

# Effects of Stott's Pilates Versus Yogic Exercise in Fibromyalgia Patients

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## ABSTRACT

**Background and purpose:** Fibromyalgia syndrome is a common condition characterized by chronic musculoskeletal pain and a reduced pain threshold as well as hyperalgesia and allodynia. It is a non-articular pain syndrome presenting with tender points. Fibromyalgia syndrome is a chronic pain disorder with an unknown cause. Physical injuries, emotional trauma (or) viral infections may set off the disorder. The purpose of the study is to compare the effect of stott's pilates exercise versus yogic exercise in fibromyalgia patients.

**Method:** 30 subjects who underwent inclusion criteria were selected and randomized 15 subjects each into stott's pilates and yogic exercise group. pilates group received stott's pilates while yogic exercise group received yoga asanas for duration of four sessions per week for 4 weeks. A Numeric pain rating scale to measure pain and Fatigue severity scale to measure fatigue severity were used.

**Results:** Analysis using Independent 't' test found that there is no statistically significant difference ( $p>0.05$ ) between stott's pilates and yogic exercise on reducing pain and fatigue severity, however the percentage of change in improvement was greater in pilates group.

**Conclusion:** Based on the results, this study concluded that stott's pilates exercise was effective in reduction of pain and fatigue severity in fibromyalgia patients.

**KEYWORDS:** Fibromyalgia syndrome, Stott's pilates exercise, Yogic exercise, Numeric pain rating scale, Fatigue severity scale.

## INTRODUCTION

Fibromyalgia syndrome is a common condition characterized by chronic musculoskeletal pain and a reduced pain threshold as well as hyperalgesia and allodynia<sup>(1)</sup>. It is a non-articular pain syndrome presenting with tender points<sup>(2)</sup>. Fibromyalgia syndrome is a chronic pain disorder with an unknown cause. Physical injuries, emotional trauma (or) viral infections may set off the disorder<sup>(3)</sup>. Fibromyalgia is more common in women compared to men, with the prevalence of fibromyalgia in the united states at 6.4 percent (7.7% in women and 4.9% in men)

and in India 0.5 % - 2% amongst the patient referred to tertiary care pain clinic, more than 40% met the criteria for fibromyalgia<sup>(4)</sup>. The risk for fibromyalgia is highest if you have an existent rheumatic disease. Fibromyalgia causes severe pain in the body. More common symptoms experienced by people with fibromyalgia include tender points on their body, insomnia, morning stiffness, head aches, numbness (or) tingling in the hands and feet<sup>(5)</sup>. FMS syndrome tends to run in families, and certain genes could make you more likely to develop it which is believed by the scientists. However, the disorder also

occurs in people with no family history of the disorder. The goals of fibromyalgia treatment are to alleviate pain, increase restorative sleep and improve physical function through a reduction in associated symptoms. Exercise program were reported to be helpful in fibromyalgia patients several studies. Such exercise includes stretching, strengthening, flexibility, aerobic exercise, yoga, tai chi etc.<sup>(6)</sup>

Pilates is a mind - body exercise which combines mobilization, stretching, strengthening, and breathing exercise and it may be a very good option for the treatment of patients with fibromyalgia. Pilates is a particular exercise approach that was intended to improve flexibility and health by emphasizing core strength, posture and coordination of breathing with movement<sup>(7)</sup>. Pilates exercise are designed to minimize unnecessary muscle requirements. These exercises mainly focusing on back extensors and abdominal musculature is referred as core strengthening. The goal of core strengthening without exerting peripheral joints are obtained through focusing on (1) coordinating breathing movement with movement ,(2) scapular, pelvic, and rib cage stabilization during abdominal movements and (3) head and cervical fostering more efficient movement patterns<sup>(8)</sup>.

yoga is one of the recommended forms of exercise for fibromyalgia. It can be a good, gentle way to stretch the body and loosen up tight muscles and joint. yoga derives from the Sanskrit word 'yukti' meaning 'union' aiming to unify spirit (consciousness) with super spirit (god). There are various aspects of yoga, which are known as ashtanga yoga for all - around development of human personality. These include Yama (moral codes), Niyama (self purification & study), Aasana (posture), Pranayama (breath control), Pratyahara (sense control), Dharana (concentration) and Samadhi (super contemplation)<sup>(9,10)</sup>. Yoga has a positive impact on hormone regulation. Individual Aasana and Pranayama leads to increased cortisol is associated with decreasing perceived stress, decreased anxiety and

improving pain management and higher level of melatonin to sleep quality<sup>(11)</sup>.

## METHOD

The study was conducted at the outpatient department in JKKMMRF college of physiotherapy and supreme ortho hospital, komarapalayam under the supervision of concerned authority. A total number of 30 subjects were selected by random sampling method after due consideration of inclusion and exclusion criteria and they all were divided into Group A and Group B with 15 subjects in each group. A total duration of 4 session in a week for 4 weeks. The parameter used for this study was Numeric pain rating scale and Fatigue severity scale. Both male and female are included in this study. Pain was measured by Numeric pain rating scale during active movements. Fatigue severity was measured by fatigue severity scale.

