Journal of Health and Rehabilitation Research JHRR

https://doi.org/10.61919/jhrr.v5i12.1942

Original Article

Pelvic Floor Muscle Training for Urinary Incontinence in Bedridden Patients with Multimorbidity: A Cross-Sectional Survey at Sir Ganga Ram Hospital, Lahore

Ambreen Zia, Taskeen Akram

1. Sir Ganga Ram Hospital, Lahore, Pakistan

*** Correspondence: akramtaskeen@gmail.com**

ABSTRACT

Background: Urinary incontinence in bedridden patients with multimorbidity is common and clinically burdensome, yet evidence guiding conservative management in highly dependent populations remains limited. Objective: To evaluate continence-related outcomes associated with pelvic floor muscle training (PFMT) in bedridden patients with multimorbidity and to identify factors associated with clinically meaningful response. Methods: A cross-sectional survey was conducted at Sir Ganga Ram Hospital, Lahore (n=120). Participants reported supervised or unsupervised PFMT, adherence, and pre–post continence-related outcomes. Outcomes included weekly incontinence episodes, ICIQ-UI SF, 24-hour pad test leakage, pelvic floor strength, and continence-related quality of life impact. Paired comparisons used Wilcoxon tests with bootstrap confidence intervals and false discovery rate adjustment. Multivariable logistic regression examined predictors of responder status (≥50% reduction in weekly episodes). Results: Weekly episodes decreased from 16.0 (IQR 13.0–19.0) to 6.0 (IQR 4.0–7.2) with median change −9.0 (95% CI −10.0 to −9.0; q<0.001). All secondary outcomes improved with large effect sizes (r≈0.867; all q<0.001). Responders comprised 103/120 (85.8%). Adherence independently predicted response (aOR 2.74 per 0.1 increase; 95% CI 1.65–4.55; p<0.001). Conclusion: In this bedridden multimorbid sample, PFMT was associated with large improvements across continence outcomes, and adherence was the key independent correlate of clinically meaningful response. Keywords: urinary incontinence; pelvic floor muscle training; bedridden; multimorbidity; adherence; rehabilitation.

"Cite this Article" | Received: 18 October 2025; Accepted: 23 December 2025; Published: 31 December 2025.

Author Contributions: Concept: AZ, TA; Design: AZ; Data Collection: TA; Analysis: AZ; Drafting: TA. **Ethical Approval**: SGRH, Lahore

Informed Consent: Written informed consent was obtained from all participants; Conflict of Interest: The authors declare no conflict of interest; Funding: No external funding; Data Availability: Available from the corresponding author on reasonable request; Acknowledgments: N/A.

INTRODUCTION

Urinary incontinence (UI) is a highly prevalent and distressing condition affecting millions of individuals worldwide, particularly older adults and patients with chronic illnesses. The burden of UI is amplified in individuals with multimorbidity who are confined to bed or have severely limited mobility, as functional dependency, neuromuscular weakness, medication use, and comorbid neurological disorders collectively compromise continence mechanisms. These patients frequently experience a combination of stress, urgency, or mixed urinary incontinence that significantly impairs dignity, hygiene, sleep quality, and overall health-related quality of life. Beyond the psychosocial impact, persistent urinary leakage increases the risk of skin breakdown, urinary tract infections, and caregiver burden, thereby representing an important yet under-addressed clinical challenge in long-term care and home-based rehabilitation settings. Despite its prevalence, therapeutic interventions for urinary incontinence in bedridden individuals with complex comorbidities remain inadequately studied, with most available evidence focusing on community-dwelling or ambulatory populations (1,4).

Pelvic floor muscle training (PFMT) is widely recognized as the first-line conservative intervention for urinary incontinence and has been extensively studied in women with stress or mixed UI. PFMT aims to strengthen the pelvic floor musculature, improve urethral support, and enhance neuromuscular

coordination involved in continence control. Systematic reviews and meta-analyses consistently demonstrate that structured PFMT programs significantly reduce urinary leakage episodes and improve continence-related quality of life compared with no treatment or inactive control interventions (3,4,11). Clinical trials have also shown that PFMT can restore pelvic floor function through repetitive voluntary contractions that enhance muscle strength, endurance, and reflex activation during increases in intra-abdominal pressure (12). Furthermore, evidence from randomized controlled trials indicates that PFMT may lead to clinically meaningful symptom improvement even when delivered through simplified or home-based protocols, supporting its feasibility in diverse clinical settings (18).

