.779
Missing	5 (12%)	3 (9%)	8 (11%)	
Type of Nursing Home				
Regular/Anthroposophic Care	33 (79%)	25 (78%)	58 (78%)	χ2 = 0.002 df = 1; p=0.963
Median (IQR) NPI score at start of treatment	6.5 (2 – 11.25)	7 (4 – 9.5)	7 (4 – 10)	*U* = 202.5 p=0.645

Effect of music therapy versus general recreational activities on neuropsychiatric symptoms

Figure 2 shows the mean total NPI-Q score for all 74 residents in both arms. The mixed model analysis showed that NPI-Q scores were reduced significantly more in the music therapy arm than in the general activities arm (F=6.753; p=0.010).

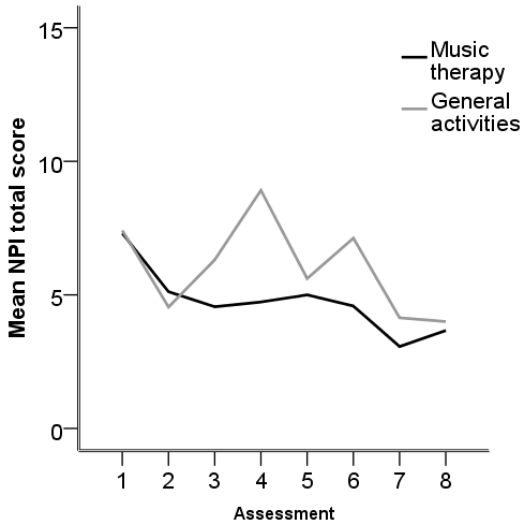

Figure 2: mean total NPI-Q score in 74 patients randomized to music therapy (n=42, total 140 assessments) or general activities (n=32, representing 95 assessments)

Discussion

In this study the effects of music therapy and recreational activities on neuropsychiatric symptoms in older people with dementia were compared in a randomised controlled trial. Residents receiving music therapy showed significantly greater reductions in neuropsychiatric symptoms from the start to the end of the treatment, compared to residents receiving recreational activities.

The strength of the study was the relatively large group of residents included in a randomized trial, in which the residents were followed over the course of four months. A large number of assessments was included at eight times during the intervention period.

A further strength in this study was that professional caregivers, who are in daily contact with the residents administered the NPI-Q. Yet, this was also a limitation in this study as due to workload the NPI-Q was not always filled in at the requested times, leading to missing data. A further complication was that not all included residents actually followed the therapy at the requested times, which complicated the design, but is controlled for by using a mixed model analysis.

The main outcome in this study confirms the findings of other recent studies (Tuet et al 2006; Raglio et al. 2008; Raglio et al. 2010) which have been conducted to study the effect of music therapy with demented people using the Neuropsychiatric Inventory as an outcome measure. The results of the present study adds to the previous three studies that the effect of music therapy is not due to extra attention only and that music therapy may also be valid in a unbiased sample of patients that do not necessarily favour music therapy beforehand.

More research is welcomed on several topics. First, more and larger randomised controlled trials are required to further demonstrate and replicate the effect of music therapy in reducing neuropsychiatric symptoms as a viable non pharmacological treatment option and to demonstrate long term effects of music therapy. Second, more research is welcomed to gain more insight which specific neuropsychiatric symptoms can be targeted by music therapy to stimulate better person oriented referrals for music therapy. The sample of the present study was too small to study the effect of individual symptoms and was also complicated due to copying errors of the NPI-Q questionnaire, resulting to a separate assessment of the apathy item. Third, more research is needed to study the effect of music therapy on positive behavioural outcomes. In many studies, the focus is to reduce behavioural problems and in relatively little studies a possible increase in positive behaviours is addressed. There are still little validated outcome measures available for this purpose. In practice and in anecdotal reports, music therapists often make notice of the increase in positive responding, even in the most apathetic persons.

To conclude, based on the current study and previous studies music therapy is a viable method for the treatment of agitation in people with dementia, residing in a nursing home setting.

Acknowledgements
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Keywords: music therapy, recreational activities, dementia, agitation, neuropsychiatric symptoms, Neuropsychiatric Inventory Questionnaire

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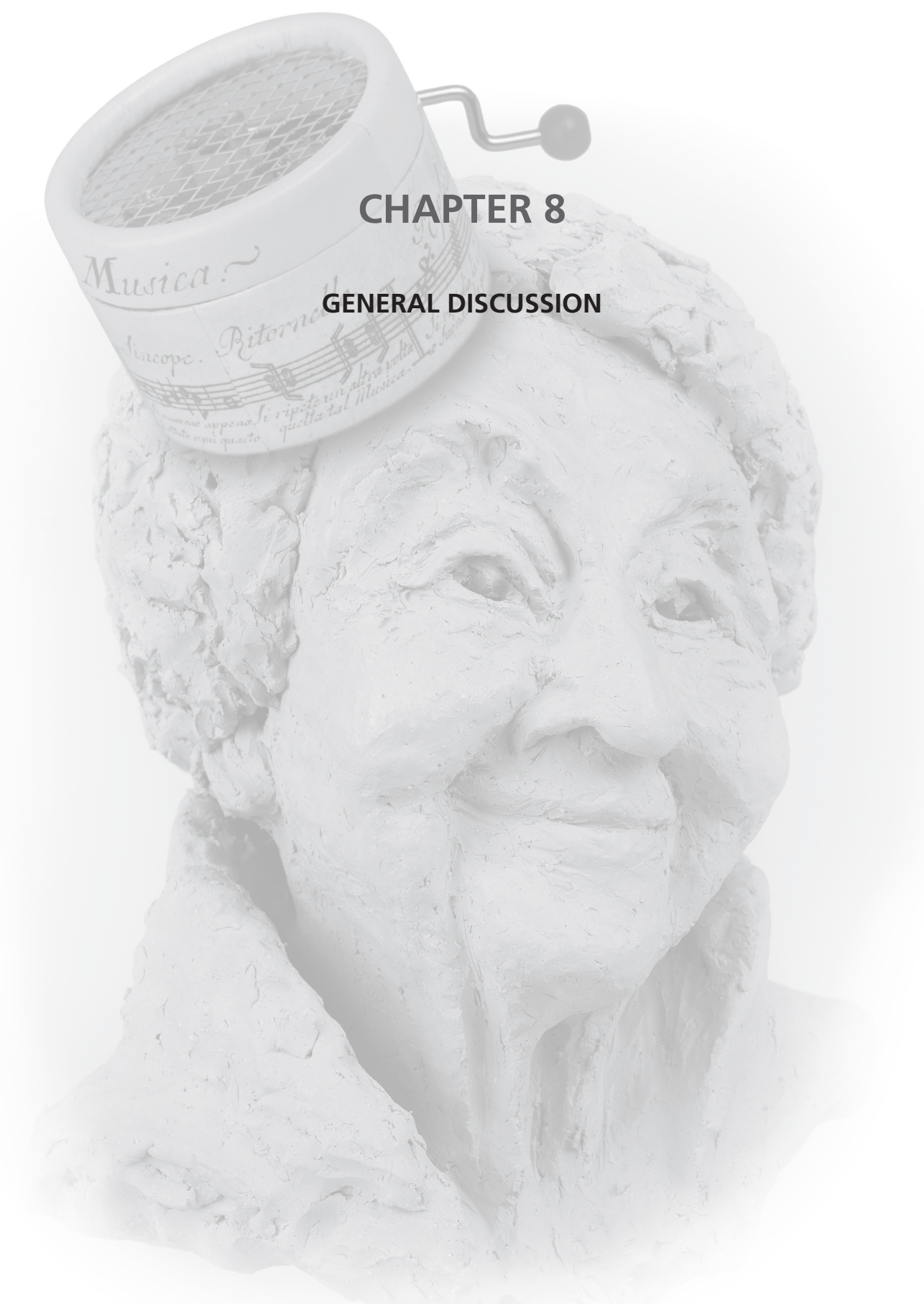

