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Effectiveness of Pelvic Stabilization Exercises with Pelvic Realignment Belt on Pain and Quality of Life in Post Pregnancy Women

J Poojasree[1], Dr. S Jeyakumar[2], Dr. Toral Jagdish Vaja[3]

[1]Garden City University, Department of Physiotherapy
Email: *poojajayachandran27[at]gmail.com*

[2]Kithaganur Main Road,Bengaluru, Karnataka, India

Abstract: ***Background: Pelvic girdle pain (PGP) is a common complaint among women during the postpartum period and often affects mobility, daily activities, and overall quality of life. Strengthening the core and pelvic muscles, along with providing external support, may help reduce discomfort. Objective of the Study: To examine the effectiveness of pelvic stabilization exercises performed with a pelvic realignment belt in reducing pain and improving the quality of life in postpartum women. Methodology: Fifteen postpartum women aged 25–30 years participated in an eight-week intervention program. Each session included stabilization exercises for the pelvic and core muscles, performed while wearing a pelvic realignment belt. Pain levels were measured using the Visual Analogue Scale (VAS), and quality of life was assessed using the WHOQOL-BREF questionnaire. Pre- and post-intervention scores were compared using a paired t-test. Results: There was a significant reduction in pain following the intervention, with VAS scores decreasing from a mean of 7.53 to 3.47 ($p < 0.0001$). All four domains of the WHOQOL-BREF- Physical Health, Psychological Well-Being, Social Relationships, and Environmental Factors- showed noticeable improvement after the eight-week program. Conclusion: Pelvic stabilization exercises combined with the use of a pelvic realignment belt can help decrease pelvic girdle pain and enhance quality of life in postpartum women. This approach is simple, practical, and may be incorporated into physiotherapy management for women recovering after childbirth.***

Keywords: Pelvic girdle pain, Postpartum women, Pelvic stabilization exercises, Pelvic realignment belt, Lumbopelvic dysfunction, Visual Analogue Scale (VAS), Quality of life (WHOQOL-BREF), Postpartum physiotherapy

1. Introduction

Pelvic girdle pain (PGP) is a frequent musculoskeletal problem that affects many women during pregnancy and after childbirth, often limiting mobility and daily functioning. It is recognized as a specific category of lumbopelvic pain and commonly presents around the posterior pelvis, gluteal region, or pubic symphysis during or following pregnancy [1]

The condition is widespread, with nearly half of all pregnant women experiencing pelvic or low back pain, and about one-fourth continuing to report symptoms during the first postpartum year. [2]

Several factors- such as a history of low back pain, higher body mass index, demanding physical activity, and emotional stress- have been identified as contributors to persistent PGP after delivery. [3] Biomechanical explanations suggest that disturbances in the mechanisms responsible for stabilizing the pelvic ring, including both form and force closure, may reduce effective load transfer and lead to discomfort. [4]

Although hormonal influences such as relaxin have been considered, research does not consistently support a strong association between hormone level changes and symptom severity. [5] Instead, pregnancy-related biomechanical changes—such as increased anterior pelvic tilt and altered spinal alignment- may disrupt efficient load transfer across the sacrum and pubic symphysis, producing pain during activities like rolling in bed or climbing stairs [6].

Clinically, women with PGP often experience difficulty walking, prolonged sitting or standing, stair climbing, or single-leg movements, all of which interfere with daily functioning. [7] Early identification through standardized clinical tests is therefore recommended to guide appropriate intervention planning [8]

Stabilization exercises that target key trunk and pelvic muscles are widely recommended in the management of postpartum PGP, as they help restore neuromuscular control and improve load transfer across the pelvis. [9] Programs focused on motor-control–based stabilization have shown superior outcomes compared to general strengthening approaches among postpartum women [10]

Although antenatal exercise may not fully prevent PGP, it has been shown to reduce symptom intensity and limit activity restriction related to pain. [11]

Pelvic belts and realignment devices offer external support to enhance force closure, and studies associate their use with reductions in pain and improved functional performance [12]. Randomized trials demonstrate that adding a pelvic realignment belt to stabilization training can accelerate symptom improvement by reducing sacroiliac loading during movement retraining [13]. Clinical guidelines also encourage a combined approach that includes education, graded exercises, and supportive devices when appropriate [14].

