TPM Vol. 32, No. S1, 2025
ISSN: 1972-6325
https://www.tpmap.org/

EFFECT OF KEGEL'S EXERCISES ON POSTPARTUM URINARY INCONTINENCE AND QUALITY OF LIFE: A RANDOMIZED CONTROLLED TRIAL

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Abstract

Background: Postpartum urinary incontinence (UI) is a prevalent but underrecognized complication following vaginal delivery, with significant implications for maternal quality of life. Pelvic floor muscle training (PFMT), or Kegel's exercises, is an evidence-based, non-invasive intervention that may reduce the incidence and severity of UI when implemented early.

Objectives: To evaluate the effectiveness of Kegel's exercises in preventing postpartum urinary incontinence and reducing urinary symptom severity among women who had undergone normal vaginal delivery.

Methods: This prospective, parallel-group, randomized controlled trial was conducted at a tertiary care teaching hospital in South India. A total of 69 postnatal women aged 18–35 years were randomized into two groups within 48 hours of delivery. The intervention group (n = 35) received supervised instruction on PFMT with printed guides and weekly follow-up, while the control group (n = 34) received standard postnatal care. The primary outcome was urinary symptom severity measured by the International Consultation on Incontinence Questionnaire – Urinary Incontinence Short Form (ICIQ-UI SF) at 6 weeks postpartum. The secondary outcome was the incidence of self-reported UI at follow-up.

Results: Baseline demographic and clinical variables were comparable between groups. At 6 weeks postpartum, the intervention group demonstrated significantly lower mean ICIQ-UI SF scores compared to controls (0.6 ± 0.5 vs. 1.8 ± 1.0; $p < 0.001$). The incidence of UI was also significantly lower in the intervention group (11.4%) than in the control group (44.1%) ($p = 0.002$). Within-group analysis in the intervention arm showed a significant reduction in mean symptom scores from baseline to follow-up ($p = 0.001$).

Conclusion: Early initiation and consistent performance of Kegel's exercises significantly reduce the severity and incidence of postpartum urinary incontinence. Given its simplicity, safety, and cost-effectiveness, PFMT should be routinely incorporated into postnatal care protocols. Further research is needed to explore long-term adherence and outcomes beyond six weeks postpartum.

Keywords: Pelvic floor muscle training, Kegel's exercises, postpartum urinary incontinence, randomized controlled trial, postnatal care, ICIQ-UI SF, maternal health

INTRODUCTION

Postpartum urinary incontinence (UI), defined as the involuntary leakage of urine following childbirth, is a common yet underrecognized complication in the postnatal period. Reported prevalence rates vary widely, ranging from 10% to 63% within the first year postpartum, with a pooled mean prevalence of approximately 31% (1–3). Vaginal delivery, in particular, has been identified as a significant risk factor due to the mechanical and neurological stress imparted on pelvic support structures during labor (1,3).Stretching of the pelvic floor muscles, pudendal nerve injury, and elevated intra-abdominal pressure during childbirth contribute to pelvic floor dysfunction and subsequent urinary symptoms.

The impact of postpartum UI extends beyond physical discomfort, significantly affecting emotional well-being and social functioning. Women experiencing moderate to severe symptoms or mixed urinary incontinence frequently report embarrassment, avoidance of physical and social activities, and reduced self-esteem(2,4).
These psychosocial burdens are further compounded by underreporting and cultural stigma, with many women perceiving UI as an inevitable or temporary consequence of childbirth, leading to delays in seeking medical care (4,5).
Pelvic floor muscle training (PFMT), commonly known as Kegel's exercises, has emerged as an evidence-based, non-invasive intervention for both the prevention and management of postpartum UI. When practiced regularly and correctly, PFMT enhances the strength and endurance of the pelvic floor muscles, thereby improving bladder control and reducing symptom severity (6,7). Clinical trials and meta-analyses affirm that supervised and structured PFMT programs yield greater improvements in continence and pelvic muscle strength, with sustained benefits up to one year postpartum (6,8).
Despite its proven efficacy, PFMT is not routinely incorporated into standard postpartum care, particularly in low-resource settings. Barriers such as limited patient education, inadequate provider training, and lack of structured exercise regimens contribute to poor adherence and suboptimal outcomes.

Objective

This study was conducted to evaluate the effectiveness of Kegel's exercises in preventing postpartum urinary incontinence and improving urinary symptom severity in women following normal vaginal delivery. The intervention group received guided PFMT instruction within 48 hours postpartum, while the control group received routine postnatal care. Symptom outcomes were assessed using a validated questionnaire at six weeks post-delivery.

