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Effects of Yoga on the Quality of Life and Mobility in Geriatric Patients with Osteoporosis

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Abstract

Background: The aim of the current study was to investigate the effects of yoga on the quality of life (QoL) in osteoporosis.

Methods: Twelve women with osteoporosis were enrolled in the yoga exercise program, 9 of whom completed the 12-sessions program. Physical characteristics of the patients were recorded and general physiotherapy assessments were performed. Twelve sessions of a yoga program including warming and breathing exercises, asanas and relaxation in supine position were applied to participants. Before and after yoga program the patients' quality of life (QoL) was evaluated using Nottingham Health Profile (NHP). Patients' mobility were assessed using Timed Up and Go Test (TUG). Patients' pain level was evaluated using the visual analog scale (VAS).

Results: The mean age of the geriatric women with osteoporosis were 66.00 ± 3.87 years. It was found that patients' QoL scores after the yoga program were better than scores obtained before the yoga program ($p < 0.05$). After sessions, there was a statistically significant decrease in their TUG mobility scores ($p < 0.05$). When the initial values were compared with the after yoga program values, the severity of pain showed a diminish ($p < 0.05$).

Conclusions: At the end of the study, it is concluded that yoga has the potential to alleviate problems related with QoL, mobility and pain the geriatric women with osteoporosis.

Keywords: Yoga; Osteoporosis; Mobility; Quality of life

Introduction

Osteoporosis is a musculoskeletal condition, leading to an increased risk of fractures, characterized by low bone mass and microarchitectural deterioration of bone tissue [1,2].

Exercises in the postmenopausal period prevent rapid bone loss and increase muscle strength, mobility and flexibility. Yoga exercises, which have been an integral part of Eastern culture, have been reported to be beneficial in osteoporosis rehabilitation in some trials [3-5]. As an ancient Indian discipline of the body, mind, and spirit, dating back to at least 2000 BC, yoga is gaining increasing popularity in Western industrialized countries as a means of alleviating stress and improving balance, flexibility, and muscle strength [6-8]. To learn yoga is simple and can be practiced even by very elderly, ill, or disabled persons [9]. Yoga may offer an especially promising and costeffective means of reducing impairment associated with gait problems in the elderly, requiring little equipment and personel to sustain. The Indian yoga exercises are routinely used to manage joint contractures caused by poliomyelitis and other disorders [10,11]. Yoga programs have also been shown to improve balance and coordination in elderly patients with stroke [12], and to improve grip strength [13], reduce pain [14], and balance and gait properties in women with musculoskeletal problems and osteoporosis [14,15].

A number of studies suggests that yoga-based interventions are readily accepted by older adults, and in elderly populations may improve a range of health outcomes [14-18]. The effects of yoga in postmenopausal osteoporosis is maintaining emotional stability, increasing body flexibility, and improving posture, balance, and coordination [5]. The concern with quality of life, physical and functional decline associated to aging is a constant in the population and a universal process. Accordingly, the aim of this study was to show the effect of yoga on the quality of life, mobility and pain in geriatric women with osteoporosis.

Materials and Methods

Subjects

The study involved twelve women aged between 65 and 75 years old who had been diagnosed with osteoporosis. Twelve participants were enrolled in the yoga exercise program, 9 of whom completed the 12-week course. Inclusion criteria were as follows: Being female, ages between 65-75, having no mobility problems, and T-score by DXA measurement below -2.5 in at least one region. Exclusion criteria included an asymmetric gait pattern, use of an assistive device for walking, evidence of neuromuscular illness, major orthopedic diagnosis in the lower back, pelvis, or lower extremities. Additionally, severe rheumatoid arthritis or osteoarthritis that would cause discomfort during the yoga exercises, acute medical illness, and symptomatic heart or lung disease were the other exclusing criteria.

