RESEARCH PAPER

Assessment of Risk Factors Associated With Postpartum Pelvic Floor Dysfunction and Opportunities for Prevention

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ABSTRACT

Background: Postpartum pelvic floor dysfunction (PFD) is a common maternal health problem that includes urinary incontinence, pelvic organ prolapse, sexual dysfunction, and chronic pelvic pain. Multiple obstetric and maternal factors contribute to its development.

Objective: To assess the risk factors associated with postpartum pelvic floor dysfunction and identify opportunities for prevention among postpartum women.

Methods: This cross-sectional analytical study was conducted at DHQ Hospital Mardan from June 2024 to June 2025 including 220 postpartum women evaluated within 12 months after delivery.

Results: The mean age of participants was 29.8 ± 5.6 years, and the mean BMI was 27.1 ± 4.2 kg/m². Vaginal delivery was reported in 156 (70.9%) women. Overall, 112 (50.9%) participants experienced at least one form of pelvic floor dysfunction. Urinary incontinence was the most common symptom, affecting 84 (38.2%) women. Women with pelvic floor dysfunction had significantly higher age and BMI. Vaginal delivery (aOR 3.18; p=0.001), BMI >30 kg/m² (aOR 2.74; p=0.005), instrumental delivery (aOR 2.41; p=0.02), prolonged labor (aOR 2.63; p=0.01), and birth weight >3.5 kg (aOR 2.29; p=0.02) were significant predictors of pelvic floor dysfunction. Pelvic floor exercises showed a protective effect (aOR 0.42; p=0.01).

Conclusion: Postpartum pelvic floor dysfunction is strongly associated with obstetric and maternal risk factors. Preventive strategies including pelvic floor rehabilitation, weight management, and improved obstetric care may reduce postpartum pelvic floor morbidity.

Keywords: Pelvic floor dysfunction; Postpartum women; Urinary incontinence; Vaginal delivery; Pelvic floor exercises; Maternal health.

How to cite this article: Rehman I, Akhtar S, Fiaz H, Aslam S, Afzal A, Rabbimovna XG, Habib U. Assessment of Risk Factors Associated With Postpartum Pelvic Floor Dysfunction and Opportunities for Prevention. Int J Drug Deliv Technol. 2026;16(59s): 683-688. DOI: 10.25258/ijddt.16.59s.75

Source of support: Nil

Conflict of interest: None

Introduction

Postpartum pelvic floor dysfunction (PFD) is a common, but under-recognized, condition in women following childbirth, and is defined as a wide array of conditions including urinary incontinence, faecal incontinence, pelvic organ prolapse, sexual dysfunction and chronic pelvic pain [1]. These conditions have profound effects on physical, emotional and quality of life during the postpartum period [2]. With the global rise in knowledge and awareness of the complications faced by women in the long run resulting from pregnancy and childbirth, the burden of pelvic floor dysfunction has grown.The burden of pelvic floor dysfunction has risen around the

world as knowledge and awareness of pregnant women and birth-related complications have improved among the general population. The pelvic floor muscles, connective tissues and nerves are heavily strained during pregnancy and childbirth [4]. Stretching and compression of pelvic structures in vaginal delivery can lead to muscle damage, nerve damage, and decreased pelvic support systems [5]. Additional factors such as the rise in levels of certain hormones during pregnancy, including relaxin and progesterone, can also cause the ligaments to relax and the pelvic floor to become weaker [6]. There have been a number of obstetric and maternal factors identified that may contribute to postpartum pelvic floor dysfunction. The most frequently reported risk factors are vaginal delivery, prolonged second stage of labor, instrumental delivery, fetal macrosomia, episiotomy and high parity [7]. Moreover, maternal obesity, advanced maternal age, chronic constipation and underlying connective tissue weakness may make women more vulnerable to the injury of the pelvic floor [8]. There is some mixed evidence that cesarean delivery provides partial protection against some pelvic floor disorders, but it has been recommended [9].

