

# Effectiveness of Telerehabilitation for Postural Correction, Pain Reduction, and Quality of Life Improvement in Women with Postpartum Low Back Pain

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**Abstract:** *Background of the study:* Postpartum low back pain commonly affects women after childbirth and is associated with reduced functional ability and quality of life. Hormonal and biomechanical changes during the postpartum period may contribute to poor posture, core muscle weakness, reduced spinal stability, and persistent low back pain. Although conventional physiotherapy interventions are effective, many postpartum women experience difficulty accessing regular rehabilitation due to caregiving responsibilities and limited accessibility to healthcare services. Telerehabilitation may improve access to physiotherapy care through remote exercise supervision, postural education, and therapist guidance, with the potential to improve pain management and quality of life in postpartum women. **Aim:** To determine the effectiveness of telerehabilitation in reducing pain and improving quality of life among postpartum women with low back pain. **Objectives:** 1) To examine the effect of Telerehabilitation intervention on pain intensity using the Visual Analog Scale (VAS). 2) To examine the effect of Telerehabilitation intervention on Quality of Life using Maternal postpartum quality of life (MPQOL). 3) To assess the adherence of postpartum women to telerehabilitation protocols. **Methods:** A quasi-experimental pre-post study included 36 postpartum women aged 20 to 40 years. Participants received supervised telerehabilitation involving postural correction, core strengthening, postural training, and stretching, three times weekly for 8 weeks. Pain and quality of life were assessed using VAS and MPQOL. **Results:** Mean VAS scores decreased from 68.64 to 42.25, while MPQOL scores improved from 18.86 to 30.17, both statistically significant ( $p < 0.001$ ). **Conclusion:** Telerehabilitation may improve pain and quality of life in postpartum women; however, controlled comparative studies are required to confirm effectiveness.

**Keywords:** Postpartum LowBack Pain, Telerehabilitation, Physiotherapy, Postural Correction, Maternal Quality of Life, Telehealth Rehabilitation, Women's Health

## 1. Introduction

Postpartum low back pain is a common musculoskeletal condition affecting nearly 50–80% of women after childbirth and significantly impacts activities of daily living (ADLs) and quality of life (QOL) [1]. Pregnancy-related biomechanical and hormonal changes such as increased lumbar lordosis, ligamentous laxity, weak abdominal muscles, altered posture, and reduced core stability contribute to persistent low back pain during the postpartum period [1,2]. Improper posture during breastfeeding, lifting, and childcare activities may further aggravate lumbar strain and discomfort [11].

Physiotherapy management of postpartum low back pain includes stabilization exercises, postural correction, strengthening exercises, and ergonomic training [5,6]. Specific stabilization exercises targeting the transversus abdominis and lumbar multifidus have shown significant improvement in pain and functional ability in postpartum women [5]. Segmental stabilization exercises help improve spinal support and reduce stress on the lumbar region [6]. Biomechanical studies have highlighted the role of abdominal and back muscles in maintaining lumbar stability during functional activities [10]. Recent evidence also supports the effectiveness of physiotherapy interventions in reducing pain, disability, and improving quality of life in postpartum women with low back pain [4,13].

Telerehabilitation has emerged as an accessible method for delivering physiotherapy remotely through virtual platforms. It includes supervised exercises, postural education, ergonomic advice, and continuous monitoring by physiotherapists. Studies have reported that telerehabilitation is effective and comparable to conventional physiotherapy for musculoskeletal conditions [3,12]. Internet-based physiotherapy assessment has also shown good validity and reliability in musculoskeletal rehabilitation [9]. Pain and quality of life in postpartum women are commonly assessed using the Visual Analogue Scale (VAS) and Maternal Postpartum Quality of Life Questionnaire (MPQOL) [7,8]. Therefore, telerehabilitation-based postural correction and stabilization exercises may help reduce pain and improve functional ability in postpartum women with low back pain.

## 2. Methodology

**Study design:** Quasi Experimental Study

**Study area:** Tele-consultation (online mode) recruiting patients from Gynaecology OPD, Mazumdar Shaw Medical Centre, Bangalore.

**Study Duration:** 8 weeks

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**Study population:** Women in the postpartum period (3 months to 1 year post-delivery) complaining of low back pain and postural alterations affecting activities of daily living (ADLs).

**Sampling:** Convenient sampling.

**Sample size (with justification):** Total sample size = 36

The Sample Size was based on evidence from a systematic review by Ozyurt et al. (2025), evaluating physical therapy interventions for postpartum lumbopelvic pain. The anticipated pre- and post-intervention means, and standard deviations [ $30.4 \pm 26.04$  (Baseline) and  $13.8 \pm 15.86$  (post-treatment)] were derived from a randomised controlled study by Sakamoto et al. (2018), identified within this review.