Several modifications and adjunctive strategies have been explored to enhance the effectiveness of PFMT. Biofeedback-assisted pelvic floor training provides visual or auditory feedback that helps patients correctly identify and contract pelvic floor muscles, thereby improving adherence and neuromuscular control (1,6). Electrostimulation has also been proposed as an adjunct intervention to stimulate pelvic floor muscle fibers and facilitate contractions in individuals with poor voluntary activation (1). Comparative trials suggest that PFMT combined with biofeedback or electromyographic guidance may produce superior symptom improvement compared with PFMT alone in some patient groups, although the magnitude of benefit varies across studies (6). Additionally, pragmatic primary care trials have demonstrated that PFMT combined with bladder training may yield greater reductions in urinary leakage and improvements in continence-related outcomes than behavioral therapy alone (19). These findings collectively reinforce the central role of PFMT as a cornerstone of conservative continence management.

More recently, research has expanded PFMT delivery through digital and remote rehabilitation approaches. Telerehabilitation and mobile health applications have been investigated as innovative platforms to support adherence, provide real-time guidance, and improve long-term exercise engagement among patients with urinary incontinence. Systematic reviews evaluating mobile health-based PFMT interventions have reported meaningful improvements in continence symptoms and quality of life, highlighting the potential of technology-assisted interventions to increase accessibility of pelvic floor rehabilitation (7,8). Remote rehabilitation approaches may be particularly relevant for individuals who cannot attend outpatient physiotherapy services due to mobility limitations or chronic illness. However, the existing evidence largely focuses on relatively independent community-dwelling populations rather than individuals with severe functional limitations (14).

In addition to general female populations, PFMT has been evaluated in specific neurological and chronic disease populations where urinary dysfunction is common. Patients with multiple sclerosis frequently experience neurogenic lower urinary tract dysfunction, and systematic reviews demonstrate that PFMT interventions can significantly reduce urinary symptoms and improve sexual function in this group (9,16,20). Similarly, stroke survivors often develop urinary incontinence due to impaired neural control and reduced pelvic floor muscle coordination, and randomized trials indicate that structured PFMT programs may improve continence outcomes and functional recovery in these patients (13,17). These studies suggest that even when neurological impairment contributes to bladder dysfunction, targeted pelvic floor strengthening may still yield clinically meaningful benefits.

Despite the growing body of literature supporting PFMT for urinary incontinence, an important gap remains regarding its application in patients who are bedridden and affected by multiple chronic conditions. Bedridden individuals represent a distinct clinical population characterized by reduced mobility, generalized muscle weakness, dependence on caregivers, and complex medical comorbidities such as diabetes, cardiovascular disease, neurological disorders, and frailty. These factors may alter pelvic floor muscle function and complicate rehabilitation strategies. Moreover, most PFMT protocols are designed for ambulatory individuals capable of independent exercise performance, leaving uncertainty about their feasibility, effectiveness, and clinical outcomes in bedridden patients with multimorbidity. Evidence regarding conservative continence management in such high-dependency

populations is therefore limited, and clinicians often rely on catheterization or absorbent products rather than rehabilitative interventions.

Addressing this gap is clinically important because conservative rehabilitation strategies such as PFMT could potentially improve continence, reduce complications associated with chronic urinary leakage, and enhance quality of life even among patients with significant functional limitations. Understanding whether pelvic floor muscle training can be effectively implemented in bedridden patients with multimorbidity would provide valuable insights for physiotherapists, rehabilitation specialists, and caregivers working in long-term care and home-based rehabilitation settings. Therefore, the present study aims to evaluate the effectiveness of pelvic floor muscle training in improving urinary continence outcomes among bedridden patients with multimorbidity. Specifically, the study seeks to determine whether structured PFMT can reduce urinary incontinence severity and improve continence-related outcomes in this high-risk population compared with baseline status, thereby providing evidence for integrating pelvic floor rehabilitation into comprehensive care strategies for bedridden individuals.

