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Original Research Article

Correlation Between Pelvic Girdle Pain and Functional Mobility in Post-Hysterectomy Women

Priya S [1], Abhilash P V [2], Brijitha Jacob *[3].

[1] Associate Professor, Laxmi Memorial College of Physiotherapy, Upper Bendoor 2nd Cross Rd, Bendoor, Mangaluru, Karnataka 575002, India.

[2] Associate Professor, Laxmi Memorial College of Physiotherapy, Upper Bendoor 2nd Cross Rd, Bendoor, Mangaluru, Karnataka 575002, India.

[*3] Second year MPT student, Musculoskeletal science, Laxmi Memorial College of Physiotherapy, Upper Bendoor 2nd Cross Rd, Bendoor, Mangaluru, Karnataka 575002, India.

ORCiD: 0009-0001-3263-9058

ABSTRACT

Background: Pelvic girdle pain (PGP) is a commonly seen musculoskeletal disorder that can influence functional mobility, particularly in women following hysterectomy due to alterations in lumbopelvic stability and neuromuscular control. However, limited evidence exists regarding the relationship between pelvic girdle pain and functional mobility in post-hysterectomy women.

Context and Purpose of Study: To determine the correlation between pelvic girdle pain and functional mobility in post-hysterectomy women.

Results: The mean PGQ score was 38.11 ± 15.57%, and the mean 5xSTS duration was 13.41 ± 2.83 seconds. A moderate positive correlation was found between PGQ score and 5xSTS test duration ($r = 0.547$, $p < 0.001$), indicating that higher pelvic girdle pain and disability are linked to reduced functional mobility.

Conclusion: There is a significant relationship between pelvic girdle pain and functional mobility in post-hysterectomy women. Increased pelvic girdle pain is associated with decreased functional mobility. These findings emphasise the need to include lumbopelvic stabilisation and functional training in postoperative rehabilitation.

KEY WORDS: Pelvic Girdle Pain, Functional Mobility, Post-Hysterectomy, Pelvic Girdle Questionnaire, Five Times Sit-to-Stand, Lumbopelvic Stabilisation.

Address for correspondence: Dr. Brijitha Jacob, Second-year MPT student, Musculoskeletal science, Laxmi Memorial College of Physiotherapy, Upper Bendoor 2nd Cross Rd, Bendoor, Mangaluru, Karnataka 575002, India. **E-Mail:** brijithajacob@gmail.com

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INTRODUCTION

Hysterectomy is considered one of the most widely performed major gynaecological surgeries worldwide [1]. It is often performed for conditions including uterine fibroids, abnormal uterine bleeding, endometriosis, chronic pelvic pain, and gynaecological malignancies [2]. This procedure is particularly prevalent among women in the middle-aged group [3]. Although hysterectomy effectively addresses primary gynaecological conditions, it has been associated with postoperative

changes in pelvic floor function and related structures [3].

Evidence suggests that hysterectomy may increase the likelihood of pelvic floor conditions, including pelvic organ prolapse and urinary disturbances [4]. These structural and functional alterations may contribute to secondary musculoskeletal complications involving the lumbopelvic region [5]. Such complications can negatively influence overall physical performance and the quality of life among affected women [6].

PGP is usually experienced in the region between the posterior iliac crest and the gluteal fold, often involving the sacroiliac area and occasionally radiating into the posterior thigh. [7]It is classified as a specific lumbopelvic musculoskeletal disorder that can be differentiated from general low back pain based on its location and clinical presentation [7]. The underlying mechanism of PGP is largely related to compromised load transfer across the pelvic girdle, often due to dysfunction of the sacroiliac joints and associated structures [8]. The stability of the pelvic region is maintained through the interaction of form closure, which depends on joint structure and ligamentous integrity, and force closure, which is generated by coordinated muscular activity [8]. When these stabilising systems are altered, it may result in reduced pelvic stability, contributing to pain and functional disturbances [7]. Pelvic stability is largely supported by the active muscular system, including the diaphragm, transversus abdominis, multifidus, pelvic floor, and gluteal muscles [8].

These muscles work in coordination to regulate intraabdominal pressure and provide dynamic support to the lumbopelvic region during movement [8]. Any disturbance in their activation or coordination may lead to inefficient movement patterns and increased stress on the sacroiliac joints [8]. Clinically, individuals with PGP often experience difficulty during activities involving load transfer, such as walking, prolonged standing, sitting, and transitional movements [9]. These activity limitations indicate reduced functional mobility and impaired neuromuscular control of the lumbopelvic region [9].

Although most commonly studied in pregnancy-related conditions, similar biomechanical and neuromuscular factors may contribute to PGP in other populations as well [7].

In addition, persistent PGP can negatively affect quality of life and reduce participation in daily and social activities [9].

