



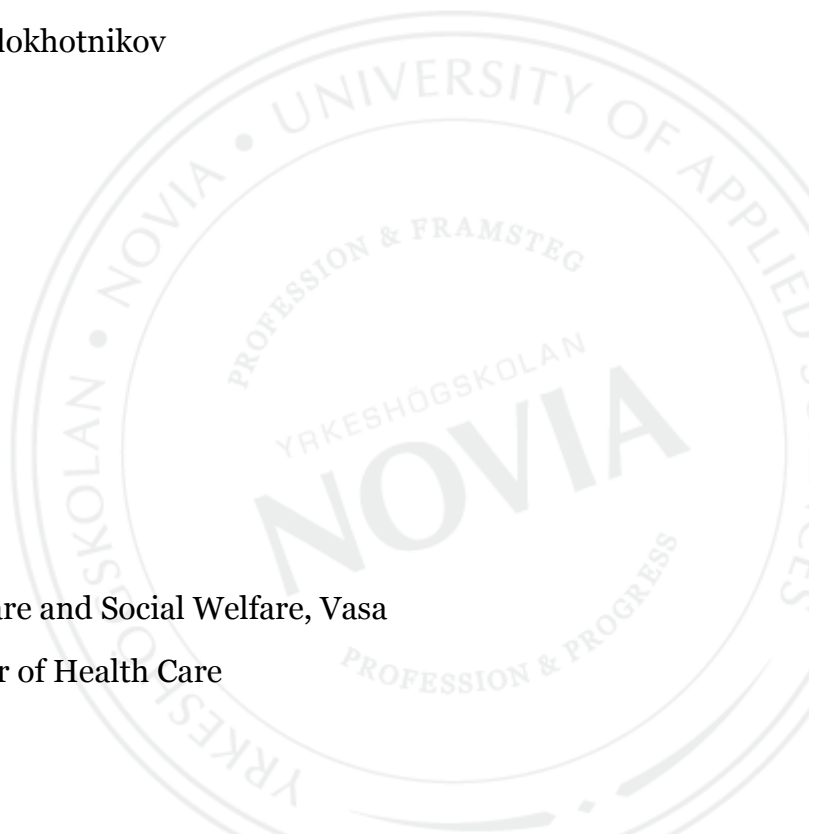
# The use of music in dementia care: A literature study

Janette Love Lamparero-Plokhonikov

Degree Thesis in Health Care and Social Welfare, Vasa

Education: Nurse, Bachelor of Health Care

Vasa / 2015



# BACHELOR'S THESIS

Author: Janette Love Lamparero-Plokhotnikov

Education and place: Nurse, Vasa

Supervisor: Rika Levy-Malmberg

Title: The use of music in dementia care: A literature study

---

Date: 29/10/2015

Number of pages 33

Appendices 3

---

## **Summary:**

The purpose of this study was to have a deeper understanding on how music impacts elderly people with dementia. In particular, the author intended to gain more knowledge on how music manages behavioural problems in elderly people suffering from dementia specifically agitation.

The theoretical framework used in this study was Eriksson's theory of caritative caring. Five scientific articles were chosen to answer the aim of this literature study through a qualitative approach.

The main result of this study was that music has positive benefits to dementia. In particular, appropriate, relaxing or individualized music significantly lowers agitation. Music was also found to have positive effects in mood, socialization, cooperation, and communication and enhanced interaction. Other findings showed that music could be facilitated by a therapist, nurse, spouse or a family member or trained health provider at home, nursing homes or in any elderly institutional settings.

---

Language: English KeyWords: elderly, dementia, behavioural problems, agitation, anxiety, aggression, anger, music, music therapy, wellbeing and quality of life.

---

## Table of contents

1	Introduction.....	1
2	Aim of the Study .....	3
3	Literature Review .....	4
	3.1 Dementia Strategies for treatment .....	4
	3.2 Behavioural problems in dementia .....	6
	3.3 Agitation in dementia .....	6
	3.4 Effects of music on behavioural problems in dementia .....	8
	3.5 The effect of music on the brain .....	9
4	Theoretical Framework.....	11
	4.1 Need-Driven Dementia Compromised Behaviour Model .....	11
	4.2 Progressively Lowered Stress Threshold Model .....	12
	4.3 Katie Eriksson's Theory of Caritative Caring .....	13
	4.3.1 The human being .....	13
	4.3.2 Suffering and death .....	14
	4.3.3 The caritative motive .....	14
	4.3.4 Caring as an expression .....	15
	4.3.5 The caring communion .....	16
5	Research Methodology .....	17
	5.1 Content analysis .....	18
6	Conduction of study .....	19
	6.1 Results of study .....	22
7	Ethical Consideration .....	29
8	Critical Review .....	30
9	Discussion.....	32

Reference

Appendices

## 1 Introduction

With the increasing number of an ageing population in Finland, the rate of dementia is common among the elderly. The Alzheimer Europe Work Plan conducted a recent study and results were published in the Dementia Europe Yearbook stating that the estimate number of people with dementia in Finland was 92,232 as of 2012 based on the total population of 5,402,627 (Alzheimer Europe, 2015). In 2013, the number of deaths due to dementia including Alzheimer's disease has doubled over the decade. Death rates suggested that more than 7,500 Finns die from dementia. In addition, women, who tend to live longer than men, have a higher share of deaths from dementia (Official Statistics of Finland, 2013). Globally, the current prevalence of dementia is estimated to be over 46.8 million cases. Prediction in the literature suggests that this figure will be expected to reach 74.7 million by the year 2030 and 131.5 million by 2050 (ADI, Alzheimer's Disease International Statistics, 2015).

Dementia in older people is associated with impairment of cognitive functions resulting to behavioural problems, depression, disorientation and memory loss. This can be validated by the definition given by the National Health Service (2011), which states, "*dementia is the loss of intellectual functions, particularly memory. It can result to decrease ability to carry out day to day activities and changes in social behaviour.*"

Alzheimer's disease and dementia are most often used interchangeably. Dementia can be categorized into primary and secondary dementia. Primary dementias are irreversible, progressive degenerative disorders and are not due to any other condition. Alzheimer's disease is the most common type of primary dementia. It accounts for more than 60% of the cases of dementia (Prince & Jackson, 2009; Casey, 2012). Secondary dementias occur as a result of another pathologic processes such as infection, subcortical degenerative disorders, hydrocephalic and vascular problems, traumatic conditions of the encephalus and subdural areas of the brain, neoplastic, inflammatory and toxic conditions, and metabolic disorders (Nettina, 2010).

Behavioural and psychological problems occur in 80% of those suffering from dementia. The line of treatment to behavioural problems in dementia involves antipsychotic medications. These drugs significantly contain risks and limited benefits. In particular, studies show that in every 100 people with dementia, who are taking antipsychotics, there will be one death, one stroke and only 20% will benefit (Banerjee, 2009; BPAC, 2010). A

national study was done in Finland stating that the prevalence use of antipsychotics among people with Alzheimer's disease was six times greater compared to those who did not have Alzheimer's disease (Laitinen *et al.*, 2011). Ames *et al.* (2005) and Moretti *et al.* (2006) pointed out that the use of psychotropic drugs to manage agitation and anxiety has negative side effects and presents risks among the elderly people with dementia. In addition, the use of antipsychotics significantly intensifies the probability of oversedation, risk of falls, pneumonia, adverse cerebrovascular events and death (Ballard, Waite & Birks, 2006; Banerjee, 2009; Trifiro, 2011; van der Maarel-Wierink *et al.*, 2011).

Pharmacotherapy is considered an effective yet limited approach to slow down the progression of Alzheimer's disease (Lanctot & Rajaram, 2009). Therefore, non-pharmacological remedies were used to counterpart the use of psychotropic medications. Interventions without the use of drugs for people with dementia focus on the significance of improving the quality of life or wellbeing, or alleviating behavioural and psychological symptoms related to dementia.

Lin *et al.* (2011) reported that music therapy includes singing familiar songs, playing musical instruments, talking about old favourite songs, and moving or dancing with the music. Music therapy lessens anxiety and agitation, improves challenging behaviour patterns in dementia, reduces isolation and morale, and develops cognitive skills.

Music has been a valuable and non-pharmacological intervention in various clinical settings. References to the healing power of music can be traced back in the writings of Plato and Aristotle. The first known reference about music and its healing power was in the Columbia Magazine titled "Music Physically Considered" in 1789. However, it was only in the 19<sup>th</sup> century that music was finally accepted as an intervention in the hospitals. Since then, medical institutions have been conducting scientific research in music and documenting its efficacy (Bunt, 2010).

Music nowadays is used in a broader spectrum in clinical settings. Although the healing effect of music is established in many supporting professions, the mechanism behind its therapeutic effect remains unclear. However, neuroscientific studies and clinical research have supplied a mounting quantity of data that may provide understanding into how music exerts its therapeutic effect. Music is used in patients to meet their physiological, psychological and spiritual needs (Beccaloni, 2011). Music is also an intervention used in patients with motor difficulties, in disabled children, in controlling anxiety and pain levels in preoperative perioperative, and postoperative surgery, for relaxation and controlling

behaviours as a result of a progressing disease, for depressed patients, autism, schizophrenia, substance use disorder, dementia and agitation, and disordered sleep (Lin et al., 2011; Dileo & Bradt, 2008; Arslan, Özer & Özyurt, 2008).

In particular, this study focuses on the use of music in dementia. The main goal of this study is to gain knowledge on how music plays a positive impact on agitation, which is considered one of the most challenging behavioural problems in elderly people with dementia. Scientific articles and books are sources of data collection in this study. Moreover, content analysis was chosen to analyze the findings.

## **2 Aims of the Study**

The purpose of this study is to gain a deeper understanding on how music impacts elderly people with dementia. In particular, this study intends to gain more knowledge on how music manages behavioural problems in elderly people suffering from dementia. Behavioural problems in dementia can be classified into many aspects such as agitation, aggression, anger, hoarding, refusing help, repetition, sleeplessness, sundowning, which means changes in behaviour triggered by fading light, hunger or thirst, tiredness, boredom or depression during early evening or late afternoon, wandering or aimlessly going anywhere, hallucinations, paranoia and delusions (Abi, O'Brien, Schoenbachler, 2006). However, this study focuses mainly on agitation. It is noted in previous literature that anxiety symptoms, which can lead to agitation occur in up to 71% of the patients (Seignourel et al., 2008).

The study question posed is:

- What are the benefits of music to elderly people with dementia who are experiencing agitation?

