Effects of sittercise on elderly subjects’ depression and sleep quality

Moon-Suk Lee, PhD1), Seon-Rye Kim, PhD2), Gyun-Gun Min, MD3), Byung-Jun Cho, PhD4)*

1) Department of Physical Education, Chungnam National University, Republic of Korea
2) Department of Pharmacy, College of Pharmacy, Chungnam National University, Republic of Korea
3) Department of Emergency Medical Technology, Woosong University, Republic of Korea
4) Department of Emergency Medical Technology, Kangwon National University: Kaydong Samcheok City, Kangwondo 245-711, Republic of Korea

Abstract. [Purpose] This study examined the effects of sittercise on elderly subjects’ depression and sleep quality. [Subjects] The subjects of this quasi-experimental study were divided into an experimental group and a control group. [Methods] The subjects of the experimental group performed sittercise and the control group received no intervention. [Results] The results demonstrate that the subjects who performed sittercise had significantly decreased depression levels compared to the control. They also reported significantly improved sleep quality. [Conclusion] A favorable change in depression levels was seen after sittercise which also had a significant effect on sleep quality. Key words: Depression, Sleep, Sittercise therapy

INTRODUCTION

The amount of physical activity of the elderly in elderly care facilities is very low. The incidence of geriatric conditions such as insomnia and depression among the elderly in care facilities is high compared to the elderly living at home. Also, health problems such as stress, depression and sleep disorders among the elderly in care facilities are more severe than among the elderly living at home1). The proportion of the elderly complaining of sleep disorders while living at home is 23.7%2), compared to 41.7% for the elderly living in care facilities, indicating poor quality of sleep3). The above statistics show that the elderly in care facilities have severe sleep disorders caused by psychological depression that is worse than that of the elderly living at home. Therefore, this suggests that aggressive efforts to treat the elderly in care facilities is required.

The WHO reported that physical activities are the most important factor affecting the health and fitness of the elderly, and physical activities have positive effects on the quality of life of seniors4). Also, there is a research that shows the quality of sleep of the elderly performing regular exercise is good, and that the quality of night sleep correlates significantly with activities during the day. Therefore, researchers have emphasized the importance of physical activity for the elderly5). A representative muscle relaxing method is stretching. Stretching can be performed as a collective exercise to increase flexibility. Stretching enables the body to move efficiently with breathing in a stable state of mind, by widening the range of motion of joints and increasing the muscle length6).

The purpose of this study was to verify the effects of sittercise on depression and sleep disorders of the elderly, since sittercise is a therapy that can be safely and easily performed in a sitting position without limitations of time and place by the elderly in a nursing home.
SUBJECTS AND METHODS

The subjects were 100 residents of a nursing home. The subjects were divided into two groups of 50, with the consent of their guardians, the participants, as well as other concerned parties. The subjects were divided into an experimental group which performed sittercises, and a control group which did not. We used a non-equivalent control group design because it was impossible to randomly allocate the subjects to the experimental and control groups (Table 1). The experimental group participated in the sittercise program three times a week for 8 weeks. The control group did not participate in the sittercise therapy. The research tools used in this study were structured questionnaire-based self-assessments. All experiments were reviewed and approved by the Committee of Chungnam National University.

The sittercise therapy used in this study was developed by Billy Gober in 1982. Sittercise is a kind of sedentary stretching designed for the elderly using wheelchairs because of walking disability.

This study used a Korean version of the Geriatric Depression Scale short form (GDSSF-K), which is an abridged version of the Geriatric Depression Scale adapted for Koreans. The GDSSF consists of 15 items and is a simplified version of the Geriatric Depression Scale which has 30 questions. The GDSSF-K has a total of 15 questions with “Yes/No” responses which are scored 0 or 1, and has a maximum possible score of 15 points. A higher score means higher depression. It’s reliability was verified in this study, and it had a Cronbach’s α = 0.781.

The Korean sleep scale was used to measure sleep disorder. It is a modified version of the tool developed by Snyder-Halpern. It measures the sleep state over one week, and the Korean sleep scale consists of 15 questions, and the answers are scored using a four-point Likert scale. The range of scores is from 15 points to 60 points, and a higher score means that the sleep state is satisfactory. The reliability of this tool was assessed in this study, and had a Cronbach α = 0.816. The sittercise program was composed of stretching, warm-ups, near-aerobic activities, and cool-down. Directly related to the program used in this study is the US Butterfield Trail Village Retirement Community (Fayetteville, Arkansas) content. The sittercise program procedure consisted of week 1: breathing (abdominal) with upbeat music, raising the arms up and down, light uphill walking, and breathing; week 2–3: breathing (abdominal) with music, moving the arms and legs to the left, and breathing; week 4–8: breathing (abdominal) with music, moving the arms and legs to the left, arm and leg movement, neck, chest, back stretching, pelvis and leg stretching, and breathing.

