

Effects of Soft Tissue Mobilization Versus Myofascial Release Technique on Low Back Pain and Disability in Post-Partum Females After Caesarean Section

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ABSTRACT

Background: Postpartum females who undergo cesarean section often experience low back pain (LBP) and disability. Effective management of these symptoms is crucial for enhancing recovery and quality of life.

Objective: To evaluate and compare the effects of soft tissue mobilization (STM) and myofascial release therapy (MFR) on LBP and disability in postpartum females after cesarean section.

Methods: A randomized clinical trial was conducted with 24 postpartum females who underwent cesarean sections. Participants were randomly assigned to two groups: Group A received STM, and Group B received MFR. Both interventions were administered twice weekly for three weeks. Pain and disability were assessed at baseline, six weeks, and twelve weeks post-intervention using the Numeric Pain Rating Scale (NPRS) and Oswestry Disability Index (ODI). Data were analyzed using SPSS version 25, with significance set at $p < 0.05$.

Results: Group B (MFR) demonstrated a significantly greater reduction in NPRS scores (1.09 ± 1.04) and ODI scores (6.54 ± 7.70) compared to Group A (STM) with NPRS scores (4.27 ± 0.90) and ODI scores (22.36 ± 12.20) ($p < 0.05$).

Conclusion: The study concluded that myofascial release therapy (MFR) is more effective than soft tissue mobilization (STM) in reducing low back pain and disability in postpartum females following cesarean section. MFR demonstrated a greater impact on pain relief and functional improvement, making it a valuable intervention in postpartum rehabilitation. These findings have significant implications for human healthcare, particularly in enhancing postpartum care strategies.

INTRODUCTION

Cesarean sections are a prevalent surgical intervention, accounting for approximately 25% of births worldwide. Despite the clinical benefits, this procedure is often associated with postoperative complications, including scar adhesions, which can contribute to persistent low back pain (LBP) in postpartum females. LBP is a significant public health concern, particularly in high-income countries, where it affects over 80% of the population, leading to prolonged disability and substantial economic burdens due to healthcare costs and loss of productivity. The underlying pathophysiology of LBP is complex, involving a myriad of factors, including structural alterations in the fascia and superficial backline (SBL), which may contribute to the onset and persistence of pain (1, 2).

Myofascial trigger points (MTrPs), characterized by palpable, tender nodules within taut muscle bands, are frequently implicated in chronic pain conditions, including LBP. These points are notably prevalent in females and are associated with referred pain patterns, including those affecting the lower back. Given the challenges of managing postpartum pain in breastfeeding mothers, where pharmacological

interventions may pose risks, non-pharmacological treatments, such as manual therapy, have garnered increasing interest. Among these, myofascial release therapy (MFR) is recognized for its potential to alleviate musculoskeletal pain through the application of sustained, low-amplitude forces that aim to restore tissue flexibility and reduce fascial tension (3, 4).

Manual therapy techniques, including soft tissue mobilization (STM) and MFR, have been widely utilized in clinical practice to address musculoskeletal dysfunctions, particularly in patients with chronic LBP. STM focuses on the manipulation of soft tissues to enhance circulation, reduce scar tissue, and improve tissue mobility, which may contribute to pain relief and functional recovery. In contrast, MFR specifically targets the fascial system, aiming to release fascial restrictions and promote mechanical, neurological, and psychophysiological adaptations within the myofascial structures (5, 6). The efficacy of these interventions in managing LBP, particularly in postpartum females following a C-section, remains an area of active research, with studies suggesting that MFR may offer superior benefits in terms of pain reduction and functional

improvement compared to other manual therapy techniques (7, 8).

The prevalence of LBP during pregnancy is a well-documented phenomenon, with up to 90% of women reporting some degree of back pain during their pregnancy. This pain often persists postpartum, particularly in women who have undergone a C-section, where scar adhesions and fascial changes may exacerbate the condition. Conservative management strategies, including exercise and manual therapy, are integral to the treatment of LBP, with evidence supporting their role in enhancing recovery and preventing long-term disability (9, 10). However, the relative effectiveness of different manual therapy approaches, such as STM and MFR, in this population requires further investigation to guide clinical practice and optimize patient outcomes.

In light of these considerations, the present study aims to compare the effects of STM and MFR on LBP and disability in postpartum females following a C-section. By examining the outcomes of these two interventions, this research seeks to provide evidence-based insights into the most effective strategies for managing postpartum LBP, thereby contributing to improved functional status and quality of life for this patient population. The findings of this study will also have broader implications for the development of targeted rehabilitation protocols for postpartum women, emphasizing the importance of personalized care approaches that address the unique needs of this group (11, 12).