### **3 Literature Review**

Literature reviews are fundamental previous studies available. A search of the literature was done for this thesis reference, which contributed to a greater understanding and critical thinking of the topic.

Data of this study was collected from scientific sources both manually from books and electronically through online research portals such as EBSCO, CINAHL, MEDLINE and ProQuest. Key words used during the search of articles were elderly, dementia, behavioural problems, agitation, anxiety, aggression, anger, music and music therapy, wellbeing and quality of life. Literature review for this study was derived from journals ranging from the year 2004-2015. However, selection of scientific journals for data analysis was inclusive from 2009-2015. Due to lack of ample time and limited updated sources, some old references were included. In particular, one very old reference dated back in 1984 mentioned on how music influences morality and health in ancient China. Other references from 1987 and 1996 are sources of theoretical models used in this study; another source from 2002 mentioned about the physiological processing of music in the brain; a reference from 1996 summarized the subtypes of agitation in dementia; and lastly, a book published in 1994 was one of the references used to explain the nurse ethical motive. These references, though old, are considered relevant to this study.

#### **3.1 Dementia strategies for treatment**

Dementia is an important health concern globally. Dementia is affecting 47.5 million people worldwide according to World Health Organization (2015). Dementia mainly affects the elderly and contributes to the deterioration of memory and thinking, causes behavioural problems and alters the ability to perform everyday activities. The prevalence of dementia increases with age and is mostly found in the elderly people residing in nursing homes and assisted living facilities (Alzheimer's Association, 2009).

Dementia can be classified into mild, moderate and severe. Mild dementia is described by changes in behavior and problems with activities of daily living such as using the telephone, shopping, etc. The person's short-term memory maybe affected in a little extent

and can disrupt some aspects of the day. Geographical disorientation will occur and make a person confused and have problems getting from one place to another. The phase of intermediate or moderate dementia is characterized by aphasia, apraxia and agnosia. In this stage, poor judgements and changes in behavior become more distinct and the person affected has more difficulty in performing the daily routine as his or her functional abilities are declining (Mooney and Shank, 2008). In the third stage, the person with dementia has severe memory loss, incontinence, and a gradual incapacity to ingest food from the mouth. As a result, assistance of all activities of daily living is necessary (Resnick & Galik, 2006). Additionally, they have no more orientation of time and space (See appendix 1).

There are different interventions used to manage the symptoms related to dementia. Pharmacological treatments have been used to handle behavioural problems. In fact, these are the expensive line of treatment and at the same time present risks for diverse effects (Moretti et al., 2006). Just in the United States alone, the World Alzheimer Association (2015) reveals that the cost of dementia has increased by 35% since 2010 and the estimate has reached to 604 billion US dollars. The cost of dementia is expected to increase up to 1 trillion US dollars by the year 2018.

According to Food and Drug Administration (FDA, 2014), all medicines have both benefits and risks. FDA only approves a drug for marketing purposes when the benefits outweigh the risks. Risks of some some drugs used for patients with dementia, for example, cholinesterase inhibitors can develop gastrointestinal problems (Birks, 2006). Memantine, which is a dementia drug to relieve behavioural and psychological symptoms, can easily irritate the stomach and can also cause constipation, dizziness and headache. Memantine cannot cure dementia but slows down the progression of the symptoms. Conversely, some literature shows that the effect of this drug can worsen the behavioural and psychological symptoms of dementia (Ridha, Josephs & Rossor, 2005; Monastero et al., 2007).

However, there are some harmless and efficient strategies to manage behavioural problems. Environmental modifications appear to be one of the most effective interventions in reducing behavioural problems of those with dementia in residential care facilities. Environmental modifications include the use of music, in which many researchers found it to be effective in reducing and preventing anxiety in elderly people with dementia (Sung, Chang, Lee, 2010).



### **3.2 Behavioural problems in dementia**

Behavioural problems in dementia are commonly manifested among older people and pose a negative impact not only to those who have dementia themselves, but also makes the caring more burdensome for the caregivers (Casey, 2012). Behavioural problems are usually accompanied by psychological symptoms as well. Neuropsychiatric symptoms or otherwise called as behavioural and psychological symptoms of dementia (BPSD) constitute a major component of the dementia syndrome. BPSD include agitation, aberrant motor behaviour, anxiety, elation, irritability, depression, apathy, disinhibition, delusions, hallucinations, and sleep or appetite changes (Cerejeira, Lagarto, & Mukaetova-Ladinska, 2012). Other behavioural problems manifested by people with dementia include anger, aggression, hoarding, repetition, sleeplessless or sundowning, wandering and paranoia (Abi, O'Brien & Schoenbachler, 2006).

### **3.3 Agitation in dementia**

Studies noted that 90% of those suffering from dementia manifest some significant behavioural and psychological problems at some point on their diseases (Meinhold *et al.*, 2005). Agitation in dementia is frequently a manifested symptom. However, the notion of agitation is ambiguous. An apparent confusion about the structures and boundaries of agitation exist, and so as distinction between agitation and related concepts (Kong, 2005). Agitated behaviour is a prevalent concern that negatively distresses the health of elderly people with dementia and somehow increases the cost of their care in nursing homes.

The impact of agitation does not only affect those with dementia but also the caregivers as well. Numerous studies showed that up to 90% of the nursing home residents manifest agitation (Steffens *et al.*, 2005). In another study, researchers found that 34% of the residents in assisted living centers display agitation at least once a week (Gruber-Baldini *et al.*, 2004).

Agitation is defined as “a behaviour and an emotion” (Petrocelli & Smith, 2005). The cause of agitation in dementia is multifaceted. It becomes more common as the disease advances and eventually functional deficiencies become more manifested as a result to frontal lobe dysfunction (Senanarong *et al.*, 2004). Agitation can cause injury to self and

others (Kovach, Noonan, Schlidt & Wells, 2005). Therefore, the safety to the elderly with dementia is a priority. This concern also goes with the safety of caregivers and staff, as well as the visiting the family members.

Agitation and some other behavioral problems linked to dementia can be very challenging for nurses or caregivers to deal with. These behaviors are often difficult to manage and may adversely affect the resident and the people providing care. Health professionals providing care should be aware of the different possible causes of agitation. Some possible physical causes of agitation may be pain or accompanying illness, hunger or thirst, and incontinence or use of restraints. The behavioural problems in dementia may be an effort to communicate a need or be as a direct result of an unmet need (Keady & Jones, 2010). Invasion of personal space, light, noise and temperature are among the environmental aspects; and overstimulation or boredom comprised the social aspect (Vance et al., 2008). While Algase et al. (1996) mentioned that agitation may also be due to unmet needs, there are also other unidentified and unexplainable causes.

A long-term study was conducted by Cohen-Mansfield (1996) on individuals in nursing homes and adult daycare facilities. The researcher identified a more diverse classification of problem behaviours. He proposed that there are four alternative categories including, physically non-aggressive behaviour such as restlessness, aimless wandering, pacing, inappropriately putting on or removing clothes, plotting to leave for some other place, handling objects in inappropriate ways, performing an action repeatedly and being generally unable to sit or stand at ease. The second category is called physically aggressive behaviour such as hitting, biting, kicking, pushing, scratching, destroying objects and spitting. Thirdly, verbally non-aggressive behaviour includes complaining and repeatedly asking questions. And lastly, verbally aggressive behaviour includes cursing, yelling or screaming, and relentless demanding to attract attention. Presently, researchers who study dementia and problem behaviour follow his concept. Table 2 describes the alternative categories of behavioural problems and examples in a simplified table format (See Appendix 2).

Agitation in dementia is considered a nonpsychotic behaviour. Agitation is a set of physical indicators that implies emotional anxiety or motor restlessness. Patients with agitation should be assessed for the underlying causing factor, such as hunger, thirst, drug use, or an undetected infection. Patients who show physical or verbal aggression, which is

frequently accompanied with delusional misidentification may possibly need a combination of both a drug and non-drug treatments (Abi, O'Brien & Schoenbachler, 2006).

A huge figure of scientific proof has been collected to reinforce the use of antidementia medication in patients with severe Alzheimer's disease. However, combination therapy with acetylcholinesterase inhibitors and memantine, for example, remains debatable. The effectiveness of antidepressants to treat depression related to dementia is not proven. Pharmacologic treatment for agitation and psychosis in dementia remains a challenge (Schwarz, Froelich & Burns, 2012). A recent systematic review of studies of single-agent pharmacotherapy found that the reduction in symptoms is modest, but that small improvements may benefit the patient and caregiver. The goal of pharmacologic treatment should be reduction of symptoms, not eradication, of the most troublesome behaviours and most importantly preservation of quality of life (Sink, Holden & Yaffe, 2005).

Kohn, Mphil and Surti (2008) also proposed that nonpharmacologic intervention should be the first step in behavioural management. Non-pharmacologic treatment, which includes environmental, behavioural and musical, is considered a relatively convenient and cost effective method and has been highly encouraged. Being inexpensive and largely without adverse side effects, music intervention is applicable for patients with dementia in all stages (Vasionyte & Madison, 2013).

### **3.4 Effects of music on behavioural problems in dementia**

Johnson & Taylor (2011) suggest that there is a reduction of aggressive behaviour in some people with dementia as a result of appropriate relaxing music. Wall & Duffy (2010) reported that music therapy has a positive effect in reducing agitation in older people with dementia. The researchers further found a positive increase in the participants' mood and socialization skills. Park & Pringle Specht (2009) study showed that mean agitation levels were significantly lower while listening to music than before listening to music. Skingley & Vella-Burrows (2010) extracted and reviewed some relevant literature and findings. All the studies included reported benefits from music and singing for older people. Marmstål et al. (2011) concluded that music therapy caregiving enhanced interaction, cooperation, communication for both the people with dementia and the caregivers as well.

Ledger and Baker (2007) piloted a quantitative study in Australia. They aimed to investigate the long-term effects of group music therapy on agitation in older people with Alzheimer's disease. Participants with moderate forms of the Alzheimer disease from 13 nursing homes were chosen. A music therapist provided music therapy sessions on a weekly basis and recorded changes in the participants' behaviour before and after each session. The Cohen-Mansfield Agitation Inventory (CMAI) revealed no significant difference on the long-term effects of music therapy. However, the music therapist indicated that during and every after music therapy sessions, patients became less agitated. The therapist also found out that the effects of this study were not cumulative over time.

