World Journal of Advanced Research and Reviews
eISSN: 2581-9615 CODEN (USA): WJARAI
Cross Ref DOI: 10.30574/wjarr
Journal homepage: https://wjarr.com/

(REVIEW ARTICLE)

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Pelvic floor dysfunction after childbirth: A systematic review of prevalence and associated risk factors

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World Journal of Advanced Research and Reviews, 2025, 26(01), 3987-3995

Publication history: Received on 18 March 2025; revised on 23 April 2025; accepted on 26 April 2025

Article DOI: https://doi.org/10.30574/wjarr.2025.26.1.1371

Abstract

Background: Pelvic floor dysfunction (PFD) is a prevalent issue that significantly impacts women's health and overall quality of life, often resulting from factors such as childbirth, anatomical changes, and lifestyle choices. Despite its widespread occurrence, both awareness and effective treatment options remain insufficient.

Objective: This study aims to systematically review existing literature regarding the prevalence, risk factors, outcomes, and conservative treatment options for PFD in women.

Methods: A total of thirty-one peer-reviewed articles published between 2007 and 2025 were examined. The study designs encompassed randomized controlled trials, cohort studies, cross-sectional studies, and longitudinal studies, with participant numbers ranging from 40 to 3,000.

Results: The findings indicated that vaginal delivery is consistently linked to a higher incidence of PFD compared to cesarean delivery. The risk of developing PFD was found to increase with perineal injury, elevated body mass index (BMI), advancing age, and imbalances in vaginal microflora. Weakness in pelvic floor muscles (PFM) was strongly associated with incontinence and dyspareunia. Conservative treatment methods, particularly pelvic floor muscle training (PFMT), biofeedback, and the use of pessaries, demonstrated effectiveness in alleviating symptoms, although caution was advised for early implementation. The psychological effects, including issues related to body image and diminished quality of life, were significant yet often overlooked. Awareness of PFD was notably low among various populations, underscoring the necessity for improved education and early screening initiatives. Imaging and biometric assessment tools were found to be effective for clinical evaluation. Additionally, cultural and regional variations highlighted the importance of personalized care approaches.

Conclusion: PFD is a complex condition with enduring effects on women's health. Key contributing factors include the mode of delivery, trauma, and muscle function. Individualized conservative management strategies can enhance patient outcomes. Increased awareness, timely intervention, and culturally appropriate care are crucial for addressing this condition effectively.

Keywords: Pelvic floor dysfunction; Vaginal delivery; Pelvic floor muscle training; Risk factors; Women's health

1. Introduction

Pelvic floor dysfunction (PFD) encompasses a range of clinical conditions including urinary incontinence, fecal incontinence, pelvic organ prolapse, and sexual dysfunction. These disorders result from impairment of the pelvic floor muscles, connective tissues, and nerves, which play a crucial role in maintaining continence and supporting pelvic

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organs. Childbirth, particularly vaginal delivery, is recognized as a major risk factor for the development of PFD, due to the mechanical and neurological trauma imposed on the pelvic floor structures during labor and delivery[1–2]. The process of childbirth leads to stretching, tearing, or avulsion of pelvic floor muscles, especially the levator ani muscle complex, contributing to both immediate and long-term pelvic floor disorders[3]. Vaginal deliveries, especially those involving forceps, prolonged second stages of labor, and obstetric anal sphincter injuries (OASIS), are associated with a higher risk of persistent dysfunction compared to cesarean deliveries[4–5]. Nonetheless, cesarean deliveries do not provide complete protection against PFD, as they may still result in pelvic floor changes due to pregnancy-related anatomical stress[6–7].

Prevalence reveals that a significant proportion of postpartum women experience one or more forms of PFD. Studies have shown that urinary incontinence affects approximately 20–50% of women in the first year following delivery[8], with symptoms persisting for more than a year or two in some cases[9]. Also, up to 30% of women report symptoms of pelvic organ prolapse, and about 40% experience sexual dysfunction during the postpartum period[10–12]. These disorders can have a profound impact on physical, mental and emotional well-being, including body image disturbances, reduced sexual satisfaction, and limitations in occupational and social functioning[13–15].

