

TITLE : TO COMPARE THE EFFECTIVENESS OF STATIC TENSOR FASCIA LATAE STRETCHING VERSUS DYNAMIC TENSOR FASCIA LATAE STRETCHING EXERCISES ON PAIN, RANGE OF MOTION AND FUNCTIONS IN PATIENTS WITH OSTEOARTHRITIS KNEE

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Abstract

BACKGROUND: Osteoarthritis (OA) is a chronic joint disease, which commonly affects the knee. OA can cause pain, stiffness, swelling, joint instability and muscle weakness, all of which can lead to impaired physical function and reduced quality of life. The major symptom of Knee Osteoarthritis is pain, decreased range of motion, and functional impairment. According to Fram-ingham study, among the individuals aged above 45 years the prevalence of radiographic knee OA was 19.2%, and in those above 80 years, it is 43.7%.

AIM: To compare the effect of Static versus Dynamic stretching of tensor fascia latae on Pain, Range of motion and function in subjects with knee Osteoarthritis.

OBJECTIVES: 1) To compare the effect of Static versus Dynamic stretching of tensor fascia latae on pain in Subjects with Knee Osteoarthritis. 2) To compare effect of Static versus Dynamic stretching of tensor fascia latae on function in Subjects with Knee Osteoarthritis.

3) To compare effect of Static versus Dynamic stretching of tensor fascia latae on Range of motion in Subjects with Knee Osteoarthritis.

METHODOLOGY: The present Study included total 30 subjects having knee Osteoarthritis between age group of 45-64 years. The subjects were treated for 12 weeks, five times a week once daily. The pain was assessed through VAS .Function was evaluated through Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC). Range of Motion was assessed through Goniometer. The pre and post data was collected and thoroughly analyzed.

RESULT: The results were statistically analyzed. In within group analysis both groups showed improvement in level of pain, range of motion and functions. In between group analysis the results showed no statistical difference in pain and range of motion, but shows significant difference in functions in which group B shows better improvement than group A.

CONCLUSION: From present study, it is concluded that both treatments are effective in reducing pain and increasing range of motion, but Dyanamic is more effective in increasing functional abilities than the static stretching group.

INTRODUCTION

- Osteoarthritis (OA) is a chronic degenerative joint disease, which commonly affects the knee. OA can cause pain, stiffness, swelling, joint instability and muscle weakness, all of which can lead to impaired physical function and reduced quality of life¹.
- As given by WHO, osteoarthritis (OA) is regarded a major public health problem with impaired functions that reduces quality of life . In India the crude prevalence of clinically diagnosed OA was higher in the urban (5.5%) than the rural community¹.
- According to recent studies and researches the overall prevalence rate for Knee Osteoarthritis 29% to 39%².
- The tight TFL muscle pulls the patella laterally during knee flexion movement and externally rotates the tibia , which may increase the valgus vector at the knee, which in turn compound the excessive lateral tracking of patella.^[4]
- According to Murphy, an activity that is more dynamic in nature may help in warming that muscle, increasing the flexibility.^[3] Another form of stretching is dynamic stretching. It can be divided into active dynamic stretching or dynamic range of motion(DROM). Active stretching generally involves moving a limb through its full range up to the end range and repeating several times.
- Physical therapy measures commonly recommend for osteoarthritis knee are: heat and cold therapy, strengthening exercise of the hip and knee muscles, range of motion exercises, and muscle stretching exercise.
- But the treatment like stretching and some other technique like Dynamic stretching of tensor fascia latae is mostly neglected.
- There are variety of interventions on literature supporting pain control in knee OA but interventions emphasizing on tight TFL in OA knee are limited and yet to be documented.
- The effectiveness of Dynamic and static stretching has been well documented in other conditions. however comparison between these two methods have not yet been documented in knee OA patients.
- Therefore this study will add to the growing body of knowledge that if these two technique yield comparable outcomes and if one technique is superior to the other which will be the alternative choice of therapy.
- So the need of the study is to investigate and to compare the effectiveness of Dynamic and static stretching of tensor fascia latae on pain, range of motion and function in patients with osteoarthritis knee.

