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Effect of music intervention on apathy in nursing home residents with dementia

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ABSTRACT

This study examined the effectiveness of group music intervention in the treatment of nursing home residents with apathy. Apathy can clinically defined with a score of 40 or above on the apathy evaluation scale (AES). Seventy-seven residents were randomly assigned to the intervention or control group. The intervention group was given a music intervention programme, which included listening to traditional music, including nostalgic songs, and playing musical instruments three times a week, for a total of twelve weeks. Results demonstrated a decrease in apathy scores in the intervention group ($z = 4.667$, $P < 0.01$), but not in the control group ($z = -1.810$, $P > 0.05$). Cognitive function, as assessed by Mini Mental State Examination (MMSE) score, was stable in the intervention group ($t = 1.720$, $P > 0.05$), but declined in the control group ($t = -1.973$, $P < 0.05$). We conclude that music intervention has the potential to be an effective therapy for the treatment of apathy in the early stages of dementia.

Introduction

As a neuropsychiatric symptom, apathy is a strong predictor of the progression of the illness that has a significant influence on the quality of life of both the patients with dementia and their caregivers.[1] Patients with symptoms of apathy are characterized by decreased goal-oriented motor behaviour, decreased goal-oriented cognition and decreased affective reaction.[2] In Levy's opinion, apathy plays an important role in the reduction of goal-directed behaviours and self-generated motivation.[3] In addition, studies have considered apathy to be a symptom associated with of the loss of emotional feelings.[4]

Previous studies, have reported symptoms of apathy to be commonly present in patients with dementia, especially those who reside in a long-term nursing care home.[5–8] Due to the lack of initiative and interest in their environment, patients with apathy often have serious restrictions on social participation. The presence of apathy, a neuropsychiatric symptom, appears during the progression of dementia, may accelerate the deterioration of dementia and can deprive patients of normal activities and reduce levels of consciousness.[9,10] Apathy has becomes an important factor that can influence patients' rehabilitation with dementia.[1,9] However, due to the heavy burden and emotional stress of providing caregiving for older people with dementia, as well as the difficult to identify symptoms, of apathy, it can be overlooked by caregivers, resulting in suboptimal care. During routine care in dementia, apathy may fail to attract a comparable level of attention to other symptoms, such as memory deterioration, aggression and agitation.[11,12] Thus, older people with apathy may sit in solitude, experiencing boredom, with limited interaction, which may in turn exacerbate symptoms of apathy.[11] Previous research has confirmed that apathy can have a negative impact on an individual's overall quality of life, impair the treatment response and increase burden on the caregiver.[13,14]

Although apathy is the most common symptom in patients with dementia, there is currently no definitive treatment for this symptom in dementia, drug therapy such as ritalin can only improve or relieve the symptoms for a certain period of time.[15,16] Moreover, there are presently no approved pharmacological guidelines for management of the symptoms of apathy and insufficient evidence to substantiate the efficacy of any drugs.[17,18] With these limitations and side effects of drug therapy, which can place a heavy financial burden on families, an increasing number of academics have suggested that non-pharmacological interventions may have a role to play in the management of the dementia. To date, however, studies of non-pharmacological intervention approaches in dementia care are lacking.

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Several studies have specifically examined the effects of music as a therapy in the management of symptoms of dementia, suggesting the positive effect in the treatment of anxiety, irritability and memory impairment.[19–21] However, only a few published non-pharmacological treatment trials have specifically aimed at relieving symptoms of apathy.[12,16,22,23]

When listening to music, the reticular structures in the brain stem receive impulses from the body, viscera and other sensory systems.[24] After integration and adjustment, the impulses reach the cerebral cortex through the thalamus with no specificity, which can cause a reaction. Via transmission of the stimulation to the cerebrum through the auditory system, music plays a potentially important role in the regulation of the central nervous system and emotional adjustment; it can control the internal and external physiological reactions and influence endocrine function.[24,25] Simultaneously, in the degenarative process of cerebral function, the part of brain that is associated with music programs is relatively well preserved. Thus, the cerebral cortex has been shown to be sensitive to the stimulation and reflexes associated with music, promoting the conduction of the peripheral nerve pathway when affected by musical interventions.[26]

Despite limited evidence of the efficacy of music interventions in the management of psychological symptoms in older people, no study to date has specifically looked at the effectiveness of music interventions in the management of symptoms of apathy, associated with dementia. It was therefore, the main aim of our study was to explore the effect of group music intervention on the motor, affection and cognitive behaviours of older people in residential homes with symptoms of apathy associated with dementia.