One of the most common symptoms of a postpartum pelvic floor dysfunction is urinary incontinence, affecting up to one third of women after childbirth [10]. Pelvic organ prolapse (POP) and sexual dysfunction are also commonly reported disorders, which is not without reason, as they are often underestimated because of social stigma and the absence of a routine screening [11]. Many women think that these symptoms are a natural part of giving birth and do not seek medical attention [12]. It is crucial to identify high-risk women early on with pelvic floor dysfunction and implement preventive measures and enhance postpartum care [13]. Antenatal counselling, control of weight gain, optimised labour practices and post-natal rehabilitation programmes have been found to have a potential role in decreasing the severity and progression of pelvic floor disorders [14]. Healthcare providers and patients need to be more aware of this so that diagnosis and management occur in a timely fashion [15]. There have been several studies that have explored the relationship between obstetric factors and postpartum pelvic floor dysfunction, but with findings that are inconsistent between various populations and health care systems [16]. There is limited evidence available locally on the prevalence of risk factors and/or opportunities for prevention among postpartum women [17]. Awareness of these relationships could inform effective preventive interventions to improve maternal health.

Objective

To assess the risk factors associated with postpartum pelvic floor dysfunction and identify opportunities for prevention among postpartum women.

Methodology

This was a cross-sectional analytical study conducted at DHQ Hospital Mardan from June 2024 to June 2025, including 220 postpartum women to assess risk factors associated with postpartum pelvic floor dysfunction and identify opportunities for prevention.

Inclusion Criteria

- Women aged 18–45 years in the postpartum period up to 12 months after delivery
- Women with singleton pregnancy and live birth
- Women willing to participate and provide informed consent
- Women attending postpartum follow-up clinics

Exclusion Criteria

- Women with preexisting pelvic floor disorders prior to pregnancy
- Women with neurological disorders affecting pelvic floor function
- Women with previous pelvic surgery unrelated to childbirth
- Women with congenital pelvic abnormalities
- Women with incomplete clinical data or follow-up information

Data Collection

After obtaining ethical approval, data were collected using a structured proforma. Baseline demographic and obstetric variables included age, body mass index (BMI), parity, mode of delivery, duration of labor, birth weight of neonate, history of instrumental delivery, episiotomy, and obstetric complications. Pelvic floor dysfunction symptoms including urinary incontinence, fecal incontinence, pelvic organ prolapse symptoms, and sexual dysfunction were assessed using validated questionnaires and clinical examination findings. Information regarding preventive measures such as pelvic floor muscle exercises, postpartum counseling, weight management, and rehabilitation practices was also recorded.

Statistical Analysis

Data were analyzed using SPSS version 26.0. Continuous variables were expressed as mean ± standard deviation, while categorical variables were presented as frequency and percentage. Chi-square tests and independent t-tests were used to assess associations between risk factors and pelvic floor dysfunction. Logistic regression analysis was performed to identify independent predictors of postpartum pelvic floor dysfunction. A p-value ≤ 0.05 was considered statistically significant.

Results

The study included 220 postpartum women with a mean age of 29.8 ± 5.6 years and a mean BMI of 27.1 ± 4.2 kg/m². Multiparity was observed in 134 (60.9%) women. Vaginal delivery was the most common mode of childbirth, reported in 156 (70.9%) participants, while 64 (29.1%) underwent cesarean section. Instrumental delivery and episiotomy were noted in 38 (17.3%) and 72 (32.7%) women, respectively. Birth weight greater than 3.5 kg occurred in 58 (26.4%) cases, and prolonged labor was reported in 49 (22.3%). Only 81 (36.8%) women performed postpartum pelvic floor exercises.

Variable	Value
Age (years), mean ± SD	29.8 ± 5.6
BMI (kg/m²), mean ± SD	27.1 ± 4.2
Multiparity, n (%)	134 (60.9%)
Vaginal Delivery, n (%)	156 (70.9%)
Cesarean Section, n (%)	64 (29.1%)
Instrumental Delivery, n (%)	38 (17.3%)
Episiotomy, n (%)	72 (32.7%)
Birth Weight >3.5 kg, n (%)	58 (26.4%)
Prolonged Labor (>12 hours), n (%)	49 (22.3%)
Postpartum Pelvic Floor Exercises Performed, n (%)	81 (36.8%)

Urinary incontinence was the most common symptom, affecting 84 (38.2%) women, followed by sexual dysfunction in 63 (28.6%) and pelvic organ prolapse symptoms in 51 (23.2%). Chronic pelvic pain and fecal incontinence were reported in 46 (20.9%) and 29 (13.2%) participants, respectively. Overall, 112 (50.9%) women experienced at least one form of postpartum pelvic floor dysfunction.