CHAPTER 8

GENERAL DISCUSSION

Conclusion

Many people with dementia residing in nursing home settings have sparse moments of activation. Most hours are spent passively in the communal living room in the nursing home.
The amount of activity and distraction offered to the resident is related to the degree at which behavioural problems are manifested. Cohen-Mansfield (1992) reported the striking finding in a three- month observational study, that most residents were unoccupied 63% of the time observations were made and were highly agitated, indicating that boredom might be a major predictor of agitation. Overall, the patients manifested a greater amount of agitated behaviours when they were unoccupied and less agitation when involved in music therapy and other structured or social activities, such as visits from family relatives.

The prevalence of behavioural problems in Dutch nursing home residents with dementia is high. More than 80% of the population studied (n=1.322) demonstrated at least one neuropsychiatric symptom, with highest prevalences of agitation/ aggression and apathy (Zuidema, 2007).
Disruptive behaviours can be a great burden, not only for the residents themselves but also for the care staff and relatives. Improved understanding of the causes of behavioural problems becomes increasingly more important and so does finding appropriate treatment. Generally, many of the symptoms are treated with pharmacological approaches, but these are only moderately effective in persons with dementia, at the cost of having major side effects (Sink et al., 2005).

In recent years, more attention has been given to studying the effectiveness of non-pharmacological approaches on reducing behavioural problems in demented elderly people. Several interventions have been found effective, such as the use of cognitive stimulation, behavioural techniques, multisensory stimulation and multicomponent interventions (Cohen-Mansfield, 2001; Sink et al., 2005; Livingston et al., 2005, Ayalon et al., 2006; Olazarán et al., 2010).

Music therapy has often been recommended as a viable non-pharmacological approach for elderly people with dementia. In music therapy, a trained music therapist is able to engage the residents in both music making and listening. Music therapy interventions include offering moments of relaxation and activation for demented elderly people in relation to a variety of therapeutic goals such as improving the overall well-being of the clients.
Music may exert its effects on psychological symptoms and behaviours in demented patients by affecting physiological parameters, such as the autonomic nervous system (Okada et al. 2009, Raglio et al. 2010).

The aim of this thesis was to provide insight into the specific effect of music therapy in reducing behavioural problems in elderly people with dementia.

In *chapter two* it has been demonstrated, based on an interview study, that music is offered on a large scale in Dutch nursing homes settings. It is often known in the nursing home setting whether patients enjoy music or not. Specific knowledge about the possible therapeutic use of music, such as reducing verbal and vocal agitation is lacking, however. This is specific knowledge in which a music therapist is trained. He or she knows how to provide music for specific treatment goals.

In *chapter three* insights were provided into the dissemination of music therapy in Dutch nursing homes and the training programme of the music therapist. At this moment, an estimated 60 to 80 music therapists are employed in Dutch nursing home settings and the number continuous to grow. Music therapists have followed a four-year specialized training program and know precisely how to use both musical and therapeutic skills within a therapeutic relationship in order to stimulate a variety of goals, such as reducing behavioural problems.

In *chapter four* a case example was presented showing how music therapy for a client with dementia is implemented in practice.

In recent years, many studies have been conducted to study the effectiveness of music therapy with dementia clients. In *chapter five*, a systematic literature review was presented in which over 500 study references relating to music and dementia have been examined. In this review, current research literature was examined to assess whether music therapy is established as an efficacious non-pharmacological approach in the treatment of behavioural, social, cognitive and emotional problems in older people with dementia. Ten randomised controlled trials have been included in this review, and in all studies a positive effect was found for music therapy in comparison to a control intervention. The methodological quality of the studies, however, was generally poor and the study results could not be pooled for further analyses to establish an overall effect size for music therapy's effectiveness as a treatment modality in dementia care.
Based on previous research outcomes, a large randomised controlled trial was set up in the Netherlands to study on a larger scale if music therapy is effective in reducing behavioural problems. A total of six nursing homes participated in this study. Residents were included in the study when they demonstrated severe behavioural problems. For four months, 94 residents participated twice weekly in small group sessions, to compare the effect of music therapy and general recreational activities in reducing agitation (*chapter 6*) and neuropsychiatric symptoms (*chapter 7*).

The main finding from this study was that both music therapy and recreational activities resulted in a short-term decrease in agitation, but there was no additional beneficial effect of music therapy over general activities, based on the Cohen Mansfield Agitation Inventory (CMAI) outcome assessments. Further it was found that neuropsychiatric symptoms decreased in both groups, from the start to the end of the treatment period. Long-term reductions in symptoms were significantly greater for residents following music therapy than for residents following general recreational activities.

Based on the present study and the literature, the following sections will present recommendations for future research involving music therapy and dementia and recommendations for practice, based on the strengths and limitations of this thesis.

Strengths and limitations

The strength of this thesis is that this is the first time a research programme has been conducted in the Netherlands which studies the effect of music therapy on elderly people with dementia. At the start of the study, not much was known about music (therapy) provision for elderly people. The first question we addressed was how many music therapists were working with this particular population. By sending out a questionnaire to all Dutch nursing homes, we charted the current practice of music therapists in these nursing homes. From the answers to the questionnaire it became clear that there was not much knowledge about this profession in many nursing homes. The nursing home volunteer who played guitar on Monday mornings was described as the nursing home's music therapist. Further preliminary studies were consequently set up to gain more insight in the general music provision in Dutch nursing homes and the implementation of music therapy.

In twenty nursing homes, interviews were conducted to study the general music provision within the nursing home setting to reduce vocal agitation. A questionnaire was sent out to 55 music therapists to gain more insight in music therapy practice in The Netherlands. Although much was learned about general methods involved, the full scope of the work of the music therapist is difficult to grasp through survey methods. By making additional site visits and conducting more interviews, further insight was gained in both the theoretical background of the music therapy, general methods employed during therapy and perceived effects in practice.

A strength of this thesis is that a Cochrane review has been conducted to examine current research literature for evidence for music therapy's effectiveness.

Archie Cochrane, 1979

"It is surely a great criticism of our profession that we have not organised a critical summary, by specialty or subspecialty, adapted periodically, of all relevant randomised controlled trials."

The Cochrane review guidelines are strict, and only randomised controlled trials can be included and regarded as evidence for the treatment of focus. A limitation of this approach is that not all practice- based evidence in this field has been covered by randomised trials, and the quality of a randomised study is often subject of debate. A study by Gerdner (2000), for example, which had won the IPA-Bayer research award, was strongly criticized by the statisticians while writing the Cochrane review. Many valuable clinical studies were not included in this review, studies which do however give insight in the treatment effects as far as covered by the research design.

Following Evidence Based Medicine principles, treatment choices should be based both on scientific evidence, clinical expertise and the patient's own choice. In practice, many people favour music or music therapy, but the patient's own 'vote', especially in nursing home care, is often the last vote to be taken into account. A lack of patients' preferences in trials and therefore also in guidelines is a major limitation of EBM.