The clinical presentation and severity of PFD are influenced by several risk factors beyond delivery mode, including maternal age, body mass index (BMI), fetal birth weight, perineal trauma, and inadequate postpartum pelvic floor rehabilitation[16–19]. The severity of perineal tears and associated pain can further compromise pelvic floor muscle strength and delay recovery[20–21].

Despite the high prevalence of PFD, awareness among postpartum women remain low, with many not seeking timely medical attention[22]. The stigma associated with urinary and fecal incontinence, and the perception that these are normal consequences of childbirth, contribute to underreporting and inadequate management[23]. Moreover, healthcare systems often lack standardized protocols for routine screening and intervention in the postpartum period[24].

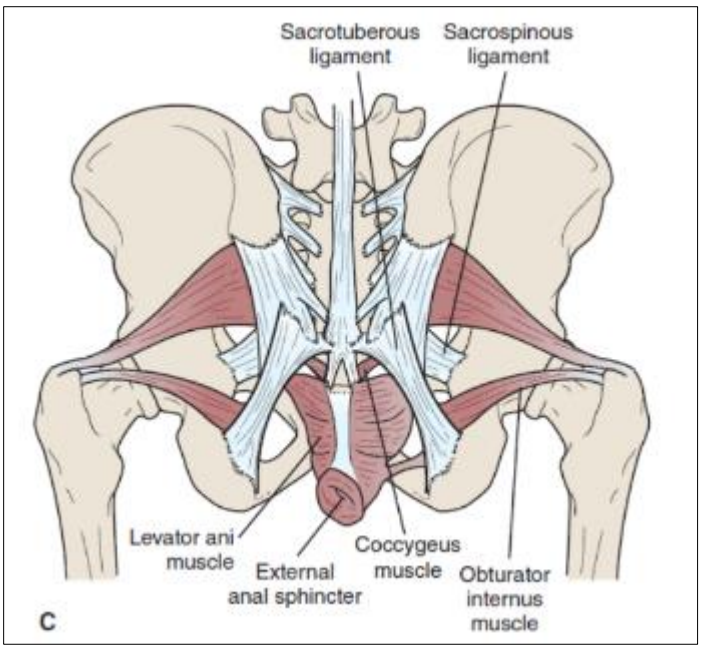

Figure 1 Anatomy of pelvic floor muscle[32]

This systematic review aims to produce current evidence on the prevalence, risk factors, functional outcomes, and treatment approaches of PFD after childbirth, utilizing findings from recent and comprehensive studies. The goal is to provide an evidence-based framework to guide clinical practice, improve maternal outcomes, and inform future research on prevention and rehabilitation strategies for pelvic floor disorders.

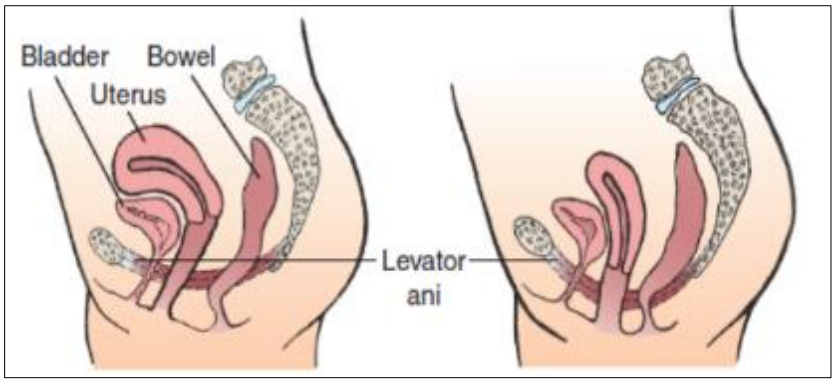

Figure 2 (A) Good pelvic support with firm base, organs in normal position. (B) Inadequate support, pelvic organs descend[32]

1.1. Need of the Study

Pelvic floor dysfunction remains an underdiagnosed consequence of childbirth that profoundly affects women's quality of life. The majority of postpartum women do not receive adequate education or screening related to pelvic floor health. There is a clear need to collect verified evidence on risk factors, prevalence, and management strategies in order to develop standardized care guidelines. Addressing this knowledge gap will aid clinicians in early identification and management of PFD, ultimately enhancing postpartum recovery and well-being.

