

COMPARISON BETWEEN RESISTED EXERCISES AND CONVENTIONAL THERAPY IN KNEE OSTEOARTHRITIS AMONG PRIMARY SCHOOL TEACHERS

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Abstract-

AIM AND BACKGROUND: To compare the effectiveness of resisted exercises and conventional therapy in knee osteoarthritis among primary school teachers and to find out the effective technique in treating knee osteoarthritis among primary school teachers and to compare the effects of resisted exercises and conventional therapy in knee osteoarthritis among primary school teachers.

METHODS: STUDY TYPE: Quasi- experimental study. **STUDY SETTING:** Samples have been selected from Saveetha Medical College Hospital, Thandalam, Chennai-602105 according to the inclusion and exclusion criteria. **SAMPLING TECHNIQUE:** Convenient sampling technique. **SAMPLE SIZE:** 30

RESULT: The values were statistically analysed using paired 't-test and the Unpaired 't-test. The statistical analysis made with the quantitative data revealed a statistically significant difference between Experimental group and Control group and also within the group. The post-test mean value of the Experimental group was 3.33 and the Control group was 3.40. This shows that the treatment given for Experimental group is comparatively more effective than Control group.

CONCLUSION: This study shows that there was an improvement in both Resisted exercises and Conventional therapy. However Resisted exercises show extremely significant improvement than Conventional therapy.

Keywords: Osteoarthritis, Resisted exercises, Conventional therapy, Primary school teachers.

INTRODUCTION:

Osteoarthritis (OA) is one of the most common musculoskeletal disorders typically seen in the middle age to the elderly population. Were the prevalence at the age of 65 is about 35-45%. It is one of the most prevalent (22% -39%) diseases seen in India. It affects thrice the times more common in women than men. The chance of developing OA increases after the age of 45 years, women (31.6%) are more likely to have OA than men.^[1] It can be generally classified into primary osteoarthritis and secondary osteoarthritis. The etiology of primary osteoarthritis is still unknown although age, genetic factors, etc. play an important role.^[2] Where three symptoms that is persistent knee pain, limited morning stiffness and reduced function been recommended for the diagnosis of knee OA. Also, restriction of joint movement and body enlargement can be very useful for the diagnosis of knee OA. Pain which is one of the most common symptoms of knee OA is termed to be the leading cause of chronic disability and a major source of the disability attributable to OA. The severity of pain ranges from barely perceptible to immobilizing. The pain in the case of knee OA increases by activity and is relieved by rest. The probability of radiographic OA increases to 99% in the presence of the above six signs and symptoms.^[3] Palpation of tenderness at the joint is evident in physical examination. There may be the presence of joint effusions which typically may exhibit elevated protein, normal viscosity and a mild pleocytosis. Another common thing observed during joint motion or walking is crepitus. One of the most common signs of OA of the knee is a limited range of motion whereas in advanced cases of OA knee malalignment may be seen (genu varus or genu valgus).^[4]

Pathogenesis mainly involves degeneration and destruction of the articular surface of the joints, alterations in biomechanics and morphology of the joint capsule and other supporting structures. There are several risk factors associated with OA, out of which the most common ones are obesity, low bone mineral density, diabetes mellitus, repetitive knee trauma, age, gender, muscle weaknesses, altered biomechanical forces, joint overuse, etc.^[5] There is a significant loss of proprioception and kinaesthesia sensation among the knee osteoarthritis individuals where the impaired proprioception adds to functional insufficiency in the individuals. Knee OA is not presently curable because the mechanism, pathology and etiology are not completely understood. Therefore, the goal of management of Knee OA is to relieve the symptoms of the disease and to slow its progression.^[6] The goal of the treatment as stated by many guidelines is to reduce pain, delay progression, improve ROM of the joint and improve functionality and mobility of the joint. Analgesics, opioids, glucocorticoids, anti-cytokines are some of the pharmacological management of OA. Some of the surgical management is Total joint replacement, arthroscopic debridement, osteotomy and uni-compartmental knee replacement. Physiotherapy for knee OA includes Electrotherapy like Ultrasound, TENS, Muscle stimulation, SWD. Resistance exercises involves strength training, Retro walking, Aerobic exercises, Manual therapy and Functional task training.^[7] Resisted exercise is an essential part of treating some of the underlying causes of knee OA, such as inadequate muscle strength, unbalanced muscle activation, abnormal biomechanics, and cartilage stress. Resisted exercises can be changed based on the patient's symptoms and