Music was played for a minimum of half an hour before the individual's peak agitation time, in which the overall peak agitation time in one particular study (Park & Pringle, 2010) was between 8:30 in the morning until 8:00 in the evening. Results showed that there was decrease in agitation during the listening to individualized music and remained at a lower peak level even after the music listening. This study implemented in a home setting supports other related results conducted in nursing homes and hospitals (Sherratt et al., 2004). Therefore, the results validate the significance of music intervention across various settings.

Individuals with dementia have reduced ability to interpret their environment. Therefore, their environment should be modified so they can easily adapt to it. Agitation can result when they feel anxious but cannot find the appropriate verbal or motor activity which lead to confusion and anxiety. Agitation can also inflict tension to the nursing staff. Medications are often used to sedate and calm the patient down, but on the other hand, makes them tired, drowsy and confused. The use of anti-psychotic drugs to manage challenging behaviour in dementia can eventually exacerbate the symptoms, reduce the quality of life and increase the risk of death twofolds (Nazarko, 2009).

In the past centuries, music was used to decrease anxiety in human beings. Soothing music, in particular, was believed to have positive influence on morality and health in ancient China (Tame, 1984).

### **3.5 The effect of music on the brain**

Every human being possesses two innate traits namely language and music. The language includes vowels, consonants and pitch contrasts of the native language while the musical

aspect includes the timbres and pitches of the culture's music. These unique features of human beings make us different from other species. The language-music relationship has been explored and has given the cognitive science an opportunity to examine the underlying mechanisms deeper (Patel, 2008).

Dementia is a syndrome in which the ability of a person to speak and communicate is affected as the disease progresses. The neuro-pathological changes in the brain caused by dementia, reduces a person's cognitive function. Since there is no cure for the pathological changes of the brain in dementia the main aim of nurses is to distinguish and eradicate excess incapacity, and maximize cognitive function (Cheung, Chien, Lai, 2011). Music is considered to have much deeper power over our emotions than does ordinary speech (Patel, 2008). Thus, when speech is lost due to dementia, music can be a tool to connect or re-connect to others and to the environment.

Music is a stimulus that produces a very complex interaction in the brain. Music connects with the human brain. It influences synaptic malleability and neuronal learning. Music processing begins when the outer and middle ear recognize the stimulus and passed it to the cochlea. The vibration of the musical sound creates an activity in the neuronal synapse, which then transmits the response to the auditory brainstem (Koelsh & Siebel, 2005). The neural signals are then passed from the auditory brainstem to the thalamus, then to the auditory cortex, where is it extracted into more specific acoustic information, such as pitch, timbre, intensity, chroma, and roughness (Tramo, Shah & Braida, 2002) (See appendix 3).

Medical findings of how music affects the brain such as engagement in the striatal and basal forebrain regions and distributed network of cortical and limbic structures still remain unclear (Perry et al., 2014). These are the parts of the brain that are responsible for language, emotion, memory and arousal. The reason why music is assumed to remain as a biological rewarding stimulus lies on the fact that it encodes emotional mental states (Clark Fletcher, Warren, 2014). Music also is considered an ideal medium to investigate connections between reward, affective and cortical information processing circuitry (Omar et al., 2011; Salimpoor et al., 2013).

## **4 Theoretical Framework**

The cause of dementia is unclear. However, some of the different interventions were considered effective to decrease or manage the symptoms. Since this study focuses mainly on the common behavioural problems associated with dementia, proposed models will be tackled to explain the theoretical background underlying these behavioural problems.

### **4.1 Need-Driven Dementia-Compromised Behaviour Model (NDB)**

The Need-Driven Dementia-Compromised Behaviour Model belongs to the middle-range theories. It embraces disruptive behaviour or disturbed behaviour (DB). This theoretical model explains that when the needs of a person with dementia are not understood and met by the caregiver, disruptive or disturbed behaviour occurs as a result. The inability of the caregiver to comprehend the needs and the inability of the person with dementia to make their needs known are both factors that can lead to manifestation of disruptive behaviour (Algase et al., 1996).

Furthermore, two variables play a role in the NDB model. The historical/developmental (background factors) and the environmental/situational (proximal factors) both influence the need-driven behaviours (Norton et al., 2010). People with dementia have impaired cognition and communication. Thus, it is difficult for them to convey their exact needs to their caregivers. Neuropsychological factors also diminish or paralyze their ability to self-regulate or execute. As a result, a person with dementia easily gets aggressive due to damage of the cortex of the brain. Furthermore, inappropriate caring on the activities of daily living (ADLs) may threaten personal abilities and obstruct goal-directed activity and lead to aggression (Algase et al., 1996). Though difficult and complex the caring and understanding of people with dementia, it should be the ultimate goal of the caregivers to respond in a manner wherein the interventions can improve the person's quality of life (Sink, Holden & Yaffe, 2005). Kovach et al. (2005) recognized the great challenge of using this model for developing appropriate interventions.

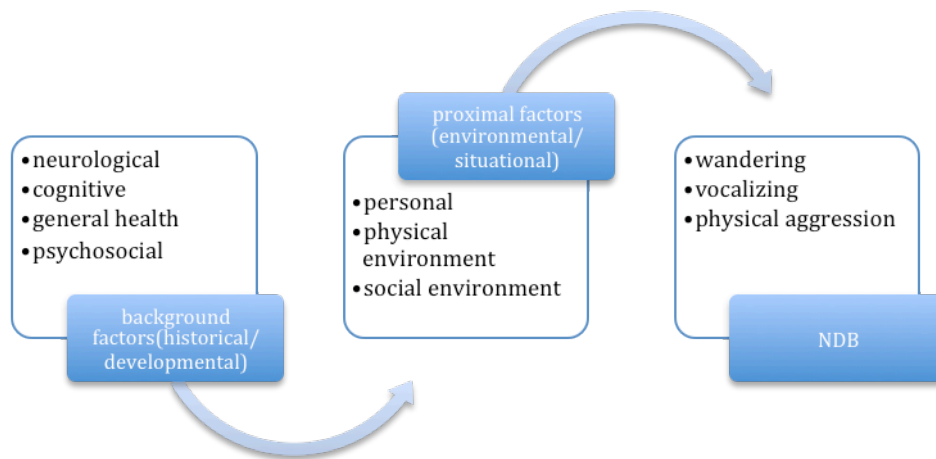


Figure 1. Background and Proximal Factors affecting Need-driven Dementia-compromised Behaviour Model (Algase et al., 1996 page 12)

#### 4.2 Progressively Lowered Stress Threshold Model (PLST)

Hall and Buckwalter (1987) proposed the Progressively Lowered Stress Threshold Model (PLST). It has been in use in many nursing studies as a theoretical framework in identifying relationships between factors and searching for appropriate and effective interventions.

Figure 2 provides a simple and brief explanation about the PLST. This model proposes that the cognitive impairment of dementia impairs a person's interaction with the environment. As a result, it affects and lowers the stress threshold of an individual. This simply means that people with dementia are less able to adjust to the environment and as the disease progresses; it is even more difficult for them to cope and manage. This whole process can then trigger anxiety and dysfunctional behaviours. Anxiety was found to be significantly correlated with agitation and could be considered as one of the primary causes of agitation (Twelftree & Qazi, 2006).

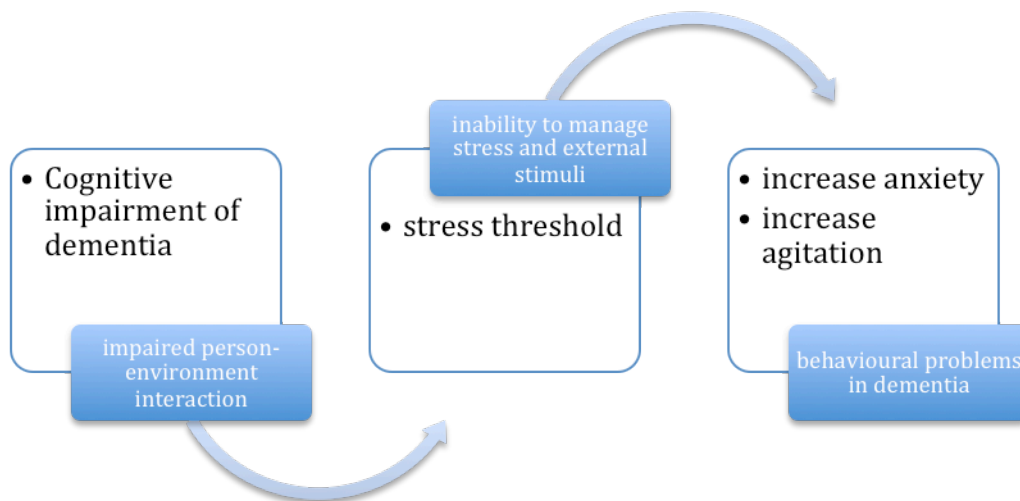


Figure 2. Progressively Lowered Stress Threshold Model (PLST) (Hall & Buckwalther, 1987)

Commonly, people with dementia exhibit a lower threshold of stress early in the morning. As the day progresses and as stressors accumulate, people with dementia start to manifest anxiety and agitation if no intervention is initiated (Smith et. al., 2004).

The PLST model was developed to stimulate further adaptive and efficient behaviours in older people with dementia and to educate caregivers to establish remarks, make care decisions, and propose effective care by modifying stress-inducing triggers in the care of those with dementia.

### 4.3 Katie Eriksson's Theory of Caritative Caring

In this thesis, Katie Eriksson's theory of caritative caring was reflected as a helpful theoretical framework. There are five basic concepts of the caritative caring model, which include the following: the human being, suffering and health, the caritas motive, caring and caring communion. Each concept is explained in this section.

#### 4.3.1 The human being (patient, carer/nurse)

Eriksson (1987) stated that the human being is an entity of body, soul, and spirit. She further emphasized that the human being is fundamentally a holy and religious being, but



not all have acknowledged this aspect. The human being considered as holy is linked to the awareness of human dignity, which further means accepting the human responsibility of serving with love and existing for the sake of others. Eriksson stresses that the human being is seen as constant becoming. It means that he is constantly in change and therefore never in a state of full completion. Furthermore, a human being is also seen as a unique individual with a conditional freedom of choice. He simultaneously longs for a relationship between a concrete other human being and an abstract other such as in some form of God. A human being finds its life's meaning by giving, receiving, and experiencing faith and hope. He has wishes and desires and is creative and imaginative. Hence, the depiction of human being only in terms of his needs is inadequate. When the human being is entering the caring context, he or she becomes a patient in the original sense of the concept. Eriksson (1994) described a human in this context as a suffering human being.