In an effort to keep the methodology in line with the advices of the Cochrane review, a large randomised trial was set up to study the effect of music therapy in reducing behavioural problems in elderly people with dementia.

The reality of conducting an RCT in nursing homes with demented patients implies limitations on the study. Many problems were encountered during this study. A first limitation had to do with the uniformity of the intervention across study centres. In an efficacy study it is required that the intervention is standardised as much as possible to be able to estimate the effect of the intervention. For this reason, many studies opted for music listening as an intervention. However, this is not an optimal form of music therapy as music therapists have to decide at a second's notice in response to the client what their next intervention will be in order to be maximally effective. For this protocol, we standardized the therapy as much as possible without limiting the therapists in their interactions. We consider this as a strength of this study compared with other studies in the literature.

A limitation of the quantitative approach is that not everything that is important for the patients can be accounted for. In all participating nursing homes, people enjoyed music therapy and observers noticed that their distant gazes disappeared. It was truly difficult to grasp what actually happened during therapy in a randomised trial and equally difficult after the fact to relate the statistical figures to what had actually

been seen in practice. To fully estimate the meaning of music for demented patients, telling stories can be more important than counting numbers. In this area we should continue to do both: quantitative and qualitative research.
While some questions were answered in the scope of this thesis, many more questions are left unanswered and in the next section advice will be provided on how to improve research designs and clinical practice.

Improvement of research designs

The current state of music therapy research involving demented patients is promising. Music can have beneficial effects on behaviour, but many aspects are still unknown. More research is needed to be able to understand the effects of different forms of music therapy in various settings and for different patients. The studies described in chapter 5 were all relatively small in terms of the number of residents studied and different centres. Another gap in the study designs is the lack of control for other factors that could have been equally responsible for a decrease in symptoms, such as medication.

In the music therapy studies presented in this thesis, the majority of the population is diagnosed as having probable Alzheimer's disease. Others have described the effect of music on patients who are severely demented, without further specification. In most studies, differentiation within the population of patients has not taken place, with MMSE scores ranging from 0 to 21, indicating a large variety of severity and aetiology within the patient group.

To gain more insight in efficacy of music therapy, studies should focus more on specific groups related to severity, symptoms and aetiology of the dementia. It is likely that specific forms of music therapy are more appropriate for specific subgroups, symptoms or settings.
When, in future research, the client population is better defined and more attention is given to possible confounding variables, clearer recommendations can be made for each stage of the disease for music therapists working in practice with demented elderly people.

We still do not know whether specific symptoms can be targeted by specific forms of music therapy. Currently mixed combinations of tailor-made music therapy interventions (i.e. group or individualized) based on the resident's preferences are advised to treat specific symptoms, such as apathy and agitation. In this study, residents with severe behavioural problems were included and although positive effects were found for music therapy, it can be questioned if this particular patient group benefits from a group approach. Many residents become confused when moved to a separate music therapy room, and for this particular patient group it is best to offer music therapy individually, in the patient's own room. Residents in the early to moderate phases of dementia generally benefit more from a group approach in a music therapy room away from the ward. Lastly, more knowledge is also needed to predict response, to know which patient will benefit from music therapy and who will not. This however is a very difficult topic for pharmacological and non-pharmacological interventions in abnormal behaviours in dementia, and could well remain trial and error in clinical practice. From this perspective, the non-pharmacological interventions such as music therapy tend to have fewer negative side effects and tend to introduce more positive well-being.

How does music work?

Another question that is important to study more thoroughly is why music has the ability to reduce agitation in demented elderly. The first and foremost reason is that music induces relaxation and reduces stress related hormones, such as cortisol. Although much has been written on the topic of the relaxing qualities of music, relatively little is known about this particular patient group. Music may exert its effects on psychological symptoms and behaviours in demented patients by affecting physiological parameters, such as the autonomic nervous system (Okada et al. 2009, Raglio et al. 2010). Kumar (1999) has demonstrated that music therapy increased the release of melatonin in Alzheimer's disease patients, which improves their circadian sleep and wake rhythm, and might have contributed to the patients' relaxed and calm mood during the day. Melatonin treatment generally improves sleep quality and suppresses "sundowning agitation".

Others have referred to the Progressively Lowered Stress Threshold Model of Hall and Buckwalter (1987). Following this model, the threshold for experiencing stress is lowered as a result of declining cognitive and social skills, which in turn lower the tolerance for dealing with stressful environmental stimuli. Generally, their coping skills are best during the morning hours and decrease during the late afternoon, when an increase in agitation is often seen. According to Hall and Buckwalter, maximum functional levels can be achieved not by challenging to regain lost functions, but by supporting the losses. Following this model, the music activities should fit the abilities of the individual to obtain optimal participation and is best provided in the morning hours. These ideas should be pursued more to be able to better understand the effect of music within therapy with demented elderly people.

Further, more research is required into which musical interventions within therapy are effective in relation to specific treatment goals. For instance, it is known that singing may stimulate hemispheric specialization. Clinical observations indicate that singing critically depends upon right-hemisphere structures. By contrast, patients suffering from aphasia subsequent to left-hemisphere lesions often show strikingly preserved vocal music capabilities. Singing may be exploited to facilitate speech reconstruction when suffering from aphasia (Riecker 2000).
Playing instruments is a suitable technique to improve gross and fine motor coordination in individuals with motor impairments (WFMT, 2012).

Which outcomes should be studied and by whom?
In this study, two well validated and often used outcome assessment scales were used: the Cohen-Mansfield Agitation Inventory and the Neuropsychiatric Inventory. They are frequently used within (music therapy) research, which facilitates comparisons between studies worldwide.

A limitation of this study was that a modified version of the Cohen Mansfield Agitation Inventory was used to assess the presence of agitated behaviours, lacking the sensitivity of the full version of the CMAI. It is advised to use the full version of CMAI in future studies and to train skilled professional raters for this purpose.

From a study by Bakker et al. (2011), it can be seen that the person who assesses the screening instrument has a noticeable effect on the outcome of the study.
Bakker et al. (2011) compared integrative care (including music therapy and creative therapies) (n=81) to usual care (n=87) in reducing neuropsychiatric symptoms in a randomized controlled trial with demented elderly patients with mild cognitive impairment. The NPI was scored by the caregiver and by nurses of various teams. In this study, offering integrative care based on problem-solving interventions was significantly more effective than standard multidisciplinary care, based on the scores of the caregiver who had the most direct contact with the patient. Based on the scores of nurses there were no significant findings.
A careful consideration is advised concerning the selection and training of the respective raters in new studies.

Lastly, more research is needed to study the effect of music therapy on positive behavioural outcomes. In many studies, the focus is to reduce behavioural problems and in relatively few studies a possible increase in positive behaviours is addressed. Few validated outcome measures are available for this purpose as of yet. In both practice and anecdotal reports, music therapists often make note of the large increase in positive response, even in the most apathetic persons. To study positive responses, it is advised to use instruments such as Dementia Care Mapping, which has been developed by Tom Kitwood (Bradford Dementia Group; 1997). This instrument enables to study an increase in positive responding and the quality of the interactions between the demented person and relevant others.

Implications for practice

In this thesis, it has been shown that music therapy is a viable method for the treatment of behavioural symptoms in people with dementia who reside in a nursing home setting.