METHODS

Study Design and Setting

This was a prospective, parallel-group, randomized controlled trial conducted at a tertiary care teaching hospital in South India. The study aimed to evaluate the effectiveness of Kegel's exercises in preventing postpartum urinary incontinence among postnatal women.

Participants

Postnatal women aged 18–35 years who had undergone normal vaginal delivery within the preceding 48 hours were recruited from the postnatal wards. Inclusion criteria included willingness to participate and ability to understand and perform pelvic floor muscle exercises. Women with pre-existing urinary incontinence, complicated deliveries, or neurological conditions affecting bladder control were excluded.

Sample Size and Randomization

A total of 69 eligible participants were randomized using simple random allocation into two groups:

- Group A (Intervention): 35 women received one-on-one instruction and demonstration of Kegel's exercises and were advised to perform them daily for six weeks.
- Group B (Control): 34 women received routine postnatal care without specific instructions on pelvic floor exercises.

Intervention

Women in the intervention group were taught standardized pelvic floor muscle training (PFMT) techniques under supervision before discharge. They were provided a printed guide for home practice and were contacted weekly for adherence reinforcement. No additional interventions were given to the control group.

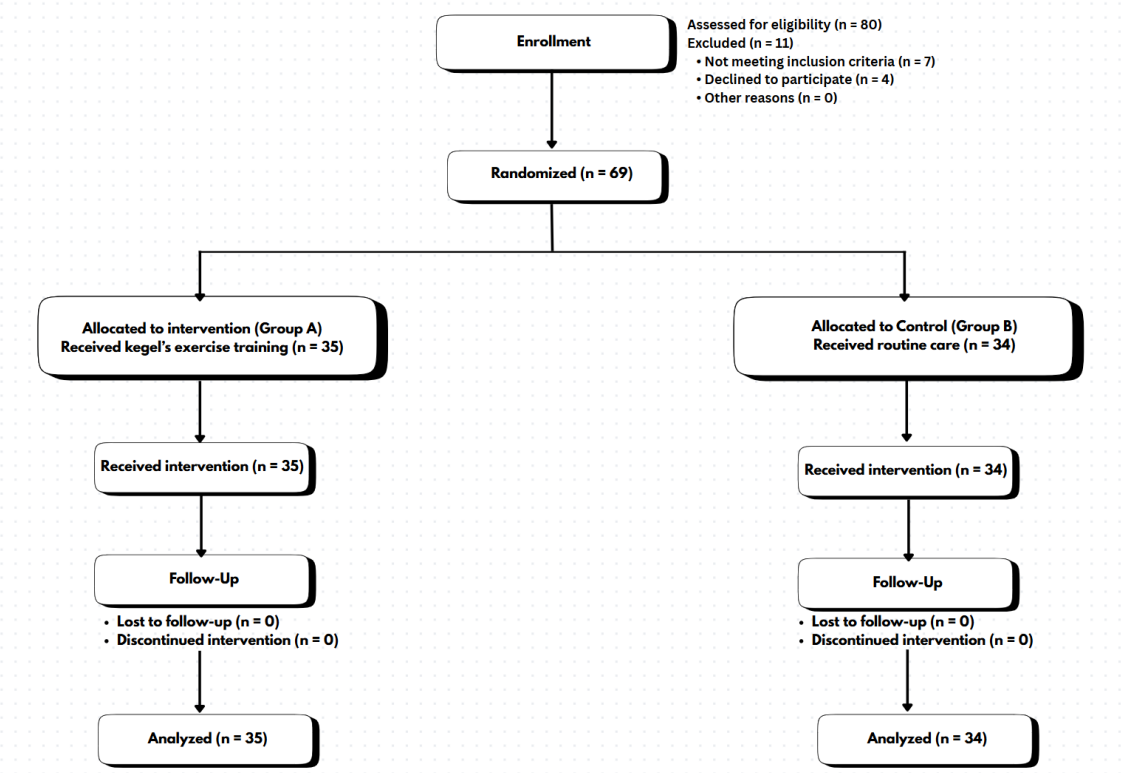
Outcome Measures

The primary outcome was the severity of urinary incontinence symptoms, assessed using the International Consultation on Incontinence Questionnaire – Urinary Incontinence Short Form (ICIQ-UI SF) at 6 weeks postpartum. The secondary outcome was the incidence of self-reported urinary incontinence at follow-up.

