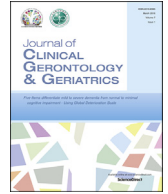




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Original article

Effects of Japanese drum exercise on depression and physical function in community-dwelling older women

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ABSTRACT

Background/Purpose: We examined whether a 3-month Japanese drum exercise program can ameliorate depressive mood and improve physical fitness in community-dwelling older women.**Methods:** The participants were 40 community-dwelling older women aged 65 years and older who satisfied one or more of the mood items on the Kihon checklist. They were divided into two groups: a 3-month Japanese drum exercise group and a control group. The study included 21 women who participated in Japanese drum exercises (mean age, 76.8 ± 5.2 years) and 19 control participants (79.8 ± 5.4 years). To evaluate the participants' psychological status, we used the depression item (D) on the short form of the profile of mood states. The body composition of participants was determined using bioelectrical impedance analysis. In addition, gait speed, grip strength, and scores on the morale scale, the geriatric depression scale, the trail making test, and the mini-mental state examination were measured before and after the intervention.**Results:** After the 3-month intervention, we found no significant main effect-induced differences ($p = 0.135$) in Profile of Mood States between the groups. No significant difference was found between groups for any of the psychophysiological or physical fitness measures after the intervention.**Conclusion:** Our results did not support the hypothesis that the Japanese drum exercise can improve depressive mood in older women. However, depressive mood showed a slight improvement in the intervention group, suggesting that a longer or more frequent session of intervention might have had an effect.Copyright © 2016, Asia Pacific League of Clinical Gerontology & Geriatrics. Published by Elsevier Taiwan LLC. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

With the current aging population, it is very important to prolong healthy lifespan and prevent frailty and disability to ensure that older people have active and independent lives. If the difference between the average overall life expectancy and healthy life expectancy can be decreased through the prevention of disease, promotion of public health, and reduction of nursing care, the following will be more likely: (1) individuals will be more satisfied with their lives and have something to live for; (2) a decrease in individuals' quality of life will be prevented; and (3) less financial

assistance from the government will be required. Thus, in addition to preventing and treating diseases, the approaches to meeting the needs of an aging society have increasingly focused on overcoming frailty and comorbidities and on maintaining/improving daily functions. Therefore, it is necessary to clarify the causes of age-related changes in daily functions as well as their processes and to adopt measures to prevent such changes.

Among age-related clinical problems, depression is one of the most debilitating geriatric syndromes and an important aspect of geriatrics worldwide. As a result of the high rate of suicide rate among older people, many Japanese researchers have attempted to address the problem of depression in this population. Previous studies attempted to ameliorate depressive symptoms through a variety of relaxation and physical/cognitive interventions.¹ According to recent meta-analyses, both supervised and unsupervised physical activity interventions are effective in reducing depressive

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symptoms among adults without clinical depression.² Using the definition of exercise employed by the American College of Sports Medicine, Cooney et al.³ reported on the effectiveness of exercise interventions in *Cochrane Reviews* and concluded that moderate exercise is effective in relieving depression. However, the optimal type, intensity, duration, and frequency of exercise for the prevention of depression have yet to be determined.

In addition to exercise interventions, music therapy showed sustained beneficial effects on study participants' self-esteem, mood, depression, and psychological distress.^{4,5} Among the musical interventions, playing Japanese drums is attractive because it requires the movement of individuals' entire body, particularly their arms, while both sitting and standing. Thus, like dancing, playing a Japanese drum is a full-body exercise. It involves dynamic motions, vocalization (e.g., increasing tone and pitch), sounds with various intensities, and rhythms with different tempos. By watching instructors' movements and listening to the sounds that they produce, Japanese drum players can understand the proper rhythms and tempos and play original music using drumsticks in their own way, which could ameliorate depressive mood and improve physical fitness even in frail older adults. Indeed, a study investigating the effects of playing Japanese drums on stress reduction in six Japanese men and women with the average age of 60.6 years showed that the rhythmic sounds of the drums, used for a therapeutic purpose, relieved tension.⁶

Therefore, it is expected that if older people with depressive mood regularly play a Japanese drum, they might improve their psychophysiological and physical functions. However, it is unknown whether playing a Japanese drum effectively reduces depressive symptoms in addition to improving players' physical fitness. Thus, the aim of this study was to investigate the effects of Japanese drum exercise on depressive mood and physical fitness in community-dwelling older women.

