

## Review Article

# Music therapy as a non-pharmacological intervention for persons living with dementia: client assessment and types of music therapy interventions

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## ABSTRACT

Geriatric giants account for the five most prevalent morbidities that cause immense decline in functional capacity and decreased quality of life. Immobility, instability leading to falls and fractures, incontinence, impaired cognition (dementia) and iatrogenesis affect majority of the ageing elderly leading to dependency, caregiving and associated burden among caregivers. Concept of non-pharmacological interventions in dementia care: interventions that involve non-pharmacological (non-medicinal) measures, have proven benefits to the people living with dementia (PLWD). music therapy, nature therapy that involves nature walks and living amidst natural spaces, have shown to have immense biophilia effects on the various organ systems in the human body. Immense health benefits have been documented among PLWD: dawn phenomenon is a clinical phenomenon where the PLWD experiences agitation, aggression and loud speech in the evenings associated with dementia. Out of all the seven studies published, there were significant improvements in mood, reduction in aggressive behavior, improving anxiety symptoms, reducing caregiver burnout and improving overall quality of life of the people living with dementia and their caregivers. With promising results among various interventional studies across the world, NPI is an important intervention with minimal to nil side effects with long term benefits on frequent administration.

**Keywords:** Non-pharmacological interventions, Dawn phenomenon, People living with dementia, Music therapy

## INTRODUCTION

Dementia is a clinical condition affecting urban and rural elderly (geriatric population).

A person's ability to perform daily tasks, forgetting become a routine habit and functional decline is evident in performing the tasks, that they performed previously. The People living with dementia, find difficulty to locate common objects at home, relate it to the symptoms of forgetfulness associated with the ageing process. Complications could arise due to double/multiple intake of medications due to the symptoms of dementia. Non

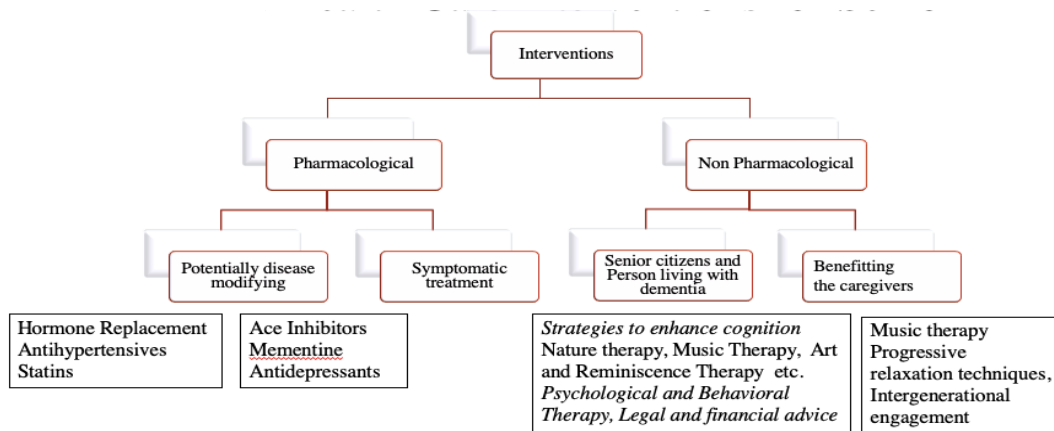
pharmacological interventions have shown to have immense benefits for the PLWD, in improving their quality of life and reducing caregiver burden associated with their caregiving.

Non-pharmacological intervention (NPI) is defined as any sort of intervention not directly involving a medication; attempting to optimize a patient's healthcare needs or to better manage their chronic illness. Non-pharmacological interventions manage pain, reduce stress, encourage positive changes in mood, reduce in depression, and increase awareness of self and environment and aid in social interaction.<sup>1</sup> With immense health benefits and

minimal to nil side effects, NPI's have immense benefits to elderly, on treatment for multiple co-morbid conditions and thus optimizing their wellbeing and quality of life.

## INTERVENTIONS IN ELDERLY CARE<sup>2</sup>

Available health care interventions for senior citizens is given in Figure 1.



World Alzheimer's report 2014

**Figure 1: Health care interventions for senior citizens.**

## PRINCIPLES OF CENTRAL AUDITORY PROCESSING: HOW THE BRAIN PROCESSES MUSIC

The human brain has a unique capacity to organize details anatomically, functionally and in a hierarchical manner, passing on information from the 5 sense organs and passing information to higher centres for processing critical information trying to associate with thoughts and memory to create a multi-dimensional output of thoughts, words, emotions or motor actions. Music, an amalgamation of the creators' skills, tune created from the instruments also follows this pattern of hierarchy. Rhythm, pitch, frequency and melody are well appreciated and coded by the brain in a particular hierarchical manner. Multiple stimulation by such rhythmic frequencies stimulates the brain and the information stored in the previous musical experience is retrieved and a particular behavioural response is evoked. The emotional aspect associate with the response is interpreted in a partly independent brain hierarchy that helps to direct the behavioural response and to determine future behaviour (such as music seeking or avoidance).<sup>3</sup>

## CONCEPT OF ENTRAINMENT

Rhythmic entrainment refers to a process whereby an emotion is evoked by a piece of music because a powerful, external rhythm in the music. This influences some internal bodily rhythm of the listener (e.g. heart rate/mood/emotion), such that the latter rhythm adjusts towards and eventually 'locks in' to a common periodicity.<sup>4</sup> This is a principle of every music therapy intervention. Human mind, body and emotions can be programmed using this principle.