1.2. Scope of the Study

- This study reviews current literature to evaluate the prevalence, risk factors, and impact of pelvic floor dysfunction following childbirth.
- It aims to highlight gaps in clinical practice and awareness while exploring evidence-based interventions such as pelvic floor muscle training.
- The findings are intended to guide healthcare professionals in implementing effective screening and treatment strategies and encourage further research into holistic postpartum care.

2. Methodology

A comprehensive literature search was conducted using PubMed, Scopus, and Google Scholar databases to identify peer-reviewed studies related to pelvic floor dysfunction following childbirth. The search focused on studies published between 2007 and 2025, with a particular emphasis on the period from 2016 to 2024 to reflect the most recent evidence.

Inclusion criteria were as follows:

- Studies examining the prevalence, risk factors, and types of pelvic floor dysfunction post-childbirth
- Research on treatment approaches and quality-of-life outcomes related to PFD
- Articles involving human subjects and published in English
- Observational studies, crosse-sectional studies, longitudinal cohort studies, and randomized controlled trials

A total of 31 studies were selected based on their methodological quality and relevance to the research objectives. Key variables extracted included study design, sample size, type of delivery, identified risk factors, treatment interventions, and reported outcomes.

3. Review of Literature

Table 1 Tabulated format of review of literature

No.	Author(s)	Year	Title	Methodology	Sample Size	Key Findings	Conclusion
1	Blomquist et al.[1]	2020	Pelvic floor muscle strength and incidence of PFD	Prospective cohort	1,528	49% vaginal births had PFD vs 11% cesarean	Vaginal delivery increases long-term PFD risk
2	Burkhart et al.[2]	2021	Occupational impact and awareness of PFD	Cross-sectional survey	200	62% unaware of PFD; 35% reported work impact	Need for better PFD education and support
3	Huber et al.[3]	2021	PFD & perineal tear severity	Cross-sectional	410	42% with 3rd/4th-degree tears had PFD	Perineal injury is a risk factor
4	Hagen et al.[4]	2020	OPAL RCT - Biofeedback vs Basic PFMT	RCT	600	20% improvement in PFM with biofeedback	Biofeedback-PFMT more effective
5	Cheng et al.[5]	2022	Vaginal microflora and PFD	Observational	150	35% with imbalance developed PFD	Vaginal health predicts PFD
6	Huser et al.[6]	2017	Vaginal vs cesarean delivery and PFD	Comparative cohort	450	60% vaginal vs 25% cesarean had symptoms	Cesarean may reduce early PFD
7	Siafarikas et al.[7]	2022	Long-term PFD post-delivery	Longitudinal	300	34% had persistent symptoms after 8 years	Long-term follow-up needed
8	Dufour et al.[8]	2018	Association between lumbopelvic pain and pelvic floor dysfunction in women	Cross-sectional	150	40% with lumbopelvic pain had PFD	Lumbopelvic pain correlates with PFD
9	Cattani et al.[9]	2024	Body image & PFD	Prospective cohort	225	45% with poor body image had PFD	Psychological health matters
10	Sigurdardottir et al.[10]	2011	PF muscle function pre/post childbirth	Longitudinal	60	30% PF strength reduction postpartum	Delivery weakens PFMs
11	Handa et al.[11]	2011	PFD 5–10 years post-delivery	Longitudinal	1,011	37% vaginal vs 14% cesarean reported PFD	Delivery method affects PFD
12	Aiyegbusi et al.[12]	2023	Prevalence of pelvic floor dysfunction and associated risk factors among	Cross-sectional	300	25% had PFD; age and BMI were key risks	Younger age and BMI linked to PFD

