

A Study To Assess The Effect Of Remote Myofascial Release With Exercises Versus Specific Myofascial Release With Exercises On Lumbar Flexibility In Nonspecific Low Back Pain Among Nursing Professionals.

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Abstract:

Background: Non-specific low back pain is defined as LBP not related to a pathological problem. Nursing is a profession with high incidence and prevalence of low back pain (LBP) with its medical and professional consequences. The prevalence of non-specific low back pain among Indian nurses is 53.4% and this is predisposed by the nature of their work. The objective of this study is to assess the effectiveness of remote area MFR with stretching versus specific area MFR with stretching.

Materials and Methods: In this study, 60 subjects with non-specific LBP were randomly divided into 2 groups i.e. group A and group B with 30 subjects in each group. Group A was given Remote MFR with flexibility exercises to SBL components of myofascial lines and group B was given specific MFR with flexibility exercises to low back region for 10 days continuously by therapist administered MFR and flexibility exercise followed by home exercises (self MFR and flexibility exercises) for 2 weeks. All patients were evaluated with VAS, ODI and Schober's test for lumbar range of motion on day 1 and day 10 and end of week 2.

Results: Following 3 weeks of treatment with myofascial release with flexibility exercises, there was improvement in range of motion, pain and functional disability. In group A, the VAS score decreased from pre-intervention mean of 6.40 to post intervention mean of 1.93 with P value 0.0001. The active range of motion of lumbar flexion improved from pre-intervention mean 2.96 to post intervention 6.99 with P value 0.0001. The Oswestry disability index improved from pre-intervention mean of 29.2 to post-intervention mean of 7.27 with P value of 0.0001. Although both groups showed statistically significant results, Group A was better than group B.

Conclusion: Although there was significant improvement in both groups, Group A shows better percentage improvement than group B under various measurements such as VAS, ODI and ROM.

Key Word: low back pain; myofascial meridian lines; myofascial release therapy; flexibility exercises program.

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I. Introduction

Work-related musculoskeletal disorders (WMSD) is found to be a second largest cause of short-term work related disability. Health care profession is at high risk for WMSDs. Among all the health care professionals

(HCPs), nurses have the highest prevalence of WMSDs with major complain of low back pain. With its medical and professional consequences, Nursing profession has a high incidence and prevalence of low back pain (LBP). The prevalence of non-specific low back pain among Indian nurses is 53.4% and this is predisposed by the nature of their work. The prevalence among nurses worldwide has reached to 40-90%. The activities which generates high spinal stresses among nurses causes low back injury and pain. All those who complain of low back pain experience a decrease in muscle strength, flexibility and limitation of lumbar and lower lumbar joint range of motion. Long-standing limitation of motion occurring in people with risk factors for the development of low back pain, as well as in those suffering from long time for CLBP gives rise to the so-called. restrictions within the fascial tissue. It has been hypothesized that fascial restrictions in one part of the body causes undue

tension in other parts of the body due to fascial continuity. A “schematic map” of the body’s fascia connections, namely “anatomy trains” has been suggested and proposed that any tension at a particular part of an "anatomy train" may have detrimental effects resulting in global decreased flexibility. Myer advocates the method of effect of MFR in one area of the “train” can have on another area.

In this study, static stretching (flexibility exercise) which includes both passive and active static stretching types are used. Intensity will be stretch to the point of feeling tightness. Frequency of stretch will be ten days for a week. Stretch is maintain for 30 sec. repeated for 3 times.

II. Material And Methods

This comparative study was carried out of Department of general Medicine at Department of General Medicine, at Kempegowda institute of medical sciences KIMS hospital, Bangalore, Karnataka from March 2019 to March 2020. A total 60 participants of nursing professionals (females) of aged ≥ 20 to 40, years were taken in this study.

Study Design: comparative study

Study Location: This was a tertiary care teaching hospital based study done in Department of General Medicine, at kempegowda institute of medical sciences KIMS hospital.

Study Duration: March 2019 to March 2020.

Sample size: 60 patients.

Subjects & selection method: The study population was drawn from Students and staff of nursing professionals who presented to kempegowda institute of medical sciences KIMS hospital. The treatment initiation between from March 2019 to March 2020. Participants were divided into two groups (each group had 30 participants).

