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EFFECTIVENESS OF PNF STRETCHING (CONTRACT-RELAX) IN KNEE OSTEOARTHRITIS

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Abstract - Osteoarthritis of the knee causes pain, restricted range of motion (ROM), diminished physical function, and other symptoms. Due to severe muscular weakness, stiffness, and joint pain, people with knee OA have demonstrated a reduction in their ability to use their lower limbs functionally[1].Hence the need for study is to compare the PNF stretching and conventional treatment in improving physical function and reducing pain in knee osteoarthritis.

Objective: The goal of the research is to determine how PNF Stretching Technique and Conventional exercise affect knee osteoarthritis pain and physical function.

Method:

STUDY DESIGN: Experimental study.

SAMPLING TECHNIQUE: Convenient Sampling technique.

SAMPLE SIZE: 30.

Result: The data that had been gathered was statistically analysed using an unpaired t-test. Compared to the traditional group, the PNF group exhibits, the test indicates significant effects (p 0.05) in lowering pain and improving physical function, as assessed by the NPRS and WOMAC questionnaires.

Conclusion:PNF stretching exercises were found to be more successful than conventional exercise in OA knee patients in relieving pain and improving functional ability.

***Key Words*:**Osteoarthritis, NPRS, WOMAC questionnaire, PNF Stretching exercise , conventionaltherapy.

1.INTRODUCTION

Osteoarthritis (OA) is a long-term, degenerative condition marked by changes in the synovial and joint capsule's morphology and biochemistry, as well as subchondral sclerosis, articular cartilage loss, marginal bone enlargement, and bone metabolism[1]. People with OA knees make up 28.7% of the population in India[1]. Osteoarthritis is a condition that severely reduces a person's quality of life by causing considerable pain and disability[1]. For people 40 and older, osteoarthritis is the main cause of a mobility disability[1]According to studies and assessments carried out internationally, Over the age of 60[1], symptomatic OA affects 18% of women and 9.6% of men.After the age of 40, knee osteoarthritis most frequently develops and slowly worsens[1].

One of the factors contributing to India's high rate of OA is genetics[1]. Sedentary behavior, squatting patterns, and nutritional circumstances are additional risk factors. The most common sign of OA knee is knee discomfort, which gets better with rest and gets worse with exercise. As a result of significant muscular weakening, joint soreness, and stiffness, people with knee OA have demonstrated a reduction in their ability to use their lower limbs functionally[1].

Patients with knee OA have less range of motion (ROM) in both flexion and extension[2]. This syndrome is triggered by pain, worn-down articular cartilage, a rigid capsule around the joint, and muscles that operate over the joint[2]. The pathophysiology of OA causes chondrocyte cells in cartilage to fail, which could impair hamstring muscle flexibility[2].

The ability of a muscle to stretch and permit a joint to move within its range of motion is known as flexibility. Flexibility of the quadriceps and hamstrings contributes to a knee joint's ability to move in a fluid and accurate manner[2]. Due to their lack of flexibility, they are more vulnerable to accidents and musculoskeletal issues[2].

Stretching that involves PNF, or proprioceptive neuromuscular facilitation, will help you lengthen and release your muscles[3]. One of the greatest strategies for stretching is known as proprioceptive muscular facilitation, or PNF for short[3].

Proprioceptive muscular facilitation, or PNF for short, is regarded as one of the best stretching methods3. PNF approaches could be used to address a variety of knee OA issues, including muscle atrophy, proprioception loss, and poor functional performance[3].

CONTRACT -RELAX*:*

Passive placement of the restricted muscle into a position of stretch followed by an isometric contraction of the restricted muscle. Most isometric contractions in PNF stretching techniques should he held for a minimum of 3 seconds at a sub maximal effort (20-50% of maximal effort) to avoid muscle fatigue and injury. After the contraction period the patient is instructed to relax the restricted muscle that was just contracting and activate the opposing muscle to move the limb into a greater position of stretch. Through Reciprocal Inhibition, the tight muscle is relaxed, and allowed to lengthen.

2. Body of Paper

METHODOLOGY:

A total of 30 people were chosen based on the inclusion and exclusion criteria, and after explaining the treatment's safety and ease of use to the participants, written agreement was obtained. Randomly selected participants were divided into the PNF Group and the Conventional Group. All subjects had pre-test evaluation using the NPRS and WOMAC questionnaire, and the same procedures were repeated for the post-test at the conclusion of 4 weeks.The WOMAC scale and the Numerical Pain Rating Scale were used to evaluate every individual as a pretest, and the same test was used again as a post-test at the conclusion of the four-week intervention regimen Interferential treatment will be administered to both groups for the first 10 minutes at a frequency of 90–130 HZ. Electrodes are positioned using the cross-fire method, and intensity is dependent on the patient's level of tolerance. PNF Group - PNF Stretching exercises along with Conventional physiotherapy: The

participants in PNF Group received the PNF Stretching along with Conventional physiotherapy for 3 sessions per week for Continuously 4weeks. The Conventional physiotherapy is Hamstring and Quadriceps isometric, stretching of Hamstring and Quadriceps, SLR, Hip adductor and abductor strengthening exercise. Conventional Group – Conventional Treatment for knee joint: The participants in Conventional Group received the conventional treatment for 3 sessions per week for continuously 4 weeks. The Conventional physiotherapy is Hamstring and Quadriceps isometric, stretching of Hamstring and Quadriceps, SLR,Hip adductor and abductor strengthening exercise.

INCLUSION CRITERIA:

Both Male and Female patients diagnosed with unilateral OA knee aged between 45 to 60 years are included in the study.

