



Cover Page



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EFFECTIVENESS OF MFR AND CUPPING THERAPY ON PAIN, FUNCTION AND DISABILITY ON PATIENTS WITH NON SPECIFIC LOW BACK PAIN- A COMPARATIVE STUDY

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Abstract

Objectives: To evaluate changes in Non-Specific low back pain with NPRS, Roland Morris scale, MFR and Cupping Therapy with conventional Physiotherapy technique.

Background: Cupping therapy and MFR is one of the oldest known medical techniques. It is still used in. Very minimal empirical study has been conducted on its efficacy.

Design: Randomized controlled trial with two parallel groups. Patients into the two groups were offered the cupping therapy with Conventional Physiotherapy. Other group received Myofascial Release with Conventional Physiotherapy.

Study Setting and Participants: The study duration from March 1, 2021, to January 31, 2022. To examine the time course of the cupping Therapy and MFR along With Conventional Physiotherapy intervention. The participants screened from different clinical and hospital setting of DELHI-NCR and after finding their suitability according to the inclusion and exclusion criteria, they will be requested to participate in the study.

Intervention: Patients in the both groups were given Cupping therapy and MFR for 20 mins for thrice a week for 4 weeks. The Measurement of Pain Intensity taken on baseline assessment that is first day of treatment, then on completion of week 4th, for both groups respectively.

Main outcome measures: Three outcomes assessed at baseline and again Completion of 4th week of following intervention: NPRS, Roland Morris scale.

Results: Both Groups are showing significantly improvement in Pain, function and disability in respectively NPRS and Ronald Morris Disability scale. Myofascial release (MFR) was associated with clinically significant improvement at 4th week follow-up. The group B who received cupping therapy significantly less than Group A. In the group A the NPRS score reduced from 7.35 with standard deviation of 0.59 to post NPRS score of 3.80 with standard deviation of 1.36 which was statistically significant (p value <0.0002) (Wilcoxon Z value is -3.7236 and Ronald Morris Disability Scale score reduced from 20.35 with standard deviation of 1.50 to post Ronald Morris Disability Scale score of 13.05 with standard deviation of 2.93 which was statistically significant (p value <0.0002) (Wilcoxon Z value is -3.7236). In the group B the NPRS score reduced from 7.50 with standard deviation of 0.61 to post NPRS score of 4.15 with standard deviation of 1.27 which was statistically significant (p value <0.00014) (Wilcoxon Z value is -3.823). and Ronald Morris Disability Scale score reduced from 20.55 with standard deviation of 1.57 to post Ronald Morris Disability Scale score of 12.25 with standard deviation of 1.97 which was statistically significant (p value <0.00014) (Wilcoxon Z value is -3.823).

Conclusions: The statistical analysis and the result outcome show **Myofascial release and cupping therapy** in a primary care setting was safe and acceptable to patients with nonspecific low back pain. Both Cupping therapy and Myofascial Release therapy was significantly effective in reducing bodily pain, function and disability at 4th weeks follow-up. Myofascial release technique is more significantly effective than cupping therapy.

Keywords: Myofascial Release, Cupping Therapy, Non-Specific Back Pain, Functional Disability, Conventional Physiotherapy.

Introduction

Back pain is considered to be a major health problem due to its high prevalence^{1,2} rate in developing countries and expenditure in terms of health care and loss of productivity. Whereas non-specific low back pain has lifetime prevalence reported to be as high as 84%, and the prevalence of chronic low back pain is about 23%, with 11-12% of the population being disabled by low back pain³. The LBP prevalence was found to 42.4% per year and 22.8% per week in young adults, approximately one in five (20.6%) patients reported limitations of daily activities that resulted from LBP and 14.4% felt emotionally depressed because of LBP⁴. Whereas non-specific low back pain accounts for over 90% of patients presenting to primary care⁵ and these are the majority of the individuals with low back pain that present to physiotherapy. Non-specific low back pain is defined as low back pain not attributable to recognizable, known specific pathology (eg, infection, tumour, osteoporosis, lumbar spine fracture, structural deformity, inflammatory disorder, radicular syndrome, or cauda equina syndrome).