The sample size was calculated for a paired comparison using a 95% Confidence Interval and 80% power, with an expected mean difference of 16.6 and a standard deviation of 22.7.

$$n \geq 2 \frac{\left( \frac{z_{1-\alpha}}{2} + z_{1-\beta} \right)^2}{\frac{\delta_{diff}}{\sigma_{diff}}} + \frac{z_{1-\alpha}^2}{2}$$

Type I error ( $\alpha$ ) = 0.05

Type II error ( $\beta$ ) = 0.2

Mean Difference = 16.6

Standard Deviation of difference = 22.7

Sample Size = 32

Including a dropout rate of 10%;

$n/(1-x)$

$= 32 / 1 - 0.10$

Required Total Samples = 36

#### Eligibility Criteria and Participants recruitment procedure:

##### Inclusion Criteria:

- Subjects aged between 20 to 40 years who gave birth within the last 3 months to 1 year both (Primigravida and Multigravida subjects)
- BMI less than 30 (to avoid obesity related postural problems)
- Subjects have no history of spinal injury, Lumbar spondylosis, Sacralisation, fractures, Musculoskeletal injury or inflammatory back conditions.
- Accessibility to internet access and understanding of digital platforms.

##### Exclusion Criteria:

- Subjects with neurological conditions affecting posture.
- Subjects diagnosed with low back pain unrelated to posture.
- Subjects currently undergoing physiotherapy or any other medical treatment for low back pain.

##### Procedure:

Subjects who fulfilled the eligibility criteria and were willing to participate in the study were recruited for the study. Informed Consent was obtained from the participant before

the onset of the study. Techniques applied in the study were of standard care.

#### Intervention Protocol (Telerehabilitation Group)

**Mode:** Live Video Call (Zoom/Google Meet) + WhatsApp follow-ups.

One in-person baseline visit was done to assess the patients before intervention

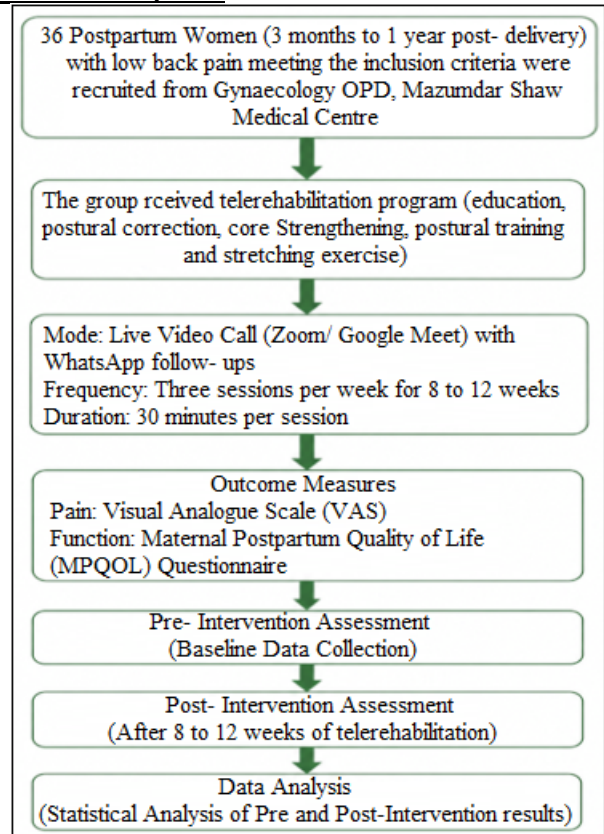
**Frequency:** 3 sessions per week for 8 weeks.

**Duration:** 30 minutes per session.

**Education:** Anatomy of back pain post-delivery.

- 1) **Postural Correction:** Correct sitting posture, Standing posture, Breast feeding posture
- 2) **Core strengthening:** Transverse abdominis activation, Pelvic tilt, Dead bug exercise, Pelvic bridging
- 3) **Postural training:** Wall angles, Scapular retraction drills, Mirror feedback posture correction
- 4) **4.Stretching techniques:** Hamstring, Lumbar region, Paraspinal stretches

