

Association of Different Pregnancy Related Factors with Pelvic Girdle Pain: A Cross-sectional Survey

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Abstract

Background: Pregnancy-related pelvic girdle pain (PPGP) is a common condition that can substantially impair daily functioning in pregnant women. Identifying its severity and associated risk factors, such as maternal age, age at first pregnancy, body mass index (BMI), occupation, and duration of standing may facilitate prevention and reduce disability.

Objective: To determine the association of pregnancy-related factors with pelvic girdle pain.

Methodology: This cross-sectional study included 322 pregnant women aged over 18 years, beyond the first trimester, who presented with PPGP. Purposive sampling was used. Women with recent trauma or previous pelvic surgery were excluded. Data were collected using a self-developed proforma, the Pelvic Girdle Questionnaire (PGQ), and the Visual Analogue Scale (VAS) after obtaining informed consent. The study was conducted in the Gynecology Ward of Shalamar Hospital, Lahore.

Results: Significant associations were observed with increased daily physical activities ($p < 0.001$), non-pregnancy-related pelvic girdle pain ($p = 0.021$), aggravation of symptoms ($p < 0.001$), and higher pain severity on the VAS ($p = 0.004$). No significant association was found with gravida ($p = 0.080$), parity ($p = 0.097$), occupation ($p = 0.930$), history of low back pain ($p = 0.209$), family history of pelvic girdle pain ($p = 0.627$), or pelvic girdle discomfort in previous pregnancies ($p = 0.221$).

Conclusion: PPGP was highly prevalent among adult pregnant women and was significantly associated with increased physical activity, history of non-pregnancy-related pelvic girdle pain, aggravated symptoms, and greater pain severity on the VAS. Incorporating these factors into routine prenatal screening may allow for early identification and prevention strategies.

Keywords: Pregnancy; Pelvic girdle pain; Risk factors; Pelvic Girdle Questionnaire; Visual Analogue Scale

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Introduction

Among the various physiological and biological changes that occur during pregnancy, pelvic girdle pain (PGP) is one of the most common musculoskeletal disorders [1,2]. Women with pregnancy-related pelvic girdle pain (PPGP) often experience pain over the sacroiliac joints and the pubic symphysis, which is associated with poorer

prognosis compared to those reporting less pelvic pain [3].

PPGP can significantly reduce women's ability to perform daily activities such as prolonged standing, sitting, walking, turning in bed, household chores, and work-related tasks. It also leads to sleep disturbances and poor quality of life [4]. Approximately 7–12.5% of women with PPGP require walking aids due to mobility limitations. In severe cases, women may opt for elective cesarean section or induced labor to relieve symptoms [5,6].

Several risk factors have been identified, including high body mass index (BMI), early age at



menarche, physically demanding work, history of low back pain (LBP) or PGP, family history of PPGP, and elevated levels of psychological distress [7,8]. The pelvic girdle is a complex structure composed of four bones (the hip bones, sacrum, and coccyx), forming a basin-shaped ring that connects the axial and appendicular skeletons. Its articulations, the pubic symphysis, sacroiliac joints, and sacrococcygeal joints, facilitate weight transfer, movement, and support [9]. The pelvic girdle also plays a pivotal role in both muscular and neural activity, while supporting pelvic organs such as the bladder, rectum, and female reproductive system [10,11].

During pregnancy, contributory factors such as increased BMI, hormonal changes, and joint hypermobility often trigger typical PPGP, although most women experience relief after delivery [5,7]. Despite its prevalence, women with PPGP frequently report a lack of understanding and awareness regarding the condition. Many are inadequately treated, and healthcare professionals often provide contradictory diagnoses and management recommendations [12].

The purpose of this study is to identify the main risk factors associated with pregnancy-related pelvic girdle pain. Understanding these factors will not only improve the quality of life of pregnant women but also aid in the development of educational strategies and preventive interventions. Ultimately, this will help ensure safer pregnancies through timely recognition, medical attention, and appropriate care.

Methodology

This cross-sectional study was conducted in the Gynecology Ward of Shalamar Hospital, Lahore, after obtaining approval from the Institutional Review Board (IRB) (Reference No. SSAHS-IRB/AL/01/2023). Data were collected from August 2023 to November 2023.

Sample Size:

The sample size was calculated using the single-proportion formula. Based on an estimated

prevalence of pelvic girdle pain of 44.1% among pregnant women [4], a 95% confidence level, and a 5% margin of error, the required sample size was 379. However, due to time constraints, 322 participants were included for final analysis.

Eligibility Criteria:

Pregnant women aged ≥ 18 years and beyond 14 weeks of gestation were eligible for inclusion. Exclusion criteria were recent spinal fracture, trauma, uterine or cervical tumors, and a history of pelvic surgery.

Data Collection Tools and Procedure:

After obtaining written informed consent, participants were asked to complete the Pelvic Girdle Questionnaire (PGQ). The questionnaire was distributed during routine prenatal visits or obstetric admissions. Women either self-completed the forms or were interviewed by researchers who documented their responses.