MATERIALS AND METHODOLOGY

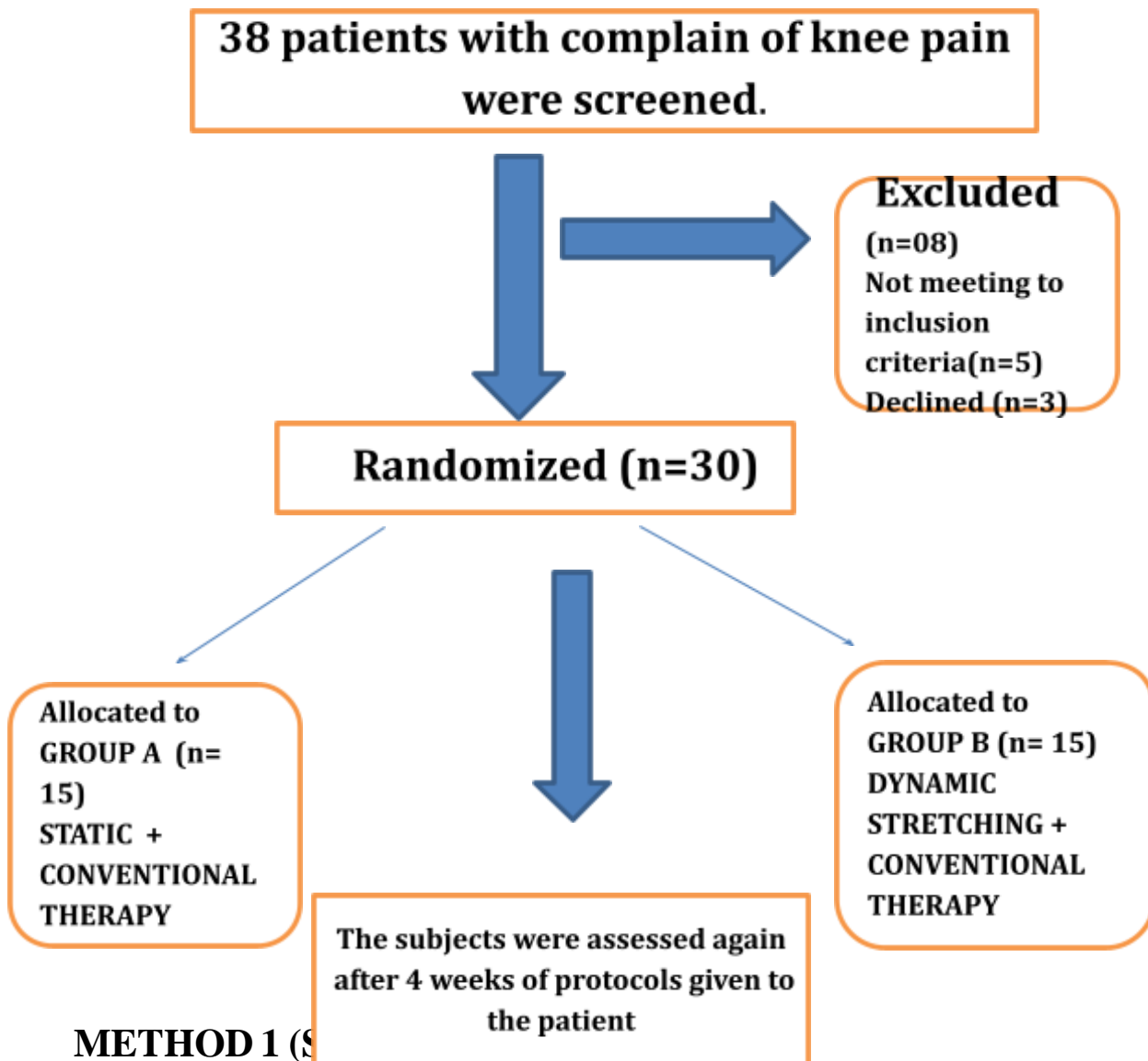
• This was a comparative study using simple random sampling, lasting over the period of 24 weeks. All subjects were treated once in a day for 5 days a week; alternatively for 4 weeks.