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Program

Sessions included pranayama (breathing exercises) and body awareness (10 minutes); warm-up activities (10 minutes); asana (physical poses) in the supine, seated, and standing positions (30 minutes); relaxation; and shavasana (corpse pose) (10 minutes). Asanas were selected based on the patients' needs and ability in relation to their muscular strength, and articular limitations. To reduce the risk of injury, to avoid discomfort and to minimize risk of overstretching, blankets, chairs, blocks were used. Each session began with seated centering and pranayama. The specific pranayamas used were diaphragmatic breathing and the full yogic breath. After pranayama, a 10-minute warm-up was performed. Warm-up activities included seated shoulder circles, wrist rolls, standing heel and toe raises, abduction, and heel walking. Yoga postures used in the program included tadasana (mountain pose), virabhadrasana, trikonoasana (triangle pose), vrikshasana, ardha kati chakrasana, trikonasana, salabasana, sasankasana, and surya namaskar (modified sun salutations using a chair), ended each session with relaxation in shavasana. The 1 hour sessions occurred twice a week. After completion of the 12 sessions treatment period, initial parameters were measured again.

Measures

Participants' age, weight, height, and duration of disease were recorded. A general physiotherapy examination was carried out to determine range of joint motion, muscular strength, edema, pain, and posture especially within upper and lower extremity of the body. Before and after treatment the QoL of participants was evaluated using the Turkish version of the Nottingham Health Profile (NHP). The NHP measures self assessed quality of life in six dimensions: emotional reactions, energy, pain, physical mobility, sleep, and social isolation. Respondents answered as "yes" or "no" to a total of 38 questions. The answers are weighted: a score of 0 indicates no problems within an area and a score of 100 indicates all possible problems within an area. It is scored using weighted values which give a range of possible scores from zero (no problems at all) to 100 (presence of all problems within a dimension) [19].

Patients' pain level was evaluated using the visual analog scale (VAS) before and after yoga sessions.

For detecting mobility impairments in older adults The Timed Up and Go is a widely used clinical tool. This test measures the time to rise from a 48 cm height armchair, walk 3 m, turn and return to a fully seated position in the chair. This test has good reliability (ICC 0.91-0.96) [20], and times ≥ 12 s have high sensitivity and specificity for identifying elderly individuals at risk for mobility impairments and falls [21,22].

Statistical analysis

Statistical analyses of the data were carried out using SPSS 16.0 for Windows. The data are presented as mean ± standard deviation (X ± SD). In the comparison of the values obtained before and after treatments, paired parametric t test was used. In all statistics, any p value equals to 0.05 was accepted as statistically significant unless otherwise noted.

Results

The mean age of 9 geriatric women with osteoporosis were 66.00 ± 3.87 years. Physical parameters of the subjects are presented in (Table 1) .

Demographic features n=9	X± SD
Age (year)	66.00 ± 3.87
Height (cm)	165 ± 0.04
Weight (kg)	65.00 ± 7.28
Body Mass Index	23.09 ± 2.27

Table 1: Demographic features of the participants.

NHP parameters	Before sessions X± SD	After sessions X± SD	z	p
Level of energy	58.48 ± 41.15	44.44 ± 41.71	-1,857	0,04*
Pain	63.08 ± 19.88	34.58 ± 13.03	-2,668	0,00*
Emotional level	60.28 ± 24.66	32.14 ± 16.56	-2,314	0,02*
Sleep	39.08 ± 32.84	13.20 ± 23.45	-2,527	0,01*
Social adaptation	31.12 ± 35.82	17.21 ± 17.57	-1,156	0,02*
Physical skills	37.29 ± 27.47	22.67 ± 23.47	-2,383	0,01*
Total score	289.32 ± 143.59	166.49 ± 100.40	-2,668	0,00*

*p < 0.05

Table 2: Comparison of the quality of life scores.