			Nulligravida college students				
13	Neels et al.[13]	2017	PF exercises & pain	Experimental	120	28% experienced pain with early PFMT	Tailor exercises post-delivery
14	Baytur et al.[14]	2007	Anatomical PF changes	Cross-sectional	150	64% had anatomical alteration postpartum	Delivery alters PF anatomy
15	Zizzi et al.[15]	2017	Incontinence and PFM strength	Cross-sectional	150	52% with weak PFM had incontinence	Strength relates to symptoms
16	Pereira et al.[16]	2018	Clinical & US evaluation of PFD	Cross-sectional	103	82% correlation between US and clinical eval.	Ultrasound useful
17	Chan et al.[17]	2014	Biometry in primiparas	Prospective	120	40% had altered PF parameters	Biometric tools valuable
18	Oblasser et al.[18]	2016	Vaginal balls post-childbirth	RCT	40	26% improvement in PF strength	Feasible intervention
19	Simanauskaitė et al.[19]	2024	PFM strengthening in OASIS	Intervention	80	32% PFM function improvement	Rehab after trauma crucial
20	Sigurdardottir et al.[20]	2021	Early PFD postpartum	Cross-sectional	400	48% reported early symptoms	Early screening needed
21	Dericioğlu et al.[21]	2018	Adolescent idiopathic scoliosis causes pelvic floor dysfunction	Cross-sectional	100	35% with scoliosis had PFD	Scoliosis associated with PFD
22	Dasikan et al.[22]	2020	Risk factors for PFD	Cross-sectional	350	38% had PFD; age and parity were key risks	Multifactorial risk
23	Tennfjord et al.[23]	2014	Dyspareunia & PF strength	Longitudinal	60	42% with weak PFM had dyspareunia	Sexual function affected
24	Barbosa et al.[24]	2013	PFD post-cesarean	Cross-sectional	116	32% had incontinence	Cesarean doesn't eliminate risk
25	Kiefner et al.[25]	2023	Pessary postpartum	Prospective	200	68% reported symptom relief	Conservative methods effective
26	Abdool et al.[26]	2018	PF morphology in African women	Longitudinal	110	56% had measurable morphological changes	Culture-specific data needed
27	Cristóvão et al.[27]	2025	PF strength and incontinence	Cohort	260	44% with low strength had bothersome symptoms	Strengthening improves QoL

28	Urbankova et al.[28]	2019	Anatomy & dysfunction post vaginal birth	Observational	130	57% anatomical changes seen	Primiparity is a risk
29	Hagen et al.[29]	2024	PFD after 20–26 years	Longitudinal	3,000	41% reported PFD decades later	Long-term care needed
30	González-Timoneda et al.[30]	2025	QoL and PFD	Cross-sectional	470	61% had QoL impairment	PFD affects life significantly
31	Rao et al.[31]	2015	Prevalence of pelvic floor dysfunction among married women of Karnataka, India	Cross-sectional	250	21% had PFD; urinary incontinence was common	PFD prevalent in rural India

4. Results and discussion

1.3. Prevalence and Risk Factors

A majority of studies, including those conducted by Blomquist et al., Handa et al., and Siafarikas et al., have demonstrated a significantly higher prevalence of pelvic floor disorders (PFD) among women who underwent vaginal deliveries in comparison to those who had cesarean sections. The reported prevalence of PFD ranges from 21% (Rao et al.) to 60% (Huser et al.). Moreover, factors such as age, body mass index (BMI), and parity have been recognized as important contributors to this condition (Aiyegbusi et al., Dasikan et al.). Additionally, the incidence of third- and fourth-degree perineal tears has been shown to considerably increase the risk of developing PFD (Huber et al.).

1.4. Pelvic Floor Muscle Function

Reduced pelvic floor muscle (PFM) strength has been linked to urinary incontinence, pelvic organ prolapse, and dyspareunia, as noted by Zizzi et al. and Tennfjord et al. Research employing biometric assessments and ultrasound imaging, conducted by Pereira et al. and Chan et al., has validated the presence of anatomical and functional impairments in women following childbirth. Sigurdardottir et al. (2011, 2021) reported that muscle strength could decrease by as much as 30% after delivery, with nearly half of the participants experiencing this reduction several months postpartum.

1.5. Interventions and Management

Multiple studies have assessed conservative treatment alternatives. Hagen et al. (2020) found that biofeedback-assisted pelvic floor muscle training (PFMT) resulted in more significant functional enhancements compared to standard PFMT. Kiefner et al. reported that 68% of postpartum women experienced symptom relief when using a pessary. However, Neels et al. warned that 28% of women felt discomfort when initiating PFMT too early, indicating the necessity for personalized timing in treatment. Additionally, Simanauskaitė et al. noted that focused rehabilitation for obstetric anal sphincter injury (OASIS) cases led to a 32% improvement in muscle function.