Music therapy is generally offered to the clients once or twice a week. It is advised to also integrate music in nursing interventions during the week. For those clients who follow music therapy, the effects will be enhanced during the weekdays when not following therapy. A music therapist can coach nursing home staff in doing so.

Not all clients require therapy and many more nursing home residents can benefit from music when it is included in daily routine as a nursing intervention.

For these clients, familiar music can help to induce pleasant feelings, or memories can be stimulated. Especially for people with dementia, who often cannot speak, music can be an important stimulus to recall pleasant memories and feelings. In patients with mild dementia it has been found that music stimulates autobiographical recall (Irish et al.; 2006). Listening to music is a pleasant activity for many people with dementia. They remember the "good old days" and often start to talk in response to the lyrics of a familiar tune. As a result, social contact with other residents, relatives and caretakers is enhanced.

Music can either relax or activate the listener. When we hear upbeat music, our feet automatically start to move along. Music induces movement. In a variety of studies it has been described that music listening has a positive effect on people with dementia. Preferred individual music listening has been shown to reduce agitation (Gerdner 2000). Foster and Valentine (2000) studied the effect of music listening to enhance cognitive functioning. Autobiographical memory was highest in the music condition. There were no differences in familiar or novel music related to this effect. Facts from the more remote past were better retrieved than more recent episodes of their lives. This finding was confirmed in a study by Irish et al. (2006).

There are many studies that describe how music can be used as nursing intervention during care moments (Thomas et al., 1997, Clark et al., 1998).
Clark, Lipe and Bilbrey (1998) investigated the effect of the resident's favourite music, played on a tape recorder during bathing time. The results showed that during the period in which music was played during bathing, twelve of the fifteen observed problem behaviours decreased.

It is often a problem for people with dementia to eat or drink adequately. This is especially the case when people have to eat while agitated or aggressive. Several researchers found that listening to music is a good way to reduce behavioural

problems during lunch (Denney, 1997; Goddaer and Abraham, 1994) and listening to relaxing music may even encourage the residents to eat more (Ragneskog et al. 1996).

To conclude, there are clear indications in the literature that music has many positive effects when integrated within general care. It is advised to implement this knowledge on a daily basis within nursing interventions. Besides integrating music during daily moments and nursing interventions, it is also advised to stimulate movement. A well-known folk wisdom is that exercise leads to long life and well-being. Still, many people often feel reluctant to involve dementia patients in movement activities, mostly because they fear the risk of falling. Residents in a nursing home often lack sufficient exercise, with many consequences for their circulatory system and overall well-being. Residents spend their days mostly sitting or lying in bed. Scherder et al. (2010) state that a decline in physical activity has a detrimental effect on cognition and behaviour in patients with dementia. The more physical inactivity, the more agitation will develop.

The Metronome: integrating music and movement in daily care for dementia elderly people

In recent years, we have developed care interventions which integrate both music and movement, and which can be used by both professional and family caregivers (Stichting Stimulering Kwaliteit Verpleeghuiszorg (SSKV, 2009; Vink, Erkelens & Meinardi, 2013). For this project, ten easy to use music and movement interventions were developed to be used by both professional and family carers to provide moments of interaction, stimulation or relaxation for demented elderly people.

Music- and movement interventions

For the development of the music- and movement interventions, multidisciplinary workgroups were formed consisting of music therapists, physiotherapists, movement therapists and professional nurse caregivers. Informal carers were also consulted for this purpose.

During these meetings, the workgroups defined various moments during the day in which music and movement strategies would be desirable. Furthermore, they specified

interventions which can be easily applied in practice by nurses, family members or volunteers. In addition, areas of care were defined for which recreational purposes of music and movement were not suitable and for which referral to a specialized music- or movement therapist is required. Ten interventions were developed in total, and all are easy to carry out. The interventions can all be used at specific care moments during the day, such as waking up or having lunch. For each intervention, goals and materials were specified. The interventions were further categorized to show if they were suitable for one person, more persons, or a group, and if any professional assistance is required.

The central aim of the interventions is to provide moments of activation or relaxation for the client. An example of a relaxation intervention is to listen to music when the client wakes up, before other daily routines are started. For this intervention, relaxation music and a music pillow are provided. Activation interventions were developed in which participants sing songs together, and include movement activities guided by music. All interventions are described and illustrated and a tool box with appropriate materials was developed to be used accordingly with each intervention. The tool box consisted of a small music set, a music pillow, various CD's (varying from slow classical music to popular folk music). Further, several materials were enclosed to be used during the interventions such as a parachute cloth. This colourful cloth can be used in group activities, in which the participants can move to the music in a circle and various muscles are stimulated. The exercise can also be done seated. Next, various books were included with reminiscence photos and lyrics accompanying the CD's. Also, pit bags, various balls and sensory stimulation materials were included to accompany the music- and movement interventions. Last, an instructional DVD was provided which further illustrated the use of the interventions in daily practice, for both family and professional caregivers.

The music and movement kit was evaluated in three sequential phases. In the first phase, the materials were tested to see if they would be used at all in practice by professional caregivers and how they evaluated the use of the interventions in daily practice.
In the second phase, the effect of the music and movement interventions on 60 demented elderly people was studied and lastly the implementation was evaluated by both professional and family caregivers and volunteers after following a training course.

The project was largely appreciated by both the residents and their caregivers.
It is not only the patients who react positively to the presence of music. Caregivers also indicated that they benefited from this method. They reported that the mood of the residents improved during the period music was present: they laughed more and were more cooperative.

The caregivers provided the following responses in their evaluation of the project:
"…The residents are more relaxed and their mood improves as a result of the interventions."
"…The atmosphere at the ward greatly improved, the residents whistle and move along with the music, having a great time."
"…The interventions have an effect on improving the mood of the residents."
"…In general the residents are more relaxed and more cooperative."

Reprise
The future for music and music therapy with demented elderly is promising. Nursing home care for institutionalized demented elderly has gone through many changes over the years. Earlier descriptions on care for the demented were mostly based on a medical model. Patients were given basic care and medicines to cope with dementia. Instead of trying to slow cognitive deterioration, new care approaches focus on the social and emotional well-being of the client and stimulate present abilities. Approaches are required that focus on improving the quality of life of the residents and reduce problematic behaviours associated with dementia. Music therapy clearly serves all these goals!

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ENGLISH SUMMARY

"Nurse, when will you finally bring me home? Nurse, where are you, Nurse?"
Typical words from someone with dementia, who is facing feelings of major anxiety and fear. A daily routine for a caregiver in a nursing home. Initially, they try to respond calmly, but if multiple people simultaneously ask questions or constantly repeat the same question, it is difficult to always remain calm.

The medical literature refers to the term agitation for behaviours such as these, when someone repeats questions or phrases continuously. Agitation also includes further severe behavioural problems such as physical aggression, general anxiety and aimless wandering in the nursing home corridors. An estimated 80% to 90% of demented elderly people will develop such behavioural problems during the course of the disease: a great burden for the demented persons themselves and their caretakers.

Reducing problematic behaviours is of great importance when improving the quality of life for the person with dementia and his caretakers. In daily practice, simple solutions will already reduce many of the problematic behaviours effectively. Often, providing individual attention and reassurance is effective to resolve many of the problems. In the more advanced stages of dementia, more intensive personal guidance is required, for which the time and adequate guidance are often lacking.
Physical and verbal aggression, depression and hallucinations are generally well treated using a pharmacological approach. Many medicines may also have negative side-effects. Antipsychotics, which are often administered to reduce agitation, will often result in feelings of drowsiness, reduced mobility and will regularly increase the risk of falling.
There is still no medical cure which solves many of the emotional consequences of dementia, such as the continuous experiencing of a feeling of insecurity and alienation.

