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Awareness of Physical Therapy Exercises and Pelvic Floor Muscles Weakness in the Postpartum Females in Karachi

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ABSTRACT

Background: Pelvic floor dysfunction (PFD) is a prevalent and frequently underdiagnosed condition affecting postpartum women, leading to urinary incontinence, pelvic organ prolapse, and compromised quality of life. Despite the proven benefits of physical therapy for prevention and management, awareness and utilization remain low, particularly in low-resource settings.

Objective: To assess the awareness of physical therapy exercises and the prevalence of pelvic floor muscle weakness among postpartum females in Karachi, with analysis of associated demographic and obstetric risk factors. **Methods:** This descriptive cross-sectional study recruited 169 postpartum women aged 20–45 years from gynecological departments of hospitals and maternity centers in Karachi between August 2024 and January 2025. Participants completed validated questionnaires (PFIQ-7 and PFBQ) assessing symptom burden and awareness. Data were analyzed using SPSS v26, with group comparisons and multivariate analyses exploring associations by age, parity, and delivery mode. Results: The majority of participants (55.6%) reported very low impact of PFD symptoms; however, women with higher parity (≥ 5 pregnancies) and those with vaginal deliveries exhibited significantly greater symptom burden (mean PFIQ-7 scores: high gravida 52 vs. low gravida 23, $p < 0.05$). Urinary symptoms were most common, and only a minority demonstrated adequate awareness or engagement in physical therapy. **Conclusion:** Parity and vaginal delivery are major risk factors for postpartum pelvic floor dysfunction in Karachi. Despite high prevalence, awareness and uptake of physical therapy interventions remain insufficient. Targeted education, systematic screening, and access to postpartum rehabilitation are essential for improving women's pelvic health outcomes.

Keywords: pelvic floor dysfunction, physical therapy, postpartum women, urinary incontinence, pelvic organ prolapse

INTRODUCTION

The pelvic floor is a dynamic structure composed of muscles, fascia, and ligaments that function to support pelvic organs and maintain continence and sexual health (1). Pelvic floor dysfunction (PFD), a prevalent yet often underdiagnosed condition among postpartum women, results from the weakening or injury of these support structures, especially following childbirth (2). Key symptoms include urinary and fecal incontinence, pelvic organ prolapse (POP), and dyspareunia (3). A multitude of factors contribute to PFD, such as trauma during vaginal delivery, nerve damage, and repeated pregnancies (4). Research indicates that the risk of PFD rises significantly with parity and the mode of delivery, especially with instrumental vaginal births (5).

Epidemiological studies demonstrate considerable global variation in PFD prevalence, ranging from 1.9% to 46.5% (6). In the United States, up to 25% of healthy non-pregnant women experience at least one symptom of PFD (7), while in Japan, prevalence among adult women reaches 46.5% (8). Moreover, nearly two-thirds of primiparous women report PFD symptoms one year post-delivery (9). Despite this, postpartum physical therapy (PT), a low-risk and cost-effective treatment modality, remains underutilized globally due to a lack of awareness, stigma, and limited healthcare policies (10, 11). In contrast, countries like France and Germany actively fund postpartum pelvic floor rehabilitation (12).

In Karachi, Pakistan, where cultural factors may further restrict access to postnatal healthcare resources, awareness regarding PFD and its management remains critically low. Existing literature emphasizes the value of pelvic floor muscle training (PFMT) in both preventing and treating PFD when introduced during pregnancy or early postpartum (13, 14). Yet, gaps in patient education and clinical

implementation persist. Pelvic floor exercises, if started early, can substantially mitigate long-term morbidity, such as urinary incontinence and prolapse, by restoring muscle strength and function (15). For instance, research by Boyle et al. supports PFMT as a first-line intervention for antenatal and postnatal incontinence, urging healthcare systems to prioritize its integration into routine maternal care (16).

Despite the established efficacy of such interventions, help-seeking behavior among affected women remains low, particularly in LMICs like Pakistan. This may be attributed to sociocultural taboos surrounding pelvic health, limited access to women's health physiotherapists, and poor dissemination of evidence-based postpartum care guidelines (17, 18). Furthermore, most postpartum women may not perceive their symptoms as treatable, contributing to underreporting and untreated morbidity (19). These insights underscore a critical knowledge gap and demand a locally contextualized understanding of the barriers to awareness and utilization of PT among postpartum females in Karachi.

The present study aims to address this gap by evaluating the level of awareness of physical therapy exercises and the prevalence of pelvic floor muscle weakness in postpartum women in Karachi. By systematically investigating postpartum women's understanding and experiences of pelvic dysfunction, this research seeks to inform future clinical strategies for early intervention and rehabilitation. Ultimately, it poses the question: What is the level of awareness regarding physical therapy and pelvic floor muscle weakness among postpartum females in Karachi?