• 30 subjects selected according to inclusion and exclusion criteria and randomly divided in two groups. – Group A: 15

– Group B: 15

• Patients with OA knee of grade 1 to 3, aged between 45 to 64 years, belonging to both male and female gender, having Tensor fascia latae muscle tightness positive according to MODIFIED OBERS TEST were included in this study.

• Patients with history of trauma or any musculoskeletal or neurological disease affecting knee, hip and ankle (except OA knee); patients having low back pain radiating to knee joint; patients having present complain of any hip, knee and ankle surgery or intra articular injection; patients having any congenital abnormality around foot, ankle and toes; and patients with any neo-plastic condition problems were excluded from this research.



- Patient position in side lying with affected leg upper most
- Patient is asked to relaxed and inhale
- The patient tested leg is extended, adducted and internally rotated from hip and hold for 30 seconds.
- This repeated for 3 times with rest period in between.

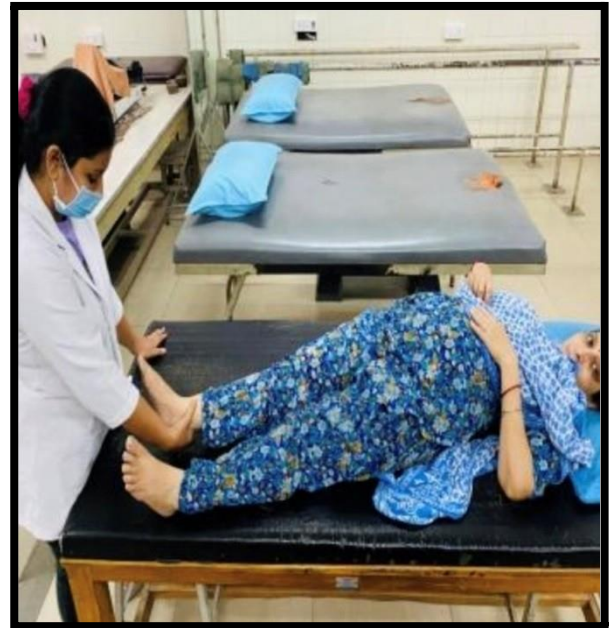
METHOD 2(DYNAMIC STRETCHING)

- Patient lies in supine lying with unaffected leg fully abducted
- The affected leg is kept in fully adducted and repeated for 10 rep and rest for 5 sec
- This technique is repeated for 4 to 5 min with intermittent rest period.

PROCEDURE FOR GROUP A (STATIC STRETCHING)



PROCEDURE FOR GROUP B (DYNAMIC STRETCHING)



CONVENTIONAL PROTOCOL

- Hot pack (10 min)
- Static quadriceps sets in knee extension, hold each contraction for 6 s with at least 10 rep with rest.
- Single leg raising 10 rep.
- Terminal knee extension .repeat for 10 repetitions.
- Active knee range of motion exercise.
- High sitting knee extension for 10 repetitions.
- Hamstring stretching with 30 seconds hold for 3 repetitions.

CONVENTIONAL PROCEDURE (BOTH GROUP)



