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Impact of Targeted Exercises on the Musculoskeletal Disorders Experienced by Breastfeeding Mothers: A Pilot Study

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ABSTRACT:

Musculoskeletal pain (MSP) is a common issue in breastfeeding mothers, often due to prolonged sitting and uncomfortable positions. Common MSPs include back, neck, and carpal tunnel syndrome. To study and investigate the impact of targeted exercises on the posture of BFM. The study was conducted at Chhatrapati Shivaji Subharti Hospital, Swami Vivekanand Subharti University, Meerut designed as a prospective intervention trial aimed at investigating the impact of specific exercises on the posture of BFM. 40 patients were recruited based on inclusion and exclusion criteria. The visual analog scale, pain rating scale, posture assessment tool, functional movement screen, and short-form health survey (SF-36) were used to assess all patients. An exercise program focusing on strengthening core muscles, improving posture, and addressing common issues associated with BF was introduced. Data analysis involved descriptive statistics and inferential tests paired with t-tests and chi-square tests.

The study found that specific exercises significantly improved the posture of BFM participants, with those who adhered to the exercise regimen showing a significant improvement. This pilot study provides valuable insights for healthcare practitioners and researchers on the role of specific exercises in enhancing posture of postpartum women.

KEYWORDS: Musculoskeletal pain, Musculoskeletal disorder, Breastfeeding mothers, Standard deviation.

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INTRODUCTION

Musculoskeletal disorders(MSD) encompass a range of disorders affecting the bones, muscles, joints, and connective tissues, presenting a multifaceted challenge to individuals across various life stages.² However, the specific impact of these conditions on breastfeeding mothers (BFM) has garnered increasing attention due to the unique physiological changes they undergo during pregnancy and postpartum.¹This paper delves into the intricate interplay between musculoskeletal health and BF, aiming to shed light on the prevalence, risk factors, and consequences of such conditions in this particular demographic. Studying MSD in BFM is essential for several reasons. Firstly, the physiological alterations experienced during pregnancy and the postpartum period can potentially exacerbate pre-existing musculoskeletal issues or give rise to new challenges.^{1,2} Secondly, understanding the implications of these conditions on BF practices is crucial, as they may influence the initiation, duration, and overall experience of BF for mothers and infants alike.⁶ By comprehensively examining these aspects, this paper seeks to contribute valuable insights in developing targeted interventions to support BFM.

Pregnancy and postpartum periods are marked by hormonal and anatomical changes that significantly affect a woman's musculoskeletal system. Understanding these changes is crucial for understanding the development of Musculoskeletal System Disorder (MSD) in BFM.⁴The act of breastfeeding (BF) can further exacerbate postural issues, as prolonged sitting or hunching can lead to muscle strain and tension in the neck, shoulders, and upper back.^{4,5}The increasing weight of the uterus and fetus alters the center of gravity, putting additional stress on the spine and pelvis. Postural changes may result in musculoskeletal imbalances, affecting the spine, pelvis, and surrounding musculature, and contributing to the development of MSD in BFM. BFM often experience a range of musculoskeletal disorders that can significantly impact their daily lives and breastfeeding practices.^{1,6} Back pain is a common issue, affecting the lower back and affecting the mother's ability to breastfeed comfortably.⁷ Neck pain is another common musculoskeletal complaint, resulting from prolonged forward-leaning positions during breastfeeding and the physical strain of holding and caring for an infant.^{4,8}Poor ergonomic practices during breastfeeding sessions can exacerbate this condition.^{10,12}Carpal tunnel syndrome may also arise due to repetitive hand and wrist movements during breastfeeding and caring for an infant, compressing the median nerve in the wrist, leading to symptoms like numbness, tingling, and pain in the hand and fingers.¹³

MSDs in postpartum women are prevalent due to a combination of intrinsic and extrinsic factors.⁵ Poor posture during breastfeeding, repetitive movements, and hormonal changes during pregnancy and postpartum can lead to overuse injuries and conditions like carpal tunnel syndrome

and musculoskeletal strain. Poor posture places undue stress on the spine, neck, and shoulders, contributing to discomfort and potential long-term issues. Repetitive movements, such as lifting, holding, and repetitive hand and wrist movements, can also lead to conditions like carpal tunnel syndrome and musculoskeletal strain. The lifestyle of a BF mother can also impact musculoskeletal health, with factors such as inadequate physical activity, poor ergonomic practices, and insufficient rest contributing to the development or exacerbation of MSD.^{1,5,6}

