

Original Article

## The effect of Tai Chi exercise on the sleep quality of the elderly residents in Isfahan, Sadeghieh elderly home

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**Abstract**

**BACKGROUND:** Sleep disturbances are common among older adults. Recently there is much interest in complementary and alternative medicine (CAM) from the population in general, and the elderly are no exception. Tai Chi exercise as a CAM can be performed by older adults. The purpose of this study was to evaluate the effects of Tai Chi Exercise on sleep quality of elderly residents in Sadeghiyeh elderly care home.

**METHODS:** In this Clinical Trial, 62 older subjects aged older than 65 years residents of elderly home in Isfahan were studied. They randomized in two experimental and control groups. The intervention was the Tai Chi Exercise sessions were held three times per week for 12 weeks. Duration of exercise was 5 minutes at first session which gradually increased to 20 to 25 minutes by the midpoint of intervention. The Pittsburgh Sleep Quality Index (PSQI) was used for pre and post evaluation of older adult sleep quality. Data analyzed using the SPSS<sub>14</sub> software.

**RESULTS:** There were no differences in demographic characteristics or psychological variables between two groups. Mean age of studied subjects in experimental and control groups was 68.74(5.48) and 69.42(5.34), respectively. In the Tai Chi group sleep quality was improved significantly with decrease in PSQI global score. In control group sleep quality was not changed significantly. At the end of study, mean differences of PSQI global score between two groups different significantly.

**CONCLUSIONS:** Our finding is coherent with other studies in this field indicated that the Tai Chi Exercise can have a significant effect on sleep quality in older adults.

**KEY WORDS:** Sleep quality, Tai chi exercise, elderly, elderly care home.

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The aging of population is one of the human honors and it is one of the biggest challenges of the country's Health and Hygiene System. Throughout the last thirty years, the elderly population of the country has grown double and currently it includes 6.5 percent of the total population. It is expected that this proportion is increased to 10% till 2020.<sup>1</sup> It's also mentioned that the whole population of the elderly will be 10 million until 2021.<sup>2</sup>

Sleep is one of the important aspects of life so much that it allocates one third of every body's life span. In a series of self-reported analyses of sleep, it has been reported that 50% of the elderly suffer sleep disorder.<sup>3</sup> It is also asserted that nearly 80% of above-70-year-old men and women are suffered from at least a chronic disorder which makes them susceptible to sleep disorder.<sup>4</sup> Besides, 65% of the old people in elderly residential care centers suffer from sleep disorders.<sup>5</sup> Through analyzing the condition of the old people in Qazvin's elderly resi-

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dential care homes, the prevalence of insomnia has reported to be 44.4%.

The most prevalent method in treating sleep disorders is the medical therapy so that it is estimated that 10 million Americans go to doctor each year as a result of sleep disorders.<sup>6</sup> It also has been estimated that the elderly consume regularly more than 40% of soporific drugs produced in America.<sup>7</sup> The researchers believe that the soporific drugs are not appropriate for curing malignant sleep disorders and their consumption is dangerous in the long run.<sup>6</sup> It also has been observed that individual become tolerant to the soporific effects after two weeks.<sup>5</sup>

Researchers assume that the main reason for the elderly insomnia is lack of motion.<sup>8</sup> It is proved in previous studies that exercising about 4 to 5 hours before sleeping improves individuals' sleep quality.<sup>9</sup> However, the previous studies have made use of stretching and resistance-based exercises which are not appropriate for the elderly.

It has been noted through recent studies that the Tai Chi exercise is among the group-based exercises that the elderly are capable of doing.<sup>10</sup> Due to its low level of intensity, ease of learning, no need to special equipments and applicability for all the elderly everywhere, it recommended to be done by the elderly.<sup>11</sup> Researchers believe that the intensity level of Tai Chi is to the extent that in contrary to other aerobic exercises, it does not exert pressure on the heart and at the same time it improves the cardio-respiratory functions in individuals.<sup>12</sup> This kind of exercise improves the coordination between mind and body, improves the muscular coordination and increases the muscular power in individuals.<sup>13-15</sup> This exercise decreases stress and anxiety in individuals and it is an effective and complementary treatment for psycho-physiologically based disorders.<sup>16, 17</sup>

This study aimed to evaluate the effects of Tai Chi Exercise on sleep Quality of old people resident at Sadeghiyeh Elderly Residential Care Home. The results of this study could increase the awareness of health workers regarding the effects of this exercise and its applica-

tion to improve and advance the quality of the elderly care. The researcher hopes that the findings of this study could be as guidance for further studies in this regard.