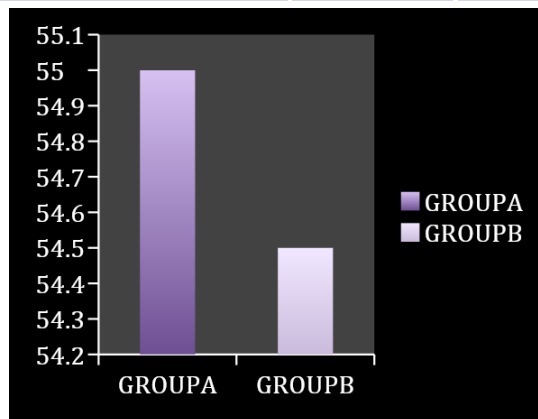
RESULT & DATA ANALYSIS

- The present study was carried out to compare the effect of static and dynamic stretching on tensor fascia latae on pain, functional disability and knee range of motion in patient with osteoarthritis knee.
- In this study 30 patients were included with age distribution between 45 to 64 years. With randomization they included into 2 groups; Group A (15 Patients) and Group B (15 Patients).The outcome measure in the present study was VAS for pain, WOMAC MODIFIED CRD version for functional activities, Goniometer for Range of Motion.
- Data was analyzed using SPSS version 20.

OUTCOME MEASURE	TEST USED TO COMPARE WITHIN GROUP A	TEST USED TO COMPARE WITHIN GROUP B	TEST USED TO COMPARE BETWEEN GROUP A AND B
VAS	Wilcoxon signed rank test	Wilcoxon signed rank test	Mann-Whitney u test
WOMAC	Paired t test	Paired t test	Unpaired t test
ROM	Paired t test	Paired t test	Mann –Whitney u test

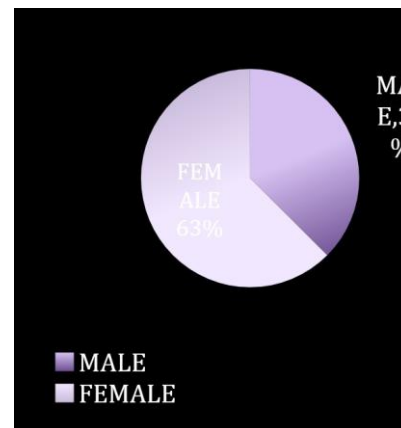
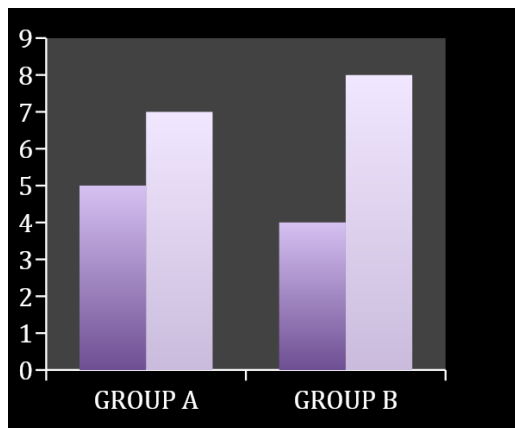
• **MEAN AGE GROUP DISTRIBUTION :**

CHARACTERISTICS	GROUP A	GROUP B
MEAN AGE + SD	55+4.69	54.5+4.77



- GENDER DISTRIBUTION:**

GENDER	GROUP A	GROUP B
MALE	7	6
FEMALE	8	9

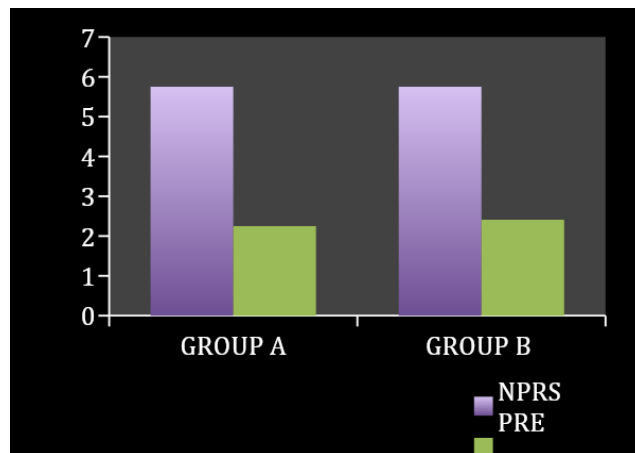


- BASELINE ANALYSIS FOR THE OUTCOMES**

<u>OUTCOMES</u>	<u>TEST APPLIED</u>	<u>P VALUE</u>	<u>Z/T VALUE</u>
<u>VAS</u>	MANNWHITNEY	0.1	Z- 0.31
<u>ROM</u>	UNPAIRED	0.2	T- 0.55
<u>WOMAC</u>	UNPAIRED	0.7	T-0.42