Cover Page



DOI: <http://ijmer.in.doi./2022/11.08.49>

Patient who takes treatment, most have improvement in pain and disability within the first 3 months or less ⁶. After that no need arises for consulting a healthcare profession and only experience low levels of pain and disability, and most have returning to work and their usual daily activities⁷ Physiotherapy being a key in treatment of Non-specific low-back pain uses a variety of treatment modalities like Ultrasound therapy, exercises, core stabilization and manual therapy. Physiotherapist being an important part of rehabilitation team it's important to seek and understand a wide-ranging and interrelated model of what happens to the body's tissues following trauma, and how we facilitate health in our patients.

MFR

Myofascial release (MFR) is a collection of techniques used for the purpose of relieving soft tissue from an abnormal hold of a tight fascia.⁸ Releasing a tight fascia and improving the interfascial moment plays a key role in improving pain and function of a patient suffering from Non-specific low back pain. Myofascial treatment can be closely- explain as “the moderate of mechanical, neural and psycho-physiological susceptible would-be as interfaced by the Myofascial Arrangement”. The Myofascial Therapy includes various techniques commonly known as Manual Myofascial Release, Instrument Assisted Soft Tissue Manipulation, and Active Release Technique.

Muscle and fascia are united forming the myofascial system, a seamless web of connective tissue that covers and connects the muscles, organs, and skeletal structures in our body. The tenacity of deep myofascial release is to release adhesion within the profounder layers of fascia. This is accomplished by a stretching of the muscular elastic components of the fascia, along with the crosslinks, and changing the viscosity of the ground substance of fascia⁹.

Cupping therapy is an antique alternate medicine, which dates to the ancient Egyptian, Chinese, and Middle Eastern empires. Cupping therapy is an old-fashioned Chinese medicine technique used for thousand centuries and is often beneficial for a wide-ranging of conditions such as pain, hypertension and stroke. On the other hand, its clinical utility remains unclear and the mechanism of action is not yet fully clarified, and the methodological excellence of the research is disadvantaged presenting many research preferences. While cupping therapy was effectively used to treat pain and an inclusive variety of other grievances for thousands of years, the practice of cupping is suitable more and more drawn-out only during the last decade since preliminary systematic clinical trials have suggested that cupping is in effect in managing aching conditions¹⁰⁻¹². In addition, IASTM and cupping therapy have a wide indication, therapeutic properties, and easiness of application, low cost, low adverse effects, and fast result in the treatment of some diseases¹³. In scientific practice, cupping is frequently observed to bring about pain relief and to raise a patient's general feeling of well-being¹⁴

We have an extreme unpredictability in the application of the cupping therapy. At least five sessions are necessary for any main effects of cupping therapy, and the cups need to be placed in the skin for around 8-10 minutes in duration of three to four days between the therapy sessions.

Review of literature

Balagué F et al in 2012 explained Non-specific low back pain has become a major public health problem worldwide. The lifetime pervasiveness of low back pain is proclaimed report to be as high as 84%, and the pervasiveness of chronic low back pain is about 23%, with 11-12% of the citizens being disabled by low back pain. Mechanical influence, such as lifting and carrying, probably do not have a significant pathogenic role, but inheritance constitution is dominant. History taking and clinical assessment are involved in most interpretation guidelines, but the use of clinical imaging for diagnosis should be restricted. The mechanism of action of many treating techniques is not clear, and effect size of commonly treatments are low. Both patient preferences and clinical evidence should be taken into account for pain management, but generally self-management, with appropriate support, is recommended and surgery and overtreatment should be avoided¹⁵

Jan wilke, et al in 2017 in their study of “the lumbodorsal fascia as a potential source of low back pain: a narrative review” focused on the role of the lumbar fascia in idiopathic low back pain. The lf of both rodents and humans displays dense innervations with nociceptive afferents. accordingly, it is closely workable that the tissue alterations illustrate the result of a reduce in everyday lumbar movements in low back pain patients. Nonetheless, these findings cannot answer the question whether the observed tissue changes are a cause or a consequence of low back pain. ¹⁶

