



Modified Chair Yoga in Older Adults with Osteoarthritis Knee

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ABSTRACT

Background

Knee Osteoarthritis (OA) causes pain, functional limitation and largest cause of disability among older women and men. Indians are more prone to Knee OA due to squatting habit in daily activities. Hatha Yoga is used as treatment, up to 50% of older adults cannot participate because they feel insecure due to pain, weakness, aggravating the condition hence in this study effect of modified Chair yoga program was found out.

Aim and objectives

To find the effect of chair yoga in patients with osteoarthritis knee on Pain, Stiffness, Physical function using WOMAC Scale and on range of motion (ROM) using goniometric Evaluation.

Materials and method

In pre and post Experimental study design, 30 subjects between age group 40-60 years were included, Informed consent was taken. Subjects with OA Knee were assessed using WOMAC scale ROM was noted prior to intervention. Chair yoga was demonstrated in 1st week and then gradually progressed till 4 weeks. Post intervention based assessment was done.

Results

Total 12 males and 18 females were evaluated with a mean Age (54.6).The mean for Neck circumference was 19.63±1.921, Waist Hip ratio was 0.902 ± 0.0293.Data analyses was done using students paired t-test. The WOMAC score for pain (p= 0.000), stiffness (p= 0.000), Physical Fitness (p= 0.000) was statistically significant. The Range of Motion for Flexion (p= 0.000) and Extension (p= 0.000) was also statistically significant.

Conclusion

The study concludes that modified chair yoga was effective in reducing pain and stiffness and increasing flexibility further reducing disability in osteoarthritis knee patients.

Keywords: Osteoarthritis Knee, Chair Yoga, WOMAC, ROM, Older Adults.

INTRODUCTION

Osteoarthritis is the second most common rheumatologic problem and it is the most frequent joint disease with a prevalence of 22% to 39% in India. OA of the knee is a major cause of mobility impairment, particularly among females. OA was estimated to be the 10th leading cause of nonfatal burden. [1]

Knee osteoarthritis is a degenerative knee disease associated with pain, swelling, stiffness, limited ambulation and declined balance function. It has been believed that chondrocytes undergo premature aging, which is called “stress induced senescent state” that is the reason for cartilage degeneration. [2]

The knee pain gradually tends to progress and many people initially attribute knee soreness or discomfort to lack of exercise or getting older. The knee cartilage wears away, the femur and tibia (and sometimes patella) bones can rub together, results in irritation and swelling of the knee (i.e. fluid in the knee). A swollen knee may be accompanied by a sensation of warmth, which can range from warm to burning. The knee may even be red and warm on the touch. Overweight is an important factor in causing osteoarthritis, especially in the knee. It also increases the chances of osteoarthritis which becomes progressively worse. [6]

Bone friction and swelling in the knee joint makes the knee stiff and less flexible leading to reduced Knee range of motion. A person with moderate to advanced knee osteoarthritis finds it difficult to straighten out his or her knee. And also experience stiffness in the knee in the morning or after sitting for a long period. [3]

Walking, sitting and rising from a chair, and ascending and descending stairs are important determinants of independence to carry out day to day activities. It has been reported that occupational squatting is a strong risk factor for knee OA. [4]. The occupational physical activities include monotonous motions and great forces such as kneeling, squatting on joints, climbing, and heavy weight lifting. In Western societies, squatting in occupational activities often occurs in conjunction with other heavy labour. Any of these activities may increase the risk of knee OA, thus confounding the relationship between squatting and knee OA. Non occupational squatting is a common posture in daily living among Chinese men and

women, and this phenomenon is also prevalent in other Asian countries. [4]

Obesity and overweight are considered to be the potential risk factor for the development of Knee OA. Indians (especially women) are more prone to Knee OA due to their squatting habits in daily activities, with higher incidence in females due to their postmenopausal status and habit of constant squatting. Higher prevalence is seen in house wives due to sex factor and sedentary lifestyle ie they used their household works in knee bend position. [5]

Non-medicinal treatments for knee osteoarthritis include physical therapy, acupuncture medicine, using assistive devices like crutch, knee brace, medical insoles and heel wedges, losing weight [6].