Table 2: Frequency of Postpartum Pelvic Floor Dysfunction Symptoms (n = 220)

Symptom	Frequency (n)	Percentage (%)
Urinary Incontinence	84	38.2%
Pelvic Organ Prolapse Symptoms	51	23.2%
Sexual Dysfunction	63	28.6%
Fecal Incontinence	29	13.2%
Chronic Pelvic Pain	46	20.9%
Any Pelvic Floor Dysfunction	112	50.9%

Mean age was 31.2 ± 5.8 years in the PFD group versus 28.3 ± 5.1 years in the non-PFD group (p=0.001), while BMI was significantly higher (28.4 ± 4.5 vs. 25.8 ± 3.7 kg/m²; p<0.001). Vaginal delivery, instrumental delivery, birth weight >3.5 kg, and prolonged labor were significantly more common among women with PFD. In contrast, pelvic floor exercises were performed less frequently in women with dysfunction (21.4% vs. 52.8%; p<0.001), suggesting a possible protective effect.

Table 3: Association Between Obstetric Factors and Pelvic Floor Dysfunction (n = 220)

Variable	PFD Present (n=112)	PFD Absent (n=108)	p-value
Age (years), mean ± SD	31.2 ± 5.8	28.3 ± 5.1	0.001
BMI (kg/m²), mean ± SD	28.4 ± 4.5	25.8 ± 3.7	<0.001
Vaginal Delivery, n (%)	92 (82.1%)	64 (59.3%)	<0.001
Instrumental Delivery, n (%)	28 (25.0%)	10 (9.3%)	0.002
Birth Weight >3.5 kg, n (%)	39 (34.8%)	19 (17.6%)	0.004
Prolonged Labor, n (%)	34 (30.4%)	15 (13.9%)	0.003
Pelvic Floor Exercises Performed, n (%)	24 (21.4%)	57 (52.8%)	<0.001

Logistic regression analysis identified vaginal delivery as the strongest predictor of postpartum pelvic floor dysfunction (aOR 3.18; 95% CI: 1.62–6.23; p=0.001). Other significant predictors included BMI >30 kg/m² (aOR 2.74; p=0.005), prolonged labor (aOR 2.63;

p=0.01), instrumental delivery (aOR 2.41; p=0.02), and birth weight >3.5 kg (aOR 2.29; p=0.02). Pelvic floor exercises demonstrated a protective association, reducing the likelihood of dysfunction by nearly 58% (aOR 0.42; p=0.01).

Table 4: Logistic Regression Analysis for Predictors of Postpartum Pelvic Floor Dysfunction (n = 220)

Variable	Adjusted OR (95% CI)	p-value
Vaginal Delivery	3.18 (1.62–6.23)	0.001
BMI >30 kg/m²	2.74 (1.34–5.58)	0.005
Instrumental Delivery	2.41 (1.12–5.19)	0.02
Birth Weight >3.5 kg	2.29 (1.10–4.76)	0.02
Prolonged Labor	2.63 (1.24–5.57)	0.01
Pelvic Floor Exercises	0.42 (0.21–0.82)	0.01

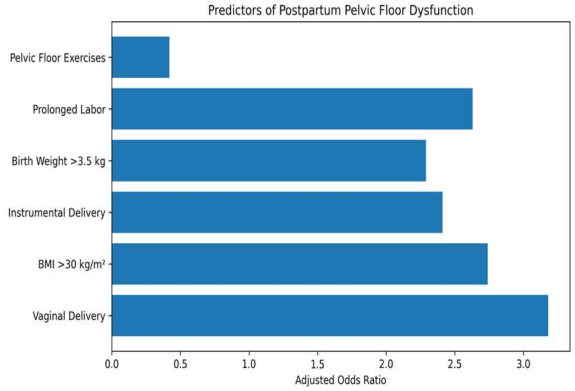

Figure 1: Logistic Regression Analysis Showing Predictors of Postpartum Pelvic Floor Dysfunction Among Postpartum Women