1.6. Psychological and Social Impact

PFD has been linked to decreased satisfaction with body image (Cattani et al.), diminished sexual function, and difficulties in the workplace (Burkhart et al.). According to González-Timoneda et al., 61% of women experiencing this condition reported a notable decline in their quality of life. Additionally, Burkhart et al. noted that 62% of the participants were not aware of PFD, and more than one-third believed it impacted their job performance.

1.7. Diagnostic Tools and Epidemiological Trends:

Pereira et al. identified an 82% correlation between clinical assessments and ultrasound results, thereby endorsing the latter as a valuable diagnostic tool. Region-specific research conducted by Abdool et al. and Rao et al. highlighted the influence of cultural differences on prevalence and symptomatology. For example, Rao et al. reported a 21% prevalence of urinary incontinence among women in rural India, identifying it as the most common symptom.

5. Discussion

This review highlights the intricate and multifaceted nature of pelvic floor dysfunction (PFD) in women. There is consistent evidence indicating that vaginal childbirth is the primary factor contributing to this condition, with mechanical injuries, perineal tears, and age-related tissue degeneration further increasing the risk. The persistence of PFD symptoms for years following delivery (Hagen et al. 2024; Siafarikas et al.) indicates a necessity for continuous monitoring that extends beyond the immediate postpartum phase. Pelvic floor muscle strength has been identified as a crucial factor influencing the severity of symptoms, with weakened muscles closely associated with urinary and sexual dysfunction. Advances in technology, such as ultrasound and biometric evaluations, improve clinical accuracy and facilitate non-invasive monitoring, yet these tools are still not widely adopted in standard care practices. Although conservative treatments like pelvic floor muscle training (PFMT) and the use of pessaries have demonstrated significant effectiveness and safety, the findings also emphasize the need for personalized treatment strategies. While early intervention may be beneficial for some, it can be uncomfortable or discouraging for others (Neels et al.), highlighting the necessity of patient-centered care approaches.

The psychosocial aspects of PFD—such as dissatisfaction with body image, work-related limitations, and diminished quality of life—are significant but often overlooked in favor of physical symptoms. Despite the high prevalence of PFD, general awareness remains low across various demographics, including young nulligravida women (Aiyegbusi et al.) and individuals in rural areas (Rao et al.). These insights collectively indicate that while the physical aspects of PFD are becoming better understood, a comprehensive approach to managing this condition—one that incorporates social, psychological, and cultural factors—needs to be prioritized in both research and clinical settings.

6. Conclusion

Pelvic floor dysfunction (PFD) is a common yet often overlooked condition that has lasting effects on women's health and overall well-being. Key factors contributing to PFD include vaginal delivery, perineal injury, age, number of childbirths, and diminished pelvic muscle strength. While conservative treatments, especially pelvic floor muscle training (PFMT) and the use of pessaries, have proven effective, they must be tailored to the individual, particularly during the postpartum phase. The psychological effects and implications for quality of life are significant but are not adequately addressed in current healthcare practices. There is an urgent need for early detection, heightened awareness among both the public and healthcare professionals, and comprehensive care strategies that take into account physical, emotional, and sociocultural dimensions. Innovations in diagnostics and culturally sensitive interventions will be essential for improving the management and prevention of pelvic floor dysfunction on a global scale.

Future studies should focus on the following objectives:

- Establish standardized protocols for postpartum screening to facilitate the early detection of pelvic floor dysfunction (PFD).
- Investigate the long-term effects of new interventions, including pessaries, vaginal vibratory devices, and digital biofeedback tools.
- Examine the influence of prenatal education and antenatal pelvic floor training on the prevention of postpartum dysfunction.
- Implement longitudinal research to evaluate how sociocultural beliefs and health literacy affect individuals' willingness to seek treatment.
- Advocate for the integration of pelvic floor assessments and care as a fundamental component of postnatal healthcare services within all tiers of healthcare systems.

Compliance with ethical standards

Acknowledgments

We thank the authors of the included studies and peer reviewers for their valuable contributions. Also acknowledging the co-authors for their invaluable support.

Disclosure of conflict of interest

No conflicts of interest to be disclosed.

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