#### Flow of Participants:

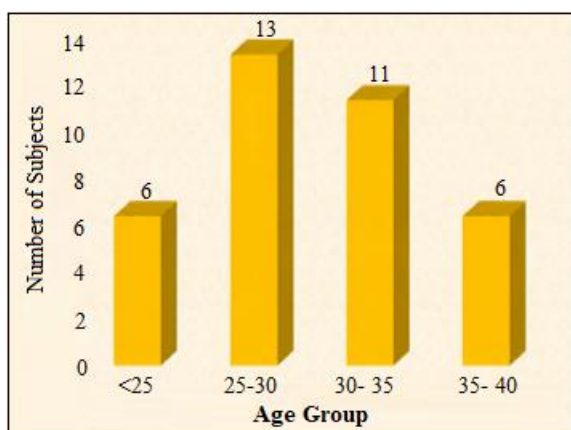


**Data Analysis:** Statistical analysis was performed using SPSS Version 27. Normality was tested using the **Shapiro–Wilk test**. Pre- and post-test comparisons were analyzed using the **Paired t-test**. Correlation was analyzed using **Pearson’s correlation test**. A p-value <0.05 was considered significant.

**Table 1:** Descriptive/ Demographic Statistics

N	Valid	36
Mean		30.11
Median		30
Std. Deviation		5.236
Range		20
Minimum		20
Maximum		40

The table shows the distribution of participants according to age group. Among the 36 participants, the majority belonged to the age group of 25–30 years (36.1%), followed by 30–35 years (30.6%). Participants below 25 years and between 35–40 years each constituted 16.7% of the sample. This indicates that most postpartum women included in the study were between 25 and 35 years of age. The mean age of the participants was  $30.11 \pm 5.236$  years, with a median age of 30 years. The age ranged from 20 to 40 years. This suggests that the study population mainly consisted of women in the early to middle reproductive age group.



**Graph 1:** Age Distribution Graph:

The graph shows the age-wise distribution of participants included in the study. Among the total participants, the highest number of subjects belonged to the age group of 25–30 years (13 participants), followed by 30–35 years (11 participants). The age groups below 25 years and 35–40 years

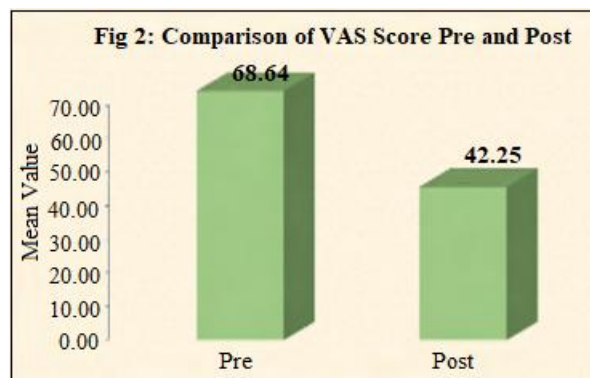
each consisted of 6 participants. This indicates that most participants were young to middle-aged postpartum women, with the majority concentrated between 25 and 35 years of age.

**Table 2 & 3:** VAS Comparison from Pre to Post (Paired t-test) & VAS Pre and Post Mean Comparison:

	Paired Differences		t	p
	Mean	Std. Deviation		
VAS Pre - VAS Post	26.389	2.697	58.71	<.001

VAS			
	N	Mean	Std. Deviation
VAS PRE	36	68.64	9.156
VAS POST	36	42.25	6.535

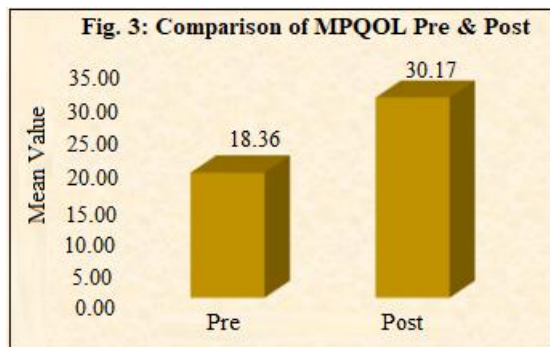
The table shows the comparison of pre- and post-intervention VAS scores using paired t-test analysis. The mean difference in VAS score was 26.389 with a standard deviation of 2.697. The obtained t-value was 58.710 and the p-value was less than 0.001, indicating a statistically highly significant reduction in pain after the intervention. The second table shows the comparison of pre- and post-intervention VAS scores. The mean VAS score reduced from  $68.64 \pm 9.156$  before intervention to  $42.25 \pm 6.535$  after intervention. This indicates a considerable reduction in postpartum low back pain following telerehabilitation intervention.