Next to medication, there are still few treatments available for people with dementia within the nursing home setting who are in the last stages of the disease. For the treatment of behavioural problems, it is generally advised to first start with a non-pharmacological approach, before any medication is started. But which approach should be used and by whom and with what intended treatment outcome?

In this thesis, the effect of music therapy on the reduction of behavioural problems was studied in people with dementia (n = 94) who followed either music therapy or general recreational for 40 minutes each session twice weekly for four months. In addition, this thesis describes how music therapy is offered in Dutch nursing homes and provides an overview of the evidence that is available from previously conducted studies in this area.

In *Chapter 1,* the background of the study is described and how music in general can help people with dementia. What does music mean to us as listeners and what can music therapy do for people with dementia? Most Dutch nursing home settings have already made music available to residents on a regular basis for many years. Music has a strong impact on dementia patients. Singing well-known songs together brings back pleasant memories of old times. Many important events in our lives are often accompanied by music, such as falling in love for the first time and weddings. These profound musical memories often remain preserved much longer than many non-musical memories from the same life-period of the person with dementia. If words are no longer understood, familiar sounds will bring a sense of safety and comfort to people who are deeply demented and will reduce anxiety in them.

Chapter 2 describes how music is provided in Dutch nursing homes and in particular for clients with verbal/vocal agitation. In 20 nursing homes, interviews were conducted to see whether and to what extent music is provided for people with verbal/vocal agitation.
The results showed that on many occasions music is presented in the nursing home, especially during the coffee and tea breaks in the morning and the afternoon, but generally not during lunch. It is often a golden rule that a mealtime moment should be a moment of silence for people with dementia. Many studies show, however, that the presence of music during meal times reduces agitation and will even stimulate people to eat more. The literature further describes that individualized music is particularly effective to achieve such goals. The interviews revealed that for the majority of the residents their musical preferences are known from their past, and carers also know which music residents currently enjoy listening to, but this knowledge generally is not

used and little knowledge is available about how music listening may reduce verbal/ vocal agitation.

Reducing (verbal) agitation is one of the goals of music therapists working within nursing home care. A music therapist is generally trained both as musician and as a therapist and knows precisely how and which music can help to achieve goals such as relaxation or activation, by, for example, varying the tempo of the music and adapting it to the specific client's needs. In recent years, music therapy has gained more and more attention as a treatment approach within dementia care. Within music therapy, the client is addressed on a level to benefit skills that are still present, regardless of the functioning level or phase of dementia: everybody is able to make music, to sing or move along with the music.
Music therapy is therefore one of the few treatment approaches which can be offered to group members with varying levels of functioning. Many care approaches rely on verbal communication. Especially when verbal communication is not possible any more, music therapy may offer a solution. People with aphasia, who can no longer speak, can often still sing a song and as such will find a possibility to express themselves. Through the non-verbal qualities of music, music therapy offers a way to help the person with dementia, in all stages of the disease. While cognitive functioning skills will progressively decline, it has been shown that musical skills remain well preserved even until the final stages of the disease.

Music therapy fits in well with current models and lines of thinking about nursing home care. There is an increasing need for approaches which improve the quality of life of the individual resident. Making use of the non-verbal qualities of music, a music therapist is able to assist and treat the client with dementia, in all stages of the disease.

Chapter 3 describes how music therapists work with people with dementia in the Netherlands. Currently, an estimated 60-80 music therapists are working in nursing home care. The main referrals for music therapy are social or emotional problems, behavioural problems and/ or passivity. The music therapist works both with

individual clients as groups and chooses active or receptive approaches within the provision of the therapy. In the active form, residents play on instruments with the therapist, within structured play forms or within improvisations. People sing or dance together. The music therapist adjusts musically to the clients and their mood at all times and adapts the music accordingly to their specific needs. The participants also listen to music presented by the music therapist. This is preselected music offered through audio equipment or music which is sung or played by the therapist based on the musical preferences of the resident. The main goals are reducing behavioural problems, anxiety and improving social and emotional well-being. By offering a non-pharmacological approach as music therapy, often multiple goals are addressed simultaneously.

To obtain a positive treatment result through music therapy, the individual's musical preference and further specific characteristics of someone's personal background should be taken into account at all times. The music therapist starts with observation sessions to see if someone still prefers classical music or perhaps responds even better to a different musical repertoire or sounds. What is the person's life history and where does he or she come from?

This last question is particularly important for migrants, who represent a large group within nursing home care. A large group has been born outside the Netherlands. It is not unusual that bilingual residents, having developed dementia, will begin reverting back to their first language, and may even lose their "adopted" language altogether. Caregivers have a difficult time communicating with these residents and often people of non-Dutch origins will isolate themselves on the nursing home ward. In *chapter 4*, a clinical music therapy case example is described involving Vonnie, a woman aged 83, with early dementia (probably of the Alzheimer's type). She was born in the former Dutch East Indies and has lived in the Netherlands since age 30. Her story resembles that of many elderly people with dementia currently living in their new, non-native country. She carries her past as a "comfort girl" with her, also in her dementing process. Vonnie's caregivers noticed that she tended to isolate herself on the ward, being the only person of Indonesian origin. She is fearful and is suffering

from confusion, hallucinations and anxiety. Within music therapy, Vonnie's cultural background is addressed by the music therapist, bringing her rest and recognition.

In many studies the effect of music therapy has already been described. *Chapter 5* offers an overview of the most important results based on a systematic literature review. Ten randomized controlled trials were analysed in this review to answer the question whether music therapy offers a contribution to improving social, cognitive, and emotional skills and reducing behavioural problems. In each study, positive effects were found as a result of music therapy intervention. However, there were also many methodological limitations within the often small-scale studies which complicate conclusions to be drawn about the effectiveness of music therapy as a treatment method. At the moment, it is not possible yet to pool the separate study results in order to describe an overall effect of music therapy.

In *chapter 6*, a randomised controlled trial is discussed, in which the effect of music therapy is studied on reducing agitation in demented elderly people. In many randomised controlled trials, the active intervention group is often compared to a control group without intervention or to whom 'treatment as usual' is offered. This study, however, has opted to compare music therapy to an active control condition in which participants follow general recreational activities, to enable the comparison with a group receiving the same amount of attention as the participants receiving music therapy. Is merely receiving attention in small groups beneficial for highly agitated patients or does music therapy have an additional value in reducing agitation? Over the course of four months, 94 elderly people with dementia from six different Dutch nursing homes, people who were highly agitated, followed either group music therapy or general recreational activities. Group sessions were provided twice weekly, with a maximum size of 5 per group, for 40 minutes each session. In order to estimate changes in agitated behaviours, the caretakers administered the Cohen-Mansfield Agitation Inventory. This checklist contains twenty-nine of the most general prevalent behavioural problems.
The CMAI was administered twice weekly on the intervention days when the residents were going to either the music therapy group or the general recreational activities

group. Nurses administered the CMAI on intervention days at four specific moments: one hour before the intervention and after session had ended: one, two and four hours after the intervention.

The results demonstrated that music therapy as well as general recreational activities are viable methods to reduce agitation in people with dementia who are highly agitated. Both music therapy and recreational activities lead to a short-term decrease in agitation, but there was no additional beneficial effect of music therapy compared to the effect of general activities. More research is required to provide insight in the effects of music therapy in reducing agitation in demented elderly people.

