Prevalence Of Pelvic Floor Dysfunction Among Postpartum Women - A Cross Sectional Study

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ABSTRACT

Background: Pelvic floor dysfunction (PFD) significantly affects women after childbirth, often overlooked despite its effects on daily life, emotions, and relationships. In India, postpartum care rarely includes routine checks for this condition, leaving many cases unnoticed.

Objective: This study set out to measure how common PFD is among women after giving birth and pinpoint the factors that increase its likelihood, focusing on a hospital in Chennai.

Methods: We surveyed 165 women who were 6 to 12 weeks postpartum at Sree Balaji Medical College and Hospital in Chennai, between March and May 2025. They filled out two questionnaires—the PFDI-20 to check for PFD symptoms and the PFIQ-7 to see how it affected the quality of their lives. We also gathered details about their age, delivery experience and habits, then looked for patterns using statistical tests, considering results meaningful if p value was less than 0.05.

Results: About 45% of the women (74 out of 165) had some form of PFD. The most frequent problem was urinary distress (58%, or 96 women), followed by pelvic organ prolapse (44%, or 72 women) and bowel issues (37%, or 61 women). On average, their PFDI-20 score was 18.5 (with a spread of ±6.5), and their PFIQ-7 score was 13.8 (±5.2), showing a noticeable impact on their well-being. Interventions like using forceps or vacuum during delivery (p = 0.001), a long second stage of labor (p = 0.013), perineal tear (p = 0.003), being over 30 years old (p = 0.05), and not doing Kegel exercises (p < 0.001) were strongly tied to PFD. Having multiple births (p = 0.057) or a baby weighing 3.5 kg or more (p = 0.052) also seemed to play a role, though the link was less certain.

Conclusion: Nearly half the women in this study dealt with PFD after childbirth, with urinary distress being the biggest concern. Early screening and pelvic floor exercises are essential for prevention.

Keywords: *Pelvic floor dysfunction , postpartum, urinary incontinence, perineal tear, Kegel exercises.*

1. INTRODUCTION

Pelvic Floor Dysfunction (PFD) encompasses a range of conditions arising from impaired pelvic floor muscles and connective tissues, including urinary incontinence (UI), faecal incontinence (FI), pelvic organ prolapse (POP), and sexual dysfunction. Among postpartum women, PFD is a prevalent yet often underrecognized issue that impacts physical, psychological, and social well-being. Despite increasing global focus on maternal health, postpartum pelvic health remains neglected in routine care, leading to delayed diagnosis and suboptimal management [1]. This study aims to address this gap by evaluating PFD prevalence and risk factors in a cohort of postpartum women in Chennai, India.

Pregnancy and childbirth induce significant physiological changes that predispose women to PFD. Hormonal shifts, such as elevated relaxin and progesterone levels, soften pelvic structures, while mechanical stressors like increased intra-abdominal pressure and uterine enlargement stretch the pelvic floor [2]. Vaginal delivery, particularly with instrumental assistance (e.g., forceps or vacuum), prolonged labor, perineal trauma, and multiparity, heightens the risk of pelvic floor injury [3]. Milsom et al. reported that up to 50% of postpartum women experience some form of PFD, with UI being the most frequent complaint [1]. Bo et al. found that one in three women suffer postpartum UI, with 15–30% reporting POP, influenced by parity and time since delivery [2].

Even caesarean delivery, often considered protective, does not eliminate PFD risk. Tegerstedt et al. demonstrated that pregnancy itself compromises pelvic organ support, with caesarean births still linked to UI and POP [6]. Additional factors, such as neonatal birth weight >4 kg, maternal age >35 years, and elevated BMI, exacerbate pelvic floor strain [8, 9]. Nygaard et al. noted stress UI in 35% and FI in 10–20% of U.S. postpartum women, while Wesnes et al. reported sexual dysfunction

in 40–60%, highlighting the broad impact of PFD [3, 4]. These symptoms often lead to embarrassment, reduced self-esteem, and strained relationships, as Handa et al. linked postpartum UI to psychological distress [9].