Salvi Shah et al, in their review on myofascial release in, 2010 projected that fascia is manipulated, directly or indirectly, allowing the connective tissue fibers to reorganize themselves in to a more flexible, functional fashion. The purpose of the myofascial release is to release restrictions (barriers) within the deeper layers of fascia. This is accomplished by a stretching of the muscular elastic component of the fascia, along with the crosslink, and changing the viscosity of the ground substance of the fascia.¹⁷

M.s. Ajimsha et al, in 2013 investigate whether myofascial release (MFR) when used as an adjunct to specific back exercises (SBE)



Cover Page



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reduces pain and disability in chronic low back pain (CLBP). The patients in the MFR group reported a 53.3% reduction in their pain and 29.7% reduction in functional disability as shown in the mpq and qbpds scores in week 8, whereas patients in the control group reported a 26.1% and 9.8% reduction in their MPQ and QBPDS scores in week 8, which persisted as a 43.6% reduction of pain and 22.7% reduction of functional disability in the follow-up at week 12 in the MFR group compared to the baseline. The distribution of replier, defined as candidate who had at least a 50% reduce in pain between weeks 1 and 8, was 73% in the MFR group and 0% in the control group, which was 0% for functional disability in the MFR and control group.¹⁸

Methodology

Study was approved by the research ethics committee. All Subjects were correctly informed about the aims and procedures and taken informed consent before testing. Patients Inclusion criteria: Patients were eligible for inclusion if they were 18 to 50 years old, with nonspecific chronic LBP for more than three months of duration and a minimum pain intensity score of 4 in the NPRS³³. Exclusion criteria: subjects were disqualified if they take physiotherapy treatment for non-specific low back pain, had no preserved sensitivity, skin infection, neurological Condition, cancer or using anticoagulants, nonsteroidal antidepressants and/or tricyclic antidepressants. Patients if they had previously surgery in the spinal column, known or doubted serious spinal pathology as fractures, tumors, inflammatory or rheumatologic illnesses of the spine, severe cardiopulmonary illness, rheumatic illness, were pregnancy supposing, had a pacemaker or metal implants.

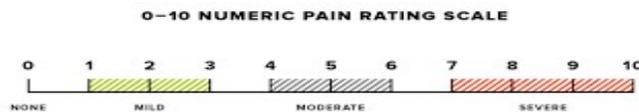
Procedures: The study duration from March 1, 2021, to January 31, 2022.To examines the time course of the cupping Therapy and MFR along With Conventional Physiotherapy intervention. The participants screened from different clinical and hospital setting of DELHI-NCR and after finding their suitability according to the inclusion and exclusion criteria, they will be requested to participate in the study. The subjects included who fulfils the inclusion and the exclusion criteria. The Selected Candidate randomly divided with a blinded lottery method equally to four groups name Group A, and B respectively. After taking an informed written consent from all subjects, a details explanation of the procedure will be explained to each and every subject.

Group A: The control group; the subjects in group A have got established Physiotherapy Treatment (PT) Consisting of Ultrasound and exercises. and Manual MFR techniques on Dorso-lumbar Fascia and erector spina, Posterior Fascia, sacram, Hip Lateral rotators and hams bilateral for 20 mins thrice a week for 4 weeks.

Group B: In the Experimental group have got established Physiotherapy Treatment (PT) Consisting of Ultrasound and exercises. and Cupping Therapy (Myofascial Decompression techniques) on Dorso-lumbar Fascia and erector spina, Posterior Fascia, around sacram and Hip Lateral rotators and hams bilateral for 20 mins for thrice a week for 4 weeks.¹⁹

Outcome Measures

- 1. Numerical pain rating scale: is a self-report measure of pain intensity with 11 point numerical scale, where “0” indicating no pain and “10” worst pain imaginable. The NPRS has been shown to be a reliable and valid measure of pain severity in CLBP.²⁰The minimal clinically important difference (MCID) for LBP has been reported to range from 1.5 to 3.2 points²¹. The Measurement of Pain Intensity taken on baseline assessment that is first day of treatment, then on completion of week 4th, for both groups respectively.



1. NPRS Scale

- 2. Roland Morris functional and disability scale: To measure Function and Disability the 24 instrument The Roland-Morris Low Back Pain and Disability Questionnaire used²² The Scoring ranges from 0 (no disability) to 24 (max. disability). Minimal clinically important difference (MCID) for LBP has been reported to 30% change.²³ The Measurement of function and disability taken on baseline assessment that is first day of treatment, then on completion of week 4th, for both groups respectively.