availability of equipment.^[8] In patients with knee OA, high-resistance and low-resistance strength training both decreased pain and enhanced function. Although high-resistance strength training regularly showed parameter estimates that were a little bit bigger than what low-resistance strength training was able to provide.^[9] PNF exercises have been designed in such a way that they help in promoting the neuromuscular response of the proprioceptors. The patterns of PNF have a spiral and diagonal direction and are in line with the topographical arrangement of muscles (Knott and Voss et al, 1968).^[11] Since PNF is more advantageous than usual strength programs in athletics in injury rehabilitation, it is used as an alternative form of progressive resistance exercise (Lusting et al, 1992).^[10] Quadriceps weakness found with early radiographic and cartilaginous signs of OA. Patients with early OA who begin performing exercises and receiving treatments aimed at strengthening their quadriceps using isometrics may be able to reduce their symptoms already present or delay the advent of new ones.^[12] IFT is hypothesized to have physiological effects on deeper layers than TENS does. A low frequency that is thought to equal the differences between these two medium frequencies is produced when two medium frequency currents that have considerably different frequencies are adjusted so that their amplitudes cross. Interferential current is the only therapy that significantly reduces pain intensity and pain score at the most recent follow-up period. It is probably the greatest therapy option among the available strategies for pain management in osteoarthritis.^[13]

METHODS:

General Survey is taken among primary teachers for OA knee and then people who meet the inclusion criteria will be included in the study, those who don't meet the inclusion criteria will be excluded and informed consent will be obtained they will be explained about the safety and simplicity of the procedure.

VAS score is used to assess the degree of knee pain in the OA knee subjects. All the subjects underwent pre-test measurement with sit and reach flexibility test. The post-test measurements were taken at the end of 4th week of intervention.

The subjects received resisted exercises for 1 session 3days/week for 4weeks. Subjects were reassessed by a physiotherapist after the end of the 4th week to measure the degree of knee pain in primary school teachers with stage 2 osteoarthritis.

EXPERIMENTAL GROUP - RESISTED EXERCISES

Experimental group was given resisted knee exercises for 2 sets every session. This was given for 3 days/week and continued for 4 consecutive weeks. After this, post values for VAS scores were noted, tabulated, and statistically evaluated. Resisted knee exercises are given to the subjects for 3 days/week for 4 weeks, and repeated for 10 times per session.

RESISTED EXERCISES FOR KNEE:

- Squats
- Weight cuffs with step-ups
- Weight cuffs with knee extension/flexion
- Weight cuffs with hip abduction/adduction
- Moderate resistance TheraBand exercises

CONTROL GROUP- CONVENTIONAL THERAPY

Control group was given conventional exercises along with IFT. This treatment was provided for 3 days/week for 4 consecutive weeks. After that, post-test values for VAS are noted, tabulated and statistically evaluated. Conventional exercises are instructed to the subjects and asked to perform the exercises for 10 repetitions each session.

CONVENTIONAL EXERCISES:

1. Knee isometrics
2. Strengthening exercises
3. ROM exercises

INTERFERENTIAL THERAPY:

Subjects were positioned in supine lying and IFT was placed in the pain full region for 10 minutes the treatment pad and the spacing between them is maintained. Frequency about 90-100 Hz was used for the treatment in planar vector field and beat frequency 100 Hz; sweep frequency 150 Hz.