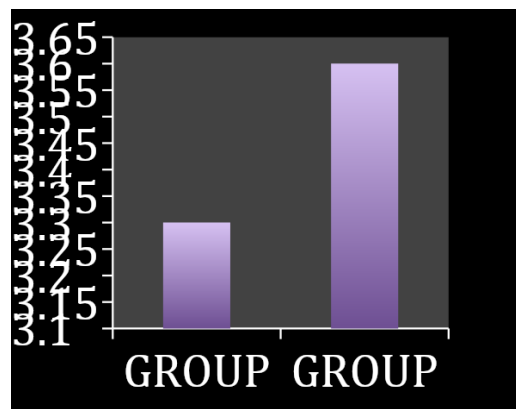
- WITHIN GROUP ANALYSIS FOR VAS :**

<u>OUTCOME MEASURE</u>	<u>GROUP</u>	<u>PRE</u>	<u>POST</u>	<u>P VALUE</u>	<u>Z VALUE</u>
<u>VAS</u>	A	5.75±0.86	2.25±1.05	0.002	-3.09
	B	5.75±0.86	2.41±0.99	0.002	-3.11



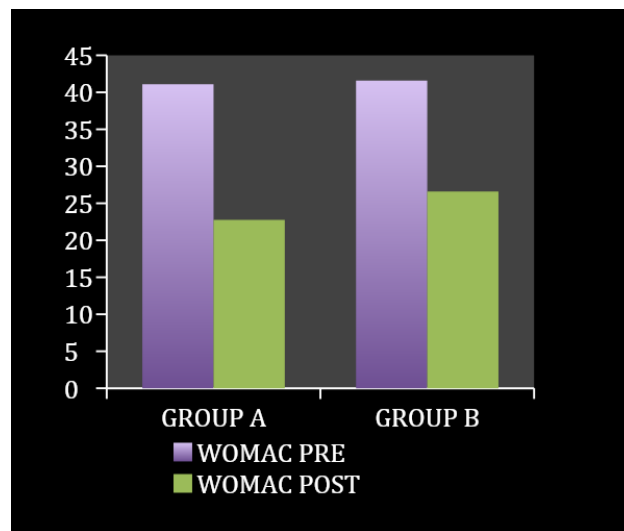
- BETWEEN GROUP ANALYSIS FOR VAS AFTER TREATMENT**

<u>OUTCOME MEASURE</u>	<u>GROUP</u>	<u>MEAN ± SD</u>	<u>U VALUE</u>	<u>P VALUE</u>
<u>VAS</u>	A	3.30±1.08	147.5	0.87
	B	3.60±0.98		



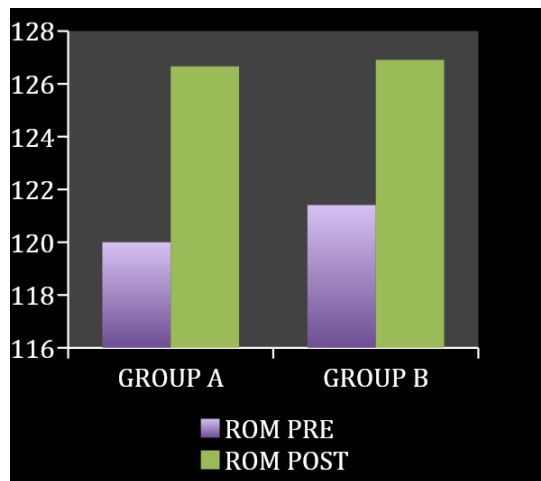
- **WITHIN GROUP ANALYSIS FOR WOMAC :**

<u>OUTCOME MEASURE</u>	<u>GROUP</u>	<u>PRE</u>	<u>POST</u>	<u>PVALUE</u>	<u>T VALUE</u>
<u>WOMAC</u>	A	41.08±7.41	26.75±2.56	0.001	9.623
	B	41.58±6.37	22.58±5.61	0.001	11.445