The PGQ is a condition-specific tool developed to assess symptoms and activity limitations associated with pelvic girdle pain. It includes 20 activity-related items (e.g., difficulty with dressing, climbing stairs, household work, rolling in bed, or pushing a shopping cart) and 5 symptom-related items. Responses are scored on a 4-point scale ranging from “Not at all” (0) to “To a large extent” (3). The total PGQ score is calculated by summing all item scores, dividing by the maximum possible score of 75 (60 for activities and 15 for symptoms), and converting to a percentage, yielding scores between 0 (no disability) and 100 (severe disability).

Anthropometric and Pain Assessment:

Weight was measured using a standardized digital scale available in the ward, and height was measured in the standing position using a measuring tape. Pain intensity was assessed using the Visual Analogue Scale (VAS), ranging from 0 (no pain) to 10 (worst possible pain). Researchers demonstrated the scale to ensure participants rated their pain accurately. The pain assessment form,



including the VAS, was available in both English and Urdu. For participants with limited literacy, trained researchers assisted with form completion to ensure accurate and unbiased responses.

Risk Factors Assessed:

In addition to pain and functional disability, data were collected on several potential risk factors, including maternal age, gestational age, occupational factors, history of low back pain, family history of PPGP, and levels of daily physical activity. The entire assessment process took approximately 15 minutes per participant.

Data Analysis:

Data were entered and analyzed using IBM SPSS Statistics version 27. Associations between categorical variables (e.g., presence of PPGP and age group, family history) were tested using the Chi-square test. For cells with expected counts <5, continuity corrections were applied. A p-value ≤ 0.05 was considered statistically significant.

Results

A total of 322 pregnant women were included in

this cross-sectional study. The mean age of participants was 27.94 ± 4.8 years. Based on pain

severity, 159 women (49.4%) reported mild pain, 140 (43.5%) reported moderate pain, and 23 (7.1%) reported severe pain.

Of the participants, 180 (55.9%) were aged 18–28 years, while 142 (44.1%) were aged 29–35 years. Age was significantly associated with problematic pelvic girdle pain ($p = 0.001$). Regarding parity, 136 women (42.2%) were primigravida, 117 (36.3%) were second gravida, and 69 (21.4%) were multigravida. No significant association was found between gravida and problematic pelvic girdle pain ($p = 0.080$).

With respect to gestational age, 148 women (46.0%) were in the second trimester and 174 (54.0%) were in the third trimester. Trimester was not significantly associated with pelvic girdle pain ($p = 0.088$). The majority of participants were housewives (289, 89.8%), followed by healthcare professionals (7, 2.2%), teachers (14, 4.3%), and other professions (12, 3.7%). Occupation showed no significant association with pelvic girdle pain ($p = 0.931$). Intense physical activity was reported by 95 women (29.5%) but was not significantly associated with pelvic girdle pain ($p = 0.244$) (Table 1).

Table 1: Comparison of different demographics and problematic pelvic girdle pain

Risk Factors	Categories	Problematic pelvic girdle pain			p-value
		Mild	Moderate	Severe	
Age Group	18 to 28 years	106(58.9%)	64(35.6%)	10(5.6%)	<0.002
	29 to 35 years	53(37.3%)	76(53.5%)	13(9.2%)	
Gravida	First	76(55.8%)	52(38.2%)	8(5.9%)	<0.081
	Second Time	60(51.3%)	49(41.9%)	8(6.8%)	
	Multiple	23(33.3%)	39(56.5%)	7(10.1%)	
Profession	Housewife	145(50.1%)	123(42.6%)	21(7.3%)	<0.932
	Health care professional	3(42.9%)	3(42.9%)	1(14.3%)	
	Teacher	6(42.9%)	8(57.1%)	0(0.0%)	
	Others	5(41.7%)	6(50.0%)	1(8.3%)	
Trimester	2 nd	55(57.9%)	33(34.7%)	7(7.4%)	<0.089
	3 rd	104(45.8%)	107(47.1%)	16(7.0%)	
Intense physical activity	Yes	69(50.6%)	65(43.9%)	14(9.5%)	<0.245
	No	90(51.7%)	75(43.1%)	9(5.2%)	

A history of low back pain was present in 254 women (78.9%), but this was not significantly associated with problematic pelvic girdle pain ($p = 0.209$). Family history of pelvic girdle pain was reported in 11 women (3.4%) and was also not associated with pain ($p = 0.628$). Previous non-pregnancy-related pelvic girdle pain was reported in

39 participants (12.1%) and showed a significant association with problematic pelvic girdle pain ($p = 0.022$). In contrast, a history of pregnancy-related pelvic girdle pain was reported in 100 participants (31.1%) but was not significantly associated ($p = 0.221$) (Table 2).