## WHY MUSIC THERAPY? IT'S BENEFITS

Playing percussion instruments, singing a song, reciting mantras, reciting ragas or group singing can significantly improve wellness in an individual.

Music helps an individual to get back from a negative state to positive. Music activates the brain, balances the mind, body and the soul. Music balances physical, mental, psychological, social interactions and wellbeing.

## MORBIDITIES WHICH HAVE HEALTH BENEFITS WITH MUSIC THERAPY

Dementia, depression, insomnia, post-traumatic fall injuries, wound healing, anxiety disorders, improving creativity, social interaction and improves quality of life.<sup>5</sup>

Dementia is a clinical condition with symptoms of forgetfulness, difficulty to perform daily routine. Cognitive, affective, social and psychomotor domains are affected here, compelling the PLWD to seek for assistance to perform their activities of daily living (adl) and instrumental activity of daily living (IADL).<sup>6,7</sup> Non-pharmacological music interventions would be beneficial to address the negative symptoms of dementia i.e., dawn phenomenon which include agitation, aggression and loud speech. Holistic chants, calming music, of a slow pace, enhances positive outcomes in behavior and controlling the dawn phenomenon. Mantras, holistic chants, soothing music works for all age-groups, slowly, but steadily; leading to improvement in overall wellbeing, over a sustained period of time. In order to address the affected domains, both pharmacological and non-pharmacological interventions are required.

## CLIENT ASSESSMENT FOR A MUSIC THERAPY SESSION

### *Proforma format, for music therapy interventions in a PLWD*

The assessment methods for a clients of dementia can be divided into six headings: 1) pre-intervention assessment: questions to be asked before the beginning of an intervention, 2) assessing the cognitive, behavioural and quality of life in geriatric clients, 3) setting up goal areas, goals and objectives for the intervention in the clients, 4) compiling all findings to decide one to one / group therapy and type of music, 5) session plan with a questionnaire format, intervention and goals and 6) post-intervention outcome assessment.

### *Description of the steps in detail*

#### *Pre-intervention assessment*

Pre-intervention assessment: (i) sociodemographic details such as name, age, gender, occupation, socioeconomic

status place of residence, marital status, religion, spoken language, knowledge about music, if listened to a particular type of music/ sings/ plays instrument, (ii) culture and background: religious customs and beliefs, (iii) forgetfulness (recent events and remote events) MMSE8/ HMMSE9, (iv) difficulty to perform daily routine (ADL, IADL), (v) assessment of mood, detailed history of psychological events, neurological insults, (vi) response assessment: responses to the questions asked speech fluency, relevance, expressions, non-verbal gestures, (vii) History of self-isolation, enuresis and loss of bladder control, (viii) physiological issues: movement disorders, CVD's, respiratory illness etc and (ix) understanding capability to Music, if he played any musical instruments, listening to music.

#### *Details and assessment before and after the intervention*

Table 1 provides the details of assessing the cognitive, behavioural and quality of life in geriatric clients, setting up goal areas, goals and objectives for the intervention in the clients.

**Table 1: Details and assessment before and after the intervention.**

Goal area	Goal	Objectives
<b>Communication</b>	To reduce the tempo of negative symptoms in PLWD (spoken comments)	By administration of music the client will be able to reduce word count from 60 words /min to 10 word per minute
<b>Cognitive</b>	To demonstrate accurate multiplication	demonstrate accurate multiplication.
<b>Behaviour</b>	To cope up with skills, effectively	On three consecutive sessions skill demonstration
<b>Social</b>	To learn social greeting	Greet recall and demonstrate using songs on three occasions.
<b>Emotional</b>	To increase the appropriateness of frustration and anger control	Not expressing anger.

#### *Group therapy and type of music*

They would conduct one to one intervention involving people living with dementia (PLWD) and interviewer and caregiver and interviewer.

## CAREGIVER BURNOUT ASSESSMENT ZARIT CAREGIVERS BURDEN ASSESSMENT<sup>10</sup>

### *Caregivers emotions*

Anger, embarrassment, not comfortable to have friends at home scoring from 0-4, caring affecting caregiver's health, privacy, their relationship with friends and family, caregivers' burnout assessment: receiving excessive help requests, responsibility of having taken completely on one caregiver.