MATERIAL AND METHODS

The study employed a randomized clinical trial design, conducted over a period of ten months at Jinnah Hospital and Zahra Nawaz Medicare in Lahore. The trial aimed to compare the effects of soft tissue mobilization (STM) and myofascial release therapy (MFR) on low back pain and disability in postpartum females following cesarean section. Ethical approval was obtained from the institutional review boards of both participating facilities, and the study adhered to the principles outlined in the Declaration of Helsinki. Informed consent was obtained from all participants before their inclusion in the study.

The sample size was determined using Epitool, based on the outcome measure of the Numeric Pain Rating Scale (NPRS). A total of 24 participants were included in the study, with 12 individuals randomly allocated to each of the two intervention groups. Group A received STM, while Group B underwent MFR, both administered in conjunction with stretching sessions. Participants were selected using convenience sampling, targeting postpartum females aged 20 to 35 years who had undergone cesarean section between six weeks to six months prior, experienced low back pain with a score greater than 2 on the NPRS, and required pain management. Exclusion criteria included women who had delivered vaginally, received general anesthesia, experienced severe postoperative complications, had active pelvic or abdominal infections, suffered from significant mental health disorders, or had

conditions such as ovarian cysts, fibroids, or obstructive endometrial polyps (15, 16).

The interventions were carried out twice a week for three weeks, with each session lasting approximately 20 minutes. Group A received STM, focusing on mobilizing soft tissues to enhance circulation, reduce scar tissue, and improve tissue flexibility. Group B received MFR, which involved applying sustained, low-amplitude forces to the fascia to release restrictions and improve tissue mobility. Both interventions were preceded by a ten-minute warm-up session to prepare the tissues for treatment.

Data collection involved the administration of the Oswestry Disability Index (ODI) and the NPRS at three time points: baseline (day 0), six weeks post-intervention, and twelve weeks post-intervention. The ODI was used to assess the impact of low back pain on daily activities, while the NPRS measured the intensity of pain experienced by the participants. Demographic and health-related information, including age, body mass index (BMI), and cesarean section history, was also collected.

Data analysis was performed using SPSS version 25. Descriptive statistics were used to summarize the demographic and clinical characteristics of the participants. Independent sample t-tests were conducted to compare the mean differences between the two groups for the ODI and NPRS scores at baseline and post-intervention. Paired sample t-tests were used to assess the changes within each group over time. Statistical significance was set at a p-value of less than 0.05. The results were further validated using normality tests and independent sample tests, with correlations examined through paired sample correlations to determine the strength of associations between pre- and post-intervention measures.

The study was conducted with strict adherence to ethical standards, ensuring participant confidentiality and the right to withdraw from the study at any point without penalty. The findings from this research provide valuable insights into the comparative effectiveness of STM and MFR in managing postpartum low back pain, contributing to the evidence base for clinical practice in the rehabilitation of postpartum women (17, 18).

RESULTS

The study included 24 participants who were randomly assigned to two groups: Group A (Soft Tissue Mobilization, STM) and Group B (Myofascial Release, MFR). Each group consisted of 12 participants. The demographic and baseline characteristics of the participants, including age, BMI, and baseline scores for the Oswestry Disability Index (ODI) and Numeric Pain Rating Scale (NPRS), were comparable between the two groups, with no significant differences observed at the outset. At baseline, there were no significant differences in the NPRS scores between the two groups ($P = 0.71$), although the ODI scores were significantly higher in the STM group compared to the MFR group ($P = 0.033$). Significant differences were observed in both ODI and NPRS

Table 1: Baseline Characteristics of Participants

Characteristic	Group A (STM) Mean \pm SD	Group B (MFR) Mean \pm SD	P-Value
Age (years)	30.2 \pm 3.1	29.7 \pm 3.4	0.62
BMI (kg/m ²)	23.5 \pm 2.8	24.1 \pm 2.5	0.48
ODI (pretest)	48.18 \pm 2.92	37.45 \pm 6.17	0.033
NPRS (pretest)	5.36 \pm 2.90	4.90 \pm 2.70	0.71

scores between the pretest and posttest timepoints for both groups. Participants in the MFR group showed a greater reduction in disability and pain scores compared to those in the STM group.

Table 2: Independent Sample Test for ODI and NPRS Scores

Outcome Measure	Timepoint	Group A (STM) Mean \pm SD	Group B (MFR) Mean \pm SD	P-Value
ODI	Pretest	48.18 \pm 2.92	37.45 \pm 6.17	0.033
	Posttest	22.36 \pm 12.20	6.54 \pm 7.70	0.002
NPRS	Pretest	5.36 \pm 2.90	4.90 \pm 2.70	0.71
	Posttest	4.27 \pm 0.90	1.09 \pm 1.04	0.00

The posttest ODI scores were significantly lower in the MFR group (6.54 \pm 7.70) compared to the STM group (22.36 \pm 12.20), with a P-value of 0.002. Similarly, the posttest NPRS scores were significantly lower in the MFR group (1.09 \pm 1.04) compared to the STM group (4.27 \pm 0.90), with a P-value of 0.00.