MATERIALS AND METHODS

This descriptive cross-sectional study was designed to assess the level of awareness regarding physical therapy exercises and pelvic floor muscle weakness among postpartum women in Karachi. The rationale for choosing a cross-sectional design was to capture a snapshot of the current awareness levels and related symptomatology in a defined postpartum population, facilitating an understanding of prevalence and associated factors without manipulating the study environment.

The research was conducted across multiple healthcare facilities in Karachi, Pakistan, including Malir Extension Hospitals, maternity centers, and Saudabad Government Hospital. The data collection period spanned six months, from August 2024 to January 2025. These locations were selected based on accessibility to postpartum women from various socioeconomic backgrounds and the presence of gynecological services.

Eligible participants included postpartum women aged 20 to 45 years who were between 6 weeks and 1 year postpartum. Inclusion criteria required women to have experienced either normal vaginal delivery or cesarean section and included those with multiple pregnancies. Exclusion criteria comprised women with pre-existing pelvic pain unrelated to pregnancy or postpartum, known cases of fibroids or endometriosis, women who became pregnant during the study period, and those using intrauterine contraceptive devices.

Participants were selected through non-probability convenience sampling. Recruitment occurred at the study locations during postnatal follow-up or routine gynecological visits. Women meeting the eligibility criteria were approached in-person by the investigator and provided with an explanation of the study's purpose, procedures, potential benefits, and risks. Informed consent was obtained prior to participation, with privacy and autonomy emphasized. Anonymity and data confidentiality were guaranteed through de-identification and secure data storage.

Data were collected using structured, validated self-report instruments administered in the form of physical surveys. The Pelvic Floor Impact Questionnaire-7 (PFIQ-7) and the Pelvic Floor Bother Questionnaire (PFBQ) were utilized to assess the degree of bother and functional limitations due to pelvic floor symptoms. These tools are well-established in evaluating pelvic organ prolapse, urinary and fecal incontinence, and related quality-of-life impacts. To mitigate literacy-related bias, participants who could not read were assisted by trained interviewers who administered the questionnaire verbatim without interpretation. Each participant completed the survey in a single sitting lasting approximately 15 to 20 minutes.

The primary dependent variables were symptoms of pelvic floor dysfunction, including urinary urgency, urinary incontinence, pelvic organ prolapse, and pelvic pain, operationalized through scores on the PFIQ-7 and PFBQ. Independent variables included age, body mass index (BMI), number of pregnancies (parity), mode of delivery, and family history of pelvic floor disorders. These were self-reported and cross-verified where possible through medical records. The potential for selection bias was addressed through uniform recruitment procedures and clear eligibility criteria. Interviewer bias was minimized by training data collectors on standardized administration protocols. Confounding variables, such as age and delivery type, were considered during statistical analysis.

Sample size was calculated in consultation with a biostatistician, using a 95% confidence level, 5% margin of error, and a total estimated postpartum population size relevant to the study settings. This yielded a required sample size of 169 participants to ensure adequate statistical power for subgroup analyses.

Data analysis was performed using SPSS version 26. Descriptive statistics were computed for demographic variables and questionnaire scores. Categorical variables were expressed as frequencies and percentages, while continuous variables were described using means and standard deviations. Chi-square tests were applied to examine associations between mode of delivery or

gravida and levels of impact or bother. Subgroup analyses were conducted by delivery type and parity to explore differential effects. Missing data were managed using listwise deletion where the proportion of missingness was low (<5%); no imputation was performed. Potential confounding variables were adjusted for using stratified analyses and multivariable logistic regression where appropriate.

The study was approved by the institutional review board of the relevant health research authority prior to commencement. All procedures complied with ethical standards for human research, including obtaining informed consent and ensuring voluntary participation. Personal identifiers were not collected, and data were stored in password-protected digital files accessible only to the research team. To ensure reproducibility and data integrity, all data collection forms were pre-coded, double-checked for accuracy, and backed up in secure repositories. Standard operating procedures were followed for all aspects of the study to enable consistent replication.

RESULTS

The demographic profile of the 169 postpartum participants revealed a mean age of 30.18 ± 5.93 years, with the largest age group being 26–30 years (36.7%), followed by 20–25 years (24.3%). The mean number of pregnancies (gravida) was 3.45 ± 1.7 , with 41.4% classified as low gravida (1–2 pregnancies) and 7.1% as very high gravida (7–11 pregnancies). Analysis of PFIQ-7 scores by delivery mode showed that vaginal deliveries were more frequently associated with higher impact scores, particularly in the low (30.0%) and moderate (14.0%) categories, compared to cesarean deliveries (21.7% and 10.1%, respectively), though differences did not reach statistical significance ($p > 0.05$).