In different studies, yoga alleviated musculoskeletal pain, improved flexibility and physical function, decreased tenderness, and in older adults. Although participants in the yoga group showed positive effects on OA, up to 50% of older adults could not participate in traditional (“standing”) yoga because they felt insecure due to pain, weakness. Some studies have assessed the adverse events associated with yoga practice which reported exacerbation of existing minor musculoskeletal pain including pain in the lower back, shoulder, wrist, knee, or Achilles tendon. Hatha Yoga poses (such as spinal flexion [forward bending] and rotation of the spine [twisting]) are relatively risky for older adults with musculoskeletal osteoporosis and have the potential for significant harm.⁽⁷⁾ Hence in this study Effect of modified chair yoga was found in Older Adults with OA Knee.

MATERIAL AND METHODOLOGY

In this prepost experimental design , After ethical clearance, 30 subjects between age group 40-60 years who had were medically diagnosed of OA knee with knee pain for about 3 months, worsening of knee pain in activities like climbing stairs, walking a ramp, squatting, decreased ROM and stiffness on knee, and lack of other musculoskeletal conditions were included. Exclusion criteria were history of knee surgery, history of acute knee damage in recent 6 months, and participation in exercise programs in recent 6 months [6].

Procedure

Ethical committee approval of institute was taken. The purpose of the study was explained to the patients and prior consent was taken. Individuals were enrolled according to inclusion and exclusion criteria. Prior assessment of the individuals was done using WOMAC scale as an outcome measure.

Each yoga session consisted of Asana (Movement), Pranayama (Breathing), and meditation (Relaxation) practices. Every exercise session consisted of three parts: 15 minutes warm-up exercises, main exercises ie Modified Chair yoga sessions were taught, and 15 minutes cool

down exercises [6]. After 4 weeks intervention post assessment was done documented and analyzed.

RESULT

Mean Age was 54.6 with a total 12 males and 18 females were evaluated. The mean for Neck circumference was 19.63±1.921 and Waist Hip ratio was 0.902 ± 0.0293. Data analysis was done using students paired t-test. The WOMAC score for pain (p= 0.000), stiffness (p= 0.000), Physical Fitness (p= 0.000) was statistically significant. The Range of Motion for Flexion (p= 0.000) and Extension (p= 0.000) was also statistically significant.

Table 1: Comparison of Mean Value of Womac Score Pre and post

WOMAC	PRE	POST	P VALUE
	MEAN ±SD	MEAN±SD	
PAIN	3.6 ±2.31	2.26±1.87	0.000
STIFFNESS	2.13±1.87	1.33±1.12	0.000
PHYSICAL FUNCTION	10.33±3.45	8.1±2.94	0.000
TOTAL SCORE	16.6	11.7	0.000
KNEE FLEXION	74±18.12	85.65±19.15	0.000
KNEE EXTENSION	74±18.12	85.65±19.15	0.000

Interpretation

The comparison of Womac score of mean values shows pain (p=0.000), stiffness (p=0.000),

physical function (p=0.000) which is statistically significant.

Table 2:

BMI CLASSIFICATION	PARTICIPANTS
UNDERWEIGHT	0
NORMAL WEIGHT	23
OVERWEIGHT	7
CLASS 1 OBESITY	0
CLASS 2 OBESITY	0
CLASS 3 OBESITY	0

Interpretation

Out of 30 people the BMI for 23 people was calculated to be as normal weight and for 7 people as overweight in the study.

DISCUSSION

Study shows that there is significant improvement in pain stiffness and physical function of WOMAC scale in Osteoarthritis knee patients also improving flexibility, by increasing ROM.