Inclusion criteria:

1. Nursing professionals
2. Age - 20-40
3. Diagnosis of NSLBP
4. Nurses with minimum of 1-year work experience.

Exclusion criteria:

1. Osteoporosis of spine
2. Primary Joint disease such as active rheumatoid arthritis
3. Malignant bone diseases
4. Fracture of lumbar spine
5. Cardiovascular disorders
6. Evidence of radiculopathy
7. Pregnancy
8. Psychiatrist disturbance
9. Use of steroids, analgesic more than 10 days a month

Procedure methodology

After written informed consent was obtained, Pain status, Range of Motion and Disability was measured by using Visual Analogue Scale, Inch tape, and Quebec Back Pain Disability Scale. The outcome measures were taken on the day before commencing the treatment, at the end of 1st week and finally at the end of 2nd week after the treatment.

ASSESSMENT OF PAIN:

The scale is designed to present to the respondent a rating scale with minimum constraints. Respondents mark the location on the 10-centimeter line corresponding to the amount of the pain they experienced. This gives them the greatest freedom to choose their pain exact intensity. It also gives the maximum opportunity for each respondent to express a personal style.

ASSESSMENT OF DISABILITY: Quebec Disability Scale: The Quebec Back Pain Disability Scale is a 20-item self-administered instrument designed to assess the level of functional disability in individuals with back pain. The patient was instructed to answer each question on a scale. The minimum score is 20 and the maximum score is 100. Higher scores correlate to greater disability. % of maximal disability = $(\text{score} - 20) / 80 * 100$

ASSESSMENT OF ROM: MODIFIED SCHOBER TEST Flexion: Patient position: Standing with feet apart 15cm. Therapist position: Stand behind the patient. Procedure: Examiner marks both Posterior Superior Iliac spine (PSIS) and then draws a horizontal line at the center of both marks. A second line is marked 5 cm below

the first line. A third line is marked 10 cm above the first line. Patient was then instructed to flex forward as if attempting to touch his/her toes, examiner remeasures the the top and bottom line.

TREATMENT PROCEDURE:Patients of group A and B were given MFR followed by the Flexibility (stretching) exercises for 5 days in week for 2 week.

Group A- MFR with manual stretch to remote areas of SBL components (lumbar fascia ,plantar fascia ,Sub-occipital region) and stretching to hamstring, gastrocnemius. On the last day of therapist-administered sessions following the measurement of outcome all the subjects were taught self-administered of techniques i.eSelfMFR to remote areas and self-stretching . This was performed by the subjects for a period of two weeks as a home program. Sessions includes:- Self -MFR and self-stretching to lumbar region, Self-MFR and self-stretching to plantar fascia, Self-MFR and Self-stretching to Sub-occipital region, Self-stretching to hamstrings Straight leg raising (SLR), Self –stretching to gastrocnemius.

Group B -Total ten therapist administered sessions was performed for a period of ten days. MFR with manual stretch to specific area(lumbar region). On the last day of therapist-administered sessions following the measurement of outcome all the subjects were taught self-administered of techniques i.e. Self MFR to specific areas and self-stretching. This was performed by the subjects for a period of two weeks as a home program. Sessions includes:- Self -MFR and self-stretching to lumbar region:

Statistical analysis

Descriptive statistics was performed to find out the mean and standard deviation of the respective groups. ANOVA test followed by post hoc analysis was used within the groups to find out the statistical significance. Unpaired t test was used between the groups to find out the significance.

III. Result

Table No: 1. COMPARISON OF VISUAL ANALOGUE SCALE GROUP A AND B

Unpaired T Test	VAS					
	DAY 1		DAY 10		week 2	
	Group A	Group B	Group A	Group B	Group A	Group B
Mean	5.90	6.40	2.90	4.00	0.73	1.93
S.D.	1.494	0.932	1.269	1.174	0.828	0.907
Number	30	30	30	30	30	30
Maximum	8	8	6	8	2	4
Minimum	3	5	1	2	0	0
Range	5	3	5	6	2	4
Mean Difference	0.50		1.10		1.20	
Unpaired T Test	1.555		3.485		5.352	
P value	0.1253		0.0009		<0.001	
Table Value at 0.05	2.00		2.00		2.00	
Result	Not-Significant		Significant		Significant	