Discussion

This study was to measure the risk factors associated with postpartum pelvic floor dysfunction (PFD) and to show the severe problem of pelvic floor symptoms in postpartum women. Over half of those who participated had at least one type of pelvic floor dysfunction, highlighting the need for early detection and prevention of pelvic floor problems during the antenatal and postpartum period. The mean age was 29.8 ± 5.6 years and most of the women were those who gave birth by vaginal delivery. Commonly observed factors among the affected women were multiparity, increased BMI, instrumental delivery, prolonged labour and delivery of larger babies. The findings of this study have been consistent with previous research [18] with higher maternal age and vaginal delivery being linked strongly with postpartum pelvic floor disorders. The most common symptom was urinary incontinence (38.3% of women), followed by sexual dysfunction and symptom of pelvic organ prolapse. This is in agreement with previous studies showing that urinary incontinence is the most frequent symptom of postpartum pelvic floor dysfunction caused by pelvic floor stretching and weakening during labor. Another study also found urinary incontinence to be the most common pelvic floor problem during the postpartum period, especially after vaginal and instrumental births [19]. The women with pelvic floor dysfunction were significantly older and had a higher BMI than women without pelvic floor dysfunction. Advanced maternal age can impact tissue elasticity and/or recovery of the pelvic floor after childbirth, and obesity can contribute to chronic intra-abdominal pressure and/or mechanical stress on the pelvic structures. An earlier study also showed that older maternal age and obesity were independent risk factors for urinary incontinence and prolapse symptoms after giving birth [20].

In this study, vaginal delivery was highly correlated with pelvic floor dysfunction and was the most powerful independent factor found by regression analysis (aOR 3.18; p=0.001). During sometimes difficult and prolonged childbirth, the vaginal delivery may cause the damage of the pelvic floor muscles, fascia and pudendal nerves. Furthermore, dysfunction was significantly associated with instrumental delivery, which may be related to the higher mechanical stress and soft tissue damage during assisted vaginal delivery. The same results were found in the previous study which showed that the risk of pelvic floor injury was higher after forceps delivery and vacuum delivery [21]. Other factors that were significant for predicting pelvic floor dysfunction were birth weight greater than 3.5 kg or prolonged labor. Larger babies, and extended second stage of labour can cause stretching and compressing of pelvic tissues and putting a pressure on pelvic nerves and muscles. An earlier study concluded that the most important obstetric risk factors for postoperative pelvic floor disorders were fetal macrosomia and long labour time [22]. The main conclusion of this research was that the pelvic floor exercises have a protective effect. Women who exercised PFMS exercises had significantly lower rates of PFD, and regression analysis revealed that these exercises decreased the risk of PFD by ~58% (aOR 0.42; p=0.01). Pelvic floor muscle training probably helps strengthen the pelvic floor muscles, support the pelvic floor and improves neuromuscular recovery following childbirth. One study, previously mentioned, showed that structured pelvic floor rehabilitation programs were able to significantly decrease urinary incontinence and enhance postpartum pelvic floor function.

Limitations

This study has several limitations. Being a single-center cross-sectional study, the findings may not be generalizable to all populations. The relatively limited sample size may have reduced the ability to assess less common pelvic floor disorders. Some symptoms were self-reported, which may introduce recall and reporting bias. The study did not include long-term follow-up to evaluate persistence or progression of pelvic floor dysfunction over time. Additionally, variations in obstetric management and postpartum rehabilitation practices were not fully controlled and may have influenced outcomes.

Conclusion

It is concluded that postpartum pelvic floor dysfunction is highly prevalent among postpartum women and is significantly associated with factors such as vaginal delivery, increased body mass index, instrumental delivery, prolonged labor, and higher neonatal birth weight. Urinary incontinence was the most common manifestation of pelvic floor dysfunction. Pelvic floor muscle exercises demonstrated a significant protective effect, highlighting the importance of preventive rehabilitation strategies.

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