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Role of Pelvic-Floor Muscle Training in the Management of Postpartum Urinary Incontinence: A Narrative Review

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Abstract:
Postpartum urinary incontinence is a common pelvic-floor disorder that may interfere with physical activity, social participation, sexual health and quality of life after childbirth. Pelvic-floor muscle training (PFMT) is a conservative intervention intended to improve urethral support, increase pelvic-floor muscle strength and coordination, and reduce leakage during rises in intra-abdominal pressure. This narrative review synthesizes evidence published from 2010 through 2020 concerning the role of PFMT in postpartum urinary incontinence. Literature was identified through focused searches of PubMed/MEDLINE, PEDro and the Cochrane Library using combinations of terms related to postpartum status, urinary incontinence, pelvic-floor muscles, exercise and physiotherapy. Priority was given to systematic reviews, randomized controlled trials, clinical guidance and clinically relevant cohort studies. Evidence supports PFMT as a low-risk first-line conservative strategy for women with urinary incontinence in general; however, postpartum-specific findings are heterogeneous. Trials differed in participant selection, timing, supervision, exercise dose, adherence and outcome measurement. Some supervised programmes improved continence, symptom-related bother and pelvic-floor muscle function, whereas other well-conducted trials found no significant reduction in postpartum incontinence prevalence. The strongest benefits appear more likely when women receive an individual assessment, confirmation of a correct contraction, progressive training, adherence support and adequate follow-up. PFMT should therefore be delivered as an individualized rehabilitation programme rather than as brief, unsupervised verbal advice. Further research should clarify optimal dose, timing, responder characteristics and long-term effectiveness.

Keywords: postpartum; urinary incontinence; pelvic-floor muscle training; physiotherapy; women's health; rehabilitation

1. Introduction

Urinary incontinence (UI) is defined clinically as involuntary leakage of urine and includes stress, urgency and mixed presentations. Pregnancy and childbirth place substantial mechanical, neuromuscular and connective-tissue demands on the pelvic floor. Consequently, leakage during coughing, sneezing, lifting or exercise may begin during pregnancy or persist after delivery. Standardized terminology is essential because postpartum women may describe leakage, urgency, heaviness and voiding difficulty in overlapping ways, while each symptom can require a different assessment pathway (Haylen et al., 2010). Postpartum UI is sometimes normalized as an inevitable consequence of childbirth. This interpretation can delay help-seeking and reduce referral to pelvic-health physiotherapy. Although symptoms may improve spontaneously during the first postpartum months, persistent leakage can restrict exercise, childcare tasks, work participation, intimacy and confidence. The condition is therefore relevant not only to continence care but also to rehabilitation and public health.

Pelvic-floor muscle training is the planned and repeated contraction and relaxation of the pelvic-floor musculature with the aim of improving strength, endurance, coordination and functional control. It is non-invasive, inexpensive and compatible with breastfeeding and most postpartum routines. Reviews of female UI generally support PFMT as first-line conservative management (Price et al., 2010; Dumoulin et al., 2018). Postpartum evidence, however, is more nuanced because recovery after childbirth, levator injury, baseline continence, intervention intensity and adherence vary considerably. This review evaluates the evidence available between 2010 and 2020 and translates it into clinically responsible physiotherapy practice.

2. Review Approach

A focused narrative search was designed to identify literature published from January 2010 through December 2020. PubMed/MEDLINE, PEDro and the Cochrane Library were searched using combinations of "postpartum" OR "postnatal," "urinary incontinence," "stress urinary incontinence," "pelvic floor muscle training," "pelvic floor exercise," "physiotherapy," and "randomized controlled trial." Reference lists of major systematic reviews were used to locate additional eligible publications. English-language systematic reviews, randomized trials, clinical reviews, guidelines and prospective studies directly relevant to pregnancy- or childbirth-associated pelvic-floor rehabilitation were prioritized. Literature outside the specified period and studies unrelated to conservative pelvic-floor rehabilitation were not used as core evidence. Because this is a narrative review, no pooled effect estimate was calculated.

3. Postpartum Urinary Incontinence

3.1 Mechanisms and contributing factors

Continence depends on coordinated interaction among the bladder, urethra, pelvic-floor muscles, connective tissues and neural control. During a rise in intra-abdominal pressure, timely pelvic-floor activation contributes to urethral closure and structural support. Pregnancy can alter muscle length, fascial loading and neuromuscular control, while vaginal delivery may add stretching, denervation or

levator trauma. These changes do not affect all women equally, and a single mechanism cannot explain every postpartum presentation.

Clinical risk is influenced by antenatal UI, parity, delivery mode, prolonged or assisted second stage, infant birth weight, perineal trauma, obesity and individual tissue characteristics. Structural injury alone also does not determine symptoms. Hilde et al. (2013) stratified primiparous women by major levator ani defects and found similar non-significant continence effects of their training programme in women with and without such defects. Bø et al. (2017) likewise showed that diastasis recti was not associated with weaker pelvic-floor muscles or greater UI, cautioning against simplistic explanations based on abdominal separation.