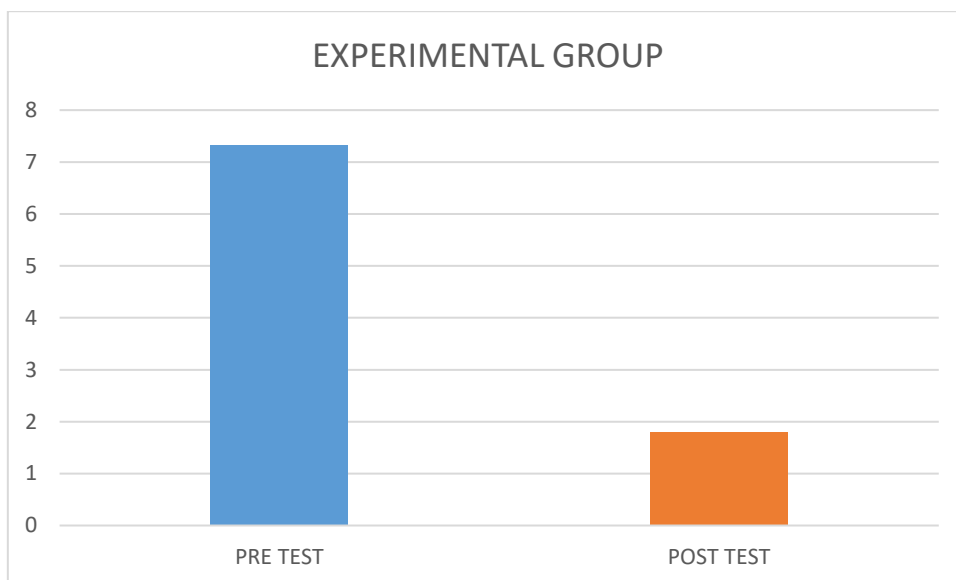
STATISTICAL ANALYSIS

Pre and Post values for VAS are assessed and analysed using paired and unpaired tests.

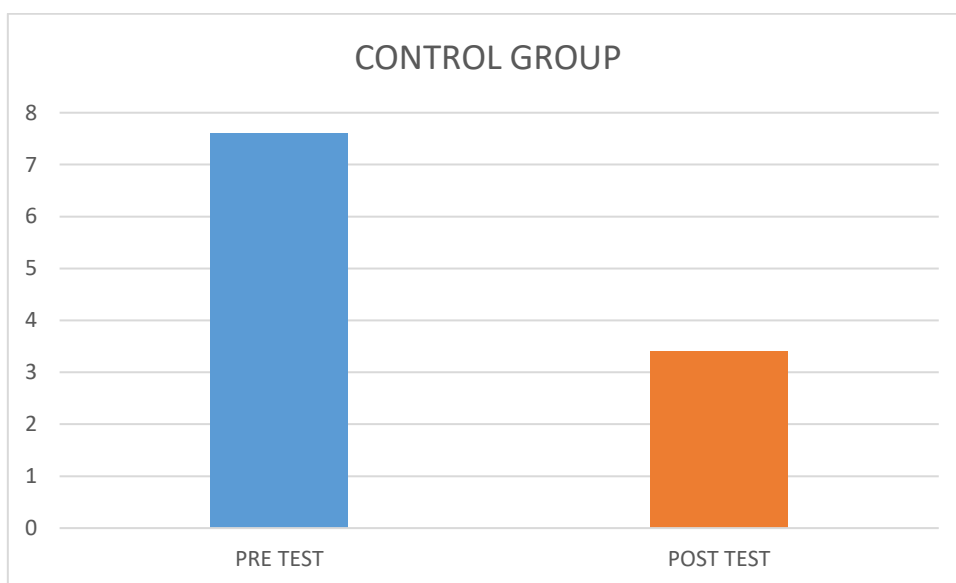
		MEAN	SD	T	P
EXPERIMENTAL GROUP	PRE-TEST	7.33	1.54	12.412	<0.0001
	POST-TEST	1.80	0.77		

CONTROL GROUP	PRE-TEST	7.60	1.50	8.3446	<0.0001
	POST-TEST	3.40	1.24		

TABLE 1: Pre-test and Post-test mean values of Experimental Group and Control Group using VAS.



