

EXPLORING THE POTENTIAL OF MUSICAL ACTIVITY SYSTEMS FOR PEOPLE WITH DEMENTIA AND THEIR CAREGIVERS

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ABSTRACT

As our population ages, more and more people develop dementia, which is a great concern for families and communities. Music has been found to be useful in relieving symptoms of dementia and in promoting interaction between patients, caregivers, and family members. However, music therapy requires a music therapist to plan and prepare equipment that is tailored to the preferences and needs of each patient. It can also be difficult to continue musical activities outside therapy sessions due to the lack of musical experience between patients and caregivers. To solve this problem, a study was conducted to investigate how caregivers can conduct musical activities using equipment commonly used in music therapy. A literature review was used to understand current issues affecting people with dementia and approaches to music therapy.

KEYWORDS

Dementia, Elderly, Human-Computer Interaction, Music Therapy

1. INTRODUCTION

The trend of an ageing society has caused a gradually rising number of dementia patients and has become a significant concern. Typically, the symptoms of dementia are divided into mild, moderate, and severe stages according to the degree of aggravation of the symptoms. The progression of dementia is irreversible. In other words, instead of fully recovering patients, treatment could only slow the aggravation of the symptoms. Patients may eventually need to depend entirely on caregivers to live. For dementia patients themselves, as well as their caregivers, this situation is undoubtedly a substantial burden (Fearnley, 2009).

Dementia is commonly treated through pharmacologic therapy and non-pharmacologic therapy. Music therapy, reminiscence therapy, and art therapy are standard non-pharmacologic therapies (Hulme et al, 2010). Through different interventions, non-pharmacologic therapy allows dementia patients to participate in activities to improve their symptoms, in which the music intervention significantly impacts patients with dementia (Riley et al, 2009). Furthermore, patients with dementia, even if their memory has been lost, can still remember the music to which they have listened (Cuddy & Duffin, 2005). Clinical practice has also proven that music intervention can effectively relieve emotional symptoms in patients with dementia (Hulme et al, 2010). Therefore, this study aims to explore the potential of music therapy activity systems for people with dementia and their caregivers.

2. CURRENT MUSIC THERAPY FOR DEMENTIA PATIENTS

Music therapy is a specialised approach that involves a trained music therapist working with people with dementia. The focus of therapy is to utilise music as the primary intervention to alleviate behavioural symptoms by fostering interaction between the therapist and the patient. The music therapist customises a series of musical activities to meet the unique needs of each patient (Park & Specht, 2009; Sung et al, 2010),

which may include selecting appropriate songs and instruments. It is important to note that the goal of music therapy is not to improve the patient's musical abilities, but rather to enhance their emotional and cognitive well-being (Guetin et al, 2009; Hannemann, 2006). In addition to personalised therapy content, caregivers are encouraged to participate in musical activities, which can strengthen the caregiver-patient relationship and provide opportunities for increased interaction with the patient (Hanser et al, 2011). The music therapist serves as a planner and advisor during the activities, and conducts ongoing assessments to ensure that the therapy remains tailored to the patient's needs. Overall, music therapy is a valuable intervention that can improve the quality of life for individuals with dementia, and promote positive outcomes for both patients and caregivers (Cheston & Bender, 1999). This section presents an overview of music therapy for dementia, followed by a discussion of the related research on persuasive technology and musical activities for dementia.

2.1 Personalised Music Therapy

A music therapist utilises music as an intervention strategy by creating personalised therapy programs and activities tailored to each patient's specific clinical needs. The program's content may vary depending on the patient's unique case, and the therapist will assess the patient's condition before developing an individual or group therapy program. During the process, the therapist focuses on the interaction between themselves and the patient or between different patients. Since each patient has diverse backgrounds and musical preferences, the music therapist needs to learn about their symptoms, experiences, preferred music, and choice of instruments to design the most appropriate therapy program (Sung et al, 2010; Sung et al, 2012).

2.2 Selecting the Musical Activities Following the Symptoms of the Patients

Dementia is associated with many symptoms. Not every activity suits all patients, and not every activity can interest all patients. Thus, tailor-made music therapy is valued. The most common music therapy activity is conducted by "completing a song" with the therapist. The patients can participate by singing, playing a musical instrument, and other ways (Bruer et al, 2007; Lin et al, 2011; Raglio et al, 2008; Svansdottir & Snaedal, 2006; Takahashi & Matsushita, 2006). In addition, passive music therapy activities can effectively relieve the emotional and behavioural problems of the patients, and active music therapy can enhance the interaction between the patients and their caregivers.

2.3 Selecting the Songs Following the Experience and Preference of the Patients

Music therapy, like music for most individuals, must be tailored to the patient's interests. Due to varying backgrounds, patients may have different musical preferences. Furthermore, dementia patients' musical memory differs from their general memory; they may recall songs from their youth despite forgetting everything else (Cuddy & Duffin, 2005). As such, therapists choose music tracks based on the patients' backgrounds and preferences to elicit emotional responses and alleviate symptoms effectively (Sung et al, 2010). Additionally, therapists may select occasional tracks to create a celebratory atmosphere during treatment, potentially eliciting patient responses (Takahashi & Matsushita, 2006). If the music cannot induce responsive feelings and behavioural responses in patients, the music therapy activity loses its significance (Gerdner, 2010).