Understanding these risk factors is crucial for developing preventive strategies and targeted interventions. MSD can significantly affect the initiation and duration of BF and present unique challenges for breastfeeding mothers. Discomfort, pain, or limited mobility in the MSS can hinder a mother's ability to adopt comfortable breastfeeding positions.⁴ Persistent MSD can impact the long-term BF experience, as mothers may struggle to sustain sessions due to discomfort or pain. The repetitive nature of breastfeeding and the demands of caring for an infant can exacerbate musculoskeletal issues, potentially leading to premature discontinuation of breastfeeding. Physical therapy and exercises can help address these issues.^{10,11,12} Exercises used were Thoracic Extension Stretch, Thoracic Extension Stretch, Neck Stretch, Upper Back Stretch, Shoulder Blade Squeezes, Chest Opener, Wall Angels, Cat-Cow Stretch, Pelvic Tilts.

METHODOLOGY

From October 2023 to January 2024, the current randomized clinical experiment was carried out at Chhatrapati Shivaji Subharti Hospital, *Swami Vivekanand Subharti University*, in Meerut. 40 BFM were recruited for the study's projected sample size. *Inclusion Criteria:* Currently BFM between age 20-30. Postpartum period within last 6 months with no pre-existing MSD. *Exclusion Criteria:* Mothers with pre-existing MCD and chronic medical conditions affecting posture. Visual analog scale, numeric pain rating scale, posture assessment tool, functional movement screen and short form health survey (SF-36) were the study tools and results.^{3,9} Following this, a tailored exercise program was introduced, focusing on strengthening core muscles, improving posture, and addressing common issues associated with BF. Participants were instructed to adhere to the exercise regimen for 6-8 weeks of duration. Data analysis involved both descriptive statistics and inferential tests, including paired t-tests, to determine the statistical significance of changes in posture. Additionally, the study aimed to explore the association between exercise adherence and posture improvement through a chi-square test. The findings from this study provided valuable insights into the efficacy of targeted exercises in enhancing the posture of BFM, potentially informing postpartum care practices and interventions.

Table 1: Descriptive Statistics - Baseline Posture

n	40
Mean	27.050
Standard Deviation	2.072
Minimum	22.000
25th Percentile (Q1)	25.750
Median (Q2 or 50th Percentile)	27.000
75th Percentile (Q3)	28.250
Maximum	30.000

Table 2: Descriptive Statistics - Post-Intervention Posture

n	40
Mean	25.725
Standard Deviation	2.094
Minimum	20.000
25th Percentile (Q1)	24.000
Median (Q2 or 50th Percentile)	26.000
75th Percentile (Q3)	27.000
Maximum	29.000

Table 3: Paired t-test for Posture Change

t-statistic	14.729
p-value	< 0.0001

Table 4: Chi-square test for Exercise Adherence

Chi-square value	12.917
p-value	0.0451

This table summarizes the descriptive statistics for baseline and post-intervention posture, the results of the paired t-test for posture change, and the chi-square test for exercise adherence. The results suggest a statistically significant improvement in posture after the intervention, and there's a significant association between exercise adherence levels and participants.

RESULT

The mean of baseline posture is 27.05, with a standard deviation (SD) of 2.072, ranging from 22 to 30, indicating variability in participants' baseline posture. The mean of post-intervention posture is 25.725, with an SD of 2.094, ranging from 20 to 29. The t-statistic is 14.729, and the p-value is less than 0.0001 ($p < 0.0001$). The low p-value suggests a statistically significant difference in posture before and after the intervention. This indicates that the specific exercises had a significant impact on improving the posture of BFM. The chi-square value is 12.917, and the p-value is 0.0451. The p-value is less than the significance level of 0.05, suggesting a significant association between exercise adherence levels and participants. This implies that exercise adherence levels might influence the effectiveness of the intervention on posture improvement.

RECOMMENDATIONS FOR FURTHER RESEARCH

Explore factors influencing exercise adherence among BFM. Investigate the long-term effects of the exercise program on posture and musculoskeletal health. Consider conducting a randomized controlled trial with a larger sample size to strengthen the evidence.

CONCLUSION

In conclusion, this pilot study lays the foundation for further research into the role of specific exercises in enhancing the posture of BFM. The positive outcomes observed provide valuable insights for healthcare practitioners and researchers aiming to address the unique needs of postpartum women for improved musculoskeletal health. Treating musculoskeletal impairment referred to pain with physiotherapy practices can help alleviate or resolve pain with BF.

LIMITATIONS AND CONSIDERATIONS

The study has inherent limitations, including the small sample size and the potential for self-reporting bias. Future research with a larger and more diverse participant pool is recommended to validate and generalize the findings.

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