EXCLUSION CRITERIA:

1. Ligament tear in and around knee joint.
2. Knee arthroplasty.
3. Surgery near knee joint.
4. Bone tumor.
5. Non-cooperative patients.

STATISTICAL ANALYSIS:

A paired t-test was used to analyze the significant changes between pre-test and post-test measures. When employing the unpaired t-test to look at significant differences between two groups, the significance threshold of p 0.05 was determined to be statistically significant

RESULT: Statistical analysis of the NPRS and WOMAC post-test results revealed that the PNF and conventional groups showed similar statistically significant differences. As a result, the PNF Group exceeds the conventional group statistically.

TABLE 1: THE COMPARISION OF PRE-TEST AND POST-TEST VALUES OF PNF GROUP

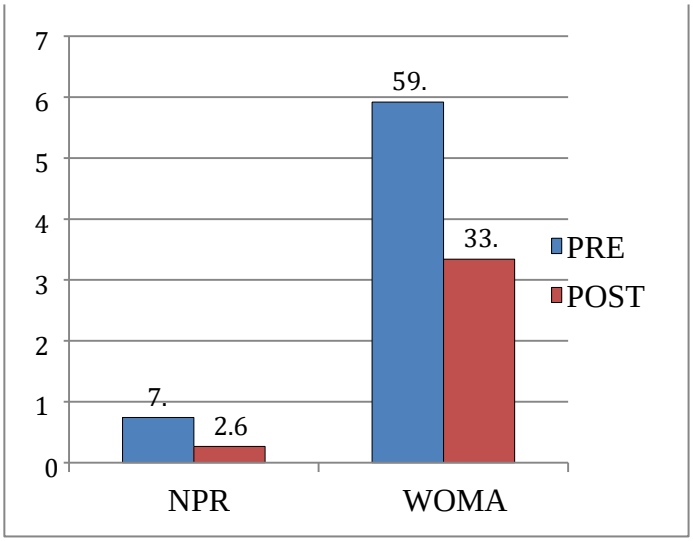
Pnf group	Mean	Standard deviation	t value	p value
Pre test	7.4	0.83	20.7444	< 0.0001
Post test	2.67	0.62		
Pre test	59.02	2.54	30.7379	< 0.0001
Post test	33.4	3.35		

The Above data showed that

The mean average of pre-test value for NPRS scale is found to be 7.4 and for womac scale is found to be 59.02

The mean average of post-test value NPRS scale is found to be 2.67 and for womac scale is found to be 33.4

GRAPH 1: COMPARISION OF PRE-TEST AND POST-TEST VALUES OF PNF GROUP



DISCUSSION:

An Earlier study by Minal Bharat Masekar (2021) on to assess the efficacy of Proprioceptive Neuromuscular Facilitation and Muscle Energy Technique in treating knee osteoarthritis was concluded that the use of PNF stretching in a protocol for OA knee patients resulted in greater pain relief, enhanced hamstring flexibility, and functional mobility independence.

An Earlier study by Meena .V,Shanthi .C (2016) on evaluating the impact of static versus PNF stretching on pain and hamstring flexibility after moist heat in people with knee osteoarthritis was concluded that PNF application In people with acute stage knee osteoarthritis, holdrelax and applying moist heat to the hamstrings can help improve flexibility and reduce pain.An earlier study by Arul Pragassame S, Mohandas Kurup VK,(2019)on comparing the the study's findings on the impact of PNF stretching versus static stretching on pain and hamstring flexibility in osteoarthritis knee patients revealed that PNF stretching is superior to static stretching at reducing pain, enhancing functional mobility, and increasing hamstring flexibility.An earlier study by Gidu diana victoria, Ene- voiculescu carmen ,(2013) was concluded that PNF improves neuromuscular control and coordination, muscular strength and endurance, and flexibility, among other things.

A study by Seema Gul, Danish Ali Khan,(2015)on comparing the effectiveness of PNF versus conventional therapeutic exercise s in knee osteoarthritis was concluded that both physical therapy regimens resulted in clinically significant pain and functional activity improvements.The goal of the current study is to determine the effectiveness of PNF stretching on the OA knee, as well as to evaluate its efficacy in terms of pain reduction and improvement of functional activities. Four weeks is used to illustrate this comparison. Before and after therapy, the NPRS Scale and WOMAC Scale were used to evaluate the end results. PNF stretching (CONTRACT-RELAX) had much better results than the more traditional therapeutic exercise. When the replies from the two groups were compared, the PNF Group performed much better than the standard Group.

In PNF Group mean of the NPRS prior to intervention was 7.4 (+0.83) and WOMAC was 59.02 (+2.5). After treating the subject with PNF stretching (Hold-Relax) exercise, the mean value of NPRS decreased to 2.67(+0.62) and WOMAC was 33.47(+3.35), This displays the group differences that are statistically significant. (Table -3).

In Conventional Group mean of NPRS prior to intervention was 7.13(+0.74) and WOMAC was 60.07(+3.53). After treating the subject with Conventional therapeutic Exercises, NPRS's mean score dropped to 5 (+0.76) whereas WOMAC's was 46.59 (+3.76), indicating a statistically significant difference between the groups. (Table-3).

According to statistical analysis, NPRS and WOMAC scores improved for both groups. When the two groups are contrasted, the PNF Group participants who underwent PNF stretching (contract-Relax) improved more than the CONVENTIONAL Group participants who underwent conventional therapeutic activity.

3.CONCLUSION:

According to the findings, In order to reduce NPRS and WOMAC, PNF stretching exercise was found to be more efficient than conventional therapy alone. As a result, patients with OA knees recovered more quickly.

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