2. Methods

2.1. Participants

Prior to recruitment, sample size was calculated using the depression item of short form of the profile of mood states as the primary outcome and considering the value from previous literature on depression improvement by music therapy as reference with an approximate effect size of 0.31.⁷ To reach a power of 0.8, with α set at 0.05 and β at 0.2, the required sample size calculated was 76. We included four more participants as dropout precaution, totaling an original plan intended for 80 people.

A total of 189 community-dwelling older people (27 men and 162 women) who regularly visited a community disability-prevention center in Kyoto, Japan were recruited for the study. The inclusion criterion for this study was at least one positive response indicating a depressive mood among answers to the five mood questions on the Kihon checklist, which has questions similar to those of the geriatric depression scale (GDS).⁸ Individuals who were taking medications for depression and those with visual impairment or physical disability were excluded from the study.

Among the 189 recruited, 114 did not meet the inclusion criterion or were excluded because of meeting the exclusion criteria stated above. Among the remaining 75 people 43 (3 men and 40 women) agreed to participate in this study. Because most of the participants were women, we asked only women to participate in this study. Thus, the planned sample size could not be reached, unfortunately. Written informed consent was obtained from each participant in accordance with the guidelines of Kyoto University Graduate School of Medicine, Kyoto, Japan. The study protocol was

approved by the Kyoto University Graduate School of Medicine Ethics Committee (No. E 1910-2).

In this study we nonrandomly divided 40 participants of community-dwelling older women (≥ 65 years) living in Kyoto City into an intervention group of 3 months of Japanese drum exercise (21 participants) and a control group (19 participants), who performed exercise independently for the same period of time (Figure 1). The allocation to the intervention or control group was performed by one healthcare professional in a community disability-prevention center in Kyoto, according to the participants' willingness to participate in the drum exercise and the convenience to commute to the drum exercise venue. The exercise intervention consisted of one 40-minute session consisting of warming up for 5 minutes, group drum exercise of moderate to vigorous intensity for 30 minutes, and cooling down and stretching for 5 minutes and the intervention group participated in this program once a week for 12 weeks. The control group was instructed to increase the amount of exercises such as stretching, and walking, and to maintain the usual level of activity during the study period according to their own discretion. The intervention group was also instructed in the same way.

2.2. Measurements

We recorded age, years of education, medication use, sleeping hours, and medical history (e.g., stroke, heart disease, diabetes, low back pain, knee osteoarthritis, cancer). Data on self-rated health status, appetite, sleep disturbance, self-efficacy, behavioral intention to go out, mood, and lifestyle changes were also collected. Changes in participants' physical condition were assessed by a questionnaire, and body mass index (BMI) was calculated as weight (kg) divided by height (m) squared. The Kihon checklist for frailty and the Tokyo Metropolitan Institute of Gerontology index of competence⁹ for instrumental activities of daily living (ADLs) were administered. The Tokyo Metropolitan Institute of Gerontology index of competence, developed according to the hierarchical model of competence proposed by Lawton,¹⁰ is a multidimensional, 13-item index used to assess advanced life function, which cannot be evaluated with a scale that assesses ADLs. This index is used to measure three types of competence: instrumental self-maintenance, intellectual activity, and social role.

2.3. Psychophysiological function

We used the short form of the profile of mood states (POMS-SF) to assess psychophysiological function.^{11,12} This is a 30-item (6 subscales) self-completed questionnaire used to evaluate an individual's mood and the following six types of emotions: tension–anxiety; depression–dejection; anger–hostility; vigor; fatigue; and confusion. Each item was scored on a scale from 0 to 4 points (0, not at all; 4, very often). For each subscale, we calculated the total scores, which were adjusted for age to obtain a participant's T score. For all these subscales, higher scores indicate higher levels of the corresponding emotion. Yokoyama¹³ developed the short Japanese form of the POMS, verified its reliability and validity, and confirmed the appropriateness of the translated terms. Akabayashi et al.,¹⁴ who employed the POMS in clinical settings, reported that the scale facilitates self-evaluation of emotion and mood in patients with depressive symptoms or anxiety-related neurosis and that the scale's scores accurately represent patients' emotional state.

The Philadelphia Geriatric Center morale scale⁹ was used to assess older people's morale, the GDS¹⁵ to assess mood, the trail making test (TMT)¹⁶ and the mini-mental state examination (MMSE)¹⁷ to assess cognitive function. The International

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