In cases where pelvic floor dysfunction is present, specific pelvic floor muscle training has demonstrated additional benefits in improving overall pelvic stability [15] Persistent

PGP can negatively affect a woman's physical functioning, psychological well-being, and participation in childcare and household activities, and some women continue to experience symptoms for several years after deliver [16]

Because related conditions, such as transient osteoporosis of pregnancy, can mimic PGP, a clear differential diagnosis is essential for effective management [17] Psychosocial factors- including fear-avoidance, distress, and catastrophizing- may further influence symptom progression and recovery [18]

Recent evidence highlights the role of structured stabilization programs in improving pain and functional capacity in postpartum women, supporting the use of targeted exercises combined with external support to optimize recovery [19]

2. Materials and Methods

This study followed a pre-test and post-test experimental design to examine the effect of pelvic stabilization exercises combined with a pelvic realignment belt on postpartum pelvic girdle pain. A total of fifteen women between 25 and 30 years of age were selected. All participants had delivered either normally or by caesarean section and reported pelvic girdle pain during the postpartum period. Women with medical complications, neurological conditions, or any condition that restricted exercise participation were excluded.

Before the intervention began, each participant was informed about the purpose of the study and the procedures involved. Written consent was obtained. Pain was measured using the Visual Analogue Scale (VAS), which served as the primary outcome measure.

The intervention lasted for eight weeks. Each participant attended supervised exercise sessions five days a week, with each session lasting approximately 40–45 minutes.

The program included a warm-up period followed by exercises designed to strengthen the pelvic floor, deep abdominal muscles, hip stabilizers, and trunk musculature. The exercises were selected to improve pelvic stability and support better load transfer across the pelvic joints.

All exercises were performed while wearing a pelvic realignment belt. The belt was fitted around the pelvic region to provide gentle compression and help maintain alignment during movement. Participants were instructed to keep the belt on throughout the session to ensure uniform support during every activity.

At the end of the eight-week program, the VAS score was recorded again under similar conditions as the pre-test to maintain consistency. The collected data were analyzed using a paired t-test to compare pre- and post-intervention values and to determine whether the changes observed were statistically significant. Confidentiality was maintained for all participants, and ethical approval for the study was obtained from the Institutional Ethical Committee.

Inclusive and Exclusive

This present review included clinical trials and randomized controlled studies that involved postpartum women diagnosed with pelvic girdle pain or lumbopelvic dysfunction following childbirth. Studies were included if the participants were between 6 weeks and 12 months postpartum, medically stable, and able to participate in exercise-based interventions. Only articles that employed pelvic stabilization exercises, pelvic realignment belts, or a combination of both as the primary intervention and measured outcomes related to pain intensity, functional disability, or quality of life using standardized assessment tools such as the Visual Analogue Scale (VAS).

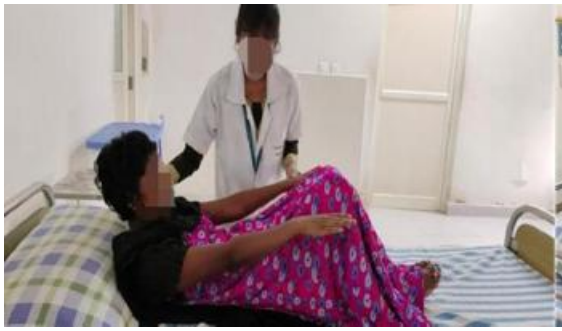
3. Procedure

The treatment program was carried out for eight weeks, with each participant attending sessions five days per week. Each session lasted around 40 minutes and followed a structured format. The exercises were selected to improve pelvic stability, core strength, and functional control of the lumbopelvic region. All activities were performed while wearing a pelvic realignment belt to provide additional support during movement.