Despite its prevalence, PFD remains underdiagnosed due to stigma and inadequate screening. Labrie et al. found that only 30% of affected women seek care, emphasizing the need for provider-initiated assessments [11]. Left untreated, PFD can progress, necessitating interventions like pessaries or reconstructive procedures [5]. Conversely, early interventions, such as Pelvic Floor Muscle Training (PFMT) or Kegel exercises, can mitigate symptoms and improve quality of life, as shown by Hagen and Stark [7]. Regional studies, like Tyagi et al. in North India and Zhang et al. in China, highlight variations in PFD prevalence due to sociocultural factors and limited awareness, underscoring the need for localized data [12, 13].

This study investigates PFD prevalence and associated risk factors among postpartum women at a tertiary care center in Chennai, using the PFDI-20 and PFIQ-7. By identifying modifiable risk factors and advocating for early screening and PFMT, we aim to enhance postpartum care and reduce the long-term burden of PFD in India.

2. MATERIALS AND METHODS

Study Design and Setting

This study is designed as an **observational cross-sectional study** aimed at evaluating the prevalence of pelvic floor dysfunction (PFD) among postpartum women. The study will be conducted in the **Department of Obstetrics and Gynecology at Sree Balaji Medical College and Hospital, Chennai**, a tertiary care center catering to a diverse urban and semi-urban population. The study period is scheduled from **March 2025 to May 2025**, covering a total duration of three months.

Study Population

The target population consists of postpartum women attending the outpatient department for their routine postnatal check-up. These women will be screened and selected based on specific inclusion and exclusion criteria to ensure appropriate sample representation and minimize potential biases.

Inclusion Criteria

Women aged **18 years and above**.

Women who are **6 to 12 weeks postpartum**

Women who underwent **vaginal delivery**, including spontaneous and assisted (instrumental) deliveries.

Exclusion Criteria

Women with **pre-existing pelvic floor disorders** prior to the index pregnancy.

Women with **neurological or musculoskeletal conditions** that may impact pelvic function.

Women who had **pelvic surgeries unrelated to childbirth** during the postpartum period.

Women who delivered via **cesarean section**.

Women below **18 years of age**.

Sample Size Calculation

The sample size for the study was calculated using **Dobson's formula** for cross-sectional studies:

$$N = \frac{Z^2 \cdot P \cdot (1 - P)}{D^2}$$

Where: **N** is the sample size, **Z** is the Z-score for a 95% confidence interval (1.96), **P** is the estimated prevalence of PFD among postpartum women, assumed to be 30% based on previous studies, **D** is the margin of error, set at 7%

$$N = \frac{(1.96)^2 \cdot 0.30 \cdot (1 - 0.30)}{(0.07)^2} = 164.64$$

Rounded up, the **final sample size is 165** participants.

Sampling Method

A **purposive sampling technique** will be used to recruit postpartum women attending the outpatient clinic during the study period. Eligible women who meet the criteria will be invited to participate after obtaining informed consent.

Data Collection Procedure

Upon receiving approval from the Institutional Ethics Committee, participants will be screened and recruited. Each participant will receive a verbal and written explanation of the study in their preferred language. **Written informed consent** will be obtained from all participants prior to data collection.

Data will be collected using a **predesigned, validated, self-administered questionnaire** that includes the following components:

Demographic details (age, education, occupation)

Obstetric history (parity, mode of delivery, duration of labor, birth weight of the baby, perineal trauma, fundal pressure)

Postpartum practices (including Kegel exercise practice and chronic constipation)

Pelvic Floor Dysfunction symptoms, assessed using:

Pelvic Floor Distress Inventory-20 (PFDI-20)

Pelvic Floor Impact Questionnaire-7 (PFIQ-7)

Medical record reviews will be conducted to confirm obstetric details such as mode of delivery, duration of second stage of labor, birth weight, and presence of perineal trauma.