2.4 Selecting the Musical Instrument Following the Ability and Preference of the Patients

During the process of music therapy, active playing by the patients often requires the use of various musical instruments. For patients gradually losing abilities in everyday life, independently selecting a musical instrument can enhance their self-confidence (Hannemann, 2006). Additionally, by providing various musical instruments, the music therapist can instruct the patients to exchange in the group, allowing more social behaviour for the patients with a heavy sense of isolation and indifference and independent selection by the dementia patients (Gerdner, 2010). Preparing many musical instruments might be a good idea for the patients

receiving group treatment or day care at a community centre. However, the music therapists or caregivers most likely need to provide all the musical instruments for patients receiving individual treatment. Considering the diversity of the musical instruments required for the music therapy activities, an inadequate budget and limited storage space for the musical instruments are other concerns for the therapists and caregivers.

2.5 Musical Activities for Dementia Patients led by Caregivers

Caregivers can assist in improving the quality of life for dementia patients by incorporating music into their daily routines, as recommended by music therapists (Götell et al, 2009). This can include participating in joint musical activities with patients or leading music-related activities themselves, such as passive listening to music using a music player (Clair & Memmott, 2008). However, to effectively engage individuals with dementia, it is recommended to involve loved ones in the musical activities. Although a book titled “Connect through Music with People with Dementia” provides recommendations for musical tracks and conducting sessions, caregivers may not have the necessary musical background and ability to plan appropriate activities (Rio, 2009). Therefore, it is recommended that only professional music therapists should be responsible for planning and designing musical activities for individual cases. Caregivers can still participate and select items to execute according to their ability levels, but leading patient musical activities may pose challenges for non-professionals (Hanser et al, 2011).

3. DEVELOPMENT OF TOOLS RELATED TO MUSIC THERAPY FOR PATIENTS WITH DEMENTIA

In the previous section, we learned about the potential problems that may arise during music therapy sessions. Therefore, some researchers have tried to improve the above issues through tool design. The design can be summarised through social interaction and collaborative music creation. Music-social interaction is a therapeutic tool developed for patients with dementia, such as the Computer Interactive Reminiscence and Conversation Aid (CIRCA), designed for two people (the patient with dementia and the caregiver) to improve the patient’s difficulties in operating the device alone. While using the device, the patient must make choices, press the execute button, and communicate with the caregiver.

In contrast, the caregiver must prompt the patient’s actions, continue to communicate with the patient, and provide the patient and caregiver with a common topic for discussion (Astell et al, 2010). Another example is the Intelligent Socially Assistive Robot, designed to stimulate, accompany, and increase the patient’s attention and interaction during music therapy games (Tapus et al, 2009). Music collaborative creation is a therapeutic tool developed for patients with dementia; for example, the music creation tool is designed to compensate for patients with different musical backgrounds and levels, enabling them to achieve music creation and enjoy a sense of achievement during the process (Riley et al, 2009). Another example is the MINWii, designed as a musical game to increase the patient’s sense of achievement by completing increasingly difficult levels (Benveniste et al, 2010). The above tools related to music therapy have their focus in the assessment. The assessment’s method, process and results are shown in Table 1, which describes the contents of each evaluation.

Table 1. Music-related tools developed for patients with dementia

Name of the tool	Literature	Assessment method/process	Results
CIRCA	Astell et al. (2010)	Observing the verbal and nonverbal performance of the patients	The sociability and satisfaction of the users were significantly positive.
Music creation tool	Riley et al. (2009)	Questionnaires/interviews/observation	The satisfaction and ease of the test used by the users were significantly positive.
Socially assistive robot	Tapus et al. (2009)	Rate of error/level of difficulty	The result of the usability test was significantly positive.
MINWii	Benveniste et al. (2010)	Rate of error/speed	The result of the usability test was significantly positive.

In addition to researchers recording and interpreting participants' behaviour, questionnaires can be used to investigate their thoughts and suggestions (Riley et al, 2009). There has been a growing number of tools developed for music therapy. One such tool is the musical instrument designed for creating and listening to music during treatment, and another is the integrated assessment scale for music therapy assessment. Both aim to enhance the effectiveness of music therapy activities for dementia patients, enabling them to obtain maximum benefit without pressure.

4. CONCLUSION

This study explores how musical activity systems can benefit patients with dementia. By analysing existing literature on music therapy activities and assessing user needs, a systematic review was conducted to identify potential musical activities. Both passive and active musical activities were examined to provide a variety of multisensory stimulation options. The results of the study can be used to propose a new musical activity system that allows dementia patients and their caregivers to participate in music therapy activities together, following a plan created by a music therapist. This approach makes music therapy more accessible and reduces the preparation time and required musical ability.

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