#### **4.3.2 Suffering and health**

Eriksson (1998) introduced the idea that suffering is the basic category of caring and that the ultimate purpose of caring is to alleviate suffering. Suffering and health are intertwined together. If suffering is an inseparable part of human life, then it is regarded as a part of health as well. Suffering has many features and attributes. Durable suffering is compatible with health, while unendurable or unnatural suffering paralyzes the human being and preventing him or her from growing.

#### **4.3.3 The caritas motive – the ethics of caring**

Lindström, Lindholm & Zeterlund (2010) cited Eriksson's theory (1990) that Caritas is considered the essential object of caring science. Caritas, which means love and charity, is the foundation for all caring.

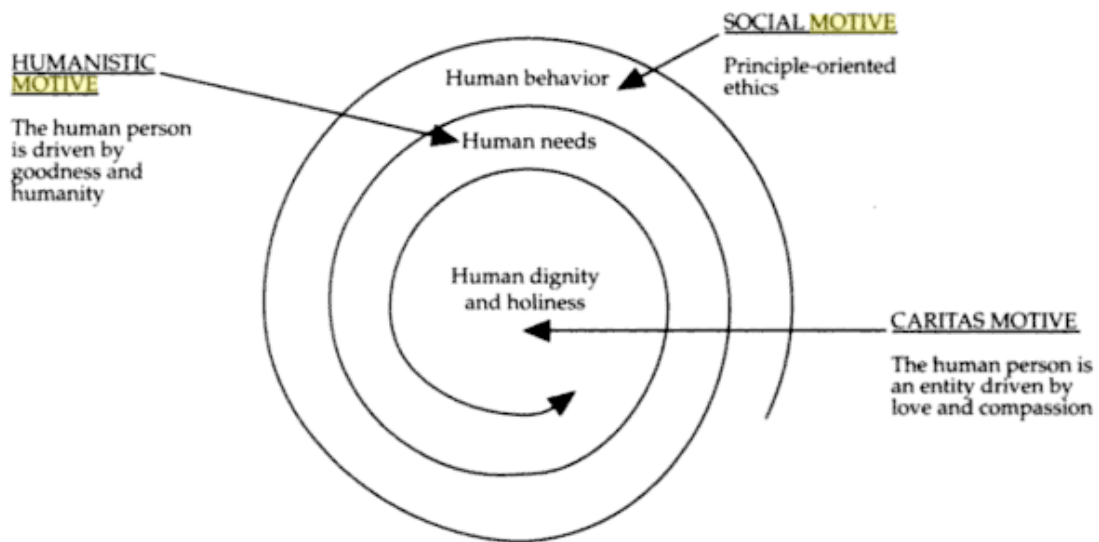


Figure 3. Nurse's ethical motive (Gaut & Boykin, 1994, p.13)

The act of caring described by Eriksson (2003) expresses the inmost nature of caring and re-establish the essential intention of caritas. The caring act expresses the innermost sacred component, and the protection of the individual patient's dignity.

#### 4.3.4 Caring as an expression of Caritas

Caritative caring is considered the essence of nursing. Eriksson (1994) differentiated two traditions namely caring nursing and nursing care. Caring nursing exemplifies a form of caring without prejudice that highlights not only the patient but also his or her suffering and desires. On the other hand, nursing care is founded on the nursing care process, and that it signifies good care only when it is grounded on the deepest essence of caring.

The fundamental assumption of caring is based on caritas. Caring is something that is original and natural. It can only be well understood by search for its origin and the idea of natural caring. Natural caring is constituted by the idea of motherliness. Natural basic caring is expressed through tending, playing, and learning in a spirit of love, faith and hope. To tend, play and learn implies sharing. Eriksson (1987, p.38) says, "sharing is presence with the human being, life and God". Therefore, true care is "not a form of behaviour, not a feeling or state. It is to be there – it is the way, the spirit in which it is done, and this spirit is caritative" (Eriksson, 1998, p.4).

True caring is grounded on compassion. Compassion is not acquired from advance skills and technology but it will develop in the course of experiencing between suffering and love. The nurse's capacity to express compassion comes out from personal encounter of suffering and love. Compassion is defined as "an awareness of one's relationship to all living creatures; engendering a response of participation in the experience of another; a sensitivity to the pain and brokenness of the other; a quality of presence which allows one to share with and make room for the other" (Gaut & Boykin, 1993, p.14).

The basic structure of caring is the relationship between two individuals consisting of the the caregiver and the patient. The ethical element of caring relationship is enclosed in our invitation. This signifies that the caregiver or nurse, by her basic attitude, welcomes the patient as a the guest of honor and assures him or her of a secured relationship (Gaut & Boykin, 1993).

Faith, hope and love are considered the basic food of life. These three human virtues emerge in different phases of our lives and appear as prevalent resources when the natural development is improved. Gaut and Boykin (1993, p. 14,15) cited that "faith for the benefit of health cannot prevent non-health, but it helps to adopt a trustful position toward existence". Thus, health and faith belong together.

A definition of hope written in a book entitled "Caring as Healing, Renewal through Hope" states that hope is a "varying mind governed by our concepts of something in the future or past, the outcome of which is not entirely certain". A person who has not given up, and that he or she believes in the future, has the ability to hope (Gaut & Boykin, 1993, p.14).

#### **4.3.5 The caring communion**

Caring communion comprise the framework of the significance of caring and is the approach that defines caring reality. Caring acquires its distinct nature through caring communion (Eriksson, 1990). It is a manner of intimate bond that embodies caring. Caring communion is seen as the source of strength and meaning in caring. Eriksson (1990) writes in *Pro Caritate*, referring to Levinas:

*"Entering into communion implies creating opportunities for the other – to be able to step out of the enclosure of his/her own identity, out of that which belongs to one*

*towards that which does not belong to one and is nevertheless one's own – it is one of the deepest forms of communion (pp.28-29)."*

Nurse theorists Katie Eriksson and Margaret Newman predict how their caring theory will be expressed in the year 2050. Eriksson is assured that the vital ideas of health and suffering in her theory of caritative caring will continue to develop into newer richer approaches in the future (Pilkington, 2007).

## **5 Research Methodology**

Research methodologies are the approaches used by researchers to construct and shape a study, gather data and evaluate information applicable to the research questions. There are two alternative models, namely, quantitative and qualitative research. Quantitative method focuses more on the positivist tradition, while qualitative methodology is most frequently allied with naturalistic or realistic inquiry (Polit & Beck, 2008).

Qualitative methodology was seen as the best research methodology for this study. In qualitative research, the researcher primarily collects together qualitative data, which is, in narrative and descriptive forms, such as the transcript of an unstructured interview or a collection of rich narrative materials from articles, journals or other reliable sources (Polit & Beck, 2008). Collection and analyses of data in this research are based on previous research within the scope of the study about how music plays a role on agitation in people with dementia.

Most qualitative researchers recognize a relation to one of the research traditions or kinds of studies while some qualitative studies, conversely, claimed no specific disciplinary or methodological roots. Researcher may basically specify that they have piloted a qualitative study based on realistic inquiry, or they may say that they have done a content analysis (Polit & Beck, 2008).

Qualitative researchers have highlighted six important characteristics in their research: (1) a belief in multiple realities, (2) a commitment to identifying an approach to understanding that supports the phenomenon studied, (3) a commitment to the participant's viewpoint, (4) the conduct of inquiry in a way that limits disruption of the natural context of the

phenomena of interest, (5) acknowledge participation of the researcher in the research, and (6) the conveyance of an understanding of phenomena by reporting in a literary style rich with participant commentaries (Streubert & Carpenter, 2011).

## **5.1 Content Analysis**

Content analysis is considered an old familiar way of interpreting results. It includes analysis of messages, books, reports, films, drawings, letters, and related kinds of data. In content analysis, there is a diverse method of evaluating contents expressed in forms of categorical components or measures.

Polit and Beck (2008) defines content analysis as “the process of organizing and integrating narrative, qualitative information according to emerging themes and concepts.” This means that this type of analysis breaks down the data into smaller components, which then involves coding and identifying names according to the content they characterized, and group coded material based on common concepts.

There are three distinct approaches of content analysis: (1) conventional, (2) directed, and (3) summative. Conventional content analysis uses coding categories derived directly the text data. The directed content analysis starts with a theoretical idea or significant research findings as basis for initial codes. Lastly, with the summative approach, analysis involves counting and comparisons, followed by the analysis of the core context (Hseih & Shannon, 2005).

In this study, content analysis for the interpretation of results has been chosen. Basis for the chosen analytical preference was solely because this study uses previous narrative materials from articles published between 2009-2015. In more detailed specification, the conventional content analysis was used to interpret the data.

## 6 Conduction of the Study

Five articles from the total literature have been selected to serve as data for the content analysis. These articles have been summarized and tabulated in a well-defined manner in terms of the title, author and year, place of study, method, aim and main results. Hence, the overview of the materials for analysis can be seen in the table below.

Overview of the articles as materials for analysis

Author and year	The title	The place of study	The method	The aim of the study	The main outcome
Skingley, A. & Vella-Burrows, T. 2010	Therapeutic effects of music and singing for older people	Sidney De Haan Research Centre for Arts and Health, Canterbury Christ Church University, Folkestone.	Content Analysis	To identify how music and singing may be used therapeutically by nurses in caring for older people.	All studies reported benefits from music of singing for older people. Positive findings related to dementia.
Johnson, R. & Taylor. C. 2011	Can playing pre-recorded music at mealtimes reduce the symptoms of agitation for people with dementia?	United Kingdom	Literature Review Analysis	To explore evidence that playing pre-recorded relaxing music at mealtimes can reduce the symptoms of agitation in people with dementia.	The use of appropriate relaxing music can help to decrease aggressive behaviours in some clients.

## Overview of the articles as materials for analysis (conj)

Author and year	The title	The place of study	The method	The aim of the study	The main outcome
Park, H., Pringle Specht, J.K 2009	Effect of Individualized Music on Agitation in Individuals with Dementia Who Live at Home	Florida State University, College of Nursing, Florida USA	Pilot study	To investigate the effect of individualized music on agitation in individuals with dementia who live at home.	The mean agitation levels were significantly lower while listening to music than before listening to music.
Wall, M. & Duffy, A. 2010	The effects of music therapy for older people with dementia	Ireland	Comprehensive Review	To explore how music therapy influences the behaviour of older people with dementia	Music therapy influenced the behaviour of older people with dementia in a positive way by reducing levels of agitation.