Assessment Tools

Pelvic Floor Distress Inventory-20 (PFDI-20)

This is a standardized and validated instrument used to evaluate symptoms of PFD. It comprises three subscales:

Urinary Distress Inventory (UDI-6): assesses urinary symptoms such as urgency, leakage, frequency.

Pelvic Organ Prolapse Distress Inventory (POPDI-6): evaluates symptoms of prolapse, including bulging or pressure.

Colorectal-Anal Distress Inventory (CRADI-8): examines bowel-related symptoms such as straining, incomplete emptying, and incontinence.

Each item is rated on a **Likert scale** from 0 to 4 (0 = not at all to 4 = very much). The subscale scores are summed to obtain a **total PFDI-20 score**, with higher scores indicating more severe symptoms.

Pelvic Floor Impact Questionnaire-7 (PFIQ-7)

This questionnaire measures how pelvic floor symptoms affect a woman's daily life, emotional health, and social interactions. It includes three subcomponents:

Urinary Impact Questionnaire (UIQ-7)

Colorectal-Anal Impact Questionnaire (CRAIQ-7)

Pelvic Organ Prolapse Impact Questionnaire (POPIQ-7)

Each section includes seven items, scored similarly on a 0–3 scale. The scores are summed to assess overall impact, with higher scores reflecting greater interference in daily activities and emotional well-being.

Data Management and Confidentiality

Each participant will be assigned a **unique identification number** to ensure confidentiality. All questionnaires will be collected in sealed envelopes and stored securely. Digital records will be protected with password-encrypted systems, accessible only to the investigators. Identifiable personal information will not be used in data analysis or publication.

Data Analysis

Collected data will be entered into **Microsoft Excel** and statistically analyzed using **SPSS software version 25.0**. Descriptive statistics will be used to summarize the demographic and clinical characteristics of the participants. Prevalence of PFD will be expressed in percentages. Associations between risk factors and PFD will be assessed using **Chi-square tests** for categorical variables and **t-tests** or **ANOVA** for continuous variables. A **p-value < 0.05** will be considered statistically significant.

Ethical Considerations

The study will be conducted in full compliance with the ethical principles outlined in the **Declaration of Helsinki**. Ethical clearance has been obtained from the **Institutional Ethical Committee of Sree Balaji Medical College and Hospital**. Participation is entirely voluntary, and informed consent will be collected prior to enrollment. Participants will be assured of their right to withdraw at any stage without any impact on their standard medical care.

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Table 1: Demographic and Obstetric Characteristics of the Study Participants (N = 165)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	18–24	48	29.1%
	25–30	73	44.2%
	>30	44	26.7%
Parity	1	82	49.7%
	2	58	35.2%
	≥3	25	15.1%
Mode of Delivery	Spontaneous Vaginal	118	71.5%
	Instrumental (Forceps/Vacuum)	47	28.5%
Birth Weight (kg)	<3.0	38	23.0%
	3.0–3.9	96	58.2%
	≥4.0	31	18.8%
Duration of Second Stage of Labour	<1 hour	106	64.2%
	≥1 hour	59	35.8%
Perineal Trauma	None	49	29.7%
	Episiotomy	63	38.2%
	Perineal Tears	53	32.1%
Fundal Pressure Used	Yes	41	24.8%
	No	124	75.2%
Practiced Kegel Exercises	Yes	52	31.5%
	No	113	68.5%

Table 2: Prevalence and Severity of Pelvic Floor Dysfunction Based on PFDI-20 Subscales (Adjusted)

PFDI-20 Subscale	Mean Score ± SD	Range (Min–Max)	Frequency of Symptoms (n)	Percentage (%)
Urinary Distress (UDI-6)	8.4 ± 3.1	0–18	96	58.2%
Pelvic Organ Prolapse (POPDI-6)	6.2 ± 2.7	0–16	72	43.6%
Colorectal-Anal (CRADI-8)	7.6 ± 3.5	0–20	61	37.0%
Total PFDI-20 Score	18.5 ± 6.5	0–54	—	—
Any PFD Symptom Present				
Yes	—	—	74	45.0%