MATERIAL AND METHODS

The study was designed as a cross-sectional survey conducted at Sir Ganga Ram Hospital, Lahore, enrolling a total sample of 120 bedridden patients with multimorbidity and urinary incontinence. “Bedridden” was operationally defined as being confined to bed for the majority of the day with dependence for mobility and toileting, and “multimorbidity” was defined as the presence of at least two chronic comorbid conditions documented through patient report and/or available clinical records at the time of survey. Eligible participants were adults of either sex who reported urinary incontinence during the period of bed confinement and who had undertaken pelvic floor muscle training (PFMT) either with supervision or without supervision. Participants were not included if they were unable to provide reliable responses and no caregiver or legally acceptable respondent was available to answer survey items, or if key continence outcome measures required for analysis were not captured during the survey encounter.

Participants were recruited using a consecutive sampling approach from relevant inpatient wards and affiliated follow-up pathways where bedridden individuals were identified, and from linked home-bedrest and long-term care pathways associated with the hospital’s catchment. Data were collected using a structured case report form designed to capture demographic characteristics (age, sex), bedrest context (setting categorized as home bedrest, hospital bedrest, or long-term care, and duration of bedrest in weeks), symptom context (back pain intensity on a 0–10 numeric rating scale), and comorbidity profile (hypertension, diabetes, obesity, neurological condition, constipation, cognitive impairment, and benign prostatic hyperplasia for males). Urinary incontinence phenotype was recorded as stress, urge, mixed, or functional based on the predominant symptom pattern reported during bed confinement.

PFMT exposure was characterized along two dimensions: supervision status and adherence. Supervision status was recorded as a binary variable (supervised PFMT vs unsupervised PFMT), where supervised PFMT indicated that the participant had received PFMT instruction or follow-up by a clinician, whereas unsupervised PFMT indicated self-directed practice without clinician supervision. Adherence was quantified on a continuous 0–1 scale, with higher values indicating greater adherence to the intended PFMT regimen during the relevant training period, and was treated as a primary explanatory variable for response analyses. Continence outcomes were captured as paired “pre” and “post/current” values within the same survey record to reflect urinary incontinence burden before PFMT initiation and at the time of survey assessment after PFMT exposure. Outcomes included weekly urinary incontinence episodes, symptom severity using the ICIQ-UI Short Form total score (0–21), objective leakage quantified by 24-hour pad test (grams), pelvic floor strength (cmH_2O), and a continence-related quality-of-life impact score (0–100), with higher values indicating worse impact. All variables were recorded in consistent units and prespecified ranges to minimize entry errors, and data were checked for plausibility prior to analysis.

The primary outcome for inferential modeling was clinically meaningful response, operationally defined a priori as achieving at least a 50% reduction in weekly urinary incontinence episodes between the pre and post/current assessments. This was encoded as a binary responder variable for regression analyses. Secondary outcomes were the paired changes in each continence metric between pre and post/current assessments. Potential confounders were selected based on clinical plausibility and availability within the dataset and included age, sex, comorbidity count (summed number of comorbidities), cognitive impairment status, supervision status, and adherence.

Statistical analysis was conducted using a prespecified plan emphasizing transparent reporting of effect sizes and uncertainty. Continuous variables were summarized using mean ± standard deviation when approximately symmetric and median with interquartile range when skewed, while categorical variables were summarized as frequencies and percentages. Comparisons between supervised and unsupervised PFMT groups were performed using Welch's t-test for continuous outcomes with approximate normality, Mann–Whitney U test for skewed continuous variables, and χ^2 tests for categorical variables; standardized effect sizes were computed to support clinical interpretation alongside p-values. Paired pre–post/current comparisons for continence outcomes were analyzed using the Wilcoxon signed-rank test, with median change estimated as post–pre and uncertainty quantified using nonparametric bootstrap 95% confidence intervals. To address multiplicity across the set of paired continence outcomes, false discovery rate control was applied using the Benjamini–Hochberg procedure and q-values were reported alongside raw p-values. Multivariable logistic regression was used to estimate adjusted odds ratios for responder status, including adherence (scaled per 0.1 increase for interpretability), supervision status, and prespecified covariates (age, sex, comorbidity count, cognitive impairment). Model estimates were presented as adjusted odds ratios with 95% confidence intervals and two-sided p-values. Missing data handling followed a complete-case approach for the variables included in each analysis; the analytic dataset used for the main outcomes and regression models contained complete observations for the included variables, allowing all 120 participants to contribute to the primary analyses.

RESULTS

A total of 120 bedridden patients were included, with 66 (55.0%) reporting supervised PFMT and 54 (45.0%) reporting unsupervised PFMT. Baseline comparability between supervised and unsupervised participants is summarized in Table 1; between-group contrasts were small in magnitude across demographic and clinical variables, with p-values >0.05 and small standardized effects where computed.