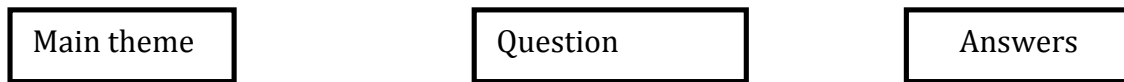
## Overview of the articles as materials for analysis (conj)

Author and year	The title	The place of study	The method	The aim of the study	The main outcome
Marmstål Hammar, L., Amami, A., Engström, G. & Götell, E.  2010	Communicating through caregiving singing during morning care situations in dementia care	Sweden	Qualitative Content Analysis from Video Observations data	To describe how persons with dementia (PWD) and their caregivers express verbal and nonverbal communication and make eye contact during the care activity “getting dressed”, during morning care situations without and with music therapeutic caregiving (MTC).	Music therapeutic caring - when caregivers sing for or together with persons with dementia (PWD) during caregiving activities has been shown to enhance communication for PWD, evoking vitality and positive emotions.



## 6.1 Results of the study

Five themes were achieved after thorough analysis of the selected articles. It comprises the question words WHO, HOW, WHEN, WHERE, and WHAT. Each theme has a corresponding question and answers, and will be presented below.



**WHO:** Who provided/facilitated music intervention?

→ Nurse, music therapist, family member, trained health caregiver

**HOW:** How was music intervention implemented? Ways of implementation.

→ Singing (communication through singing), listening to relaxing music, individualized or personalized music (music preference), music group therapy

**WHEN:** When was music intervention used?

→ During morning wash, mealtimes, during group therapy

**WHERE:** Where was music intervention implemented?

→ at home, nursing homes or institutional settings

**WHAT:** What are the benefits of music?

→ Significantly lower agitation levels after listening to music, appropriate relaxing music decreases aggressive behaviours in some clients, music has positive effect in mood and socialization and reduces agitation, positive benefits to dementia, enhanced interaction, cooperation, communication

### **WHO: Music intervention provider/facilitator**

Caregivers can be trained specialist, healthcare staff or family members. Although music therapists and other professionals provide music therapy, family members and other caregivers embrace a better understanding and background of the patient, and familiarity and thorough knowledge is a vital facet in caring for patients with dementia. A study of a spousal caregiver-directed music intervention found out that music-sharing experiences were beneficial to the spousal relationship. In addition, it promoted satisfaction with caregiving and caregiver wellbeing. It also was found out to enhance the mood of both the caregiver and the spouse with dementia (Baker, Grocke & Pachana, 2012).

- *“Although music therapists provide music therapy, other professionals and family caregivers can also provide music therapy to induce a therapeutic effect.” (Clair, 2000)*

Sung et al. (2011) explored the nursing staff’s attitudes and the use of music for older people with dementia in long-term care facilities. Results showed that most of the nursing staff held positive attitudes towards the use of music in dementia care. However, only 30.6% claimed that they had used music throughout their nursing practice in caring for people with dementia. Most of the nurses reported that they have limited knowledge and skills in incorporating music to dementia care. Over half of the participants perceived that they lack time and resources to effectively implement music therapy in nursing practice.

Alligood & Tomey (2010, p. 197) cited Eriksson’s theory that “a human being is fundamentally holy, and this axiom is related to the idea of human dignity, which means accepting the human obligation of serving others with love and existing for the sake of others”. Thus, every human being has the fundamentals of natural care, which are constituted by the idea of motherliness, and implies cleansing and nourishing, spontaneous and unconditional love.

### **HOW: Listening to (preference) music , singing (Communication through singing)**

People with dementia manifest several behaviours including aggression, resistance, wandering and screaming. Behavioural problems start to occur and exaggerate as the day progresses, when there are no effective interventions given right from waking up or during morning wash. In one study done by Park and Pringle Specht (2009), the peak agitation

time occur many times during the day from 8:30 a.m. to 8:00 p.m. People with dementia have cognitive dysfunctions and speech disability. Once directed activities are not clear to them, and when speech problems inhibit them to express themselves, they easily get irritable, resistant or aggressive.

Communication is an integral part of caring. Communication can be verbal or nonverbal. Depending on the level of dementia a person has affects the interaction between the caregiver and the patient. Verbal communication used in Music Therapeutic Caregiving include singing songs about things other than getting dressed, such as dancing, love, sailing, God. Non-verbal communication, on the other hand, consist of non-verbal body movements related to getting dressed and eye contact.

Marstål Hammar et al. (2010) found that using music therapy caregiving enhances communication, cooperation and evokes vitality and positive emotions. This very interesting approach of music therapy caregiving is highlighted in this section. Below is a comparison of an ordinary morning care situation and morning care with music therapeutic caregiving.

In an ordinary morning care situation, the caregiver provides instructions. Some people with dementia comply physically and verbally, while others cooperate physically but remained silent. Some passively respond to the procedure, some were incapable of appropriate nonverbal communication but performed the movements correctly, and some do the opposite pattern, which shows correct verbal ability but movements were done incorrectly. In addition, the giving of instructions during morning care situations causes confusion, resistance and aggression to some people with dementia (Marstål Hammar et al., 2010).

In contrast to the typical daily routine of morning care from bed to bathroom, washing and dressing up, a different kind of set up was done emphasizing communication through singing and eye contact. All caregivers who participated in the study were given training in Music Therapeutic Caregiving (MTC) after the ordinary morning care situation prior to the intervention. Caregivers invite communication during morning care situations and patients with dementia respond actively and comply, communicate mutual relaxation and wellbeing, but some others respond with resistance or in incongruent manner.

The morning care situation with Music Therapeutic Caregiving involves eye contact throughout the whole procedure. Results show that while the caregiver is singing and

giving some non-verbal cues, the person with dementia actively participated either in singing, humming or whistling along and at the same time nonverbally participating in getting dressed movements. Other responses were resistance to the morning care procedure, closing eyes and sighing with exhaustion. However, most people with dementia were compliant (Marstål Hammar et al., 2010).

A person with dementia mentioned in this section is considered a suffering human being according to Eriksson's theory. In this concept, Eriksson uses to describe the suffering human being the patient. In Latin "patiens" means suffering. "The patient is a suffering human being, or a human being who suffers and patiently endures (Alligood & Tomey, 2010, p.195)".

As dementia progresses among the affected elderly, the ability to communicate gradually decreases in time. Their ability to process information gets progressively weaker and their responses can become delayed. Taking care of them in a daily basis is a great challenge. This requires a structure of caring that involves understanding, patience, and love. Eriksson's theory of Caritative Caring quoted that "Caritative Caring is a manifestation of the love that just exists...caring communion, true caring, occurs when the one caring in a spirit of carita alleviates the suffering of the patient" (Eriksson, 1992, pp.204-207).

Communication is one of the most integral parts of connecting to your patients, whether verbally or nonverbally. Caring communion is a form of intimate connection that characterizes caring (Eriksson, 1990). The concept of invitation finds a room for place where the suffering human being is allowed to rest, a place that breathes genuine hospitality, and where the patient's appeal for charity meets with a response (Eriksson & Lindström, 2000).

Communication isn't just talking. Gestures, movement and facial expressions can all express meaning. Body language and physical contact become meaningful when speech is challenging for a person with dementia. Though speech in dementia is either partially or fully affected, Eriksson (1992) believes that a caregiver can find out the patient's possibilities and help him move forward toward that which is no longer one's own but which belongs to one's self. Thus, communicating with the patient in any form alleviates the suffering of human beings and at the same time preserves human dignity (Eriksson, 1998).

There is a mounting evidence to validate the benefits of music and singing. Nurses should take into consideration singing or music as an intervention for older people. Skingley & Vella-Burrows (2010) suggested that individual preference to music should be taken into account. Individualized music has positive effects on agitation in individuals with dementia who live at home (Park & Pringle Specht, 2009). Playing pre-recorded music was facilitated during mealtimes. The aim of the study was to explore if music can reduce the symptoms of agitation. Findings showed that appropriate relaxing music can aid reduce aggressive behaviours in some patients (Park & Taylor, 2011).

### **WHEN & WHERE: time and location of music intervention**

This section includes only the time of intervention mentioned in the chosen articles, although there are others, which are being highlighted in other studies. A pilot study investigated the effect of individualized music to agitation. Participants who have dementia and who live at home listened to preferred music for 30 minutes before the peak agitation time, twice in a week for a period of two weeks duration. Findings showed that agitation levels were significantly lower after listening to music than before listening to music (Park & Pringle Specht, 2009).

Mealtime can be very stressful for some elderly people with dementia who are living in nursing care homes or other institutional settings. Johnson & Taylor (2011) explored the effects of pre-recorded music at mealtime. Findings showed that the pre-recorded relaxing music reduce the symptoms of agitation. It was further suggested in this study that music preference should be assessed through individual basis.

Communicating through singing to the patients during morning care activities promoted cooperation, relaxation and enhanced wellbeing (Marstål Hammar et al., 2010).

The act of caring in the context of Eriksson's theory embraces the caring elements such faith, hope, love, tending, playing, and learning. These fundamental components involve infinity and eternity and invite to deep communion. "*The act of caring is the art of making something very special out of something less special*" (Alligood & Tomey, 2010, p.194). Thus, the act of caring should be manifested to the suffering human being anywhere and anytime of the day regardless of time and space.

## **WHAT: Positive effects of music on agitation in dementia**

Another theme to emerge from the data literature was the positive effects of music on agitation among people with dementia. This theme will answer the aim of this thesis. The results include:

*“Agitation levels were significantly reduced while listening and after listening than before listening to individualized music.” (Park & Specht, 2009)*

*“...positive benefits from music or singing for older people” (Skingley & Vella-Burrows, 2010)*

*“The use of appropriate music relaxing music can help to decrease aggressive behaviour in some clients (Johnson & Taylor, 2011)*

*“Music Therapy influences the behaviour of older people with dementia” (Wall & Duffy, 2010)*

*“In Music Therapy Caregiving, most responded to caregivers in a composed manner, by being active, complicit and relaxed, although some were also resistant or incongruent (Marstål Hammar et al, 2010).*

There are other literatures supporting positive benefits of music to people with dementia. Chang et al. (2010) found that music programme during lunchtime significantly reduced physical and verbal aggressive behaviour among elderly people with dementia. In contrast, studies reported that music programme did not significantly affect agitation and anxiety in older people with dementia (Cooke et al., 2010).