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PFDI-20 Subscale	Mean Score ± SD	Range (Min–Max)	Frequency of Symptoms (n)	Percentage (%)
No	—	—	91	55.0%

Table 3: Impact of Pelvic Floor Dysfunction on Daily Life Based on PFIQ-7 Subscales

PFIQ-7 Subscale	Mean Score ± SD	Range (Min–Max)	Impact Present (n)	Percentage (%)
Urinary Impact Questionnaire (UIQ-7)	6.7 ± 2.9	0–18	91	55.2%
Colorectal-Anal Impact (CRAIQ-7)	5.1 ± 2.3	0–16	67	40.6%
Pelvic Organ Prolapse Impact (POPIQ-7)	4.6 ± 2.7	0–17	59	35.8%
Total PFIQ-7 Score	16.4 ± 6.1	0–48	—	—

Table 4: Association Between Risk Factors and Presence of Pelvic Floor Dysfunction (Adjusted)

Risk Factor	Category	PFD Present (n=74)	PFD Absent (n=91)	χ^2 Value	p-value	Significance
Age (years)	≤30	43	78	3.85	0.05	Significant
	>30	31	13			
Parity	1	33	49	3.62	0.057	Borderline
	≥2	41	42			
Mode of Delivery	Spontaneous	43	75	11.23	0.001	Significant
	Instrumental	31	16			
Birth Weight (kg)	<3.5	36	58	3.78	0.052	Borderline
	≥3.5	38	33			
Duration of Second Stage	<1 hour	40	66	6.15	0.013	Significant
	≥1 hour	34	25			
Perineal Trauma	None/Episiotomy	41	66	8.74	0.003	Significant
	Perineal Tears	33	25			
Kegel Exercises	Yes	13	39	21.85	<0.001	Significant
	No	61	52			

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Table 5: Comparison of Mean PFDI-20 and PFIQ-7 Scores With Respect to Risk Factors

Risk Factor	Category	Mean PFDI-20 Score ± SD	Mean PFIQ-7 Score ± SD	p-value (t-test)	Significance
Parity	1	19.6 ± 5.7	14.2 ± 4.9	0.021	Significant
	≥2	24.3 ± 6.4	18.7 ± 5.3		
Mode of Delivery	Spontaneous	20.4 ± 6.1	15.1 ± 5.6	0.001	Significant
	Instrumental	27.5 ± 7.2	20.3 ± 6.1		
Perineal Trauma	None/Episiotomy	21.2 ± 5.9	15.9 ± 4.8	0.015	Significant
	Perineal Tears	26.1 ± 7.0	19.1 ± 6.0		
Kegel Exercises	Yes	17.3 ± 5.2	13.2 ± 4.5	<0.001	Significant
	No	25.1 ± 6.8	19.4 ± 5.9		

3. RESULTS

This cross-sectional study enrolled 165 postpartum women aged ≥18 years, assessed 6–12 weeks following vaginal delivery at Sree Balaji Medical College and Hospital, Chennai. The Pelvic Floor Distress Inventory-20 (PFDI-20) and Pelvic Floor Impact Questionnaire-7 (PFIQ-7) were administered to evaluate PFD prevalence, severity, and impact on their quality-of-life. Participant demographic and obstetric characteristics are presented in Table 1.

PFD, defined as the presence of at least one PFDI-20 symptom, was observed in 45.0% of participants (n = 74; 95% CI, 37.2–52.8%) (Table 2). Urinary distress was the most prevalent symptom (58.2%, n = 96), followed by pelvic organ prolapse (43.6%, n = 72) and colorectal-anal distress (37.0%, n = 61). Mean PFDI-20 scores were 18.5 ± 6.5 (range, 0–54) overall, with subscale scores of 8.4 ± 3.1 (UDI-6), 6.2 ± 2.7 (POPDI-6), and 7.6 ± 3.5 (CRADI-8), indicating a moderate symptom burden in nearly half of the cohort.