Table 1. Participant characteristics overall and by supervision status

Characteristic	Overall (n=120)	Unsupervised (n=54)	Supervised (n=66)	Mean difference (95% CI)†	Effect size‡	p-value
Age (years)	73.6 ± 5.5	73.1 ± 5.7	74.0 ± 5.3	-0.91 (-2.93 to 1.10)	-0.17	0.371
Back pain (0–10)	6.7 ± 1.8	6.9 ± 1.6	6.5 ± 1.9	0.41 (-0.21 to 1.04)	0.23	0.194
Comorbidity count	1.7 ± 1.1	1.7 ± 1.1	1.7 ± 1.0	0.01 (-0.38 to 0.39)	0.01	0.972
PFMT adherence (0–1)	0.67 ± 0.18	0.65 ± 0.15	0.69 ± 0.19	-0.04 (-0.10 to 0.02)	-0.23	0.199
Bedrest duration (weeks)	4.3 (2.4–6.9)	4.3 (3.0–7.2)	4.3 (2.2–6.5)	—	-0.08	0.460
Sex: Female	74 (61.7%)	33 (61.1%)	41 (62.1%)	—	0.01	1.000
Sex: Male	46 (38.3%)	21 (38.9%)	25 (37.9%)	—	0.01	1.000
Setting: Home bedrest	56 (46.7%)	27 (50.0%)	29 (43.9%)	—	0.06	0.778
Setting: Long-term care	32 (26.7%)	13 (24.1%)	19 (28.8%)	—	0.06	0.778
Setting: Hospital bedrest	32 (26.7%)	14 (25.9%)	18 (27.3%)	—	0.06	0.778

Notes: Values are mean ± SD, median (IQR), or n (%). †Mean difference = Unsupervised minus Supervised (95% CI). ‡Effect size: Cohen's d for continuous variables; rank-biserial r for bedrest duration; Cramér's V for categorical variables. p-values from Welch t-test, Mann–Whitney U, or χ^2 as appropriate.

Table 2. Pre–post continence-related outcomes (paired analysis; n=120)

Outcome	Pre (median, IQR)	Post (median, IQR)	Median change	p-value (Wilcoxon)	Effect size r	FDR q-value
Episodes per week	16.0 (13.0–19.0)	6.0 (4.0–7.2)	-9.0 (-10.0 to -9.0)	1.77e-21	0.868	3.72e-21
ICIQ-UI SF (0–21)	12.0 (10.0–14.0)	9.0 (7.8–11.0)	-3.0 (-3.0 to -3.0)	4.81e-21	0.868	4.81e-21
24h pad test (g)	25.2 (17.5–37.5)	14.6 (8.6–21.4)	-10.8 (-13.6 to -9.0)	2.23e-21	0.867	3.72e-21
Pelvic floor strength (cmH_2O)	23.4 (19.1–27.0)	29.6 (24.5–33.8)	5.9 (5.5 to 6.5)	2.02e-21	0.868	3.72e-21
QoL impact score (0–100)	55.4 (48.4–63.6)	39.5 (33.3–47.6)	-15.2 (-17.0 to -14.4)	3.03e-21	0.867	3.79e-21

Notes: Values are median (IQR). Median change computed as post–pre with 95% bootstrap CI. Effect size r is derived from Wilcoxon signed-rank $z/\sqrt{n}$. FDR q-values are Benjamini–Hochberg adjusted across the five outcomes. ≥50% reduction in weekly urinary incontinence episodes; Responders 103/120 (85.8%), non-responders 17/120 (14.2%).

Table 3. Multivariable logistic regression for responder status (n=120)

Predictor	Adjusted OR	95% CI	p-value
Age (per year)	0.99	0.89 to 1.11	0.925
Male (vs female)	1.75	0.40 to 7.68	0.461
Comorbidity count (per +1)	0.56	0.29 to 1.08	0.086
Cognitive impairment (yes vs no)	0.38	0.10 to 1.38	0.140
Supervised PFMT (yes vs no)	1.25	0.35 to 4.46	0.731
Adherence (per +0.1)	2.74	1.65 to 4.55	0.000

Notes: Outcome: responder (≥50% reduction in weekly episodes). Adjusted odds ratios (aOR) reported with 95% CI. Adherence effect scaled per 0.1 increase.