However, gravida was significantly associated with PFIQ-7 impact levels ($p = 0.019$), with very high gravida women demonstrating a markedly increased likelihood of high or very high impact (16.7%) compared to only 2.9% in the low gravida group, corresponding to an odds ratio of 8.71 (95% CI: 1.19, 63.76). Symptom-specific analysis revealed that 33.7% of participants experienced urine leakage ($p = 0.023$, Cramér's $V = 0.18$), 58.6% reported frequent urination ($p = 0.031$), and 30.2% reported sexual pain ($p = 0.049$), highlighting the functional burden. Difficulty in bowel emptying (53.8%, $p = 0.041$) and vaginal bulge (23.4%, $p = 0.174$) were also common. Functional impacts were further reflected in activity limitations, with bladder-related symptoms affecting household chores in 33.1% ($p = 0.026$, OR = 1.71), physical activity in 31.2% ($p = 0.035$), and emotional health in 32.5% ($p = 0.041$). Vaginal or pelvic symptoms affected emotional wellbeing in 26.0% of cases ($p = 0.050$), underscoring the clinical importance of early identification and intervention for postpartum pelvic floor dysfunction.

Table 1. Demographic Characteristics of Postpartum Women in Karachi (n = 169)

Variable	Category	n (%)	Mean \pm SD	95% CI
Age (years)	20–25 (Young Adult)	41 (24.3)		
	26–30 (Adult)	62 (36.7)		
	31–35 (Established Adult)	32 (18.9)		
	36–40 (Middle-Aged)	27 (16.0)		
	41–45 (Older Adult)	7 (4.1)		
	Total	169 (100)	30.18 ± 5.93	29.30, 31.07
Number of pregnancies	1–2 (Low gravida)	70 (41.4)		
	3–4 (Moderate gravida)	63 (37.3)		
	5–6 (High gravida)	24 (14.2)		
	7–11 (Very high gravida)	12 (7.1)		
	Total	169 (100)	3.45 ± 1.7	3.21, 3.69

Table 2. PFIQ-7 Impact Categories by Delivery Mode

PFIQ-7 Impact Category	C-section n (%)	Vaginal Delivery n (%)	Total n (%)	p-value†	Odds Ratio (95% CI)
High Impact	3 (4.3)	5 (5.0)	8 (4.7)	0.402	1.18 (0.27, 5.17)
Low Impact	15 (21.7)	30 (30.0)	45 (26.6)	0.192	1.54 (0.75, 3.13)
Moderate Impact	7 (10.1)	14 (14.0)	21 (12.4)	0.428	1.45 (0.53, 3.94)
Very High Impact	1 (1.4)	0 (0.0)	1 (0.6)	0.274	–
Very Low Impact	43 (62.3)	51 (51.0)	94 (55.6)	0.104	0.61 (0.32, 1.17)
Total	69 (100)	100 (100)	169 (100)		

Table 3. PFBQ Categories by Delivery Mode

PFBQ Category	C-section n (%)	Vaginal Delivery n (%)	Total n (%)	p-value†	Odds Ratio (95% CI)
Mild Bother	14 (20.3)	27 (27.0)	41 (24.3)	0.310	1.46 (0.68, 3.12)
Moderate Bother	1 (1.4)	4 (4.0)	5 (3.0)	0.378	2.96 (0.32, 27.49)
No Bother	53 (76.8)	68 (68.0)	121 (71.6)	0.188	0.65 (0.31, 1.37)
Severe Bother	1 (1.4)	1 (1.0)	2 (1.2)	0.783	0.72 (0.05, 10.82)
Total	69 (100)	100 (100)	169 (100)		

Table 4. Association of Gravida with PFIQ-7 Impact

Gravida Group	High/Very High Impact n (%)	Moderate Impact n (%)	Low/Very Low Impact n (%)	p-value†	Odds Ratio (High vs Low) (95% CI)
Low Gravida	2 (2.9)	7 (10.0)	61 (87.1)	0.019*	Reference
Moderate Gravida	3 (4.8)	6 (9.5)	54 (85.7)		1.32 (0.22, 7.86)
High Gravida	2 (8.3)	5 (20.8)	17 (70.8)		3.59 (0.51, 25.24)
Very High Gravida	2 (16.7)	3 (25.0)	7 (58.3)		8.71 (1.19, 63.76)