Results and Discussion

The Data recorded and analysed using ONE WAY ANOVA for analysis of variance

Table with 5 columns: SR. No., Variable, Group A, Group B, P-value. Row 1: Age, 37.20±10.60, 46.80±11.55, >0.022. Row 2: Gender (M/F), 12/8, 10/10, >0.957.

Table I: Baseline data for demographic variables



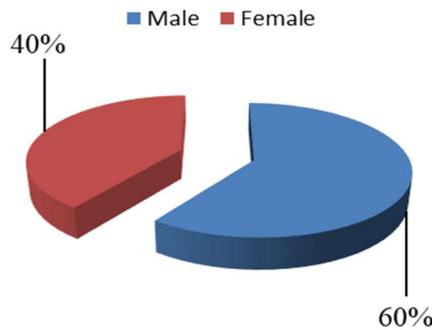
Cover Page



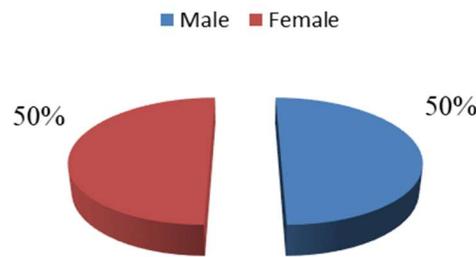
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Data are mean ± standard deviation (sd). In the Group A the mean age is 37.20 and sd is 10.60, in the Group B the mean age is 46.80 and sd is 11.55 which was not statistically significant (p value >0.022) (f-value is 3.01646). In the Group A, there were 12 males & 8 females and the Group B, there were 10 males & 10 females which were not statistically significant (p-value >0.957) (chi square value is 0.6528). In summary data were homogenous among both groups.

Gender distribution in Group A



Gender distribution in Group B



Graph I: Gender distribution in group A and B

SR. No:	Variable	Group A	Group D	P-value
1	NPRS	7.35±0.59	7.50±0.61	>0.402
2	Ronald Morris Disability Scale	20.35±1.50	20.55±1.57	>0.986

Table II: Baseline data for outcome variables

In the Group A, the mean NPRS Was 7.35 with standard deviation of 0.59, in the Group B, the mean NPRS is 7.50 with standard deviation of 0.61 which was not statistically significant (P-value >0.402) (H- value is 4.03). In the Group A, the mean Ronald Morris Disability Scale was 20.35 with standard deviation of 1.50 in the Group B, the mean Ronald Morris Disability Scale is 20.55 with standard deviation of 1.57 which was not statistically significant (P-value >0.986) (H- value is 0.3582).

GROUP	Variable	Pre	Post	P-value
Group-A	NPRS	7.35±0.59	3.80±1.36	<0.0002
Group-B	NPRS	7.50±0.61	4.15±1.27	<0.00014
Group-A	Ronald Morris Disability Scale	20.35±1.50	13.05±2.93	<0.0002
Group-B	Ronald Morris Disability Scale	20.55±1.57	12.25±1.97	<0.00014

Table III: Pre-post difference within group A and B NPRS and Ronald Morris Disability Scale

In the group A the NPRS score reduced from 7.35 with standard deviation of 0.59 to post VAS score of 3.80 with standard deviation of 1.36 which was statistically significant (p value <0.0002) (Wilcoxon Z value is -3.7236). In the group A the Ronald Morris Disability Scale score reduced from 20.35 with standard deviation of 1.50 to post Ronald Morris Disability Scale score of 13.05 with standard deviation of 2.93 which was statistically significant (p value <0.0002) (Wilcoxon Z value is -3.7236).

In the group B the NPRS score reduced from 7.50 with standard deviation of 0.61 to post VAS score of 4.15 with standard deviation of 1.27 which was statistically significant (p value <0.00014) (Wilcoxon Z value is -3.823). In the group D the Ronald Morris Disability Scale score reduced from 20.55 with standard deviation of 1.57 to post Ronald Morris Disability Scale score of 12.25 with standard deviation of 1.97 which was statistically significant (p value <0.00014) (Wilcoxon Z value is -3.823).