Whereas *chapter 6* describes the effects of both music therapy and general recreational activities in reducing agitation, *chapter 7* discusses the effect of both interventions in reducing a more broad spectrum of neuropsychiatric symptoms. During the course of the study, the Neuropsychiatric Inventory Questionnaire was administered twice weekly for this purpose. This instrument assesses twelve of the most prevalent neuropsychiatric symptoms in people with dementia, such as hallucinations, agitation, depression and night-time disturbances. The study outcomes revealed that both groups showed reductions in NPI-Q scores, but reductions were significantly greater for residents following music therapy than for residents following general recreational activities, from the start to the end of the treatment. Further research should focus on adapting music therapy to specific individual needs and to address further which specific symptoms can be targeted through music therapy to stimulate better referrals.

Chapter 8 is the general discussion and provides a general overview of the results as well as recommendations for new research involving music therapy and dementia and recommendations for practice. For which clients is music therapy a viable treatment and which patients will benefit when music is integrated in daily care moments?
We all benefit from music!

NEDERLANDSE SAMENVATTING

"Zuster, wanneer brengt u me nu eindelijk eens naar huis? Zuster komt u nog, Zuster..?
Typische woorden van iemand met dementie die kampt met grote onrust en angst. Een dagelijks tafereel voor een verzorgende in een verpleeghuis. In eerste instantie probeert hij in alle rust te reageren, maar als meerdere bewoners tegelijkertijd vragen stellen of voortdurend dezelfde vraag herhalen, wordt het toch moeilijk om altijd kalm te blijven.

De medische literatuur gebruikt de term agitatie voor het gedrag waarbij iemand vragen of zinnen continu herhaalt. Onder agitatie verstaat men ook zwaardere gedragsproblemen zoals fysieke agressie, algehele onrust en het voortdurend doelloos dwalen over de afdeling. Gemiddeld 80% tot 90% van de mensen met dementie ontwikkelt gedurende het ziekteverloop dergelijke gedragsproblemen: een grote belasting voor de persoon zelf met dementie en zijn verzorgenden.
Het verminderen van probleemgedrag is van groot belang om de kwaliteit van leven voor de persoon met dementie te kunnen verbeteren. In de dagelijkse praktijk blijken simpele middelen vaak veel van het probleemgedrag al effectief te kunnen verminderen. Vaak is simpelweg persoonlijke aandacht en geruststellen al voldoende bij sommige mensen met dementie. Bij gevorderde stadia van dementie is meer intensieve persoonlijke begeleiding nodig, waarvoor vaak de tijd en adequate zorgbegeleiding ontbreekt.
Fysieke en verbale agressie, depressie en hallucinaties zijn goed te verminderen met behulp van medicijnen. Medicijnen hebben ook nadelen. Antipsychotica, die vaak worden toegediend ter bestrijding van agitatie, geven regelmatig sufheid, verminderde mobiliteit en een hoger risico om te vallen worden veel genoemd. Emotionele problemen, zoals het continue ervaren van een gevoel van onveiligheid en vervreemding, is met geen enkel medicijn te behandelen.

Vaak is er naast medicatie maar beperkt ander behandelaanbod aanwezig voor mensen met dementie, met name in de laatste stadia van dementie, binnen de verpleeghuiszorg, specifiek gericht op de sociaal-emotionele gevolgen van de ziekte. Bij probleemgedrag wordt vaak geadviseerd eerst te starten met een niet-

farmacologische benadering voordat met medicatie wordt gestart. Maar welke benadering moet worden ingezet en bij wie, met welk beoogd behandelresultaat?

In deze studie is gekeken naar het effect van muziektherapie in het kunnen verminderen van probleemgedrag bij mensen met dementie (n=94) die gedurende vier maanden twee keer wekelijks muziektherapie of reguliere activiteiten volgden gedurende 40 minuten. Daarnaast wordt in dit proefschrift ook aandacht besteed aan de inbedding van muziektherapie in Nederland en een overzicht gegeven van het bewijs dat voor handen is uit eerder wetenschappelijk onderzoek.

In *hoofdstuk 1* wordt de achtergrond van de studie beschreven en wat muziek kan betekenen binnen de zorg voor mensen met dementie. Wat doet muziek bij ons als luisteraar en wat kan muziektherapie betekenen voor mensen met dementie? In verpleeghuisinstellingen wordt van oudsher al bijzonder veel gedaan met muziek. Muziek heeft een sterke uitwerking bij dementerenden. Het samen zingen van bekende liedjes brengt associaties teweeg met prettige tijden. Belangrijke gebeurtenissen in het leven gaan vaak vergezeld van muziek, zoals het verliefd worden en het huwelijk. Dergelijke muzikale herinneringen blijven vaak langer behouden dan veel niet-muzikale herinneringen uit eenzelfde periode van de dementerende. Als de woorden niet meer kunnen doordringen, kunnen vertrouwde klanken een gevoel van veiligheid en welbehagen teweegbrengen bij de diep dementerenden en onrust verminderen.

In *hoofdstuk 2* wordt in kaart gebracht hoe muziek in Nederlandse verpleeghuizen wordt toegepast en in het bijzonder bij mensen met verbale/vocale agitatie. In twintig verpleeghuizen zijn interviews gehouden om te kijken of en in welke mate muziek wordt ingezet bij mensen met verbale/vocale agitatie. Hieruit blijkt dat er veel muziek wordt aangeboden in verpleeghuizen, met name tijdens koffie en theemomenten in de ochtend en de middag, maar bijvoorbeeld niet tijdens de maaltijd. Vaak wordt gedacht dat de maaltijd nuttigen een moment van stilte moet zijn voor mensen met dementie. Uit verschillende onderzoeken blijkt echter dat rustige muziek tijdens maaltijdmomenten ertoe leidt dat mensen met dementie rustiger worden en ook

meer eten. Verder blijkt uit de literatuur dat met name muziek van de eigen voorkeur effectief is bij mensen met dementie. Uit de interviews bleek dat voor het merendeel van de bewoners weliswaar deze muzikale voorkeur wordt bijgehouden, ook dat er veel kennis is over welke bewoners van muziek genieten, maar dat er nog weinig doelgericht wordt gewerkt met muziek bij individuele bewoners om bijvoorbeeld verbale onrust te kunnen verminderen.

Het verminderen van (verbale) onrust is één van de doelen waaraan muziektherapeuten binnen de verpleeghuiszorg werken. Een muziektherapeut is zowel musicus als therapeut en weet precies hoe en welke muziek kan inwerken op doelen als ontspanning of activering, door bijvoorbeeld te variëren in het tempo van de muziek in aansluiting bij de cliënt. Steeds vaker is er aandacht voor de positieve werking van muziektherapie bij dementerenden. Binnen muziektherapie worden de vaardigheden benut waarover de bewoner nog wèl beschikt: iedereen, ongeacht het functioneringsniveau, kan muziek maken, zingen en bewegen op muziek.

Muziektherapie is daarmee één van de weinige zorgbenaderingen die kan worden aangeboden aan groepsleden van een verschillend functioneringsniveau. Veel zorgbenaderingen zijn voor hun effect afhankelijk van verbale communicatie. Juist waar taal niet meer mogelijk is, biedt muziektherapie uitkomst. Mensen met afasie die niet meer kunnen spreken, kunnen dikwijls nog wel een liedje zingen en vinden zo een mogelijkheid zich te uiten. Door de non-verbale kwaliteiten van muziek is muziektherapie bij uitstek geschikt om de bewoner -in alle stadia van de ziekte- te begeleiden in de omgang met de gevolgen van dementie. Waar gedurende het ziekteverloop de cognitieve capaciteiten steeds verder verloren gaan, is gebleken dat muzikale vermogens behouden blijven tot in de laatste stadia van de ziekte.