Group music therapy among patients with dementia was found out to have a positive influence in participation during the sessions, especially those having mild phases of dementia. However, patients with more severe stages of dementia manifested signs of restlessness (Solé et al., 2014). Ledger & Baker’s (2007) findings indicated that patients were less agitated during and immediately after music therapy sessions. However, no significance was found on the long term effects of music therapy in reducing agitation”. During music therapy, agitated behaviours including anxiety, irritability and restlessness were reduced. Levels of CgA, a psychological stress indicator present in saliva, were decreased, indicating reduced levels of stress during music therapy (Suzuki et al., 2007).

Music preference should be considered in music intervention. While specific music might benefit some, it might not be as effective for others, or even not at all. Sherratt, Thornton & Hatton, (2004) reported that agitation was decreased while participants listened to their preferred music and remained at a lower than peak level even after the music listening. Park & Specht (2009) study also supports the use of listening to preferred music for home-dwelling individuals with dementia to reduce their agitation. There is reduction in some types of behaviour after listening to preferred music (Sung & Chang, 2005). Through familiar music and active participation, findings show that there was a decrease in symptoms, especially aggressive behaviour and anxiety". (Svansdottir & Snaedal, 2006). Thus, the use of preferred music has the potential to provide a therapeutic approach to the care of older people with dementia.

The themes altogether presented a whole view of the study. Although the main aim was to explore the benefits of music on agitation among elderly people with dementia, the respondent assumed that the other themes are parts of the whole spectrum of this study. Thus, giving the reader a clearer understanding and view of this phenomenon.

Eriksson's theory of caritative caring deals with the ethics of caring, which is considered the core of nursing ethics. Ethical caring is what we actually do as a definite approach in nursing practice; an approach embedded with respect, without prejudice, preserving human dignity and willingness to sacrifice something of ourselves (Alligood & Tomey, 2010, p.195).

In contrary to the use of pharmacological approach to dementia, the lack of side-effects in nonpharmacological intervention such as music therapy, is an advantage. Non-pharmacological interventions pose assuring techniques to develop the quality of life and music in specific create long lasting results on patient's emotional wellbeing (Clement et al., 2012). Hicks-Moore and Robinson (2008) also endorsed music therapy as a relatively inexpensive and non-invasive intervention very pertinent in the present economic climate. Music intervention established with ethical caring act of Eriksson's caritative theory can be a beneficial approach to dementia care. "In an ethical act, the good is brought out through ethical actions" (Alligood & Tomey, 2010, p.195).

## 7 Ethical Considerations

Nursing research has been competent in the past decades. The emphasis of nursing research has been aimed concerning problems associated to nursing practice. Nursing care involves human beings. Indeed, special concerns in qualitative research exist because the nature of the relationship that typically develops between the researcher and the study participants is more intimate (Polit & Beck, 2004, p.57). Thus, nursing research, which involves human beings is guided by ethical principles.

Ethical guidelines are imperative in nursing research. However, this ethical consideration pose a challenge to nurse researchers because sometimes the guidelines required contradict with the need to produce evidence of the highest possible quality for practice (Polit & Beck, 2004, p. 141).

Various codes of ethics have been developed due to human rights violation in the past. The Nuxemberg Code was developed after the Nazi annihilations. The most distinguished international ethical standard is the Declaration of Helsinki, which was approved in 1964 by the World Medical Association, and then later amended most recently in 2000 (Polit & Beck, 2004, p. 143).

Ethical principles in nursing research include respecting autonomous participation in research without any negative consequences. It should not cause harm but rather promotes good. The investigator protects the privacy of research participants as well as respects the personhood of not only the individuals but also including their families and significant others, valuing their diversity (Polit & Back, 2004, p. 144).

The International Council of Nurses (ICN) Code of Ethics for Nurses is a handbook for accomplishment grounded on societal standards and demands. The Code has served as the universal paradigm for nurses since it was first acknowledged in 1953. The Code is consistently studied, re-assessed and revised to cater out better solutions to the demands of nursing and health care in a changing society. The Code's essential and innate characteristic in nursing is respect for human rights, which includes the right to life, to dignity and to be treated with respect (ICN, 2012). The ICN Code of Ethics directs nurses in their day-by-day work decisions as well as supports their refusal to partake in activities that oppose with caring and healing.



## 8 Critical Review

Nursing research contributes to the scholarly knowledge and supports improvement in the nursing care field. However, not all published studies are considered sound without flaws. In fact, most research has limitations and weaknesses. Professional nurses should do reflective and thorough critique of nursing research to evaluate relevant reports and results. Therefore, it is worth knowing both the strengths and limitations as this plays a role in advancing nursing knowledge (Polit & Back, 2004, p. 654).

The critiquing guidelines of qualitative research by Streubert & Carpenter (2007, pp.316-318) outlined the section critical review. The guidelines involve credibility, auditability, and fittingness. The subject matter of this thesis was to identify the benefits of music among elderly people with dementia. Specifically, the respondent wished to discover how music manages agitation among elderly people with dementia. The respondent believed that this issue is a global one and that the results can be projected to the advancement of nursing profession. A qualitative approach was taken into consideration for the purpose of attaining a more and in-depth comprehension of this phenomenon.

The respondent chose five articles and used content analysis to analyse the data collected in the study. These five articles were extracted from academic search engines from 2009-2015. One criterion for choosing the data was the year of publication, which should be at least not more than 7 years ago. The second criterion was based on the topic of the scientific article, which the respondent believed could answer the aim of this thesis. As a result, five articles from 2009-2011 were chosen by the respondent to cater the aim of this study. Places of study among these articles include U.S.A., Sweden, UK, and Ireland.

The Need-Driven Dementia-Compromised Behaviour Model (NDB) and Progressively Lowered Stress Threshold Model (PLST) are believed to be appropriate models to have a better foundation and understanding about how a non-pharmacological approach such as using music is beneficial to dementia care. Furthermore, the theoretical framework used in this study was Eriksson's theory of caritative caring. Since nursing research deals with the care of human being, Eriksson pointed out that "*caritative caring means that we take caritas into use when caring for the human being in health and suffering*" (Lindström, Lindholm & Zeterlund, 2010, p. 190). Understanding the concepts of the two models mentioned in this study, nurses and other health professionals become more equipped in

dealing with dementia care. And incorporating the caritative caring based of Eriksson's theory will eventually alleviate the suffering of the patients.

Credibility refers to the trustworthiness of qualitative research finding (Polit & Beck, 2004 p. 430; Streubert & Carpenter, 2011, p. 94). It is called as a primary criterion to validity of qualitative research (Whittemore, Chase & Mandle, 2001). However, the credibility of this study was not completely undertaken. The researcher used findings of other articles, reviewed them, and made themes to make a new meaning. This means that there was no actual contact between the researcher and the participants of the study. On the other hand, credibility can be displayed when the participants themselves can familiarize with the reported findings. In the respondent's point of view, this thesis is partially credible, although the chosen articles in this study may have possessed credibility per se.

Streubert and Carpenter (2011, p.93) refer auditability as the ability of other academic scholars to grasp and understand the methods and findings of the original researcher. Fittingness (Streubert and Carpenter, 2011, p. 94) is a term used in qualitative research that denotes the probability of finding meaning significance in research findings to other people in similar situations. The respondent believed that this thesis possess both auditability and fittingness in a sense that the findings are easy to apprehend and can be applicable to similar situations.

## 9 Discussion

The aim of this study was to gain knowledge about the benefits of music on agitation among elderly people with dementia. In this chapter, the respondent will evaluate if the aim of the study has been answered, and will also check the study question, theoretical framework and results. The study question posed was “What are the benefits of music to elderly people with dementia experiencing agitation?”

The respondent collected data from online search engines using the following search keywords: elderly, dementia, behavioural problems, agitation, anxiety, aggression, anger, music and music therapy, wellbeing and quality of life. Five articles from 2009-2011 were chosen to answer the study question of this thesis. Content analysis was best chosen to analyze this particular study since it is based solely on a review of literature.

The nonpharmacological approach of using music to dementia involves an array of many aspects. Firstly, it involves someone to provide the music intervention. According to this study results, a nurse, a music therapist, or a family member can be a tool to implement this approach. However, some nurses perceived that they lack time and resources and that they need training skills to be able to implement music in dementia care more effectively and efficiently.

Secondly, how to implement music intervention is also vital. There are several ways to connect music to the patients. However, the respondent will only include what was in the scope of the data. Communicating through singing, listening to music and group therapy were mentioned. However, preferred or individualized music was found out to be effective in dementia care.

Thirdly, when and where to implement music intervention in dementia care are both themes obtained in this study. Specifically mentioned was the use of communicating through singing (music therapy caregiving) during morning care activities and listening to relaxing or individualized music during mealtimes. In addition, music intervention was done with elderly people living at home, in elderly care/ institutional settings.

According to a study by Park & Pringle Specht (2009), the peak agitation time of agitation was manifested from 8:30 in the morning until 20:00. They added that the participants' agitation occurred many times within that time range. Therefore, it is more likely to use

music intervention when the possibility of agitation may occur. However, the respondent recommends more research on this area.

Lastly, the benefits of music to dementia include: music therapy reduces levels of agitation levels, music and singing have positive benefits to dementia, listening to individualized music significantly lowers agitation level while listening than before listening, listening to pre-recorded music at mealtimes reduce the symptoms of agitation for people with dementia and music therapy caregiving during morning care situations enhances communication, activity, compliance, relaxation, and wellbeing.

Eriksson's theory of caritative caring was used as a theoretical framework for this study. Caritas is considered the fundamental motive of caring science. Love moves us to love and care for others. People with dementia are considered the suffering human beings. Healthcare providers are opted to manifest this act of caritative caring to their patients, preserve their dignity and commune an intimate connection with them. Communion in the context of this study means that creating possibilities for the other is involving genuinely in the care of people with dementia and allowing them to alleviate their suffering.

In conclusion, the respondent believes that music is a helpful additional tool along with the other interventions to manage agitation in dementia. However, effective ways to implement the right music on the right place and right time would make a difference to cater the need of people with dementia. People with different stages of dementia respond differently to musical intervention. Thus, this specific area needs to be considered in some future research.

## References:

Abi, V.R., O'Brien, J.G., Schoenbachler, B. (2006). Behaviour Disorders of Dementia: Recognition and Treatment. *American Family Physician*, 73:4.