Cover Page



DOI: <http://ijmer.in.doi./2022/11.08.49>

Discussion

In this study, MFR group increased significantly after the intervention. We found that the MFR and Cupping therapy was useful for decrease Pain and functional disability. Cupping therapy and MFR was applied with focus on the painful lumbar spine itself. MFR was first applied to the thoracic spine and then to the lumbar spine. LBP patients have to correct anomalous trunk movement pattern, which can be enhanced by changing trunk muscle activities or muscle lengths. Therefore, the therapist should seek how to apply substituted thoracic trunk movements when lumbar spine movement is limited in persons with LBP^{24,25}.

Our study showed that decreased functional disability significantly in the MFR group compared with the cupping therapy group. MFR applied to the local area promoted an increase in thoracolumbar ROM by the biomechanical effect as well as improved dynamic standing balance by system effect²⁶. That is, when stimulated, the Ruffini corpuscles (mechanoreceptors) have been associated with a further decrease in activity of the sympathetic nervous system of the autonomic nervous system, as fascia has a high density of free nerve endings that belong to the sympathetic nervous system, leading to a more relaxed parasympathetic response, thus allowing for improve Pain and decrease disability.

Few studies disclose that mature patients with non-specific LBP reduce their dependency on ankle approach and hip approach on proprioceptive signals throughout balance control. Some studies have shown that MFR or joint mobilization is effective in improving the balance of persons with non-specific LBP²⁷. Also, the myofascial connections (myofascial trains or sequences) could be directly effective in the organization of movement and muscular force transmission, and finally the released stiffness could have an influence on motor control and improve balance²⁸. Similarly, our current study showed increased trunk motility could lead to improvements in functional dynamic standing balance.

M S Ajimsha³¹ et al in 2013 have experimented in 80 nursing professionals and found that the MFR group performed better than the control group in weeks 8 and 12 ($P < 0.005$). The patients in the MFR group reported a 53.3% reduction in their pain and 29.7% reduction in functional disability. Where as in the control group, which persisted as a 43.6% reduction of pain and 22.7% reduction of functional disability in the follow-up at week 12

Aric J. Warren³² et al in 2020 have compared acute outcomes of myofascial decompression (MFD) (cupping therapy) to self-myofascial release (SMR) on pathology of hamstring after a single treatment. Seventeen collegiate athletes [13 males (20.6+/- years; 184.9+/-cm; 90.8+/-kg) and 4 females (20.5+/-years; 167.1+/-cm; 62.7+/-kg)] with diagnosed hamstring pathology (mild strain and/or symptoms of tightness, pain, reduce strength, and low flexibility) were without conscious choice assigned to undergo MFD or SMR. The MFD group (n=9) get three minutes of treatment using 6 cups along the hamstrings followed by 20 repeat of voluntary movement with cups in place. SMR (n=8) get 10 minutes of heat treatment over the hamstrings followed by 60 seconds of mobilization over the hamstring area, and 90 seconds of targeted foam rolling on the area of most perceived tightness. Passive ROM and subjective Perceived Functional Ability Questionnaire (PFAQ) measures for overall flexibility and flexibility of the hamstrings were significantly different from pre- to post-intervention measurements regardless of the treatment received. A significant difference was found in favor of the MFD group for the e Global Rating of Change measure (GROC) values. The results finding suggest that both treatments are favorable in increasing hamstring length. Patients although felt a magnify treatment effect using MFD over SMR for recognize benefits to hamstring flexibility.

Conclusion

The statistical analysis and the result outcome show **Myofascial release and cupping therapy** in a primary care setting was safe and acceptable to patients with nonspecific low back pain. Both Cupping therapy and Myofascial Release therapy was significantly effective in reducing bodily pain, function and disability at 4th weeks follow-up. Myofascial release technique is more significantly effective then cupping therapy.

Limitations: There were some limitations to this study. Firstly, we did not distinguish the various pathological causes of NLBP. Secondly, there was a small sample of only 40 participants for each group, warranting further studies with a full sample size calculated by a power analysis to follow after this study to establish the inference of these results.

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Cover Page



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