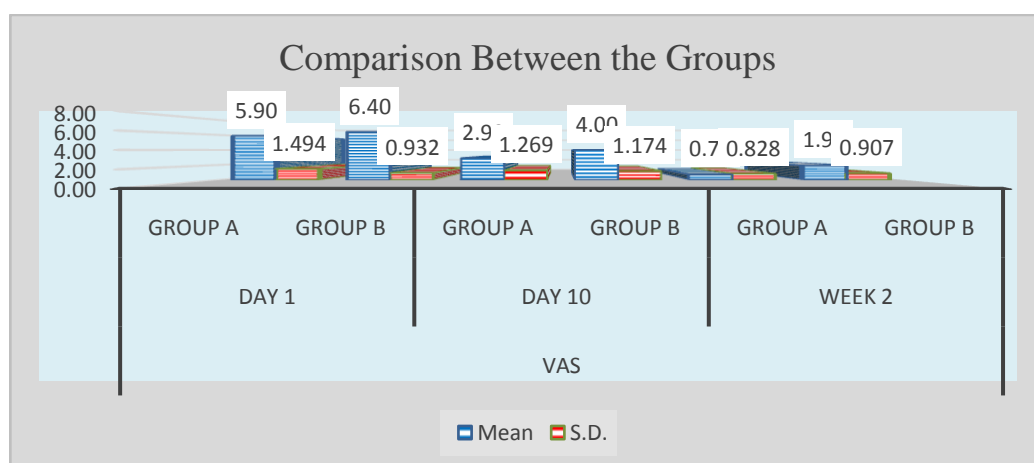


Table 1 shows the mean values and the Standard Deviation of the Visual Analogue Scale for group A and group B. Group A shows a mean of 5.90 with standard deviation 1.49 on day 1 ; Mean of 2.90 with standard deviation 1.26 at the end of day10 and a mean of 0.73 with a standard deviation of 0.82 at the end of week 2. Group B shows a mean of 6.40 with standard deviation 0.93 day 1 ; Mean of 4.00 with standard deviation 1.17 at the end of day 10 and a mean of 1.93 with a standard deviation of 0.90 at the end of week 2.Statistical

analysis using unpaired t test Between the groups showed significant difference of improvement at DAY 1, DAY 10 & WEEK 2 in both the groups(P<0.001). Within group analysis using ANOVA followed by Post Hoc Test showed significant improvement between DAY 1-WEEK 2(P<0.01) in group A as well as group B.

Table No:2. COMPARISON OF OSWESTRY DISABILITY SCALE GROUP A AND B

Unpaired T Test	ODI					
	DAY1		DAY10		week 2	
	Group A	Group B	Group A	Group B	Group A	Group B
Mean	29.20	28.70	17.20	22.80	7.27	17.07
S.D.	4.824	3.593	5.235	3.845	4.258	3.796
Number	30	30	30	30	30	30
Maximum	36	36	30	33	16	24
Minimum	20	22	10	15	2	4
Range	16	14	20	18	14	20
Mean Difference	0.50		5.60		9.80	
Unpaired T Test	0.455		4.722		9.409	
P value	0.6506		<0.001		<0.001	
Table Value at 0.05	2.00		2.00		2.00	
Result	Not-Significant		Significant		Significant	

Graph No:9. COMPARISON OF OSWESTRY DISABILITY SCALE GROUP A AND B.