Muziektherapie sluit goed aan bij het huidige denken over verpleeghuiszorg. Er is een toenemende behoefte aan benaderingen, waarin het verbeteren van de kwaliteit van leven van de individuele bewoner voorop staat. Door de non-verbale kwaliteiten van muziek, is muziektherapie bij uitstek geschikt om de bewoner te begeleiden in de omgang met de gevolgen van dementie, in alle stadia van de ziekte.

In *hoofdstuk 3* wordt beschreven hoe muziektherapeuten in Nederland werken met mensen met dementie. Er zijn momenteel naar schatting 60-80 muziektherapeuten werkzaam in de verpleeghuiszorg. De belangrijkste verwijzingen voor muziektherapie zijn sociale en/of emotionele problematiek, gedragsproblematiek en/of passiviteit. De muziektherapeut werkt zowel met individuele cliënten als met groepen en kiest daarbij voor actieve of receptieve werkvormen binnen het aanbieden van de therapie. Bij de actieve vorm spelen de bewoners op instrumenten mee met de therapeut, binnen gestructureerde werkvormen of binnen improvisaties. Er wordt samen gezongen of gedanst. De therapeut stemt voortdurend muzikaal in op de stemming en het muzikale gedrag van de bewoners. Ook wordt er geluisterd naar muziek. Dat kan muziek zijn via geluidsdragers of muziek gespeeld of gezongen door de therapeut op basis van de voorkeur van de bewoner(s). De belangrijkste doelen die zo behaald worden zijn het verminderen van de onrust en het verbeteren van de sociale en emotionele vaardigheden. Een niet-farmacologische interventie zoals muziektherapie bereikt zo vaak meerdere doelen tegelijk. Wil muziek effectief zijn voor mensen met dementie dan moet rekening worden gehouden met de individuele muzieksmaak en kenmerken van de bewoner en zijn of haar eigen achtergrond. De muziektherapeut kijkt binnen observatiesessies onder andere of iemand nog altijd van klassieke muziek houdt of misschien op heel andere muziek beter reageert. Wat is iemands levensgeschiedenis en waar komt hij vandaan?

De laatste vraag is met name van belang bij migranten, die in de verpleeghuiszorg een steeds grotere groep gaan vormen. Een toenemend aantal is in een ander land dan Nederland geboren. Het is niet ongebruikelijk dat mensen die al jaren in Nederland wonen tijdens het dementeringsproces weer hun moedertaal gaan spreken en zelfs het Nederlands niet meer begrijpen. Dit betekent dat zorgverleners moeilijk met hen kunnen communiceren en de persoon zondert zich vaak af in het verpleeghuis. In *hoofdstuk 4* wordt een individuele therapie beschreven bij Vonnie, een vrouw van 83 met een beginnende dementie. Zij is geboren in het voormalig Nederlands-Indië en woont sinds haar dertigste in Nederland. Haar verleden als "troostmeisje" draagt zij met haar mee, ook binnen haar dementeringsproces. In het verpleeghuis ziet de zorg dat zij zich steeds meer isoleert, als enige Indonesische. Ze is erg angstig, heeft

veel hallucinaties en is continu verward. Binnen muziektherapie wordt haar culturele achtergrond aangesproken door de muziektherapeute, die deze verklankt, waarbij ze tot rust komt en herkenning vindt.

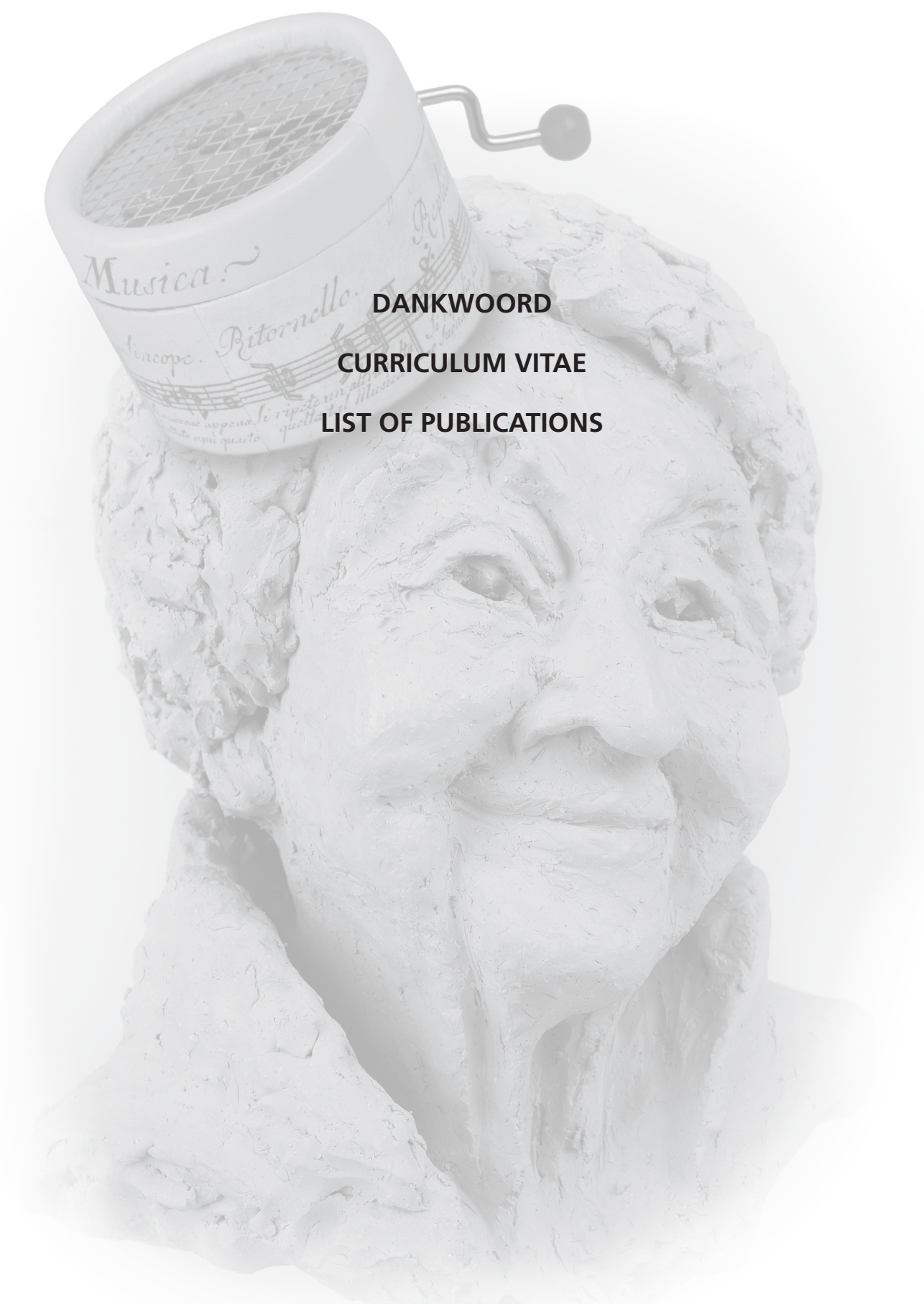
In veel studies is het effect van muziektherapie bij mensen met dementie inmiddels beschreven. In *hoofdstuk 5* worden de effecten van muziektherapie in kaart gebracht op basis van systematisch literatuuronderzoek. Tien gerandomiseerde onderzoeken zijn geanalyseerd in deze review met de vraag of muziektherapie een bijdrage biedt in het verbeteren van sociale-, cognitieve-, en emotionele vaardigheden en het verminderen van probleemgedrag. In iedere studie zijn positieve effecten gevonden als gevolg van een muziektherapeutische behandeling. Er waren echter ook veel methodologische beperkingen binnen de vaak kleinschalige studies om solide conclusies te kunnen trekken over de effectiviteit van muziektherapie als behandelmethode. Het is vooralsnog nog niet mogelijk om de data uit de afzonderlijke, vergelijkbare studies te combineren om zo een overall effect te kunnen beschrijven van een muziektherapieinterventie.