Statistical Analysis

Data were analyzed using SPSS version 22. Descriptive statistics were used to summarize baseline demographic and clinical variables. Between-group comparisons for categorical variables were performed using the Chi-square test, while changes in continuous variables (ICIQ-UI SF scores) were analyzed using the paired t-test and independent t-test where appropriate. A p-value < 0.05 was considered statistically significant.

Figure:1 CONSORT flow chart of study design



Results

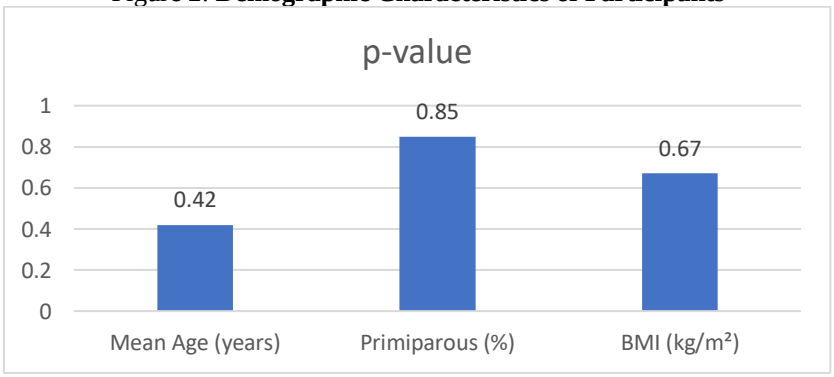
Demographic Characteristics

The baseline demographic and clinical characteristics of the study population were comparable between the two groups. The mean age was 26.5 ± 3.2 years in Group A and 27.1 ± 2.8 years in Group B, with no statistically significant difference (p = 0.42). Similarly, the proportion of primiparous women was 60% in Group A and 58% in Group B (p = 0.85). The mean body mass index (BMI) was 23.8 ± 2.5 kg/m² in Group A and 24.1 ± 2.7 kg/m² in Group B (p = 0.67). These results indicate that the two groups were well-matched at baseline (Table 1, Figure 2).

Table 1: Demographic Characteristics of Participants

Characteristic	Group A (n=35)	Group B (n=34)	p-value
Mean Age (years)	26.5 ± 3.2	27.1 ± 2.8	0.42
Primiparous (%)	60%	58%	0.85
BMI (kg/m²)	23.8 ± 2.5	24.1 ± 2.7	0.67

Figure 2: **Demographic Characteristics of Participants**



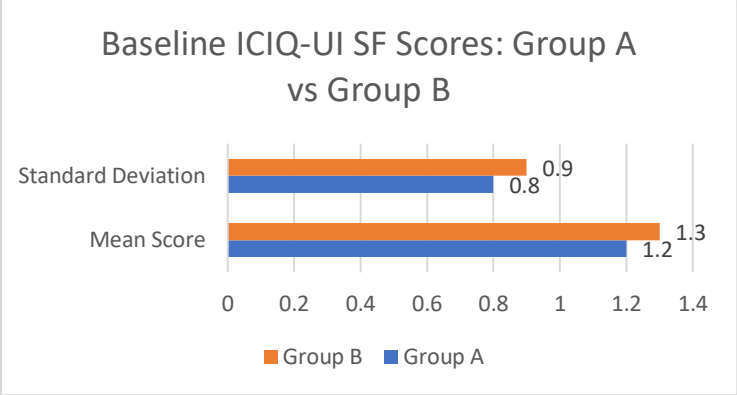
Baseline Severity of Urinary Incontinence

The baseline severity of urinary incontinence, measured using the International Consultation on Incontinence Questionnaire - Urinary Incontinence Short Form (ICIQ-UI SF), was not significantly different between the two groups. Group A had a mean ICIQ-UI SF score of 1.2 ± 0.8, while Group B recorded a mean score of 1.3 ± 0.9 ($p = 0.74$), confirming similar urinary symptoms at the start of the study (**Table 2**, **Figure 3**).