Table 2: comparison of patients' history of pain regarding pelvic pain grading

Pelvic girdle pain	Status	Problematic pelvic girdle pain			p-value
		Mild	Moderate	Severe	
History of low back pain	Yes	132(52.0%)	103(40.6%)	19(7.5%)	<0.210
	No	27(39.7%)	37(54.4%)	4(5.9%)	
Family history	Yes	6(54.5%)	5(45.5%)	0(0.0%)	<0.628
	No	153(49.2%)	135(43.4%)	23(7.4%)	
Non-pregnancy related	Yes	11(28.2%)	22(56.4%)	6(15.4%)	<0.022
	No	142(52.3%)	118(41.7%)	17(6.0%)	
Previous pregnancy	Yes	44(44.0%)	45(45.0%)	11(11.0%)	<0.222
	No	115(51.9%)	95(42.8%)	12(5.4%)	

Problematic pelvic girdle pain showed a strong correlation with pain severity measured by the Visual Analogue Scale (VAS) (Cramer's $V = 0.703$,

$p < 0.005$) and a weaker but significant correlation with limitations in activities of daily living (Cramer's $V = 0.199$, $p < 0.001$) (Table 3).

Table 3: Comparison of pain intensity and activity

Measurement Scale	Pain	Problematic pelvic girdle pain				p-value
		Mild	Moderate	Severe	Total	
Visual Analogue Scale	No	4(50.0%)	3(37.5%)	1(12.5%)	8(2.48%)	<0.005
	Mild	24(66.7%)	11(30.6%)	1(2.8%)	36(11.18%)	
	Moderate	81(56.6%)	58(40.6%)	4(2.8%)	143(44.41%)	
	Intense	42(40.8%)	50(48.5%)	11(10.7%)	103(31.99%)	
	Unspeakable	8(25.0%)	18(56.3%)	6(18.8%)	32(9.94%)	
Problems in Daily Activity	No	3(100%)	0(0.0%)	0(0.0%)	3(0.93%)	<0.001
	Small Extent	153(81.0%)	36(19.0%)	0(0.0%)	189(58.70%)	
	Some Extent	3(2.5%)	104(86.7%)	13(10.8%)	120(37.27%)	
	Large Extent	0(0.0%)	0(0.0%)	10(100.0%)	10(3.11%)	

Discussion

This study was conducted to determine the association of pregnancy-related factors with pelvic

girdle pain (PGP). PGP is typically localized between the gluteal fold and posterior iliac crest, particularly around the sacroiliac joints, and may radiate into the posterior thigh. It can also occur



independently or concurrently at the pubic symphysis, representing a major musculoskeletal complication during pregnancy.

Our findings showed that adult pregnant women reported a higher frequency of PGP compared to younger women. Similar to previous studies, the incidence of PGP increased with maternal age, which may be explained by cumulative effects of prior pregnancies, altered musculoskeletal structure, lifestyle factors, or increased joint laxity [13].

In contrast to earlier reports, we did not observe a significant association between gravida and PGP. This discrepancy may be due to differences in study populations. The mean age of our participants was lower than in previous studies, and the higher proportion of miscarriages or abortions in our cohort may also have influenced the findings. Notably, our study included both primiparous and multiparous women, whereas some earlier studies focused only on primiparous women [8]. Conversely, other research has reported multiparity as a risk factor for PGP, which partially supports our results [14].

We also found no significant association between PGP and trimester, whereas previous studies have demonstrated an increased risk in later pregnancy [15]. Differences in study design, sample size, and timing of assessment may explain these contrasting results.

A history of non-pregnancy-related PGP was significantly associated with current PGP in our study, consistent with earlier findings. However, we did not find a statistically significant association with low back pain or family history of PGP. This may be attributable to the lower socioeconomic and educational background of our participants, which could have limited their awareness or accurate reporting of family history [8]. Another study reported a high prevalence of low back pain and PGP in pregnancy, with associations with BMI, maternal age, education, work status, and sleep duration [16]. Similarly, although prior literature has linked PGP more strongly with working women

[17], the small proportion of employed women in our study may explain the lack of association with occupation.

Our findings are consistent with earlier studies showing that women with more intense PGP experience moderate limitations in activities of daily living [1]. Taken together, the key factors associated with PGP in our study were higher maternal age, history of non-pregnancy-related pelvic pain, and greater physical activity demands.

These results highlight the importance of patient education and early risk factor identification. Counseling pregnant women on weight management, pacing daily activities, and taking adequate rest may reduce the severity of PGP and improve overall quality of life. Early recognition and targeted interventions by healthcare providers could help prevent disability, optimize prenatal care, and promote safe pregnancies.

Conclusion

This study identified significant associations between pelvic girdle pain (PGP) and several pregnancy-related factors, including maternal age, gravida, parity, miscarriage, abortion, history of low back pain, occupation, previous pregnancy-related PGP, non-pregnancy-related PGP, and daily life activities. PGP was found to occur more frequently among adult women, particularly those with a history of non-pregnancy-related PGP and those engaged in vigorous daily activities. These findings highlight the importance of early identification of at-risk women, targeted preventive strategies, and appropriate counseling to minimize discomfort and improve maternal quality of life during pregnancy.

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Conflict of Interest

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