



Original Article

Effects of compound music program on cognitive function and QOL in community-dwelling elderly

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Abstract. [Purpose] Interventions using music, physical exercise, and reminiscence therapy are widely used both for rehabilitation and care of the elderly. This study aimed to investigate the effect of structured interventions comprising music, physical exercise, and reminiscence therapy on cognitive function and quality of life of the community-dwelling elderly. [Subjects and Methods] The study included 15 community-dwelling elderly people who used a day-care center. Participants underwent sessions comprising the following three factors: 1) singing songs familiar to the elderly; 2) physical exercise to music; and 3) observation of historical pictures. Sessions were conducted once or twice per week, 30 to 40 min per day, for 10 weeks. Pre and post interventions of the Mini Mental State Examination, the Behavioral Rating Scale for the Elderly, and the SF-8 were compared. [Results] No significant difference was observed between pre- and post-intervention scores on the Mini Mental State Examination and the Behavioral Rating Scale for the Elderly. However, the post intervention physical component summary of SF-8 was significantly higher than the pre intervention summary. [Conclusion] This study suggests that interventions comprising music, physical exercise, and reminiscence therapy may contribute toward the improvement of elderly individuals' health-related quality of life, especially physical health.

Key words: Music, Reminiscence therapy, Elderly

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INTRODUCTION

Intervention through music is widely used in the rehabilitation and care of the elderly. A previous study reported that singing affects the mental health and oral function of the elderly¹⁾ and that listening to music or singing is effective in improving cognitive function²⁾ and quality of life (QOL)²⁾, and reducing anxiety³⁾ in elderly individuals with dementia. Some recent reports suggested that interventions combining music and physical exercise were more effective than listening to music alone. For example, Sakamoto et al.⁴⁾ reported that, in individuals with dementia, an interactive music intervention in which individuals listened to music and clapped, sang, and danced affected the improvement of behavioral and psychological symptoms of dementia (BPSD) more than a passive music listening group. In addition, Satoh et al.⁵⁾ reported that physical exercise combined with music produced more positive effects on the cognitive function of elderly individuals than exercise alone. Thus, these findings suggest that the combination of music and physical exercise more effectively improves cognitive function, BPSD, and QOL in people with dementia or the elderly.

Reminiscence therapy (RT) also affects cognitive function, BPSD, and QOL in elderly individuals with and without dementia⁶⁻⁹⁾. In RT, people speak about their experiences or memories in a group using pictures as clues. Combining RT with

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the music and physical exercise combination mentioned above may be more effective in the elderly and in individuals with dementia. However, no previous research has investigated the effects of interventions comprising music, physical exercise, and RT. Therefore, this study aimed to investigate the effect of structured interventions that comprised music, physical exercise, and RT on cognitive function and QOL in the elderly.

SUBJECTS AND METHODS

Participants included 15 community-dwelling elderly people who used a day-care center (Table 1). All participants signed an informed consent form prior to participation. The study protocol was approved by the Tohoku Fukushi University's institutional ethics review board.

Structured interventions comprising music, physical exercise, and RT were conducted for participants. Their cognitive function and QOL were compared before and after interventions. Each session included the following three factors: 1) singing songs familiar to the elderly or matched seasons; 2) physical exercise to music; and 3) observation of historical pictures. Participants could see the song lyrics, demonstrations of physical exercises, and historical pictures on a big monitor in front of them. Under the recreation instructors' instructions, sessions were conducted by an occupational therapist or care staff. They conducted sessions using a music device and facilitated participant interaction. On observing historical pictures, participants were requested to share their memories. Participants received intervention once or twice per week, 30 to 40 min per day, for 10 weeks.

Participants were assessed using the Mini Mental State Examination (MMSE)¹⁰, the Behavioral Rating Scale for the Elderly¹¹, and the Japanese version of the Medical Outcome Study Short Form 8-Item Health Survey (SF-8)¹². The MMSE was used to assess cognitive function while the Behavioral Rating Scale for the Elderly was used to assess vital function at home. SF-8 was used to assess health-related QOL. All assessments were conducted by occupational therapists. The Wilcoxon signed-rank test was performed to compare each pre and post intervention score. The SPSS Statistics 22.0 (IBM, Chicago, IL, USA) was used as the statistical software and the level of significance was set at 5%.

RESULTS

Table 2 outlines the outcomes of each assessment. No significant difference was observed between pre- and post-intervention scores on the MMSE and the Behavioral Rating Scale for the elderly. However, the post-intervention physical component summary of SF-8 was significantly higher than the pre-intervention summary ($p < 0.05$).

DISCUSSION

This study suggests that interventions comprising music, physical exercise, and RT could contribute toward improving community-dwelling elderly individuals' health-related QOL, especially their physical health. In SF-8, the average values for Japanese individuals with respect to the "physical component summary score" and the "mental component summary score" of 70–79 year-old individuals (the oldest age group to be examined) were 44.78 and 50.95 points, respectively¹²; as the participants' scores in this study were 42.2 and 51.0 points, respectively, little difference was observed between the two. Post

Table 1. Characteristics of study participants

	Mean ± SD
Age (years)	84.3 ± 6.6
Female (%)	86.6
Diagnosis of dementia (%)	26.6
Able to walk (%)	93.3

Table 2. Comparison of each evaluation score by pre-post intervention

	Pre	Post
Mini mental state examination	20.8 ± 5.7	20.9 ± 5.9
Behavioral Rating Scale for the Elderly	119.7 ± 22.8	121.0 ± 28.3
SF-8		
Physical component summary	42.2 ± 10.9	48.1 ± 7.5*
Mental component summary	51.0 ± 9.0	51.8 ± 5.8

* $p < 0.05$

intervention, the “physical component summary score” showed an improvement, and this score was higher than the national average value for 70–79 year-old individuals. Previous studies have reported that listening, singing, and RT improve QOL of individuals with dementia^{2, 9}). As our intervention included these three factors, we could provide relative improvement in QOL in short sessions. However, our study had no control group. Therefore, we cannot refer to the relevance between each factor and its effect and further studies are required to examine the same.

Physical therapists have an important role to play in not only improving physical functions but also the QOL of patients. Previous studies reported that experiencing a fall or pain was associated with a low health-related QOL related to bodily functions¹³). Some studies also reported that physical exercise can have beneficial effects on the “physical component summary score” of SF-8 in the community-dwelling elderly¹⁴). However, there are cases where it is difficult to clinically carry out continual aggressive physical exercise due to various reasons such as pain, disease, or motivation in the elderly. In such cases, the intervention used in this study may be useful to improve health-related QOL related to bodily functions in the elderly.

On the other hand, our intervention did not affect cognitive and vital functions. Our results indicated that using music improved QOL but did not improve cognitive function; the results thus corresponded with a previous study by Choi¹⁵). The relationship between interventions using music and improvement of cognitive function is as yet unclear. For example, some research results did indicate that interventions using music showed effects on the improvement of vital functions including cognitive function and BPSD in elderly people with and without dementia^{1, 2, 16–19}). However, other results do not indicate such significant effects on these functions^{13, 20, 21}). It is assumed that these differences are associated with the variations in the duration of the interventions and the level of participants’ cognitive function. It is possible that the duration of the intervention in our study was shorter and thus did not affect people’s cognitive and vital functions. Therefore, it is necessary to investigate long-term intervention effects in future studies.

This study has some limitations. First, the participants of this study belonged only to one facility. Second, the study used small samples. Third, we did not verify carry-over effects data. Therefore, long-term intervention studies that include more number of participants and use a control group are required.

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