Table 2. Baseline ICIQ-UI SF Scores, Standard Deviation, and p-Value Between Intervention and Control Groups

Group	Mean Score	Standard Deviation	p-value
Group A	1.2	0.8	
Group B	1.3	0.9	**0.74**

Figure 3: Comparison of Baseline Mean ICIQ-UI SF Scores and Standard Deviation Among Postnatal Women in Intervention and Control Groups



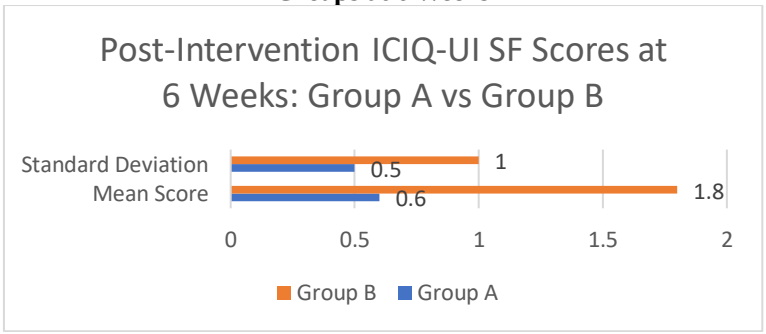
Post-Intervention ICIQ-UI SF Scores

At 6 weeks postpartum, a statistically significant reduction in urinary incontinence symptoms was observed in the intervention group. Group A, which performed daily Kegel's exercises, had a mean post-intervention ICIQ-UI SF score of 0.6 ± 0.5, whereas Group B recorded a higher score of 1.8 ± 1.0 ($p < 0.001$). These findings suggest that consistent pelvic floor muscle training led to marked symptom improvement (**Table 3**, **Figure 4**).

Table 3: Post-Intervention ICIQ-UI SF Scores (at 6 Weeks)

Group	Mean Score	Standard Deviation	p-value
Group A	0.6	0.5	
Group B	1.8	1	**< 0.001**

Figure 4. Comparison of Post-Intervention Mean ICIQ-UI SF Scores Among Intervention and Control Groups at 6 Weeks



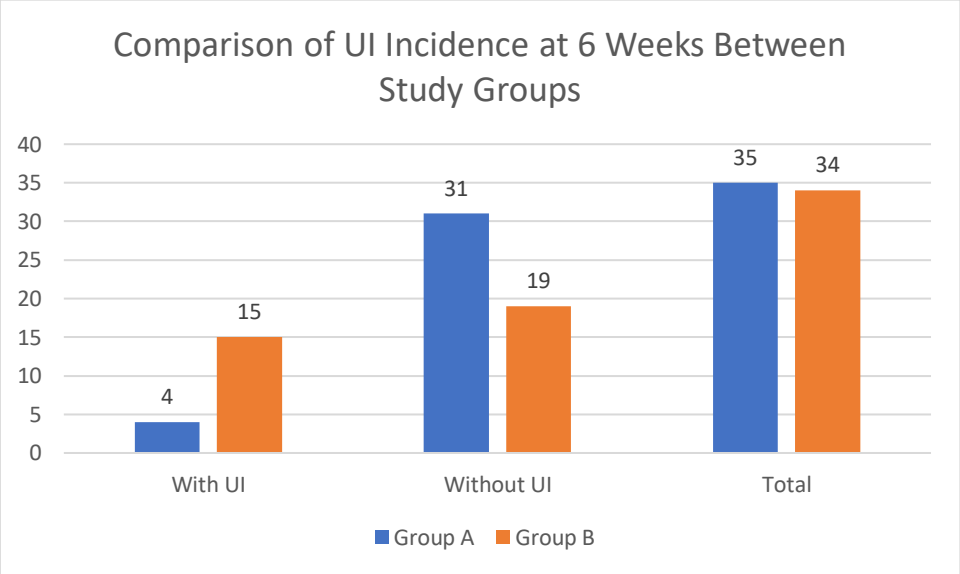
Incidence of Urinary Incontinence at 6 Weeks

The incidence of urinary incontinence at 6 weeks postpartum was significantly lower in the intervention group compared to controls. Only 4 out of 35 women (11.4%) in Group A reported symptoms of urinary incontinence, as opposed to 15 out of 34 women (44.1%) in Group B. This difference was statistically significant (p = 0.002), demonstrating the preventive benefit of Kegel's exercises (**Table 4**, **Figure 5**).

Table 4: Incidence of Urinary Incontinence at 6 Weeks

Group	No. with UI	No. without UI	Total	p-value
Group A	4	31	35	0.002
Group B	15	19	34	

Figure 5. Comparison of Postpartum Urinary Incontinence Incidence at 6 Weeks: Group A vs Group B



Within-Group Comparison in the Intervention Arm

A within-group comparison for Group A revealed significant improvement over time. The mean ICIQ-UI SF score decreased from 1.2 ± 0.8 at baseline to 0.6 ± 0.5 at 6 weeks postpartum (p = 0.001), indicating the effectiveness of the intervention in reducing urinary symptoms within the same cohort (Table 5).