Functional mobility can be described as an individual's capacity to move safely and independently while performing routine activities such as walking, transfers, and postural changes [10]. It is an essential component of physical function and plays a crucial role in maintaining independence, participation, and overall quality of life in adult populations [11]. Functional mobility relies on the coordinated interaction of multiple systems, including muscle strength, joint integrity, neuromuscular control, and balance mechanisms [12]. Surgical interventions involving the abdominal and pelvic regions may negatively influence these components due to factors such as tissue trauma, postoperative pain, and reduced physical activity levels [13]. Studies on abdominal surgeries have reported impairments in core muscle function and alterations in normal movement patterns, which can contribute to decreased trunk stability and reduced functional performance [14]. Additionally, pain-related protective behaviours and fear of movement following surgery may further limit mobility and delay the recovery of functional activities [13]. Similar findings have been observed in populations undergoing pelvic or gynaecological procedures, where postoperative changes can affect physical function and daily activity performance [15]. Alterations in lumbopelvic stability and muscle function following such procedures may also predispose individuals to conditions, such as pelvic girdle pain, further influencing movement and functional capacity [7]. The presence of PGP can further restrict functional mobility by limiting activities that involve load transfer and coordinated movement [9]. Although previous studies have examined functional limitations following surgery and the impact of PGP independently, there is limited evidence exploring the relationship between PGP and

functional mobility specifically in women following hysterectomy. Therefore, investigating this relationship is important to better understand functional impairments and to support the development of targeted rehabilitation strategies for this population.

METHODS

This study is a cross-sectional correlational study aimed at determining the relationship between pelvic girdle pain and functional mobility in post–hysterectomy women. The study was carried out among women aged 40-65 years who had undergone hysterectomy for benign conditions. Forty participants were enrolled through non-probability convenience sampling, and the study took place at a tertiary hospital in Mangalore. Data was collected for a duration of 10 months.

PROCEDURE

Ethical clearance for this study was granted by the Institutional Ethics Committee. Participants were recruited based on predefined inclusion and exclusion criteria. The inclusion criteria comprised women who were aged between 40-65 years, women who had undergone abdominal or vaginal hysterectomy for benign conditions, women who were 6 months to 2 years post-hysterectomy, women reporting pelvic girdle pain persisting for more than 3 months post-surgery, participants willing to participate and provide informed consent, and participants able to walk independently without any assistive devices.

Participants who underwent hysterectomy due to malignancy, participants with a history of neurological disorders affecting mobility, participants with recent lower limb musculoskeletal injuries or fractures within the past 6 months, participants with cognitive impairments affecting the ability to comprehend instructions or respond to questionnaires, participants with current pregnancy or any major pelvic surgery post-hysterectomy, and participants with severe visual or vestibular impairments affecting balance were excluded.Forty female participants who fulfilled the inclusion criteria were part of the study. The procedures were clearly explained to them, and consent was obtained prior to the commencement of data collection. Basic demographic information, including age and duration since hysterectomy, was recorded.

Pelvic girdle pain was measured with the Pelvic Girdle Questionnaire (PGQ). The questionnaire was explained to the participants, and they were instructed to respond based on their pain intensity and the level of difficulty they experienced during daily activities.

Functional mobility was assessed using the Five Times Sit-to-Stand Test (5xSTS). Participants were seated on a standard chair without armrests, keeping their feet placed flat on the floor and arms folded across the chest. They were instructed to perform five sit-to-stand repetitions as quickly as possible without using their hands.

The total time required to complete the test was recorded using a stopwatch. All assessments were carried out under standardized conditions to ensure consistency and reliability of the data.

RESULTS

The statistical analysis for the present pilot study on the correlation between pelvic girdle pain and functional mobility in post-hysterectomy women was carried out using SPSS version 23.0. Descriptive statistics are reported as mean ± standard deviation (Mean ± SD) for continuous variables, including PGQ score (%) and Five Times Sit-to-Stand test duration (seconds), while categorical variables such as age group and post-surgery duration are expressed as frequency and percentage (%). The relationship between PGQ score and functional mobility was analysed using Karl Pearson's correlation coefficient (r), with the level of statistical significance set at $p < 0.05$.

The present pilot investigation included 40 post-hysterectomy women, among whom 52.5% (n = 21) were in the d"47 age group and 47.5% (n = 19) were in the >48 age group. The mean age of participants was 47.57 ± 3.19 years, with values ranging from 41.00 to 53.00 years. Regarding post-surgery duration, 55.0% (n = 22) were within d"8 months post-surgery,

Table 1: Summary of Clinical Characteristics and Correlation among Post-Hysterectomy Women (n = 40).