## PROCEDURE: Group A (STOTT'S PILATES EXERCISE)

- The pilates exercise is given to group A for 4 weeks in alternative days week.
- There are 10 sets of exercises.
- Subjects are given warm up (general mobility exercises) for 7 to 8 minutes, then pilates exercises are given, each for 5 repetitions and then cool down (stretching exercise) are given for 7 to 8 minutes.

## Pilates Exercises includes,

- Bilateral leg lift in supine.
- Bridging with swiss ball
- Neck extension with forearm supported prone.
- Heel slides with swiss ball.
- Shoulder and trunk roll with swiss ball
- Shoulder and trunk flexion with swiss ball.
- Alternate arm lifting with swiss ball.
- Knee extension with swiss ball.
- Rowing on swiss ball.
- Chest hold and arm lifting in supine.

**GROUP B (YOGIC EXERCISE )**

- The yogic exercises are given to group B for 4 weeks in alternative days /week.
- There are 10 alternating supine, prone and sitting poses
- Subjects are given with warm up for 7 to 8 minutes, then yoga poses are given, each for 5 repetitions then cool down are given for 7 to 8 minutes.

**The yoga poses are,**

- Tadasana
- Uttanasana
- Dandasana
- Bhadrasana
- Setubandhasana
- Uttanpadasana
- Paschimottasana
- Balasana
- Bhujangasana
- Savasana

**RESULTS AND TABLES**

**Table: 1 Comparison of numeric pain rating (NPRS) between group - A and Group – B :**

The comparative mean values, mean difference, standard deviation and unpaired ‘t’ value between Group A and Group B on fibromyalgia patients in numeric pain rating (NPRS) scale.

NPRS	Mean	Mean Difference	Standard Deviation	Unpaired ‘t’ Value
Group A	4.80	0.87	0.90	2.694
Group B	5.67			

The unpaired ‘t’ value of 2.69 was greater than tabulated ‘t’ value of 2.05, which showed that there was statistically difference at 0.05 level thus there is a significant improvements regarding reduction in pain and fatigue in patients with fibromyalgia in response to treatment in Group-A when compared to Group-B.

**Table: 2 Comparison Of Fatigue severity scale Between Group - A And Group – B**

The comparative mean values, mean difference, standard deviation and unpaired ‘t’ value between Group A and Group B on reduction of fatigue and fatigue in fatigue severity scale.

Fatigue severity scale	Mean	Mean Difference	Standard Deviation	Un Paired ‘t’ Value
Group A	4.94	0.73	0.63	3.58
Group B	5.67			

The unpaired ‘t’ value of 3.58 was greater than tabulated ‘t’ value of 2.05, which showed that there was statistically difference at 0.05 level thus there is a significant improvements regarding weight reduction in participants with obesity in response to treatment in Group-A when compared to Group-B.

**DISCUSSION**

Exercise training, as a management of fibromyalgia, had been proved to be beneficial in clinical field and several studies has examined it as a therapeutic intervention to improve the outcome. The study examined the gradual effect of pilates and yogic exercise in patients who were affected by fibromyalgia. It also showed that pilates exercise and yogic exercise results in positive changes on fibromyalgia management, reduction in pain and fatigue severity and improvement of muscle endurance.

The mechanism responsible for the analgesic effect are not briefly understood. There is a widely accepted hypothesis states

that activation of endogenous opioid system during exercise plays a important role in the analgesic response mechanism. The result of the statistical analysis shows that pilates exercise has the better improvement in fibromyalgia patients<sup>(12,13)</sup>.

The pilates exercise involves closed kinematic chain exercise, which provide the compressive and decompressive forces to the joints which reduce the risk of degenerative changes and also helps to reduce chronic axial musculoskeletal pain activating endogenous opioid system<sup>(14)</sup>. In yoga practice the postures assumed are isometric exercises which provide optimally maintained stretch to the muscles<sup>(15)</sup>.

### **In the analysis and interpretation of NPRS in Group A and Group B**

In the analysis and interpretation of NPRS, the unpaired 't' value of group-A and B was 2.69 which is greater than the tabulated 't' value of 2.05, which showed that there was statistically difference at 0.05 level thus there is a significant improvements regarding pain reduction and fatigue severity reduction in patients with fibromyalgia in response to treatment in Group-A when compared to Group-B.

### **In the analysis and interpretation of fatigue severity scale In Group – A and Group – B**

The unpaired 't' value of group-A and B was 3.58 which is greater than the tabulated 't' value of 2.05, which showed that there was statistically difference at 0.05 level thus there is a significant improvements regarding pain and fatigue severity reduction in patients with fibromyalgia in response to treatment in Group-A when compared to Group-B.

### **CONCLUSION**

Based on the results, the study concluded that the pilates exercise was more beneficial for pain reduction and fatigue severity reduction in fibromyalgia patients than yogic exercise.

#### **Declaration by Authors**

**Ethical Approval:** Approved

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**Conflict of Interest:** The authors declare no conflict of interest.

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