1) Stabilization Exercises in Lying Position

These exercises were performed on a comfortable surface with the aim of activating the deep abdominal and pelvic muscles.

a) **Partial Curls:** The participant lay on her back with knees bent. She gently tightened her abdominal muscles and slowly lifted her head and shoulders off the bed. The position was held briefly before lowering back down. This was repeated five times.
b) **Diagonal Curls:** Starting in the same lying position, the participant placed her hands lightly behind her head. She lifted her shoulders and rotated the trunk toward the opposite knee. After holding the position for a few seconds, she returned to the starting position. Five repetitions were performed.
c) **Knee Raises:** While lying supine, the participant bent one knee and slid the heel toward the buttocks in a controlled manner. The knee was lifted to a comfortable height, held for a few seconds, and then lowered. This was repeated five times on each side.


Partial Curls


Knee Raises

2) Standing Exercises

After the mat exercises, participants practiced functional stabilization activities while standing.

a) Static Squats

Participants performed five repetitions of partial squats to activate the hip and core muscles while maintaining proper alignment.

3) Functional Activities with Pelvic Belt

These activities were practiced with the pelvic realignment belt in place to support the pelvis during movement.

a) **Stepping:** While standing upright, participants lifted one knee as if marching. The focus was on controlled movement and maintaining pelvic alignment. Each leg performed ten repetitions.
b) **Pelvic Shifting:** Standing with feet shoulder-width apart, participants shifted their weight from one side to the other without rotating the trunk. This was repeated ten times on each side.
c) **Pelvic Rotation with Knee Flexion/Extension:** Participants practiced gentle pelvic rotations coordinated with knee movements to improve mobility and control.
d) **Trunk Flexion:** With knees slightly bent, participants bent forward from the hips and returned to standing. Five repetitions were completed.
e) **Trunk Extension:** Participants leaned slightly backward without arching excessively and returned to neutral. This was also repeated five times.


Stepping


Trunk Extension

4. Data Analysis

Pre and Post Test Values of the Visual Analog Scale

Paired t-Test Results

P Value and Statistical Significance:

The two-tailed p value is less than 0.0001.

By conventional criteria, this difference is considered to be extremely statistically significant.

Confidence Interval:

The mean difference (Pre-test minus Post-test) = 4.07

95% Confidence Interval of this difference: from 3.75 to 4.39

Intermediate Values Used in Calculations:

t = 34.41

df = 14

Standard Error of Difference = 0.15

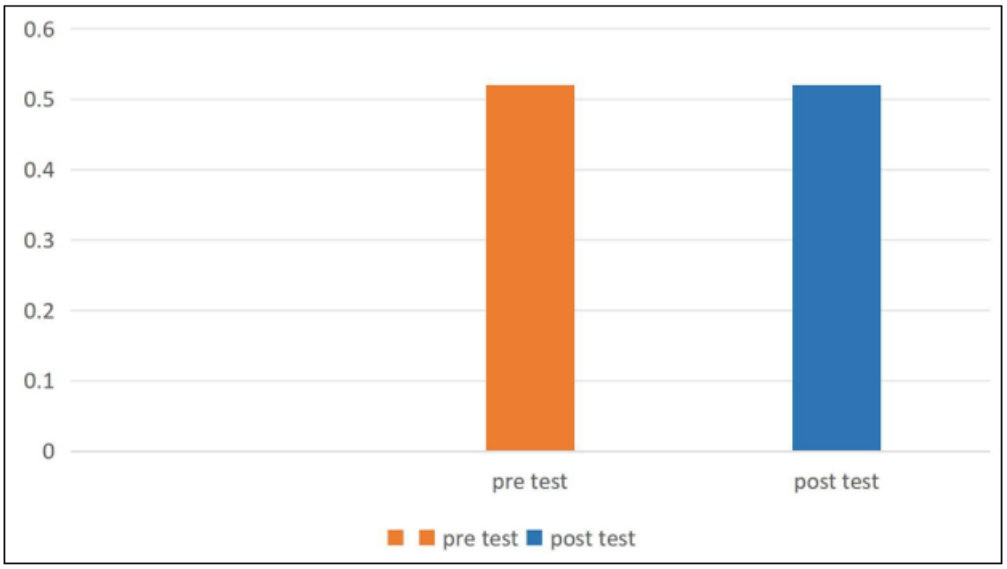
Table 1: Visual Analogue Scale- Pre and Post Test Values (N = 15)