Females were more affected than men with OA knee is consistent with other researches where a recent WHO report on the worldwide burden of disease indicates that knee OA alone is likely to become the 4th most important cause of disability in women and the 8th in men. The probable reason for higher incidence among female patients may be due to do their postmenopausal status and habit of constant squatting. The highest prevalence found among the housewives and the reason due to sex factor and sedentary life style i.e they used to their household works in the knee bent position. [5]

The study also showed that people with osteoarthritis knee were overweight and obese. The data revealed high prevalence of (Knee OA in patients of high BMI). Researches have showed that obesity and overweight are considered to be the potential risk factor for the development of Knee OA. [5]

BMI is positively associated with knee OA in women and suggested that more active individuals have lower risk of knee OA. [1]

Also studies have shown that OA prevalence was found to be significantly more in participants who used Western toilet as compared to those who used Indian toilet or both types, but it reflects more a condition of difficulty to use Indian toilet than a predisposition to OA [1]

Yoga is currently one of the fitness programs recommended by the Arthritis Foundation (AF) to promote joint flexibility and lower stress to potentially benefit individuals with arthritis in general. [2] Yoga therapy involves asana which not only strengthen quadriceps muscles but also relieves stress. It is a good complimentary therapy and could be more beneficial than other therapy.⁽⁸⁾ Yoga has been used to alleviate musculoskeletal pain and has been associated with significant improvement in range of motion and function, decreased tenderness and decreased pain during activity in patients with OA Knee [9]

Researchers have shown that Knee OA is much more prevalent in India than in west, as Indians are more prone to Knee OA due to their squatting habits in daily activities. [10] Yoga is usually

performed on floor causing patients to perform repeated squatting activities. Knees can become stiff after sleeping or sitting for a long period of time. People with knee osteoarthritis often find stiffness and pain are most noticeable when they try to get out of bed in the morning or out of a chair after a long period of sitting. [3]

A variation of yoga that may be particularly applicable for older adults with OA knee is chair squat while performing yoga. The chair squat is performed by squatting (i.e., lowering the body's centre of mass by flexing the hip and knee joints and dorsiflexion the ankle joints) onto a stable surface such as a box, bench, or chair, and then rising to a standing position. [10] The use of the Sit 'N' Fit Chair Yoga program for older adults with OA who are unable to participate in regular exercise or standing yoga programs. No adverse events were associated with the chair yoga, which led to the conclusion that this program is safe and appropriate for this population. [7]

Chair yoga is often preferred by older persons because they feel safer in completing exercise while seated in a chair rather than standing. Chair yoga as a gentle form of yoga, is practiced sitting in a chair or standing while holding the chair for support. [11] Chair yoga is often preferred by older people because they feel safer in completing exercise while seated in a chair rather than standing also reduces risk of fall and prevents further injuries. The effectiveness of chair yoga for older adults with OA suggested that chair yoga offered potential reduction in pain and disability among older adults with OA and also decreases pain and physical limitations and also improved pain level and physical function and might offer a low-cost exercise program to prevent or reduce functional disability due to inactivity. [11] The frequent joint motion when practicing yoga is believed to have physiologic effects at the cellular level. Because in vitro production of pro-inflammatory interleukin-1 and tumor necrosis factor decreases under low-level intermittent fluid pressure, yoga exercise may reduce fluid pressure, which, in turn, preserves cartilage that would allegedly be lost by immobilization. [2]

Park et al used Sit 'N' Fit Chair Yoga, a gentle form of yoga, practiced sitting in a chair, consisting of a safe and secure program of stretching, muscle strengthening, breathing, and relaxation. [2] Modified Chair yoga showed improvement in

flexibility, physical function and reducing knee pain. The use of chair yoga was effective for older adults with osteoarthritis knee who were unable participate in regular exercise or exercise in standing. [4] Hence Modified Chair yoga is found to be effective in patient with OA knee.

CONCLUSION

The study shows that modified chair yoga was effective in increased flexibility, reduced pain and improved physical function and reduced disability in osteoarthritis knee patients.

Future scope of study

- Larger sample size should be taken for the future study.

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- The duration of the study should be longer.
- Comparison of modified chair yoga with other variations in yoga can be performed.

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Conflict of interest

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