A. Frequency and Percentage Distribution of Age Among Post- Hysterectomy Women					
			Frequency	**Percent**	
Age	≤ 47 years		21	52.5	
	>48 years		19	47.5	
	Total		40	100	
B. Descriptive Statistics of Pelvic Girdle Questionnaire (PGQ) Score Among Post- Hysterectomy Women					
	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
PGQ score (%)	40	11.03	69.6	38.108	15.571
C. Descriptive Statistics of Five Times Sit-to-Stand Test Among Post- Hysterectomy Women					
	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
5 times sit-to-stand	40	9.3	21	13.414	2.828
D. Frequency and percentage distribution of Post-Surgery Duration Among Post-Hysterectomy Women					
			Frequency	**Percent**	
Post surgery month	**≤8 months**		22	55	
	>9 months		18	45	
	Total		40	100	
E. Correlation between Pelvic Girdle Questionnaire (PGQ) Score and Five Times Sit-to-Stand Test among Post-Hysterectomy Women					
				5 times Sit-to-Stand (sec)	
PGQ score (%)		**r value**		0.547	
		p value		0	
		N		40	

while 45.0% (n = 18) were > 9 months post-surgery. The descriptive statistics for PGQ score among post-hysterectomy women showed a mean of 38.11 ± 15.57%, with scores ranging from 11.03% to 69.60%. The descriptive statistics for the 5xSTS test duration showed a mean of 13.41 ± 2.83 seconds, with values ranging from 9.30 to 21.00 seconds. Correlation analysis showed a moderate positive relationship between PGQ score and 5xSTS test duration ($r = 0.547$), with high statistical significance ($p < 0.001$).

DISCUSSION

This study found a statistically significant moderate positive correlation between Pelvic Girdle Questionnaire (PGQ) score and Five Times Sit-to-Stand (5xSTS) test duration among post-hysterectomy women ($r = 0.547$, $p < 0.001$). This suggests that women reporting greater PGP and disability tend to take longer to complete the sit-to-stand task, indicating reduced functional mobility as lumbopelvic symptoms worsen.

Forsgren et al. reported that hysterectomy is associated with lasting changes in pelvic floor function, which may predispose women to secondary musculoskeletal problems beyond the immediate postoperative period [1]. This is particularly relevant given that Rout et al. noted the procedure is most prevalent among middle-aged women — a group already at increased risk of age-related declines in musculoskeletal function and physical performance [3].

The underlying mechanism linking PGP to reduced mobility likely involves disruption of normal lumbopelvic load transfer. Vleeming et al. described how the sacroiliac joint depends on both form closure and force closure for stability, and that failure of either mechanism results in abnormal movement patterns and increased joint stress [8]. The same authors highlighted that muscles including the transversus abdominis, multifidus, and gluteal group are integral to dynamic pelvic stability, and their dysfunction during tasks such as sit-to-stand may explain the prolonged 5xSTS durations observed in the present cohort [7]. Ericksen et al. further noted that gynaecological surgery can alter sacroiliac joint stiffness and pelvic floor mechanics, adding a surgical dimension to this biomechanical vulnerability [5]. Torstensson et al. similarly reported that intra-pelvic structural changes following surgery are associated with persistent pain and activity limitation [6]. The impact of surgery on functional mobility extends beyond

structural changes. Kehlet et al. described how postoperative tissue trauma, pain, and reduced physical activity can impair neuromuscular function required for movement [13]. Hides et al. demonstrated that reduced core muscle activation following abdominal procedures compromises trunk stability and limits functional performance [14]. Shumway-Cook and Woollacott further emphasised that pain-related movement avoidance and fear of re-injury may delay recovery and reduce mobility [12]. Guralnik et al. showed that performance-based mobility tests are strong predictors of functional decline and disability in adults [11].

Clinically, these findings emphasise the importance of assessing PGP and functional mobility in post-hysterectomy women. Rehabilitation programmes focusing on lumbopelvic stabilisation, functional training, and pain management may help reduce disability and improve overall functional outcomes in this population.

CONCLUSION

In this study, a statistically significant moderate positive correlation was observed between Pelvic Girdle Questionnaire (PGQ) score and Five Times Sit-to-Stand (5xSTS) duration ($r = 0.547$, $p < 0.001$) in post-hysterectomy women. This indicates that as pelvic girdle pain and disability increase, functional mobility decreases. The findings suggest that lumbopelvic dysfunction following hysterectomy contributes to impaired physical performance. Clinically, this highlights the importance of incorporating pelvic girdle pain assessment and lumbopelvic stabilisation training into postoperative rehabilitation protocols to improve functional outcomes in post-hysterectomy women.

ABBREVIATIONS

PGP - Pelvic Girdle Pain
PGQ - Pelvic Girdle Questionnaire
5×STS - Five Times Sit-to-Stand

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AUTHORS CONTRIBUTION

Priya S: Conception of the study, guided throughout the manuscript preparation process, performed critical revisions, and provided guidance in topic selection.
Abhilash P V: reviewing the study and providing critical intellectual input to ensure the accuracy and integrity of the work.
Brijitha Jacob: Conceptualised and identified the research topic, performed data collection, collected study samples, conducted statistical analysis in collaboration with a statistician, and prepared the manuscript.

Disclosures: This study was presented as a pilot study during a conference conducted by IAPWC in 2025.

Conflicts of interest: **None**

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