- BETWEEN GROUP ANALYSIS FOR WOMAC AFTER TREATMENT :**

<u>OUTCOME MEASURE</u>	<u>GROUP</u>	<u>MEAN± SD</u>	<u>T VALUE</u>	<u>P VALUE</u>
<u>WOMAC</u>	A	15.33±7.01	-3.24	0.004
	B	18.00±3.75		



- BETWEEN GROUP ANALYSIS FOR RANGE OF MOTION AFTER TREATMENT :**

<u>OUTCOME MEASURE</u>	<u>GROUP</u>	<u>MEAN ± SD</u>	<u>U VALUE</u>	<u>P VALUE</u>
<u>ROM</u>	A	5.25±1.48	140.00	0.541
	B	6.25±0.96		



DISCUSSION

- An experimental study was conducted on 30 patients with mean age of group A = 54.5 ± 4.77 and group B 55 ± 4.69 to see and compare the effect of STATIC STRETCHING and DYNAMIC STRETCHING on tensor fascia latae in patient with osteoarthritis knee on pain intensity, functional mobility and range of motion.
- Group A subjects were given static stretching along with conventional therapy and Group B subjects were given Dynamic stretching along with conventional therapy.
- In this study there is positive improvement in reducing pain measure with VAS in both the groups. In both group the pre VAS was taken before the intervention. Then after the four weeks of intervention the post data was collected which shows positive result. Within group analysis reveals that both dyanamic and static stretching is effective in reducing pain, decrease in functional disability and improvement in range of motion.
- In within group analysis of all the outcome measure including VAS, WOMAC and ROM .Dynamic and Static stretching of TFL found to be effective and give better result.
- In this study there is positive improvement in reducing pain measure with VAS in both the groups. In both group the pre VAS was taken before the intervention. Then after the four weeks of intervention the post data was collected which shows positive result. Within group analysis reveals that both dynamic and static stretching is effective in reducing pain, decrease in functional disability and improvement in range of motion.
- The reduction in pain due to static stretching can be confirmed on the basis that when stretch force is applied to a muscle over a prolonged interval of time, the primary and secondary afferent of intrafusal muscle fiber sense the length changes and activate the extrafusal muscle fibers via alpha motor neurons in the spinal cord, thus activating the stretch reflex and increasing tension in the muscle. With prolonged stretch GTO gets activated as it monitors the tension change in the muscle fiber has an inhibitory effect on the level of muscle tension referred as the autogenic inhibition¹¹.
- The finding is supported by other study done by **D Ruparrel et al**, who concluded that static stretching of TFL is effective in decreasing pain in OA knee patients.²⁹ Another study done by **Nishant et al** has found that static stretching is effective in reducing pain in medial OA knee.¹²
- This can correlate with the reducing functional disability measured with WOMAC and increasing ROM by static stretching technique applied in GROUP A. The reduction in pain by static stretching cause functional activities more efficiently with reduced extra effort during work and activities that result in improvement in WOMAC score.

- Study done by **Ketki kane vishwas** , on IT band stretching in OA knee supported this present study and concluded that static stretching can reduce pain and increase the functional ability¹³.
- The reduction in pain due to Dynamic stretching can be explained on the basis of warming up the muscle tissue pre stretching which enhances the increased blood supply and increasing washing off waste metabolites which leads to decrease in pain which ultimately increases the functional activities.

CONCLUSION

- The present study concluded that both Static and Dynamic stretching groups improved Pain, Functional disability and Range of motion after treatment. Pain and Range of motion improved equally in both the groups, while functional disability improved more in Dynamic stretching group. Hence both interventions are equal effective in improving pain and Range of motion while comparatively dynamic stretching is more effective in improving functional disability in patient osteoarthritis knee.
- So Null hypothesis is accepted for Pain and Range of motion while it is rejected in case of Functional disability.

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