Table 5: Within-Group Comparison of ICIQ-UI SF Scores (Group A Only)

Time Point	Mean Score ± SD	p-value
Baseline	1.2 ± 0.8	
6 Weeks	0.6 ± 0.5	0.001

DISCUSSION

This randomized controlled trial assessed the effectiveness of Kegel's exercises—also known as pelvic floor muscle training (PFMT)—in the prevention and management of postpartum urinary incontinence (UI) following normal vaginal delivery. The findings demonstrate that early initiation and consistent practice of PFMT significantly reduced both the incidence and severity of UI at six weeks postpartum, confirming its value as a non-pharmacological, non-invasive intervention in postpartum care.

At baseline, the intervention and control groups were well matched in terms of age, parity, and BMI, with no statistically significant differences (p > 0.05). Additionally, the mean baseline scores on the ICIQ-UI SF questionnaire were comparable, indicating a homogeneous starting point for evaluating the intervention effect. This comparability enhances the internal validity of the study and affirms that outcome differences can be attributed to the intervention.

By six weeks postpartum, the intervention group exhibited a statistically and clinically significant reduction in mean ICIQ-UI SF scores compared to the control group (0.6 ± 0.5 vs. 1.8 ± 1.0; p < 0.001). This finding is consistent with prior randomized controlled trials and meta-analyses demonstrating that structured PFMT significantly reduces the severity of UI symptoms, particularly when exercises are initiated early and supervised during the postnatal period(9–11). The sustained improvement in urinary symptoms observed in the intervention

group from baseline to follow-up (p = 0.001) further supports the longitudinal benefits of PFMT in restoring pelvic floor muscle strength and continence control (12,13).

Moreover, the incidence of urinary incontinence was substantially lower among participants who performed Kegel's exercises, with only 11.4% reporting UI at six weeks compared to 44.1% in the control group (p = 0.002). This aligns with previous research indicating that consistent postpartum PFMT effectively reduces the likelihood of stress urinary incontinence and contributes to early pelvic floor recovery (9,11,14).

The magnitude of difference observed in our study not only reinforces the efficacy of Kegel's exercises but also emphasizes their preventive potential when incorporated into routine postnatal care.Despite the robust evidence supporting PFMT, its integration into standard postpartum protocols remains inconsistent, especially in low-resource settings. Factors such as lack of structured instruction, minimal provider engagement, and insufficient awareness among mothers contribute to suboptimal adoption. Addressing these barriers through early counseling and supervised instruction, as demonstrated in this study, could substantially improve adherence and clinical outcomes.

Overall, the results support the implementation of PFMT as an accessible, low-cost strategy to prevent postpartum UI. Given the significant improvements in both symptom severity and prevalence, and the corroborative evidence from existing literature(9–14), incorporating Kegel's exercises into postpartum counseling and discharge protocols may substantially enhance maternal quality of life in the early postnatal period.

Strengths and Clinical Implications

The study's strengths include its randomized controlled design, use of a validated outcome tool (ICIQ-UI SF), and focus on an early postpartum window where behavioral interventions can be most impactful. The intervention was low-cost, non-pharmacologic, and easily teachable, with high acceptability and feasibility in both urban and rural healthcare settings. Incorporating PFMT as part of postnatal counseling could greatly reduce the burden of postpartum UI, improving quality of life and long-term pelvic health.

Limitations

Despite its strengths, the study has limitations. The follow-up duration was limited to 6 weeks, and long-term adherence or recurrence of UI symptoms was not assessed. The study relied on self-reported outcomes, which, although standardized, may introduce recall bias. Additionally, adherence to the exercise regimen was not objectively monitored beyond weekly reminders, and this could influence the measured effectiveness.

CONCLUSION

This study demonstrates that structured instruction and regular practice of Kegel's exercises significantly reduce both the severity and incidence of postpartum urinary incontinence within 6 weeks of delivery. Given its simplicity, safety, and demonstrated benefit, pelvic floor muscle training should be universally promoted as part of routine postnatal care. Further studies with longer follow-up periods are warranted to evaluate the sustained effects of PFMT and its impact on long-term pelvic health.

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