The subjects were evaluated at pre- and post-intervention. The SPSS 14.0 statistical program was used for data processing and statistical analysis. Data were subjected to the t-test and multiple regression analysis in order to determine the significance of changes in the degree of depression and sleep disturbances between before and after the stretching program.

RESULTS

The result of GDSSF-K for each group are shown in Table 2. At the start of the intervention the experimental group’s score was 12.33 ± 0.21, while the control groups score was 13.88 ± 0.46, with little difference between the groups. However, at the end of the intervention the experimental group’s score was 8.98 ± 0.15 which was significantly different from the control group’s score of 13.1 ± 0.01.

| Group factor          | Experimental | Control | N   | Total |
|-----------------------|--------------|---------|-----|-------|
| Gender                | Male         | 21      | 22  | 43    | 98   |
|                       | Female       | 27      | 28  | 55    |      |
| Age (years)           | 65–70        | 15      | 15  | 30    |      |
|                       | 70–75        | 16      | 18  | 34    |      |
|                       | 75–80        | 12      | 13  | 25    |      |
|                       | >80          | 5       | 4   | 9     |      |
|                       | <3           | 10      | 13  | 23    |      |
| Medical treatment     | 3–5          | 12      | 16  | 28    |      |
| period (years)        | 5–8          | 21      | 18  | 39    |      |
|                       | >8           | 5       | 3   | 8     |      |
|                       | Primary school| 25     | 26  | 51    |      |
|                       | Junior high school | 14 | 16  | 30    | 98   |
|                       | High school  | 6       | 5   | 11    |      |
|                       | University graduate | 3 | 3   | 6     |      |
The results of sleep disturbance in each group are shown in Table 3. At the start of the intervention the experimental group’s score was 42.11 ± 2.86, while the control group’s score was 45.38 ± 1.31 with little difference between the groups. However, at the end of the intervention the experimental group’s score was 50.3 ± 3.88 which was greater than that of the control group’s score of 44.12 ± 2.87.

**DISCUSSION**

Sittercise is usually prescribed to treat imbalance in the muscles of patients using wheelchairs. One study reported that after an 8-week home-exercise program, pain of wheelchair patients with shoulder pains was reduced19–21).

The present study showed that depression was lower in the experimental group than in the control group after the intervention. These results are consistent with the results of a cognitive therapy study which reported a positive effect on the emotional aspects after Tai Chi training for elderly women to reduce tension, anger, and depression9). Physical activity, was also effective as replacement therapy for medication providing some comfort and improvement in depression10).

Regular exercise three times a week performed by the elderly in a Longitudinal Study of Depression Status was reported to have lowered depression three years after the intervention.

Relaxation therapy and guided imagery therapy including stretching for 12 weeks for the elderly who suffered from osteoarthritis reduced depression and improved the quality of life of the experimental group. The results of that study can assist in promoting increased comfort11). The study conducted stretching with upbeat music and familiar songs as a background. Participation in sports with an emphasis on fun and sociability with peers participating in the program, to create enjoyment was helpful in spiritual terms.

In another study, a group that participated in stretching reported greater reduction in sleep disorders than the control group. Progressive muscle relaxation therapy for patients with depression reduced anxiety, and had a positive effect, similar to the present study, which carefully measured depression. The results for sleep induction and sleep disorders suggest that there were effective improvements12).

A substance abuse group comprised of 28 women in a care facility performed progressive muscle relaxation therapy, 30 minutes a day for five days. The progressive muscle relaxation therapy was performed with the subjects’ preferred background music, and the quality of sleep in the experimental group was reported to improve13). Two meta-analysis studies of behavioral therapy research, provided support for the efficacy of progressive muscle relaxation therapy21,22), improving sleep disorders14). Stretching exercise performed for three to four weeks by elderly cancer patients resulted in significant improvements in their quantity and quality of sleep. Elderly insomnia patients were instructed to perform a self-assessment for 6–8 weeks of quality of sleep and were treated with relaxation therapy15,23).

Regarding the relationship between sleep and depression in the elderly, one study reported there is a negative correlation, which was consistent with the findings of the present study16). In addition, it appears that at 65 years of age, there is a negative correlation between depression and the length of time until sleep17).

| Table 2. The depression results |
|--------------------------------|
| Group            | N   | Pre-test (Mean±SD) | Post-test (Mean±SD) |
| Experimental     | 48  | 12.3±0.2           | 8.9±0.1*            |
| Control          | 50  | 13.8±0.4           | 13.1±0.01           |
| Total            | 98  | 13.1±0.33          | 11.05±0.8           |
* p<0.05

| Table 3. The sleep disturbance results |
|---------------------------------------|
| Group            | n   | Pre-test (Mean±SD) | Post-test (Mean±SD) |
| Experimental     | 48  | 42.1±2.8           | 50.3±3.8*           |
| Control          | 50  | 45.3±1.3           | 44.1±2.8            |
| Total            | 98  | 43.7±2.0           | 47.2±3.3            |
* p<0.05
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