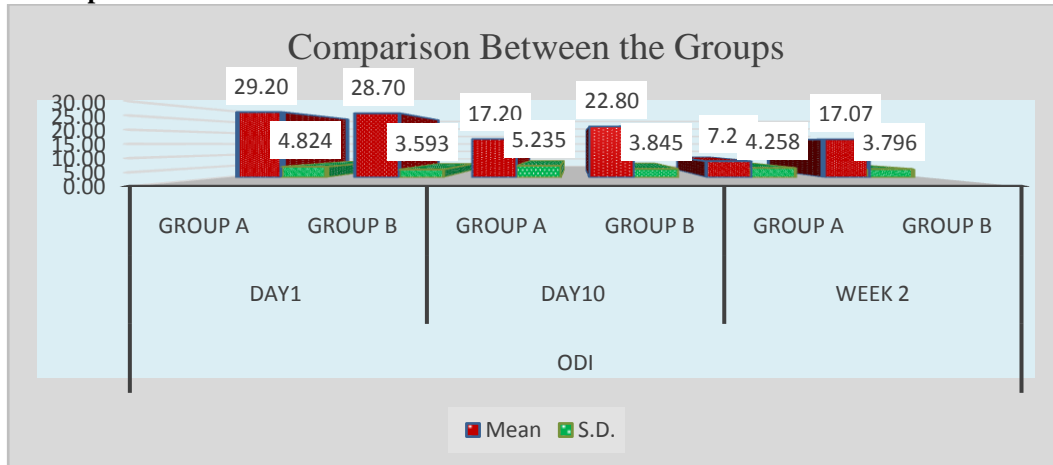


Table show the mean values and the standard deviation for the Oswestry disability index (ODI) for group A and group B. Group A shows a mean of 29.2 with standard deviation 4.82 on Day 1 ; Mean of 17.2 with standard deviation 5.23 at the end of day 10 and a mean of 7.27 with a standard deviation of 4.25at the end of Week 2.Group B shows a mean of 28.07 with standard deviation 3.59on day 1; Mean of 22.8with standard deviation 3.84 at the end of day 10 and a mean of 17.07with a standard deviation of 3.79 at the end of week 2. Statistical analysis using unpaired t test Between the groups showed significant difference of improvement at DAY 1,DAY 10 &WEEK 2 in group B(P<0.001) whereas in group A significant difference was observed just between DAY 1 vs

DAY 10 interval. Within groupanalysis using ANOVA followed by Post Hoc test showed significant improvement between DAY 1-WEEK 2(P<0.001) in group A as well as group B.

Table No:3.COMPARISON OF MODIFIED SCHOBERS TEST GROUP A AND B.

Unpaired Test	MST					
	DAY1		DAY10		Week2	
	Group A	Group B	Group A	Group B	Group A	Group B
Mean	2.96	2.42	4.74	2.71	6.99	2.99
S.D.	1.103	1.342	1.384	1.138	1.430	1.166
Number	30	30	30	30	30	30
Maximum	5	8	7.5	7	9	8
Minimum	1.1	1	2.6	1.5	2	1.9

Range	3.9	7	4.9	5.5	7	6.1
Mean Difference	0.55		2.03		4.00	
Unpaired T Test	1.723		6.204		11.862	
P value	0.0902		<0.001		<0.001	
Table Value at 0.05	2.00		2.00		2.00	
Result	Not-Significant		Significant		Significant	

Graph No:3. COMPARISON OF MODIFIED SCHOBERS TEST GROUP A AND B

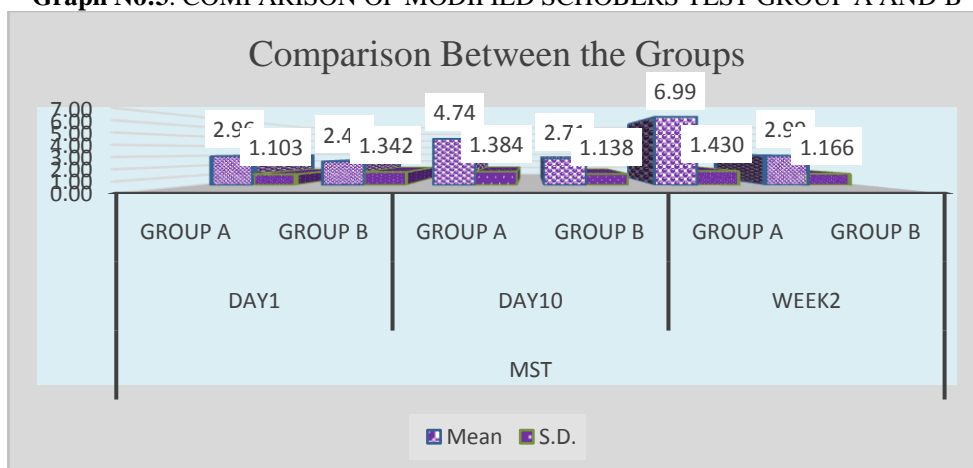


Table 3. show the mean values and the standard deviation for the modified schobers test for lumbar flexion for group A and group B. Group A shows a mean of 2.96 with standard deviation 1.10 on Day 1 ; Mean of 4.74 with standard deviation 1.38 at the end of day 10 and a mean of 6.99 with a standard deviation of 1.43 at the end of Week 2.