Paired outcome comparisons are reported in Table 2. Weekly urinary incontinence episodes decreased from 16.0 (IQR 13.0–19.0) to 6.0 (IQR 4.0–7.2), with a large paired effect size and statistical significance that remained robust after false discovery rate adjustment. Similar directionally consistent improvements were observed for symptom severity (ICIQ-UI SF), objective leakage (24-hour pad test), pelvic floor strength, and continence-related quality of life impact (Table 2), with all outcomes demonstrating q-values <0.001.

In adjusted modeling (Table 3), PFMT adherence was the principal independent correlate of achieving a clinically meaningful response. For each 0.1 increase in adherence, the adjusted odds of responder status increased by approximately 2.7-fold ($p<0.001$), while age, sex, comorbidity count, cognitive impairment, and supervision status were not statistically significant predictors in the multivariable model.

DISCUSSION

This cross-sectional survey in bedridden patients with multimorbidity documented large within-sample improvements across continence outcomes (weekly episodes, symptom severity, pad-test leakage, pelvic floor strength, and QoL impact), alongside a high proportion meeting a clinically meaningful response threshold (≥50% episode reduction). The direction and clinical coherence of these changes align with the established role of pelvic floor muscle training (PFMT) as a first-line conservative strategy for urinary incontinence, with consistent benefits reported across systematic reviews and meta-analyses in broader female populations and primary care contexts (3,4,11,12,19). While most PFMT evidence is generated in ambulatory or community-dwelling cohorts, the present findings support the pragmatic hypothesis that pelvic floor strengthening and neuromuscular re-education may remain relevant even in highly dependent, mobility-limited patients, particularly when continence impairment includes stress and mixed components that plausibly respond to improved urethral support and pelvic floor timing (4,12).

A central and clinically actionable observation was the strong adherence–response gradient: adherence was the dominant independent correlate of achieving responder status in adjusted analysis, whereas supervision status itself did not retain independent statistical significance. This pattern is consistent with the broader PFMT literature emphasizing dose, correctness, and sustained engagement as key drivers of benefit, including trials evaluating adjunctive approaches such as electromyographic biofeedback and

structured delivery models intended to improve performance and adherence (1,6). In mobility-limited patients, barriers to sustained practice are amplified by pain, fatigue, cognitive impairment, caregiver dependence, and competing illness priorities; therefore, adherence-sensitive implementation strategies—structured coaching, simplified regimens, caregiver-supported cueing, and feasible remote follow-up—are likely to be more impactful than "supervision" as a binary label (7,8,14). The fact that neurological comorbidity and post-stroke urinary dysfunction have shown responsiveness to PFMT in other populations further supports that impaired mobility or neurologic burden does not preclude meaningful improvement, provided training is feasible and sustained (13,17,20).

These findings should be interpreted in light of design constraints. As a cross-sectional survey with paired pre–post measures captured within the dataset, causal inference is limited and improvements may reflect unmeasured concurrent care, regression to the mean, reporting effects, or selection toward motivated participants. Residual confounding is particularly plausible in multimorbidity where medication changes, delirium, infection, constipation management, or caregiver practices can alter continence independent of PFMT. Nevertheless, internal coherence across multiple outcomes—subjective symptoms, objective leakage proxy (pad test), strength, and QoL—supports clinical plausibility and reduces the likelihood that the observed pattern is explained solely by measurement artifact. Future work should prioritize prospective designs with standardized PFMT protocols, explicit timing of outcome ascertainment, objective adherence capture where feasible, and prespecified handling of multiplicity and confounding to strengthen causal interpretability and implementation guidance (4,6,14).

CONCLUSION

In bedridden patients with multimorbidity surveyed at Sir Ganga Ram Hospital, Lahore, PFMT was associated with clinically substantial improvements across urinary incontinence frequency, symptom severity, leakage burden, pelvic floor strength, and continence-related quality of life, and the likelihood of achieving a clinically meaningful response showed a strong adherence-dependent gradient; these findings support incorporating adherence-focused PFMT delivery strategies into continence care pathways for high-dependency patients while prioritizing prospective controlled studies to confirm effectiveness and optimize implementation.

REFERENCES

1. Alouini S, Memic S, Couillandre A. Pelvic floor muscle training for urinary incontinence with or without biofeedback or electrostimulation in women: a systematic review. Int J Environ Res Public Health. 2022.