Table 3: Paired Sample Statistics for ODI and NPRS Scores

Outcome Measure	Group	Pretest Mean \pm SD	Posttest Mean \pm SD	P-Value
ODI	Group A	48.18 \pm 2.92	22.36 \pm 12.20	0.00
	Group B	37.45 \pm 6.17	6.54 \pm 7.70	0.00
NPRS	Group A	5.36 \pm 2.90	4.27 \pm 0.90	0.001
	Group B	4.90 \pm 2.70	1.09 \pm 1.04	0.001

Paired sample t-tests confirmed significant reductions in both ODI and NPRS scores from pretest to posttest within each group. In Group A, the mean ODI score decreased from 48.18 \pm 2.92 to 22.36 \pm 12.20 (P = 0.00), and the mean NPRS score decreased from 5.36 \pm 2.90 to 4.27 \pm 0.90 (P = 0.001). In Group B, the mean ODI score decreased from 37.45 \pm 6.17 to 6.54 \pm 7.70 (P = 0.00), and the mean NPRS score decreased from 4.90 \pm 2.70 to 1.09 \pm 1.04 (P = 0.001).

Overall, the results indicated that both STM and MFR significantly improved pain and disability outcomes in postpartum females with low back pain following cesarean section. However, the MFR group demonstrated a more pronounced and rapid reduction in pain and functional impairment compared to the STM group. The significant differences observed between the two groups underscore the potential of MFR as a superior intervention for managing postpartum low back pain.

DISCUSSION

The findings of this study demonstrated that both soft tissue mobilization (STM) and myofascial release therapy (MFR) significantly reduced low back pain and disability in postpartum females following cesarean section. However, MFR was observed to have a more substantial impact on pain relief and functional improvement, as evidenced by the greater reductions in Oswestry Disability Index (ODI) and Numeric Pain Rating Scale (NPRS) scores in the MFR group compared to the STM group. These results are consistent with previous research that has highlighted the efficacy of MFR in managing chronic musculoskeletal pain, particularly in the context of low back pain (5).

The superior outcomes associated with MFR may be attributed to its targeted approach, which focuses on releasing fascial restrictions that contribute to pain and functional limitations. The fascial system plays a crucial role in the biomechanics of the body, and its dysfunction can lead to persistent pain and disability. By addressing these restrictions, MFR likely promotes greater tissue flexibility and reduces tension within the affected areas, thereby enhancing recovery. This aligns with earlier studies that have reported the effectiveness of MFR in improving tissue elasticity and reducing pain in patients with chronic low back pain (7).

In contrast, STM, while effective in reducing pain and disability, appeared to be less potent than MFR in this study. STM primarily focuses on improving circulation and reducing scar tissue through manual manipulation of soft tissues, which may not fully address the underlying fascial dysfunction contributing to postpartum low back pain. Previous research has also suggested that while STM can be beneficial for general musculoskeletal conditions, it may not be as effective as more specialized techniques like MFR in cases where fascial restrictions are a key factor (6).

The strengths of this study include its randomized controlled design, which minimized bias and allowed for a direct comparison between two commonly used manual therapy techniques. The use of validated outcome measures, such as the ODI and NPRS, provided reliable data on the effectiveness of the interventions. Additionally, the study's focus on a specific population—postpartum females following cesarean section—adds valuable insights to the

literature, as this group is often underrepresented in pain management research.

However, several limitations should be acknowledged. The sample size was relatively small, which may limit the generalizability of the findings. The short duration of the intervention period may also have affected the long-term outcomes, as the study only tracked participants for up to twelve weeks post-intervention. Furthermore, the reliance on self-reported measures of pain and disability introduces the potential for subjective bias. Although the study adhered to strict ethical guidelines and ensured participant confidentiality, future research could benefit from larger sample sizes and longer follow-up periods to assess the sustained effects of these interventions.

The study's findings suggest that MFR may be a more effective intervention for managing postpartum low back pain compared to STM, particularly in cases where fascial restrictions are present. Clinicians should consider incorporating MFR into rehabilitation protocols for postpartum females experiencing low back pain after cesarean section. However, it is essential to tailor interventions to the individual needs of patients, taking into account factors such as pain severity, functional limitations, and overall health status.

CONCLUSION

The study concluded that myofascial release therapy (MFR) is more effective than soft tissue mobilization (STM) in reducing low back pain and disability in postpartum females following cesarean section. MFR demonstrated a greater impact on pain relief and functional improvement, making it a valuable intervention in postpartum rehabilitation. These findings have significant implications for human healthcare, particularly in enhancing postpartum care strategies. Integrating MFR into standard postpartum rehabilitation protocols could improve recovery outcomes, reduce chronic pain, and enhance the quality of life for postpartum females, thereby addressing a critical need in maternal healthcare.

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