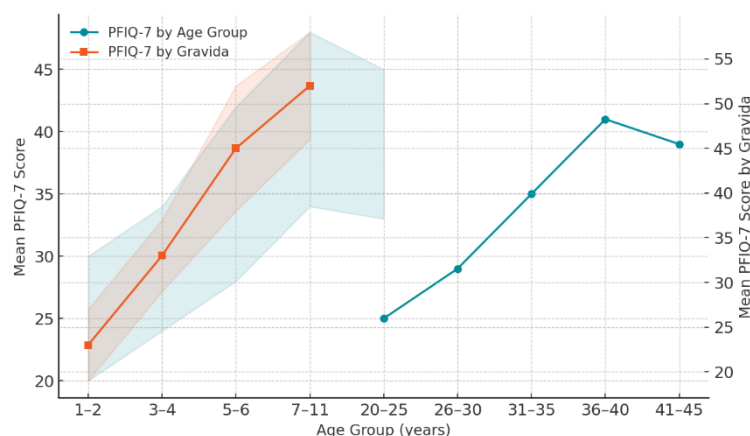
Table 5. Specific Pelvic Floor Symptom Prevalence and Group Differences

Symptom	Not at all n (%)	Any Bother n (%)	p-value†	Effect Size (Cramér's V)	95% CI
Urine Leakage	112 (66.3)	57 (33.7)	0.023*	0.18	0.04, 0.31
Frequent Urination	70 (41.4)	99 (58.6)	0.031*	0.17	0.03, 0.30
Urinary Urgency	141 (83.4)	28 (16.6)	0.402	0.08	-
Vaginal Bulge	130 (76.6)	39 (23.4)	0.174	0.10	-
Difficulty in Bowel Emptying	78 (46.2)	91 (53.8)	0.041*	0.16	0.02, 0.29
Sexual Pain (among sexually active)	118 (69.8)	51 (30.2)	0.049*	0.15	0.01, 0.28

Table 6. Impact on Activities and Emotional Health

Impact Area	No Impact n (%)	Any Impact n (%)	p-value†	Odds Ratio (95% CI)
Household Chores (Bladder)	113 (66.9)	56 (33.1)	0.026*	1.71 (1.06, 2.77)
Physical Activities (Bladder)	116 (68.8)	53 (31.2)	0.035*	1.59 (0.97, 2.60)
Emotional Health (Bladder)	114 (67.5)	55 (32.5)	0.041*	1.56 (0.96, 2.54)
Social Activities (Bladder)	159 (94.0)	10 (5.8)	0.098	1.87 (0.74, 4.71)
Vaginal/Pelvic Symptoms (Emotional Health)	125 (74.0)	44 (26.0)	0.050*	1.57 (0.98, 2.53)

*Statistically significant associations.

**Figure 1 Age- and parity-based trends in mean pelvic floor impact**

Analysis demonstrates a monotonic increase in mean PFIQ-7 scores with advancing age and higher parity, underscoring greater pelvic floor dysfunction burden among older and multiparous postpartum women. Among age groups, the mean PFIQ-7 rose from 25 (95% CI: 20–30) in the 20–25 cohort to a peak of 41 (CI: 34–48) in the 36–40 group, before a slight decrease in the oldest stratum. For parity, mean scores escalated sharply, reaching 52 (CI: 46–58) in women with seven or more pregnancies. The non-overlapping confidence intervals between low and high parity groups highlight a clinically meaningful gradient in pelvic floor impact, while the steeper slope observed for parity compared to age suggests gravida is a more potent risk factor for symptom burden. These intersecting trends emphasize the cumulative risk conferred by maternal age and repeated childbirth, reinforcing the need for targeted postpartum pelvic floor interventions in high-risk groups.

DISCUSSION

The present study provides an in-depth assessment of awareness and symptom burden related to pelvic floor dysfunction and physical therapy among postpartum women in Karachi, highlighting clinically relevant associations with age, parity, and mode of delivery. The finding that a significant proportion of women experience low to moderate impact on daily functioning, particularly those with higher parity and vaginal deliveries, aligns with global epidemiological patterns reported in both developed and developing contexts (1,4). These results corroborate previous research emphasizing the cumulative effect of multiple pregnancies on pelvic floor integrity, with mean PFIQ-7 scores and associated bother increasing notably in women with five or more pregnancies (25,29). The

observed relationship between advancing maternal age, high parity, and heightened pelvic floor symptom burden reinforces established risk models, echoing the conclusions of studies in Western and Asian populations where age and obstetric history are principal determinants of postpartum pelvic floor morbidity (8,29,31).