ADI, Alzheimer's Disease International Statistics. (2015). <http://www.alz.co.uk> (Retrieved: 30.7.2015).

Algase, D.L., Beck, C., Kolanowski, A., Whall, A., Berent, S., Richards, K., & Beattie, E. (1996). Need-driven dementia-compromised behavior: An alternate view of disruptive behavior. *American Journal of Alzheimer's Disease*, 11(6), 10-19.

Alligood, M.R. & Tomey, A.M. (2010). *Nursing Theorists and Their Work*. Mosby Elsevier, U.S.A.

Alzheimer Europe. (2015). The Prevalence of Dementia in Europe/ Finland <http://www.alzheimer-europe.org/Policy-in-Practice2/Country-comparisons/The-prevalence-of-dementia-in-Europe/Finland> (Retrieved: 14.04.2015).

Ames, D., Ballard, C., Cream, J., Shah, A., Suh, G.H. & McKeith, I. (2005). For debate: should novel antipsychotics ever be used to treat the behavioural and psychological symptoms of dementia (BPSD)? *International Psychogeriatrics*, 17, 3-29.

Arslan, S., Özer, N., Özyurt, F. (2008). Effect of music on preoperative anxiety in men undergoing urogenital surgery. *Aust J Adv Nurs*. 26:46-54.

Ballard, C., Waite, J., Birks, J. (2006). Atypical antipsychotics for aggression and psychosis in Alzheimer's disease. *Cochrane Database of Systematic Reviews*, 1: CD003476.

Banerjee, S. (2009). *Report on the prescribing of anti-psychotic drugs to people with dementia*. United Kingdom Department of Health. [www.dh.gov.uk/en/Publicationandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_108303](http://www.dh.gov.uk/en/Publicationandstatistics/Publications/PublicationsPolicyAndGuidance/DH_108303). (Retrieved: 4.11.2015).

- Baker, F., Grocke, D., Pachana, N. (2012). Connecting through music: a study of a spousal caregiver-directed music intervention designed to prolong fulfilling relationship in couples where one person has dementia. *Australian Journal of Music Therapy*, 23, 4.
- Beccaloni, M.B. (2011). The Medicine of Music: A Systematic Approach for Adoption Into Perianesthesia Practice. *Journal of Peri-Anesthesia Nursing*, 26, 323-330.
- Birks, J. (2006). Cholinesterase Inhibitors for Alzheimer's disease. *Cochrane Database Syst Rev.* , 1:CD005593.
- BPAC. (2010). Antipsychotics in people with dementia – an update and reminder. BPACNZ. [www.bpac.org.nz/magazine/2010/antipsychotics.asp](http://www.bpac.org.nz/magazine/2010/antipsychotics.asp) (Retrieved: 4.11.2015).
- Casey, G. (2012). Alzheimer's and other dementias. *Kai Tiaki Nursing New Zealand*, 18,6.
- Cerejeira, Lagarto, & Mukaetova-Ladinska, (2012). Behavioural and psychological symptoms of dementia, *Front Neurol*, 7;3:73.
- Chang, F., Huang, H., Lin K., Lin, L. (2010). The effect of music programme during lunch time on the problem behaviour of the older residents with dementia at an institution in Taiwan. *Journal of Clinical Nursing*, 19, 939-948.
- Cheung, S.K., Chien,W.T, Lai, K.Y. (2011). Conceptual framework for cognitive function enhancement in people with dementia. *Journal of Clinical Nursing*, 20, 1533-1541.
- Clark, C., Fletcher, P., Warren, J. (2014). Music, reward and frontotemporal dementia. *Brain*, 137(10):e300.
- Clement, S., Tonini, A., Khatir, F., Schiarature, L. Samson, S. (2012). Short and longer term effects of musical interventions in severe alzheimer's disease. *Music Perception*, 29(5), 553-541.
- Cohen-Mansfield, J. (1996) Conceptualization of agitation: results based on the cohen-mansfield agitation inventory and the agitation behaviour mapping instrument. *International Psychogeriatrics* 8, 309-315.
- Cooke, M., Moyle, W., Shum, H.K., Harrison, S.D., Murfield, J. (2010). A randomized controlled trial exploring the effect of music on agitation behaviours and anxiety in older people with dementia, 14, 8.

Dileo, C. & Bradt, J. (2008). Music for Pre-operative Anxiety. (Protocol). *Cochrane Database of Syst Rev*, 1. CD006908. Doi:10.1002/14651858.CD006908.

Eriksson, K. (1987). *Vårdandets ide*. Stockholm: Almqvist & Wiksell. The idea of caring. Stockholm: Almqvist & Wiksell.

Eriksson, K. (1990). Pro Caritate. En lägesbestämning av caritativ vård. *Vårdforskningar* 2/1990. Vaasa, Finland: Instituteten för vårdvetenskap, Åbo Akademi. (Caritative Caring- A positional analysis, Vaasa, Finland: Department of Caring Science, Åbo Akademi).

Eriksson, K. (1992). Different forms of caring communion. *Nursing Science Quarterly*, 5, 93.

Eriksson, K. (1994). *Den lidande människan*. Stockholm: Liber Förlag. (The suffering human being. Stockholm: Liber Förlag.) (English translation published in 2006 by Nordic Studies Press, Chicago.)

Eriksson, K. (1998). Understanding the world of the patient, the suffering human being: The new clinical paradigm from nursing to caring. In C.E Guzzetta (Ed.), *Essential readings in holistic nursing* (pp.3-9). Gaithersburg, MD: Aspen.

Eriksson, K. (2003). Ethos, in K. Eriksson & U.Å. Lindström (Eds.) Dawn II. *Clinical caring science* (pp.21-34).

Food and Drug Administration (2014). *Drugs Side-effects*. Silver Springs, MD. [www.fda.gov/drugs/ResourcesForYou/ucm196029.htm](http://www.fda.gov/drugs/ResourcesForYou/ucm196029.htm) (Retrieved 27.10.2015)

Gaut, D.A. & Boykin, A. (1994). *Caring as Healing: Renewal Through Hope*. National League for Nursing Press, New York, NY.

Gruber-Baldini, A.L., Boustani, M., Sloane, P.D., & Zimmerman, S. (2004). Behavioral symptoms in residential care/assisted living facilities: Prevalence, risk factors, and medication management. *Journal of the American Geriatric Society*, 52, 1610-1617.

Hall, G.R., Buckwalter, K.C. (1987). Progressively lowered stress threshold. A conceptual model for care of adults with Alzheimer's disease. *Archives of Psychiatric Nursing*, 1,399-406.

Hicks-Moore, S.L. & Robinson, B.A. (2008). Favorite music and hand massage: Two interventions to decrease agitation in residents with dementia. *Dementia* 7(1):95-108.

Hsieh, H.F., Shannon, S.E. (2005). Three approaches to qualitative content analysis. *Qual Health Res.* 15(9):1277-88.

International Council for Nurses (ICN) Code of Ethics (2012). <http://www.icn.ch/who-we-are/code-of-ethics-for-nurses/> (Retrieved: 5.10.2015).

Johnson, R. & Taylor, C. (2011). Can playing pre-recorded music at mealtimes reduce the symptoms of agitation for people with dementia? *International Journal of Therapy and Rehabilitation*, 18, (12).

Keady, J. & Jones, L. (2010). Investigating the causes of behaviours that challenge in people with dementia, *Nursing Older People*, 22,9.

Koelsch, S., Siebel, W.A. (2005). Towards a neural basis of music perception. *Trends Cogn Sci*; 9:578-84.

Kohn, R., Mphil & Surti, M. (2008). Management of Behavioural Problems in Dementia. *Medicine and Health*, 91(11).

Kong, E.H. (2005). Agitation in dementia: concept clarification. *J Adv Nurs*, 52(5):526-36.

Kovach, C.R., Noonan, P.E., Schlidt, A.M., & Wells, T. (2005). A model of consequences of need-driven dementia-compromised behavior. *Journal of Nursing Scholarship*, 37, 134-140.

Laitinen, M.L., Bell, J.S., Lavikainen, P., Lönnroos, E., Sulkava, R., Hartikainen, S. (2011). Nationwide study of antipsychotic use among community-dwelling persons with Alzheimer's disease in Finland. *Int Psychogeriatr*, 23 (10):1623-31.

Lanctot, K. L., Rajaram, R.D. (2009). Therapy for Alzheimer's disease. How effective are current treatments? *Therapeutic Advances in Neurological Disorders*, 2, 163-180.

Ledger, A.J., Baker, F.A. (2007). An Investigation of long-term effects of group music therapy on agitation levels of people with Alzheimer's Disease. *Aging Ment Health* 11(3):330-8.



- Lindström, U.Å., Lindholm, L., and Zetterlund, J.E. (2010). Theory of Caritative Caring. In: Alligood MR and Tomey AM(eds) *Nursing theorists and their work*. 7<sup>th</sup> ed. Missouri, USA: Mosby Elsevier, pp.191-221.
- Lin, S., Yang, P., Lai, C., Su, Y., Yeh, Y., Huang, M., Chen, C. (2011). Mental Health Implications of Music: Insight from Neuroscientific and Clinical Studies. *Harv Rev Psychiatry*, 19:34-46.
- Marmstål Hammar, L., Emami, A., Engström, G., Götell, E. (2010). Communicating through caregiver singing during morning care situations in dementia care. *Scandinavian Journal of Caring Sciences*, 25;160-168.
- Meinhold, J.M., Blake, L.M. Mini, L.J., Welge, J.A., Schwiers, M., Hughes, A. (2005). Effect of Divalproex Sodium on Behavioural and Cognitive Problems in Elderly Dementia. *Drugs Aging*, 22 (7): 615-626.
- Monastero, R., Camarda, C., Pipia, C. and Camarda, R. (2007). Visual hallucinations and agitation in Alzheimer's disease due to memantine: report of three cases. *J Neurol Neurosurg Psychiatry*, 78(5):546.
- Mooney, S.F., & Shank, S.L. (2008). Alzheimer's: The elusive mind stealer. National Center of Continuing Education, Course # 3010, 4-26.
- Moretti, R., Torre, P., Antonello, R.M. & Pizzolato, G. (2006) Atypical neuroleptics as a treatment of agitation and anxiety in Alzheimer's disease: risk or benefits. *Expert Review of Neurotherapeutics* 6, 705-710.
- Nazarko, L. (2009). Dementia care: the use and abuse of anti-psychotic drugs. *Nursing & Residential Care*, 11, 3: 138.
- Nettina, S.M (2010). *Manual of Nursing Practice*. Wolters Kluwer Health, Lippincott Williams & Wilkens.
- Norton, M.J., Allen, R.S., Snow, A.L., Hardin, J.M., Burgio, L.D. (2010). Predictors of need-driven behaviours in nursing home residents with dementia and associated certified nursing assistant burden. *Aging Mental Health*, 14(3):303-9.
- Official Statistics of Finland (OSF) (2015): Causes of death, ISSN=1799-5078. 2013, 3. Deaths from dementia and Alzheimer's disease are increasing . Helsinki: Statistics Finland

[http://www.stat.fi/til/ksyyt/2013/ksyyt\\_2013\\_2014-12-30\\_kat\\_003\\_en.html](http://www.stat.fi/til/ksyyt/2013/ksyyt_2013_2014-12-30_kat_003_en.html) (Retrieved 26.10.2015).