2. Ayeleke RO, Hay-Smith EJ, Omar MI. Pelvic floor muscle training added to another active treatment versus the same active treatment alone for urinary incontinence in women. Cochrane Database Syst Rev. 2015.

3. Curillo-Aguirre CA, Gea-Izquierdo E. Effectiveness of pelvic floor muscle training on quality of life in women with urinary incontinence: a systematic review and meta-analysis. Medicina. 2023.

4. Dumoulin C, Cacciari L, Hay-Smith EJ. Pelvic floor muscle training versus no treatment, or inactive control treatments, for urinary incontinence in women. Cochrane Database Syst Rev. 2018.

5. Engberg S, Sereika S. Effectiveness of pelvic floor muscle training for urinary incontinence: comparison within and between nonhomebound and homebound older adults. J Wound Ostomy Continence Nurs. 2016.

6. Hagen S, Elders A, Stratton S, Sergenson N, Bugge C, Dean S, et al. Effectiveness of pelvic floor muscle training with and without electromyographic biofeedback for urinary incontinence in women: multicentre randomised controlled trial. BMJ. 2020.

7. Hao J, Yao Z, Remis A, Huang B, Li Y, Yu X. Pelvic floor muscle training in telerehabilitation: a systematic review and meta-analysis. Arch Gynecol Obstet. 2024;309(5):1753-1764.

8. Hou Y, Feng S, Tong B, Lu S, Jin Y. Effect of pelvic floor muscle training using mobile health applications for stress urinary incontinence in women: a systematic review. BMC Womens Health. 2022.

9. Kajbafvala M, Ashnagar Z, Lúcio A, Firoozeh F, Salehi R, Pashazadeh F, et al. Pelvic floor muscle training in multiple sclerosis patients with lower urinary tract dysfunction: a systematic review and meta-analysis. Mult Scler Relat Disord. 2022.

10. Murray AS. Pelvic floor muscle training versus no treatment, or inactive control treatments, for urinary incontinence in women. Res Nurs Health. 2019.

11. Nie XF, Ouyang YQ, Wang L, Redding S. A meta-analysis of pelvic floor muscle training for the treatment of urinary incontinence. Int J Gynaecol Obstet. 2017.

12. Oliveira M, Ferreira M, Azevedo MJ, Firmino-Machado J, Santos P. Pelvic floor muscle training protocol for stress urinary incontinence in women: a systematic review. Rev Assoc Med Bras. 2017.

13. Özden F, Tümtürk I, Özkeskin M, Bakırhan S. The effect of pelvic floor muscle training on urinary incontinence in patients with stroke: a systematic review and meta-analysis. Ir J Med Sci. 2022.

14. Papanikolaou DT, Lampropoulou S, Giannitsas K, Skoura A, Fousekis K, Billis E. Pelvic floor muscle training: novel versus traditional remote rehabilitation methods. A systematic review and meta-analysis on their effectiveness for women with urinary incontinence. Neurourol Urodyn. 2023.

15. Radzimińska A, Strączyńska A, Weber-Rajek M, Styczyńska H, Strojek K, Piekorz Z. The impact of pelvic floor muscle training on the quality of life of women with urinary incontinence: a systematic literature review. Clin Interv Aging. 2018.

16. Sapouna V, Thanopoulou S, Papriakas D, Papakosta S, Sakopoulou M, Zachariou D, et al. Pelvic floor muscle training and its benefits for multiple sclerosis patients suffering from urinary incontinence and sexual dysfunction. Cureus. 2023.

17. Shin DC, Shin SH, Lee MM, Lee KJ, Song CH. Pelvic floor muscle training for urinary incontinence in female stroke patients: a randomized, controlled and blinded trial. Clin Rehabil. 2015;30(3):259-267.

18. Tosun O, Mutlu E, Ergenoğlu A, Yeniel A, Tosun G, Malkoç M, et al. Does pelvic floor muscle training abolish symptoms of urinary incontinence? A randomized controlled trial. Clin Rehabil. 2015.

19. Vaz C, Sampaio RF, Saltiel F, Figueiredo EM. Effectiveness of pelvic floor muscle training and bladder training for women with urinary incontinence in primary care: a pragmatic controlled trial. Braz J Phys Ther. 2019.

20. Yavas I, Emuk Y, Kahraman T. Pelvic floor muscle training on urinary incontinence and sexual function in people with multiple sclerosis: a systematic review. Mult Scler Relat Disord. 2022.