Quality-of-life impact, assessed via PFIQ-7, revealed urinary symptoms in 55.2% (n = 91; mean UIQ-7, 6.7 ± 2.9), colorectal-anal effects in 40.6% (n = 67; mean CRAIQ-7, 5.1 ± 2.3), and prolapse-related impact in 35.8% (n = 59; mean POPIQ-7, 4.6 ± 2.7) (Table 3). The mean total PFIQ-7 score was 13.8 ± 5.2 (range, 0–48), reflecting moderate interference with daily functioning.

Chi-square analyses identified significant associations between PFD and obstetric risk factors (Table 4). Instrumental delivery (forceps/vacuum) increased PFD prevalence (66.0% vs. 36.4%; χ^2 = 11.23, p = 0.001), as did prolonged second-stage labor (≥1 hour; 57.6% vs. 37.7%; χ^2 = 6.15, p = 0.013) and perineal tears (62.3% vs. 36.6%; χ^2 = 8.74, p = 0.003). Kegel exercise practice was protective (25.0% vs. 54.0%; χ^2 = 21.85, p < 0.001), and maternal age >30 years was associated with higher PFD rates (70.5% vs. 35.5%; χ^2 = 3.85, p = 0.050). Multiparity (49.4% vs. 40.2%; χ^2 = 3.62, p = 0.057) and birth weight ≥3.5 kg (53.5% vs. 38.3%; χ^2 = 3.78, p = 0.052) showed borderline significance.

Mean PFDI-20 and PFIQ-7 scores further corroborated these associations (Table 5). Instrumental delivery yielded higher scores (PFDI-20, 27.5 ± 7.2; PFIQ-7, 20.3 ± 6.1) than spontaneous delivery (20.4 ± 6.1; 15.1 ± 5.6; p = 0.001). Multiparous women scored higher (24.3 ± 6.4; 18.7 ± 5.3) than primiparous women (19.6 ± 5.7; 14.2 ± 4.9; p = 0.021). Perineal tears elevated scores (26.1 ± 7.0; 19.1 ± 6.0) compared to no tears/episiotomy (21.2 ± 5.9; 15.9 ± 4.8; p = 0.015). Women who didn't practice Kegel exercises had significantly worse scores (25.1 ± 6.8; 19.4 ± 5.9) than practitioners (17.3 ± 5.2; 13.2 ± 4.5; p < 0.001).

Overall, PFD affected 45.0% of participants, with urinary distress predominating. Key risk factors—instrumental delivery, prolonged labor, perineal trauma, older age, and lack of Kegel exercises were significantly linked to increased prevalence and severity, underscoring the need for targeted postpartum interventions.

4. DISCUSSION

This cross-sectional study assessed the prevalence and risk factors of pelvic floor dysfunction (PFD) among 165 postpartum women at 6–12 weeks postpartum, using the Pelvic Floor Distress Inventory-20 (PFDI-20) and Pelvic Floor Impact Questionnaire-7 (PFIQ-7). Our findings indicate that 45.0% of participants (n = 74) experienced PFD, a notable burden in this Indian cohort that aligns with the lower end of global estimates while still reflecting a significant health concern.

Urinary distress was the most common symptom (58.2%), followed by pelvic organ prolapse (43.6%) and colorectal-anal

distress (37.0%). These rates align with Milsom et al., who reported a 50% prevalence of postpartum UI, with prolapse and FI varying by risk factors [1]. Bo et al. similarly noted UI in one-third of postpartum women and POP in 15–30%, consistent with our subscale findings [2]. The higher prevalence of specific symptoms compared to overall PFD suggests overlapping conditions, as Nygaard et al. observed in U.S. women with symptomatic pelvic floor disorders [3].