GRAPH 1: Pre-test and Post-test mean values of Experimental group using VAS

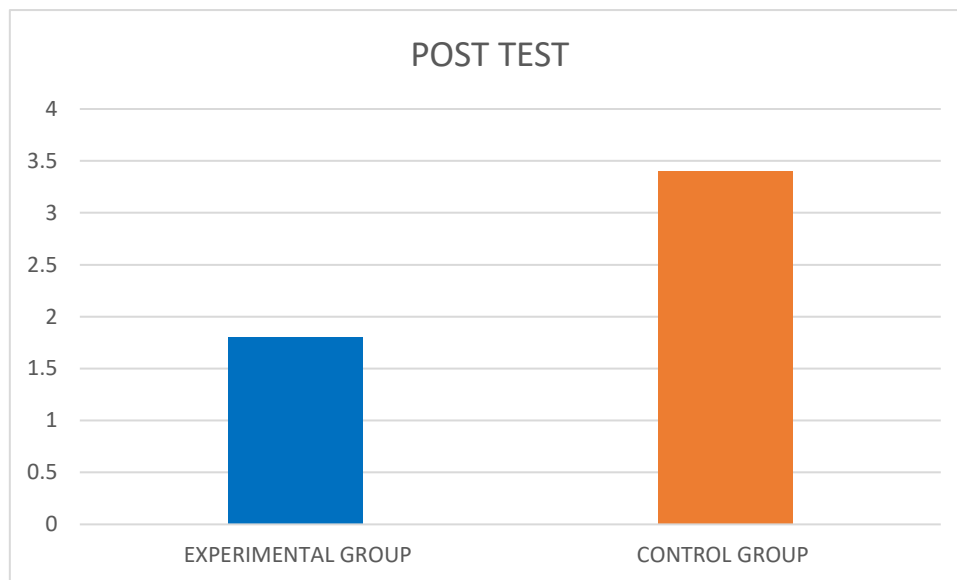


GRAPH 2: Pre-test and Post-test values of Control group using VAS

TABLE 2

TEST (post-test)	Mean	Standard Deviation	P-value
EXPERIMENTAL GROUP	1.80	1.23	<0.0001
CONTROL GROUP	3.40	1.24	

Comparison between the post-test values of Experimental Group and Control Group using VAS



GRAPH 3: Comparison between the post-test mean values of Experimental Group and Control Group using VAS

RESULT:

The statistical analysis made with the quantitative data obtained from the Visual analogue scale revealed statistically significant differences between the Experimental group and Control group and also within the group.

The statistical analysis made with quantitative data obtained from VAS in the Experimental group revealed that there was an improvement in the post-test mean value from the pre-test mean value. The pre-test mean value collected from the pre-test values obtained from VAS in the Experimental group is 7.33 and the post-test mean value is found to be 3.33. The statistical analysis obtained from VAS in the Control group showed the pre-test mean value is 7.60 and the post-test mean value found to be 3.40. The post-test mean values obtained from the Visual analogue scale were then compared between the Experimental group and Control group. The post-test mean value of the Experimental group was 3.33 and the post-test mean value of the Control Group was 3.40. This showed that the intervention received by the Experimental group was more effective than the intervention received by the Control group. Therefore, Resisted exercises are proven to be more effective in relieving pain among primary school teachers with knee osteoarthritis when Compared to the conventional therapy given.

CONCLUSION:

In this study, it has been concluded that resisted exercises given were more effective than conventional therapy given to the knee among primary school teachers with knee osteoarthritis, in reducing pain, and stiffness and improving the range of motion of the knee joint.

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ETHICAL CLEARANCE - Institutional Scientific Review Board, Saveetha College of Physiotherapy, Thandalam, Chennai.

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CONFLICT OF INTEREST - There are no conflict of interest

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