In *hoofdstuk 6* wordt een gerandomiseerde studie besproken naar de effectiviteit van muziektherapie in het verminderen van agitatie bij mensen met dementie. In veel gerandomiseerd onderzoek wordt de interventie vergeleken met een controlegroep waarin geen interventie wordt aangeboden of wordt een vergelijking gemaakt met de standaard aangeboden zorg. In deze studie wordt ingegaan op de vergelijking van muziektherapie met activiteitenbegeleiding om te kunnen kijken naar de vraag of simpelweg aandacht bieden op een regelmatige basis effectief is in het verminderen van onrust en agitatie of dat muziek een bijzondere meerwaarde heeft? Gedurende vier maanden volgden 94 mensen met dementie met ernstige gedragsproblemen in zes verschillende verpleeghuizen muziektherapie of activiteitenbegeleiding. Zij deden dit twee keer per week, in kleine groepjes van maximaal vijf bewoners, voor 40 minuten per keer. Om vast te kunnen stellen of probleemgedrag verminderde, vulden de verzorgenden de Cohen-Mansfield Agitation Inventory in. Dit meetinstrument inventariseert de 29 meest voorkomende probleemgedragingen. De CMAI werd twee keer wekelijks gescoord als de mensen hun therapie of activiteitendag hadden.

Dit gebeurde op vier meetmomenten per interventiedag: één uur voorafgaand aan de therapie en vervolgens één, twee en vier uur na afloop van de therapie of activiteitensessie. De resultaten lieten zien dat zowel muziektherapie als activiteiten aanbieden zinvolle methoden zijn om onrust te kunnen verminderen bij mensen met dementie. Het verschil was echter niet significant zodat niet gesteld kan worden dat muziektherapie een additionele meerwaarde heeft ten opzichte van andere interventievormen waarin aandacht en activiteit centraal staan. Meer onderzoek is nodig om vast te kunnen stellen wat de specifieke waarde is van muziektherapie in het verminderen van agitatie.

Waar in *hoofdstuk 6* wordt gekeken naar de effecten van muziektherapie en activiteitenbegeleiding op het verminderen van specifiek alleen geagiteerd gedrag worden in *hoofdstuk 7* de uitkomsten besproken van het effect van de interventies op een breder spectrum van neuropsychiatrische symptomen die voorkomen bij mensen met dementie. Tijdens de studie is twee keer wekelijks, gedurende de studieperiode, de Neuropsychiatric Inventory Questionnaire afgenomen. Dit meetinstrument meet twaalf veel voorkomende neuropsychiatrische symptomen bij mensen met dementie, zoals hallucinaties, agitatie, depressie en nachtelijke onrust. Uit de studie blijkt dat de mensen die muziektherapie volgden significant minder symptomen hadden, gemeten van het begin tot het eind van de behandeling, dan de deelnemers die in dezelfde periode activiteitensessies volgden. Meer onderzoek is geadviseerd om te kijken naar de vraag welke specifieke neuropsychiatrische verminderen als gevolg van muziektherapie om zo betere verwijzingen voor muziektherapie te stimuleren.

In *hoofdstuk 8* wordt tenslotte stil gestaan bij de belangrijkste uitkomsten van dit onderzoek en de implicaties hiervan voor de praktijk. Aanbevelingen worden gedaan voor toekomstig onderzoek en aanbevelingen voor mensen die werkzaam zijn in de verpleeghuiszorg. Wanneer moet gedacht worden aan muziektherapie als behandelmethode voor iemand met dementie en hoe kan de inzet van muziek worden geïntegreerd binnen dagelijkse zorgmomenten. We hebben allemaal baat bij muziek!



DANKWOORD

CURRICULUM VITAE

LIST OF PUBLICATIONS

Dankwoord

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Lieve Joost: dank voor het al vele jaren samen luisteren naar muziek!

D A N K

Curriculum Vitae

Annemieke Vink is a psychologist and works as a lecturer in theory of music therapy at the ArtEZ School of Music in Enschede.
She is also a core team member and lecturer on the Master of Arts Therapies Course (Zuyd University) and a researcher at KenVaK, the joint knowledge network of Zuyd University, the HU University of Applied Sciences Utrecht, ArtEZ Institute of the Arts and Stenden University. Her main area of expertise is the effect of music therapy on people with dementia and music psychology.
Next, she is a board member of Stichting Muziektherapie. Annemiek Vink has presented at various national and international congresses on music therapy and dementia. She was also the head organizer of the 7th European Music Therapy Congress in the Netherlands and has written various publications about music psychology, EBP and the effects of music therapy on people with dementia.

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Gemiddeld 80% tot 90% van de mensen met dementie ontwikkelt gedurende het ziekteverloop probleemgedrag zoals algehele onrust of het voortdurend doelloos dwalen over de afdeling. Dit gedrag vormt een grote belasting voor de persoon zelf met dementie en zijn verzorgenden.

Vaak is er naast medicatie maar beperkt ander behandelaanbod aanwezig voor mensen met dementie, met name in de laatste stadia van dementie. Bij probleemgedrag wordt geadviseerd eerst te starten met een niet-farmacologische benadering voordat met medicatie wordt gestart.

Het verminderen van probleemgedrag is één van de doelen waaraan muziektherapeuten binnen de verpleeghuiszorg werken. Een muziektherapeut is zowel musicus als therapeut en weet precies hoe en welke muziek kan inwerken op doelen als ontspanning of activering, door bijvoorbeeld te variëren in het tempo van de muziek in aansluiting bij de cliënt. Steeds vaker is er aandacht voor de positieve werking van muziektherapie bij dementerenden. Waar de dementerende dagelijks wordt geconfronteerd met cognitieve achteruitgang, worden binnen muziektherapie de vaardigheden benut waarover de dementerende bewoner nog wèl beschikt: iedereen, ongeacht het functioneringsniveau, kan muziek maken, zingen en bewegen op muziek.

In dit proefschrift is gekeken naar het effect van muziektherapie in het kunnen verminderen van probleemgedrag bij mensen met dementie (n=94) die gedurende vier maanden twee keer wekelijks muziektherapie of reguliere activiteiten volgden gedurende 40 minuten. Daarnaast wordt in dit proefschrift ook aandacht besteed aan de inbedding van muziektherapie in Nederland en een overzicht gegeven van het bewijs dat voor handen is uit eerder wetenschappelijk onderzoek naar de effecten van muziektherapie.

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