## Methods

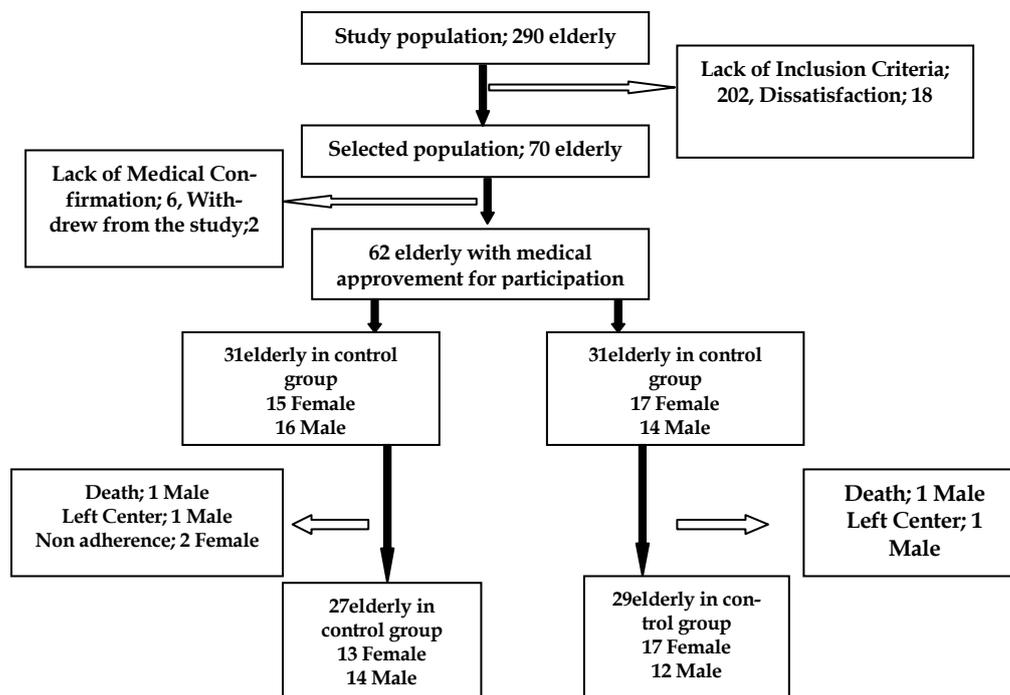
In this Clinical Trial, 62 older residents of elderly home in Isfahan were studied. The population in this study consisted of all the 60-year-old-and-above elderly who resided at Sadeghih Elderly Home in Isfahan city and were interested to volunteer in the study and didn't have any record of exercising or continuous and regular physical activity. They had received a score of 5 and above in an analysis done by Petersburg Sleep Quality Questionnaire and had gotten a confirmation from their doctor in order to participate in the exercising program. Blood tests and cardiograph were taken from all the elderly to receive the doctor's confirmation. They randomized in two experimental and control groups. The Sampling Procedure is presented in Figure 1.

The experiment group in this study included the elderly who participated in Tai Chi exercising program beside their daily activities at Sadeghih Elderly Home. The intervention was the Tai Chi Exercise sessions. The control group included the elderly who didn't participate in any exercising activity along their daily activities at the Elderly Home. With regard to the nature of athletic interventions, there was no possibility to adopt blinding in this study.

Also, the elderly who had not participated continuously in 5% of the exercising sessions or frequently in 10% of the sessions or didn't show consent to keep up with the study were omitted.

In order to collect the data, the Petersburg Sleep Quality Questionnaire was used, which is a reliable questionnaire with a Cronbach alpha of 89 percent and is applied for examining the sleep quality of the elderly.<sup>5, 18</sup>

This questionnaire examines seven aspects of sleep in the recent month, including the duration of being in bed, delay in starting to sleep, sleep efficiency, the individual's perception of his/her sleep quality, sleep disturbing



**Figure 1.** Sampling Procedure

factors, the amount of the consumed soporific, and the morning functioning of the individual. The Likert scale with a budgeting of 0 to 3 was employed to budget all the questions in this questionnaire on which "zero" represents the absence of any disorder in individual's sleep quality and accordingly "three" represents the maximum level of disorder in the individual's sleep quality. In order to examine and ultimately balance the effect of depression, the Bach 2 Depression Questionnaire with a Cronbach alpha coefficient of about 91 percent was used<sup>19, 20</sup>. This questionnaire has 21 items and each item is assigned 0 to 3 points, in which the "zero" means not having that temperamental mood and "three" means having that temperamental mood in a severe manner. After coming up with the total of all the points in the questionnaire, the attained points were interpreted in this way. With regard to the inclusion of 21 items in the questionnaire, each individual would receive points 0 to 63 from the Bach 2 Depression Questionnaire. In order to define the Body Mass Index,

the measurement of height and weight of the elderly was used.