Subjects and methods

Participants

The participants in this study were recruited from a 1000 bed residential nursing facility, which specializes in the management of dementia-related symptoms in Guangzhou, China. For older adults with MMSE of 27 or below, informed consent was provided by either a close relative or a legally authorized representative as proxy of the older person. Although the overall size of the nursing home is 1000 beds, only 150 beds on two floors specifically manage individuals with dementia. From 150 potentially eligible residents, one hundred and twenty were wiling to consent to participate and twenty-three residents refused.

After written informed consent was obtained in accordance with the University's ethical Institutional Review Board's procedures, participants were screened by a member of medical staff using the Structured Clinical Interview for International Classification of Diseases-Tenth Revision (ICD-10) to ensure confirmation of dementia diagnosis, the Apathy Evaluation Scale-Clinician (AES-C) and the Mini Mental State Exam (MMSE) scores were also collected at this time-point. The inclusion criteria for entry into this study was aged 60 years or older, mild to moderate dementia (defined by a MMSE score ranging from 10 to 27), meeting the AES-C diagnostic criteria for apathy, no other serious co-morbidities and voluntary participation and the ability to communicate and cooperate with the research assistant to complete the questionnaires. The exclusion criteria included the absence of apathy, severe dementia (defined by a MMSE score of 9 or below), other severe chronic diseases, previous trauma, poor compliance, failure to communicate and other factors that may affect the delivery and assessment of the musical intervention.

Using ICD-10 classification, 101 residents from the original sample of 127 were diagnosed with mild to moderate dementia. Of these, 77 residents met the diagnostic criteria for apathy, recording an AES-C score of 40 or above. All participants and their relatives or legal guardians were provided with relevant information sheet outlining the study and given a full explanation of study procedures, if they agreed a consent form was signed. Then the older residents were randomly divided into an intervention group and a control group, using a computer-based random number allocation method, resulting in 39 cases in intervention group and 38 in the control group.

Design and procedure

This was a randomized, controlled, parallel, partially masked (rater) twelve-week interventional clinical trial. The participants in the intervention group were randomly divided into four independent subgroups. There were approximately nine older people in each subgroup. The schedule for the weekly music intervention is presented in Table 1. During the intervention each patient subgroup had one trained therapist with overall responsibility for implementation of music intervention, someone who was responsible for recording the participants' emotional reactions during the intervention process and the performance of the interaction, and one research assistant, predominantly providing assistance to the therapist and the participants. The intervention group received the 50-minute music intervention three times a week for a period of 12 weeks (36 sessions in total). Those participants who were absent from the intervention five times or more were removed from intervention group, and their assessment results were excluded, although they were allowed to continue to receive the intervention. The control group did not receive any special interventions except those regularly provided regularly in the nursing homes, such as watching television. The therapist, recorder and research assistant excluded from any participation in the evaluation work, which occurred one week before and after delivery of the intervention, using the AES-C scale, the MMSE scale and Holden's communication scale.

Ethical approval to conduct the study was obtained from the Guangzhou Medical University Human Research Ethics Committee and the older people's residential facility (Table 2).

Intervention

Sensory stimulation with music

The primary goal of the music intervention in this study was to promote the residents' receptive ability of perception by listening to music. Individuals with dementia commonly exhibit a loss of connection with reality and disordered perceptions of time, place, people and surrounding environment.[27] After listening to music or songs, participants were asked to distinguish the sounds of various musical instruments (e.g., drum, gong, mouth organ, flute), different sounds

Table 1
Music intervention weekly schedule.

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
9:00~9:50 am	subgroup 1	subgroup 2	subgroup 3	subgroup 4	subgroup 1	subgroup 2
10:00~10:50 am	subgroup 3	subgroup 4	subgroup 1	subgroup 2	subgroup 3	subgroup 4