Group B shows a mean of 2.42 with standard deviation 1.34 on day 1; Mean of 2.71 with standard deviation 1.38at the end of day 10 and a mean of 2.99 with a standard deviation of 1.16 at the end of week 2. Statistical analysis using unpaired t test Between the groups showed significant difference of improvement at DAY 1, DAY 10 & WEEK 2 in group B (P<0.001) whereas in group A significant difference was observed just between DAY 1 vs DAY 10 interval. Within group analysis using ANOVA followed by Post Hoc test showed significant improvement between DAY 1-WEEK 2 (P<0.001) in group A as well as group B.

IV. Discussion

The present study was conducted to analyze the effect of remote area MFR with exercises compared with specific area MFR with exercises on lumbar flexibility in non-specific low back pain among nursing professionals. Evidence from various literatures demonstrates the importance of these myofascial release with stretching exercises to reduce pain and also improve the lumbar range of motion. The outcome measures of this study were evaluated using Visual Analogue Scale and Modified Schobers Test along with Oswestry Disability Index. The results of the present study were consistent with previous studies which showed that there was a specific importance of remote MFR along with remote area flexibility exercises which when implemented on the nursing professionals have shown significant improvements in non-specific low back pain.

Table 1 and fig.1. Shows the results of VAS scale on Group A and Group B patients on Day 1 day 10 and Week 2 treated with MFR and Flexibility exercises. Group A patients had a mean of 5.90 on Day 1 with standard deviation of 1.49 which was reduced to the mean of 2.90 and standard deviation 1.26 at the end of week 1 (day 10) and this was further reduced to the mean of 0.73 with standard deviation of 0.82 at the end of week 2 . Group B patients had a mean of 6.40 with standard deviation 0.93 of day 1 which reduced to mean of 4.00 with standard deviation of 1.17 at the end of week 1 which was further reduced to a mean of 0.82 and standard deviation 0.90 at the end of week 2 . Thus the present study showed significant improvements in the VAS between Day 1 and week 2 (p<0.001) in group A compared to Group B patients. Further, the present study was supported by Victoria Misailidou from the department of Physical Therapy, Greece in the year 2012 concluded that VAS is a valid and reliable scale to measure the pain intensity.

Table 2 and fig.2, shows the mean values of the Oswestry Disability scale scores. The patients of group A had a mean value on Day 1 was 29.2 with a standard deviation of 4.82 which was further decreased to the mean of 17.2 with standard deviation of 5.23 at the day 10 and it was further seen that the scores the disability percent was decreased to the mean of 7.27 with a standard deviation of 4.25 at the end of week 2. Group B had a mean of 28.7 with a standard deviation of 3.59 on day 1, which was decreased to the mean of

22.8 with a standard deviation of 3.84 at the day 10 which was further decreased to a mean of 17.0 with a standard deviation of 3.79 at the end of week 2.

Thus the present study showed that there is significant improvement in the scores of the Oswestry Disability Scale between the day 1 and week 2 ($p < 0.001$) in group B patients. Further the present study was supported by Hameeda Dharani from the Ramaiah medical college and hospital, Department of Physiotherapy, Karnataka in the year 2017 in study the ODI shows moderate to good validity to measure the functional performance of the subject.

The modified schobers test showed an increase in the range of motion of flexion of lumbar spine. As seen in the Table 3 and Fig.3, the patients of group A had a mean of 2.96 and standard deviation of 1.10 on Day 1 which was increased to the mean of 4.74 and standard deviation of 1.38 at the day 10, which was further increased to the mean of 6.99 with a standard deviation of 1.43 at the end of week 2. The group B results also show an increase in the range of lumbar flexion where the mean of the patients in group B was found to be 2.42 with a standard deviation of 1.34 on day 1, which was increased to a mean of 2.71 with a standard deviation of 1.13 at the day 10, which was further increased to a mean of 2.99 with a standard deviation of 1.16 at the end of week 2. Thus, the Modified schobers test for lumbar flexion in group A and Group B showed significant improvement between day 1 and week 2 ($p < 0.001$). The present study was supported by Jay Christine, Mac Dermid from McMaster University School of Rehabilitation Sciences, Hamilton Ontario in 2004 who had concluded that Modified Schober test can be used to check Lumbar ROM.

Overall in this study, effect of remote area MFR with exercises shown more effective compared to specific area MFR with exercises on lumbar flexibility in non-specific low back pain.

In our view, application of remote area MFR with exercises can be of great help on lumbar flexibility in non-specific low back pain among nursing professionals.

V. Conclusion

Application of remote area MFR with exercises can be of great help on reducing pain and improving lumbar flexibility in non-specific low back pain among nursing professionals.

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