	Before sessions X± SD	After sessions X± SD	z	p
TUG	12.26 ± 1.81	9.94 ± 1.19	-2,668	0,00*
VAS	8.22 ± 1.44	4.46 ± 0.79	-2,666	0,00*

*p < 0.05

Table 3: The participants' before- and after-sessions mobility and pain scores.

It was found that patients' QoL scores after the yoga program were better than scores obtained before the yoga program ($p < 0.05$) (Table 2).

After sessions, there was a statistically significant decrease in their mobility scores (TUG) ($p < 0.05$). When the values before yoga program were compared with the values after the program, it was reported that the severity of pain diminished ($p < 0.05$) (Table 3).

Discussion

Due to the outcome of the current study of yoga for osteoporosis in geriatric women it can be concluded that yoga has a positive effect on quality of life, mobility and pain. This pilot study has provided useful data and information to inform the yoga program for osteoporosis in geriatric women.

It has been reported that yoga showed a reduction in back pain, arthritis, and anxiety and an improvement in gait, all capacities that mitigate against the falls that produce osteoporotic fractures and yoga injuries are uncommon and nearly always minor in the literature [18,23,24]. In this article, we investigated the applicability of yoga for osteoporosis in the geriatric population. We also describe our recent pilot study determining the effects of yoga on quality of life, mobility and pain in geriatric women with osteoporosis. It was thought that yoga has a positive effect on these parameters due to the potential of yoga to decrease fracture risk in a geriatric population via several mechanisms, including improving balance and functions, reducing hyperkyphosis, and improving bone turnover [18,23-25].

The NHP is often regarded as a measure of general perceived health status, but the profile has been used in several osteoporosis trials as

a measurement of QoL [26,27]. With significantly fewer problems for the osteoporosis group in the domains of energy, emotional reactions, social isolation, physical mobility, and sleep, the results on the NHP strongly indicate a better QoL in that group than in the general wards group [5,15].

In our study, the patients included in the classic yoga program demonstrated significant improvement for all subparamaters of NHP such as pain, sleep, social isolation etc. and total NHP scores. Pain reduction could be explained by the strengthening of back muscles, stretching and posture exercises. Other components of NHP also showed beneficial effects. There was an improvement in all NHP parameters in the yoga group following the 12-week program. Although the number of the patients is limited in our study, it can be stated that 12 weeks of yoga training had beneficial effects on the QoL in geriatric women with osteoporosis. Studies with longer duration and larger numbers of patients would be able to demonstrate these effects more clearly.

The yoga program additionally was found to have positive effects on balance and mobility evaluated by TUG test, and these results were significant too. Alves et al. [28] investigated sedentary elderly women submitted to a Hatha yoga program consisting of three 60-min sessions per week for a 12-week period and found a reduction in TUG tests. These findings corroborate the results of the present study, since the same results were found. This indicates that performance in TUG improved after yoga program. Thus, it can be inferred that engaging in yoga may enhance flexibility and mobility in elderly individuals [15,28].

The VAS results in our trial indicate that the patients' own ratings of pain were in favor of after yoga session in all subjects. The literature mentioned that yoga offers the opportunity to help people managing their pain and sometimes eliminate it from their life. When we feel pain it naturally causes the body to become tense and tighten the muscles in the area of the pain. This natural reaction actually makes the pain more intense and using simple yoga relaxation techniques will help to retrain the body's response to the pain.

Breathing techniques of yoga help the body to become more relaxed and the tension in the muscles can be reduced somewhat. These relaxation techniques also help the brain to release more of the positive chemicals that not only make the person feel better, but also help to reduce the effects of the pain [15,28-30]. We believe that yoga reduces pain in women with osteoporosis due to these mechanisms and these effects reflect VAS score and the NHP subparameter pain score.

Conclusions

In conclusion and based on the results of the present study, it can be inferred that the regular practice of yoga contributes to increased mobility, reduced pain and consequent improvement in the functionality and QoL of elderly females. It is suggested that yoga can be prescribed as an effective physical exercise to minimize the harmful effects of osteoporosis.

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