### *Scores*

0-20 no or minimal burden, 21-40 mild to moderate burden, 41-60 moderate to severe burden and severe burden.

#### *Quality of life assessment using dementia quality of life scale (DEMQOL) before and after the intervention<sup>11</sup>*

In the past one week what would be the domains that are affected and need to be addressed are as follows: mood, behavior, mindset, emotional state, living together/alone, memory: forgetfulness, difficulty to perform daily routine, thoughts and decision making, their social interactions with people at home and around.

#### *Intervention proper*

Music therapy is done individually for a single person living with dementia. Music in particular, stimulates the limbic system & the hippocampus, which is known to retain long-term memory and has retained emotional impact. Music triggers these long-term memories. PLWD who have not interacted in years, begin to sing songs that they knew in their early teenage and adulthood. Thus, music therapy can be an effective tool for wellbeing and improvement in the overall quality of life by alleviating the symptoms of aggression/agitation

associated with sun dawning in the people living with dementia.

### RAAGAS USED FOR DEMENTIA CARE (INDIAN RAAGAS)

Irregular sleep patterns and depression are major problems in patients with late-stage dementia. A study that used Indian music found that raagas like “Bahar,” “Bihag,” “Mishra Pilu,” and “Malay Marutam” caused sustained improvement in the sleep quality of patients with depression.<sup>12</sup> A study on healthy individuals found that a raaga named “Desi Todi” decreased blood pressure, symptoms of anxiety, and stress while enhancing feelings of satisfaction, hope, and optimism.<sup>13,14,21</sup>

“Raaga Dwijavanthi” and “Raaga Madhyamavati” provides health benefits for muscle paralysis and reducing heaviness on one side of the body.<sup>21</sup>

### NEUROTRANSMITTERS STIMULATED DURING MUSIC THERAPY SESSIONS

Dopamine and Opioid hormones stimulation reward centers, provides motivation and contentment. Reduces the secretion of cortisol and ACTH, thus reducing stressors. Oxytocin release helps in bonding, improving social interaction and communication.

**Table 2: Other types of music interventions in dementia care in different countries around the world.**

S. no.	Year (author)	Place of study	Participants and study design	Therapy/ intervention used	Outcome of the intervention	Limitations of the study
1	2002 (Jennings and Vance) <sup>15</sup>	LSU Health Sciences Center in New Orleans, Louisiana, USA	16 Alzheimer's patients/pre post evaluation study	30 minute music classes once a week for 4 weeks	Agitation was markedly reduced	Didn't have reduction in aggressive symptoms: hitting/ spitting
2	2005 (Methisus et al) <sup>22</sup>	Germany	40 patients with dementia / observational study with nested in single case vignettes	To explore the effectiveness of home-based music therapy. Singing songs and playing familiar music	Improvement in mood.	None
3	2005 (Gotell et al) <sup>16</sup>	Sweden	Caregivers and persons living with dementia/ qualitative study	Background music and caregiver singing	Enhancing positive emotions between patient and caregiver/ reduction in aggressiveness	None
4	2006 (Holmes et al) <sup>17</sup>	United Kingdom (U.K.)	32 patients living with dementia/RCT Placebo controlled trial with blinded observer	Exposed to live interactive music, passive prerecorded music followed by 30-minute silent period	Positive engagement to live music reduces aggression, apathy	Prerecorded music less beneficial. /
5	2010 (Baker et al) <sup>18</sup>	Australia	120 couples where one partner has a probable diagnosis of dementia/two-armed RCT	To advance the understanding of MT-techniques to enhance spousal relationship and reduce functional and emotional strain on the spousal caregiver. Singing familiar songs, movement to music, listening to music control:		

Continued.

S. no.	Year (author)	Place of study	Participants and study design	Therapy/ intervention used	Outcome of the intervention	Limitations of the study
				recreational reading intervention		
6	2007 (Ledger and Baker) <sup>19</sup>	University of Queensland, Australia	Alzheimer's patients/Non randomized experimental study design	Short term music therapy	Only short-term reduction in agitation symptoms	Need for long term music therapy, required.
7	2012 (Sung et al) <sup>20</sup>	Taiwan	Alzheimer's patients	Similar music played on percussion instruments	Reduction in anxiety and agitation	Non

## CONCLUSION

Out of all the seven studies published, there were significant improvements in mood, reduction in aggressive behavior, improving anxiety symptoms, reducing caregiver burnout and improving overall quality of life of the people living with dementia and their caregivers. Non-Pharmacological interventions could be an important tool which shows promising results for elderly care.

## Recommendations

Generating awareness about these interventions, among the elderly, on addressing the common morbidities and improving elderly care, could have immense implications in the days ahead.

Demonstrating the health benefits with documented research studies, is the need that has to be addressed, at their earliest.

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