VAS	Pre -Test	Post -Test
N	15	15
Mean Score	7.53	3.47
Standard Deviation	0.53	0.52

In the above table, the pre-test and post-test mean values clearly demonstrate a reduction in pain intensity following

intervention. The paired t-test value ($p < 0.0001$) indicates that there is a statistically significant difference between the values obtained before and after the treatment. The mean reduction of 4.07 points on the VAS signifies a clinically meaningful decrease in low back and pelvic girdle pain in postpartum women, indicating positive treatment response to stabilization exercises combined with use of a pelvic realignment device.

Visual Analog Scale



Graph 1: Pre-test and Post-test VAS Score Comparison

5. Results

A comparison of the pre-test and post-test scores on the Visual Analogue Scale (VAS) showed a clear reduction in pain after the eight-week intervention. Before starting the program, the mean VAS score of the participants was 7.53, indicating a high level of discomfort. After completing the stabilization exercises while using the pelvic realignment belt, the mean score decreased to 3.47. This reduction suggests that most participants experienced meaningful relief from pelvic girdle pain.

A paired t-test was used to analyze the difference between the two sets of scores. The test showed a statistically significant improvement, with a p-value of less than 0.0001. This confirms that the change in pain levels was not due to chance but was likely a result of the exercise program and the use of the pelvic belt.

Quality of Life Assessment

Quality of life was assessed using the WHOQOL-BREF questionnaire, which contains 26 items categorized into four domains:

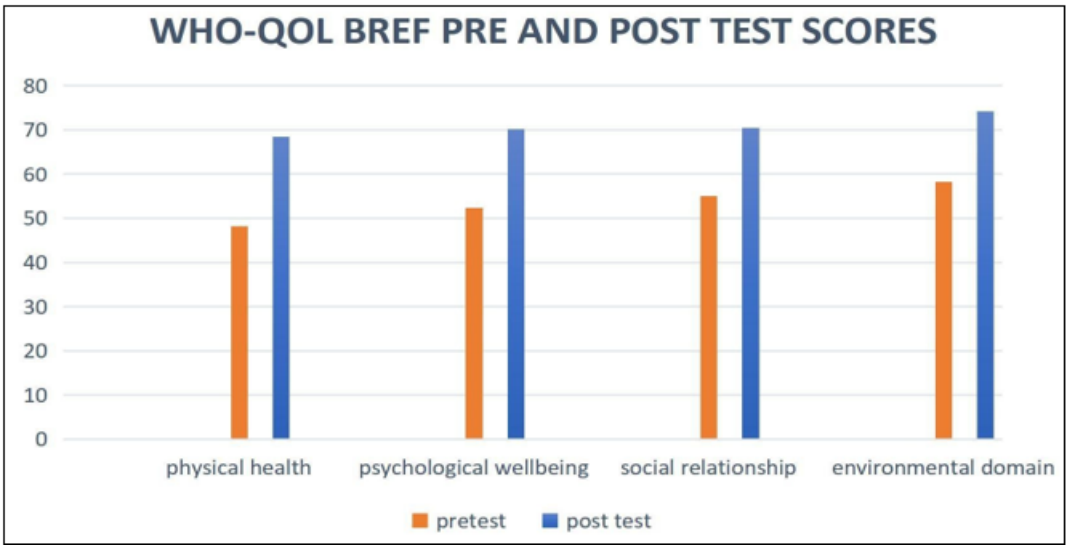
1) Physical Health Domain
2) Psychological Domain
3) Social Relationships Domain
4) Environmental Domain

Each domain score was converted to a scale of 0–100, where higher scores indicate better quality of life.Pre-test and post-test QOL scores were analyzed using paired t- test, similar to the VAS analysis.