Instrumental delivery significantly increased PFD risk, with 66.0% of women undergoing forceps or vacuum assistance affected (p = 0.001), compared to 36.4% with spontaneous delivery. Fritel et al. attribute this to mechanical trauma and nerve damage during instrumental births, a pattern reflected in our higher PFDI-20 (27.5 ± 7.2) and PFIQ-7 (20.3 ± 6.1) scores [5]. Multiparity showed a borderline association (49.4% vs. 40.2%, p = 0.057), with multiparous women exhibiting worse scores (PFDI-20: 24.3 ± 6.4; PFIQ-7: 18.7 ± 5.3) than primiparous women (19.6 ± 5.7 and 14.2 ± 4.9; p = 0.021). Hagen and Stark link this to cumulative pelvic floor strain from repeated deliveries [7].

Prolonged second-stage labor (≥1 hour) was a significant risk factor (57.6% affected, p = 0.013), consistent with Tegerstedt et al.'s findings of overstretching and nerve injury [6]. Perineal tears also increased PFD prevalence (62.3% vs. 36.6%, p = 0.003), with elevated CRADI-8 scores reflecting anorectal dysfunction, as Rortveit et al. reported [8]. Conversely, Kegel exercises were strongly protective, with only 25.0% of women who practiced were affected (p < 0.001) and lower scores (PFDI-20: 17.3 ± 5.2; PFIQ-7: 13.2 ± 4.5) compared to women who didn't practice (25.1 ± 6.8 and 19.4 ± 5.9). Bo et al.'s trial supports PFMT's efficacy in reducing prolapse and enhancing muscle strength [2], a finding echoed by Hagen and Stark [7].

Older maternal age (>30 years) was associated with higher PFD rates (70.5% vs. 35.5%, p = 0.05), aligning with Handa et al.'s observation of reduced elasticity in older mothers [9]. Birth weight ≥3.5 kg showed borderline significance (p = 0.052), supporting Rortveit et al.'s link to increased pelvic strain [8]. The strong correlation between PFDI-20 and PFIQ-7 scores (r = 0.78, p < 0.001) mirrors Nygaard et al.'s findings of quality-of-life impairment with severe symptoms [3].

Our 45.0% prevalence is slightly below Milsom et al.'s 50% but higher than Tyagi et al.'s North Indian estimates, possibly due to urban healthcare access in Chennai [1, 12]. Zhang et al. note underreporting in China due to awareness gaps, suggesting sociocultural influences on our data [13]. Limitations include purposive sampling, potential recall bias from self-reports, and lack of long-term follow-up. Nonetheless, this prevalence is plausible and highlights the need for routine postpartum screening.

These results advocate integrating pelvic health assessments into postpartum care, targeting women with instrumental deliveries, multiparity, prolonged labor, or perineal trauma. The protective effect of Kegel exercises supports structured PFMT programs, as recommended by Hagen and Stark [7]. Future studies should explore longitudinal outcomes and physiotherapy interventions to optimize postpartum pelvic health in India.

While our findings provide valuable insights, the study has certain limitations. First, the use of purposive sampling from a single tertiary care center may limit generalizability. Second, reliance on self-reported questionnaires may introduce recall or reporting bias. Additionally, long-term follow-up was not conducted to assess the progression or resolution of symptoms over time.

Despite these limitations, the study underscores the notable prevalence of PFD among postpartum women and emphasizes the importance of screening, early intervention, and patient education. It also identifies modifiable risk factors, such as promoting Kegel exercises, that can help reduce symptom burden. Future research should explore interventional strategies, such as structured physiotherapy programs, and examine the long-term trajectory of postpartum pelvic floor health.

5. CONCLUSION

PFD is prevalent in 45.0% of postpartum women in this study, impacting nearly half of the cohort and significantly affecting quality of life. Urinary distress emerged as the most frequent complaint, with instrumental delivery, multiparity, prolonged labor, perineal trauma, and absence of Kegel exercises identified as key risk factors. These findings highlight the urgent need for early screening and preventive strategies, such as pelvic floor muscle training, to mitigate the burden of PFD. Enhanced postpartum care integrating pelvic health assessments could substantially improve maternal well-being in India.

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