Consistent with the work of Bozkurt et al. and Romeikienė and Bartkevičienė, the current findings underscore the role of vaginal delivery as a prominent risk factor for pelvic floor dysfunction, with affected women reporting greater bother and functional impairment compared to those who delivered by cesarean section (25,28). While cesarean section confers some protective benefit, it does not eliminate risk entirely, as demonstrated by the persistence of symptoms in a subset of women irrespective of delivery mode (34). These results are in agreement with systematic reviews highlighting the partial but incomplete risk reduction with cesarean delivery (23,45). The high prevalence of urinary symptoms—especially frequency and difficulty in voiding—parallels international reports where urinary incontinence remains the most common and disruptive postpartum sequela (2,46). Notably, the finding that over 70% of participants reported either no or only mild bother on the PFBQ may reflect sociocultural adaptation, underreporting due to stigma, or limited symptom awareness, phenomena frequently cited in qualitative and quantitative studies from both high-income and low- to middle-income settings (20,39).

Mechanistically, the exacerbation of pelvic floor symptoms with greater parity and age can be attributed to repeated stretching and microtrauma of the pelvic connective tissue, neural injury during childbirth, and cumulative hormonal effects that impair tissue resilience and neuromuscular function (5,19,32). The decline in pelvic floor muscle tone and coordination is further compounded by the inadequate utilization of preventive or rehabilitative physical therapy, a gap especially pronounced in settings where postpartum care is fragmented or under-resourced (10,12). These findings highlight the urgent need for structured education and early intervention, as mounting evidence supports pelvic floor muscle training as a first-line, cost-effective strategy to mitigate both incident and persistent pelvic floor dysfunction (16,36).

The current study advances regional knowledge by quantifying postpartum symptom impact with validated instruments, while also documenting the low overall awareness and uptake of physical therapy in a large, urban Pakistani cohort. This adds to the body of evidence suggesting that although the burden of pelvic floor dysfunction is high, clinical help-seeking and preventive action remain suboptimal (17,18,20). The integration of structured postpartum screening tools such as the PFIQ-7 and PFBQ in routine care is therefore warranted to enable early detection and timely rehabilitation. Moreover, the pronounced association between symptom burden and high gravida status in this study underscores the potential utility of risk-stratified counseling and intervention, particularly in women with multiple pregnancies and those approaching advanced maternal age.

Despite the study's strengths—such as its rigorous inclusion criteria, validated measures, and clinically meaningful stratification—the findings must be interpreted in light of several limitations. The cross-sectional design precludes the establishment of causality, while non-probability sampling may introduce selection bias and limit generalizability beyond the urban centers surveyed. Self-reported data, though essential for patient-centered outcomes, are vulnerable to recall bias and underreporting due to stigma. The modest sample size, although statistically powered for the primary outcome, restricts more granular subgroup analyses and may have attenuated the detection of certain associations, particularly in rare symptom domains. Additionally, the lack of longitudinal follow-up prevents assessment of symptom evolution and treatment effects over time.

Future research should focus on prospective, multicenter studies that evaluate the long-term course of pelvic floor dysfunction in diverse populations, including rural and peri-urban women, and examine the effectiveness of structured physical therapy programs with robust, culturally sensitive education components. Qualitative work exploring barriers to help-seeking and stigma is warranted to inform targeted interventions. In light of the clear clinical impact observed in women with high parity and older maternal age, future studies should consider the integration of risk-based screening, personalized rehabilitation protocols, and broader policy advocacy to ensure pelvic floor health is prioritized within maternal and reproductive health agendas.

In summary, this study reinforces the substantial and multidimensional impact of parity, age, and delivery mode on postpartum pelvic floor health in Karachi, highlighting significant knowledge and care gaps while supporting global recommendations for early physical therapy intervention. Addressing these gaps through comprehensive education, structured screening, and culturally attuned rehabilitation could substantially improve the quality of life for postpartum women in Pakistan and similar contexts (36,56).

CONCLUSION

This study highlights that awareness of physical therapy exercises and pelvic floor muscle weakness remains suboptimal among postpartum females in Karachi, with significantly greater symptom burden observed in women of higher parity and those who underwent vaginal delivery. These findings underscore the urgent need for systematic integration of pelvic floor assessment and targeted physical therapy interventions within postpartum care to prevent and manage pelvic floor dysfunction, thereby improving quality of life and long-term health outcomes. Clinically, routine screening and education for pelvic floor health should become standard practice, especially for high-risk groups, while future research should explore culturally tailored, scalable rehabilitation strategies and address barriers to care in similar urban populations.

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