The 10-stage Tai Chi exercise recommended by Mr. Wolf et al and designed for the above-60-year-old elderly is used in this study.<sup>21</sup> This protocol has been used by other researchers too and Audit, et al employed it to so a study on elderly women.<sup>22</sup>

Two physical training coaches, who had the experience of working with the elderly performed the exercising interventions equally for all the elderly; one coach performing them during the study and another one guiding the elderly, correcting their motions and coordinating them. At the beginning of the study, the men's group was divided into two groups of 8 and the women's group was also divided into two groups of 7 and 8. The exercising intervention was performed for 12 weeks, 3 sessions each week, while the duration of the Tai Chi exercise was 5 minutes in the first session and 5 minutes were added in each following week so that the intervention reached to 20 to 25 minutes

**Table 1.** Baseline characteristics of studied elderly population in experiment and control groups

variable	Experiment Group	Control Group	P value
Gender (male%)	51.6%	45.1%	0.611
Age (years)	68.74 ± 5.48	69.42 ± 5.34	0.624
Illiterate (%)	41.9%	51.6%	0.555
Body mass index (kg/m <sup>2</sup> )	24.37 ± 4.23	22.96 ± 3.86	0.178
Depression score	16.35 ± 8.06	18.09 ± 9.10	0.429

**Table 2.** Mean total score of sleep quality based on Petersburg Sleep Quality Questionnaire before and after intervention in experiment and control groups

Sleep quality total score	Experiment Group	Control Group	P value
Before intervention	10.333 ± 2.236	10.413 ± 2.43	0.955
After Intervention	8.963 ± 2.695	10.069 ± 2.3	0.031
<b>P value</b>	0.001	0.294	

of Tai Chi exercise in each session at the end of the first month.

The data in this study are of qualitative and quantitative types, for the analysis of which the SPSS software, version 14 was used to conduct descriptive and inferential statistical tests. In order to compare each group both before and after the study, the Paired t-test was used and to compare both groups, the Independent t-test was employed.

## Results

The age range of the participants was from 60 to 83 years old. Baseline characteristics of studied population are presented in Table 1. The majority of the individuals in the control group were the elderly aging 65 to 74. Meanwhile, the majority of individuals in the experiment group were the elderly aging 65 to 69. The lowest percentage of education in both control and experiment groups was related to higher-level educations, being equal to 3.2 percent.

Mean of Body Mass Index in the elderly was in the normal range. The ranking of depression intensity in this Table shows that the majority of the participants in both groups are in the normal range. Both groups were approximately homogeneous. Mean total score of sleep quality based on Petersburg Sleep Quali-

ty Questionnaire .before and after intervention in two study group is presented in Table 2.

## Discussion

The results of this study showed that the Tai Chi exercise brings about a significant improvement in the sleep quality of the experiment group. In a study by Lee 2004 on the elderly with mean age of 75.30 ± 7.8, mean score of the sleep quality in Tai Chi group was 13.32 ± 2.32 before the study and the effect of Tai Chi on sleep quality has been statistically significant.<sup>23</sup> These findings are in line with the findings of the present study. As it is seen the sleep quality of the participants in Li's study was to some extent less than this study which probably due to the older age and higher body mass of the participants in his study.

With regard to this point that the positive effects of exercise on sleep quality of individuals who have a low quality of sleep are more than those who enjoy a good quality of sleep, Tai Chi has shown a higher effect and the resulted difference in the mean of sleep quality in Li's study was more than the present study because the sleep quality of the elderly who participated in this study was lower than the current study.

Caldwell et al's study was done in 2009 on the sleep quality of 127 students with mean

age of  $21.27 \pm 2.24$  years. Considering the lower age of studied population in Caldwell et al's study, the main reason for the lower score of sleep quality of individuals was the lower age range of the individuals.<sup>24</sup> At the end of Caldwell et al's study, the Tai Chi exercise did not have any significant effect on the average score of sleep quality questionnaire which may be due to shorter duration of the study which was done for 50 minutes in 15 sessions and because of the proper sleep quality of the participants with a sleep score of lower than 5 in nearly half of the participants.

According to the findings of rwin et al's study Tai Chi resulted in an increase of sleep quality score in a group who had normal sleep quality.<sup>25</sup>

In this study, however, the sleep quality of the elderly who had a score of more than five, had been improved by doing sleep quality exercise, and the results of his study are consistent with the findings of the present study.

In Yeh et al's study which was conducted in noticed that Tai Chi exercise resulted in a significant improvement in their sleep durability when compared with the control group. It must be mentioned that Polysomnography was used to record the brain waves in this study. The recorded brain waves showed that the sleep quality in the experiment group members had been improved more significantly than the control group.<sup>26</sup>

With regard to this point that Tai Chi exercise has been considered by researchers as a supplementary and alternative treatment method in the last 10 years to improve the health level of the elderly, the researcher of this study hopes that this kind of exercise would be considered by Iranian researchers and further studies would be done in this regard.

The authors declare no conflict of interest in this study.

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