Omar, R., Henley, S.M., Barlett, J.W., Hailstone, J.C., Gordon, E., Sauter, D.A., et al. (2011). The structural neuroanatomy of music emotion recognition: evidence from frontotemporal lobar degeneration. *Neuroimage*, 56:1814-21.

Park, H., Pringle Specht, J. K. (2009). Effect of Individualized Music on Agitation in Individuals with Dementia Who Live at Home. *Journal of Gerontological Nursing*, 35, (8).

Patel, A.D. (2008). *Music, Language, and the Brain*. Oxford University Press, New York, U.S.A.

Perry, D.C., Sturm, V.E., Seeley, W.W., Miller, B.L., Kramer, J.H., Rosen, H.J. (2014). Anatomical correlates of reward-seeking behaviours in behavioral variant frontotemporal dementia. *Brain*, 137: 1621-26.

Petrocelli, J.V., & Smith, E.R. (2005). Who I am. Who we are, and why: Links between emotions and causal attributions for self and group discrepancies. *Personality and Social Psychology*, 31, 1628-1642.

Pilkington, F.B. (2007). Envisioning nursing in 2050 through the eyes of nurse theorists: Katie Eriksson and Margaret Newman. *Nurse Sci Q*; 20(#): 200.

Polit, D. F., Beck, C.T. (2008) *Nursing Research: Generating and Assessing Evidence for Nursing Practice*, 8<sup>th</sup> ed. Philadelphia: Lippincott Williams & Wilkins.

Prince, M. & Jackson, J. (eds.) (2009). *Alzheimer's Disease International World Alzheimer's Report*. London.

Ridha, B.H., Josephs, K.A, Rossor, M.N.(2005). Delusions and hallucinations in dementia with Lewy bodies: worsening with memantine. *Neurology*, 65:481-2.

Salimpoor, V.N., van den Bosch, I., Kovacevic, N., McIntosh, A.R., Dagher, A., Zatorre, R.J. (2013). Interactions between the nucleus accumbens and auditory cortices predict music reward value. *Science*, 340:216-9.

Schwarz, S., Froelich, L. and Burns, A. (2012). Pharmacological treatment of dementia. *Curr Opin Psychiatry*, 25(6):542-50.

Seignourel, P.J., Kunik, M.E., Snow, L., Wilson, N., and Stanley, M. (2008). Anxiety in dementia: A Critical Review. *Clin Psychol Rev*, 7:1071-1082.

Senanarong, V., Cummings, J.L., Fairbanks, L., Mega, M., Masterman, D.M., O'Connor, S.M., & Strickland, T.L. (2004). Agitation in Alzheimer's Disease is a manifestation of frontal lobe dysfunction. *Dementia and Geriatric Cognitive Disorders*, 17, 14-20.

Sherratt, K., Thornton, A., & Hatton, C. (2004). Emotional and behavioural responses to music in people with dementia: An observational study. *Aging & Mental Health*, 8, 233-241.

Sink, K.M., Holden, K.F., & Yaffe, K. (2005). Pharmacological treatment of neuropsychiatric symptoms of dementia: a review of the evidence, 293:596-608.

Skingley, A. & Vella-Burrows, T. (2010). Therapeutic effects of music and singing for older people. *Nursing Standard*. 24, 19, 35-41.

Solé, C., Mercadal-Brotons, M., Galati, A., De Castro, M. (2014). Effects of Group Music Therapy on Quality of Life, Affect, and Participation in People with Varying Levels of Dementia. *Journal of Music Therapy*, 51(1), 103-105.

Smith, M., Gerdner, L.A., Hall, G.R., & Buckwalter, K.C. (2004). History, development, and future of the Progressively Lowered Stress Threshold: a conceptual model for dementia care. *Journal of American Geriatric Society*, 52, 1755-1760.

Steffens, D.C., Maytan, M., Helms, M.J., & Plassman, B.L. (2005). Prevalence and clinical correlates of neuropsychiatric symptoms in dementia. *American Journal of Alzheimer's Disease and Other Dementias*, 20, 367-373.

- Streubert, H.J., Carpenter, D.R. (2011) *Qualitative Research in Nursing: Advancing the Humanistic Imperative*. 5th ed. Philadelphia: Lippincott Williams & Wilkins. Wolters Kluwer Health.
- Sung, H. & Chang, A. M. (2005). Use of preferred music to decrease agitated behaviours in older people with dementia: a review of the literature, *Journal of Clinical Nursing*, 14, 1133-1140.
- Sung, H., Chang, A.M., Lee, W.L. (2010). A preferred music listening intervention to reduce anxiety in older adults with dementia in nursing homes. *Journal of Clinical Nursing*, 19, 7-8: 1056-1064.
- Suzuki, M., Kanamorei, M., Nagasawa, S., Tokiko, I., Takayuki, S. (2007). Music Therapy-induced changes in behavioural evaluations, and saliva chromogranin A and immunoglobulin A concentrations in elderly patients with senile dementia. *Geriatric and Gerontology International* 7(1):61-71.
- Svandsdottir, H.B. & Snaedal, J. (2006). Music therapy in moderate and severe dementia of Alzheimer's type: a case control study. *Int Psychogeriatr* 18(4): 613:21.
- Tame, D. (1984). *The Secret Power of Music*. Destiny Books: New York.
- Tramo, M.J., Shah. G.D., Braida, L.D. (2002). Functional role of auditory cortex in frequency processing and pitch perception. *Journal of Neurophysiology*; 87:122-39.
- Trifiro, G. (2011). Antipsychotic drug use and community-acquired pneumonia. *Curr Infect Dis Rep*, 13(3): 262-8.
- Twelftree, H. & Qazi, A. (2006). Relationship between anxiety and agitation in dementia. *Aging and Mental Health*, 10(4):362-367.
- Vance, D.E., Moore, B.S., Farr, K.F., & Struzick, T. (2008). Procedural memory and emotional attachment in Alzheimer's disease: Implications for meaningful and engaging activities. *Journal of Neuroscience Nursing*, 40(2), 96-102.
- Van der Maarel-Wierink, C.D., Vanobbergen, J.N.O., Bronkhorst, E.M. Schols, J.M.G.A., de Baat, C. (2011). Risk factors for aspiration pneumonia in frail older people: a systematic literature review. *J Am Med Dir Assoc*, 12(5):344-54.
- Vasionyte, I. & Madison, G. (2013). Music intervention for patients with dementia: a meta-

analysis. *Journal of Clinical Nursing*, 22, 1203-1216.

Wall, M. & Duffy, A. (2010). The effects of music therapy for older people with dementia. *British Journal of Nursing*, 19,2.

Whittemore, R., Chase, S.K., & Mandle, C.L. (2001). Validity in qualitative research. *Qualitative Health Research*, 11, 522-537.

World Alzheimer's Association (2015). Alzheimer's disease facts and figures. (Retrieved April 26, 2015) <http://www.alz.org/AboutAD/Statistics.asp>

World Health Organization (2015). Dementia <http://www.who.int/mediacentre/factsheets/fs362/en/> (Retrieved: 26.04. 2015).

## Appendices:

### Appendix 1

Below is a simplified and well-defined table consisting the different stages of dementia and each of its characteristics.

**Table 1. Stages of dementia**

<b>Stages</b>		<b>Characteristics</b>
Stage I	Mild	Changes in behaviour, problems with ADL(activities of daily living) such as using phone, shopping,etc., short-term memory affected, geographical disorientation
Stage II	Moderate	Aphasia, apraxia, agnosia, increase problems with ADL, behaviour problems, impaired short-term memory, more disorientation
Stage III	Severe	Severe memory loss, incontinence, gradual incapacity to ingest food from the mouth, full dependence in ADL, no orientation of time and space

Sources: (Mooney & Shank, 2008)

## Appendix 2

**Table 3. Subtypes of agitation in dementia**

Physically aggressive behaviour	Hitting, biting, kicking, pushing, scratching, destroying objects, spitting
Physically non-aggressive behaviour	Restlessness, aimless wandering, pacing, inappropriately putting on or removing clothes, plotting to leave for some other place, handling objects in inappropriate ways, performing an action repeatedly, being generally unable to sit or stand at ease
Verbally agitated behaviour	Cursing, yelling or screaming, relentless demanding to attract attention
Verbally non-agitated behaviour	Complaining, repeatedly asking questions

Source: (Cohen-Mansfield, 1996)

## Appendix 3

**Table 3 Components of music and respective brain region processing**

<b>Components of music</b>	<b>Brain region being processed</b>
<b>Pitch</b> – the perceived fundamental frequency of a sound	Heschl's gyrus, planum temporale, parietal lobe, anterior superior-temporal gyrus, insula, left dorsolateral cortex, right inferior frontal cortex
<b>Timbre</b> – the quality of a musical sound that distinguishes different types of sound production	Planum temporale, parietal lobe, anterior superior-temporal gyrus
<b>Rhythm</b> – the organizational pattern of sound in time of the timing of musical sound	Planum temporale, parietal lobe, anterior superior-temporal gyrus, insula, premotor cortex, supplemental motor area, cerebellum, basal ganglia
<b>Melody</b> – the dominant tune of composition	Heschl's gyrus, anterior superior-temporal gyrus, planum temporal
<b>Music Recognition</b>	Anterior superior-temporal gyrus, temporal pole, insula, middle/inferior temporal gyri, frontal lobe
<b>Music Emotion</b>	Planum temporal, parietal lobe, insula, limbic circuit, nucleus accumbens, ventral tegmental area, orbitofrontal cortex

Source: Lin et al. Harv Rev Psychiatry, 2011 page 36