**Graph 2:** Comparison of Pre and Post VAS Scores:

**Table 2 & 3:** MPQOL Comparison from Pre to Post (Paired t-test) & MPQOL Pre and Post Mean Comparison:

MPQOL – pre to post					MPQOL			
	Paired Differences		t	p	N	Mean	Std. Deviation	
	Mean	Std. Deviation						
MPQOL PRE - MPQOL POST	-11.306	.467	-145.198	<.001	MPQOL PRE	36	18.86	3.965
					MPQOL POST	36	30.17	3.598



**Graph 3:** Comparison of Pre and Post MPQOL Scores

### 3. Results

This interventional study was conducted to analyze the effectiveness of telerehabilitation on postural correction (observational analysis was done during the virtual consultation), pain reduction, improvement in activities of daily living and quality of life in women with postpartum low back pain. All 36 participants completed the 8 week telerehabilitation without any dropouts.

A total of 36 postpartum women with low back pain were included in the study. Participants were recruited from the Gynaecology OPD, Mazumdar Shaw Medical Centre. The intervention consisted of telerehabilitation sessions conducted 3 sessions per week for 8–12 weeks, with each session lasting 30 minutes. Outcome measures used for assessment were the Visual Analogue Scale (VAS) for pain and the Maternal Postpartum Quality of Life (MPQOL) questionnaire.

**VAS:** The mean value of pre-intervention VAS score was 68.64, whereas the post-intervention value reduced to 42.25, with a mean difference of 26.389. The p-value was less than 0.001 ( $p < 0.001$ ), indicating a statistically highly significant reduction in pain following telerehabilitation.

**MPQOL:** The mean value of pre-intervention MPQOL score was 18.86, whereas the post-intervention value increased to 30.17, with a mean difference of 11.306. The p-value was less than 0.001 ( $p < 0.001$ ), indicating a statistically highly significant improvement in maternal postpartum quality of life after the intervention.

**Correlation between VAS and MPQOL:** Pearson's correlation analysis showed a strong negative correlation between VAS and MPQOL scores both before and after intervention. The correlation coefficient between VAS pre-test and MPQOL pre-test was  $r = -0.995$ , while the correlation between VAS post-test and MPQOL post-test was  $r = -0.993$ , with  $p < 0.001$ . The extremely high correlation values observed in the study should be interpreted cautiously, as the study included a relatively small sample size and a single group pre- post design. This indicates that reduction in pain was associated with improvement in quality of life.

The descriptive statistics revealed that the mean pre-test VAS score was  $68.64 \pm 9.156$  and post-test VAS score was  $42.25 \pm 6.535$ . Similarly, the mean pre-test MPQOL score was  $18.86 \pm 3.965$  and the post-test score improved to  $30.17 \pm 3.598$ . The normality of data was assessed using the Shapiro–

Wilk test, which showed that the data were normally distributed. Hence, parametric analysis using the paired t-test was performed. The paired t-test analysis demonstrated statistically significant improvements in both outcome measures following telerehabilitation intervention. The VAS score showed a marked reduction in pain intensity, while the MPQOL score demonstrated improvement in quality of life and functional status in postpartum women.

The findings of the present study suggest that telerehabilitation may be effective in reducing pain and improving quality of life in women with postpartum low back pain. Improvement was also observed in functional activities and posture-related symptoms following the intervention. These findings are consistent with previous studies that reported beneficial effects of exercise-based telerehabilitation programs in the management of musculoskeletal conditions. Supervised virtual physiotherapy sessions may improve accessibility and continuity of rehabilitation for postpartum women who are unable to attend regular in-person sessions due to caregiving responsibilities and time constraints. In addition, telerehabilitation may help increase patient compliance, encourage regular exercise participation, and provide cost-effective physiotherapy care within the home environment. The flexibility and convenience offered through virtual rehabilitation programs may further contribute to better adherence and long-term management of postpartum musculoskeletal symptoms. Therefore, telerehabilitation may be considered a useful, accessible, and effective physiotherapy approach for the management of postpartum low back pain.

### 4. Conclusion

This quasi-experimental study suggests that telerehabilitation may help reduce pain intensity and improve maternal postpartum quality of life in women with postpartum low back pain. Improvement was also observed in posture-related symptoms and functional activities following the intervention.

*“Telerehabilitation provided supervised physiotherapy care remotely, which may improve accessibility and continuity of rehabilitation for postpartum women.”*

*“The present study demonstrates that telerehabilitation is an effective approach for reducing postpartum low back pain and improving maternal postpartum quality of life in postpartum women.”*

However, the findings should be interpreted cautiously due to the absence of a control group, convenient sampling method, and modest sample size. Therefore, larger controlled studies are required to further establish the effectiveness of telerehabilitation in the management of postpartum low back pain before definitive clinical recommendations can be made.

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