Table 2: WHO-QOL BREF – Pre-test and Post-test Scores (N = 15)

QOL Domain	Pre-Test Mean ± SD	Post-Test Mean ± SD	Mean Difference	p-value
Physical Health	48.20 ± 4.10	68.47 ± 3.85	+20.27	$p < 0.0001$
Psychological Well-Being	52.33 ± 3.90	70.13 ± 4.22	+17.80	$p < 0.0001$
Social Relationship	55.00 ± 4.21	72.40 ± 4.18	+17.40	$p < 0.0001$
Environmental Domain	58.27 ± 3.50	74.27 ± 3.61	+16.00	$p < 0.0001$

Interpretation: All the domains of quality of life improved significally after the 8 - weeks pelvic stabilization exercise program using the pelvic realignment belt.



Graph 2: WHO-QOL Bref Pre and Post Test Scores

6. Results

Quality of life was also assessed using the WHOQOL-BREF questionnaire. All four domains- Physical Health, Psychological Well-Being, Social Relationships, and Environmental Factors—showed improvement after the intervention. The Physical Health domain showed the largest gain, which is consistent with the reduction in pain scores. The other domains also increased, suggesting that participants felt better emotionally, interacted more comfortably with others, and managed daily activities with greater ease.

Overall, the results indicate that the combination of pelvic stabilization exercises and the pelvic realignment belt helped reduce pain and improved several aspects of quality of life for postpartum women who participated in the study.

7. Discussion

The findings of this study indicate that an eight-week stabilization program performed with a pelvic realignment belt can meaningfully reduce pelvic girdle pain in postpartum women. The substantial drop in VAS scores suggests that most participants experienced noticeable improvement in pain levels by the end of the intervention period. This change likely reflects the combined effect of targeted muscle activation and improved load transfer across the pelvic region.

During pregnancy, many women develop reduced coordination and strength in muscles such as the transversus abdominis, pelvic floor, and hip stabilizers. Re- engaging these muscles through structured stabilization exercises may help restore pelvic control and reduce strain on sensitive structures. The participants in this study performed controlled activities that emphasized alignment and motor control, which may have contributed to reduced discomfort during everyday tasks.

The pelvic realignment belt appears to have supported the exercise program by offering additional external stability. Several participants reported feeling more secure while performing standing and stepping movements with the belt in place. Although the belt alone is not expected to resolve PGP, it likely enhanced the effectiveness of the exercises by minimizing excessive pelvic motion and making the movements easier to perform with proper technique.

Improvements in quality-of-life scores further demonstrate the broader value of this intervention. As pain decreased, women reported better physical comfort, emotional well-being, and confidence in handling daily routines and childcare responsibilities. These findings highlight how PGP can affect multiple aspects of postpartum life and why early rehabilitation is beneficial.

Despite the positive outcomes, this study does have limitations. The small sample size limits generalization, and the eight-week duration does not provide information about long-term maintenance of benefits. Future studies with larger groups and extended follow-up periods would help determine whether these improvements persist over time and whether continued training is needed.

Overall, the results suggest that a structured, supervised stabilization program paired with a pelvic realignment belt is a practical and accessible approach for managing postpartum pelvic girdle pain. This combined method can be easily integrated into physiotherapy practice to support postpartum recovery and improve women's functional ability.

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Ethical Clearance:
The study was approved by the Institutional Ethical Committee prior to participant recruitment. All participants were informed about the study procedures, and written informed consent was obtained before data collection.

Conflict of Interest
The authors declare that there is no conflict of interest regarding the conduct, outcomes, or publication of this research.

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