3.2 Types and consequences

Stress UI, characterized by leakage with effort or exertion, is particularly relevant to postpartum physiotherapy. Urgency UI involves leakage associated with a compelling urge, and mixed UI combines stress and urgency features. A bladder diary and symptom history help distinguish these patterns. The physiotherapist should also identify pain, prolapse symptoms, bowel dysfunction, infection indicators and voiding difficulty, because these findings can modify treatment or require medical referral.

The burden of UI is not captured by leakage frequency alone. A small amount of leakage can be highly disruptive for a woman returning to running or employment, whereas another woman may report less bother despite more frequent episodes. Trials increasingly include symptom-related bother and quality-of-life measures alongside continence prevalence. This broader approach is important when judging clinically meaningful benefit.

4. Rationale for Pelvic-Floor Muscle Training

PFMT applies principles of motor learning and skeletal-muscle conditioning. Initial instruction aims to isolate a correct contraction without excessive breath-holding, gluteal substitution or downward straining. Training then targets strength through near-maximal contractions, endurance through sustained holds, and coordination through rapid contractions and pre-activation before activities that provoke leakage. Relaxation between repetitions is necessary, particularly when pain or overactivity is present.

The expected continence effect is multifactorial. Repeated training may improve muscle force and endurance, enhance elevation and support of the pelvic organs, and increase the speed of urethral closure during sudden pressure. Teaching a voluntary contraction immediately before coughing or lifting—the functional “knack”—connects isolated exercise to daily activity. Physiological change is unlikely when advice is limited to an unidentified number of “Kegels” without assessment, progression or adherence monitoring.

5. Evidence of Effectiveness

5.1 Evidence from systematic reviews

Price et al. (2010) concluded that pelvic-floor exercise was beneficial for female stress UI, while emphasizing variation in protocols. The 2012 Cochrane review by Boyle et al. found evidence that PFMT could prevent postpartum UI in women having their first baby, although treatment evidence was less certain. A later review by Mørkved and Bø (2014) supported supervised strength-training principles during pregnancy and after delivery.

Dumoulin et al. (2018), reviewing women with UI across life stages, reported substantially greater likelihood of cure or improvement with PFMT than with inactive control conditions. These results establish PFMT as a first-line treatment for female stress UI but cannot automatically be applied to every postpartum population. Davenport et al. (2018) found that prenatal exercise, including but not limited to PFMT, reduced the odds of prenatal and postnatal UI. The analysis nevertheless combined exercise formats and therefore does not isolate the effect of postpartum PFMT.

The 2020 Cochrane update by Woodley et al. provided the most comprehensive synthesis within the selected period. Structured antenatal PFMT for continent women reduced the risk of UI in late pregnancy and the early-to-mid postnatal period. In contrast, evidence for PFMT begun after delivery as treatment for established postpartum UI remained uncertain, with heterogeneity and imprecision limiting confidence. This distinction between prevention and treatment is central: a programme effective before symptoms develop may not produce the same effect when initiated after childbirth in a mixed population.

5.2 Evidence from randomized and clinical studies

Postpartum trials have produced contrasting findings. Hilde et al. (2013) randomized 175 primiparous women to a 16-week programme involving weekly supervised group training plus daily home exercise or to control care. At six months postpartum, UI prevalence did not differ significantly between groups. The trial included women with and without UI and gave all participants initial instruction, which may have reduced between-group contrast.

Fritel et al. (2015) similarly found that supervised prenatal PFMT was not superior to written instructions for reducing UI severity at 12 months postpartum. These neutral results show that supervision alone does not guarantee effectiveness and that control groups receiving credible instruction may also improve. They also underline the importance of baseline risk, intervention contrast and long-term adherence.

Other studies reported favourable outcomes. Kahyaoglu Sut and Balkanli Kaplan (2016) observed greater improvement in pelvic-floor muscle strength and prevention of deterioration in urinary symptoms and quality of life with exercises performed during pregnancy and the postpartum period. Sangsawang and Sangsawang (2016) reported that a six-week supervised programme reduced stress UI severity during pregnancy, supporting the value of structured instruction. Gagnon et al. (2016) found improvement using a two-tiered postpartum approach that allowed women to select a level of support.

In an assessor-blinded randomized trial, Sigurdardottir et al. (2020) reported that individualized postpartum PFMT reduced UI and related bother at six months and improved pelvic-floor muscle strength and endurance. The programme's individualized assessment and repeated physiotherapist contact may explain why its findings differed from trials based mainly on group instruction. Collectively, these studies suggest that programme quality, participant targeting and adherence may be as important as the exercise label itself.

6. Clinical Physiotherapy Application

6.1 Assessment

A postpartum continence assessment should establish symptom type, onset, frequency, triggers, pad use, urgency, nocturia, bowel symptoms, pelvic pain, sexual concerns and functional goals. Obstetric history

should include delivery mode, perineal trauma and complications. Where appropriate and with informed consent, a trained clinician may use vaginal palpation to confirm contraction technique and grade strength, endurance, repetition capacity and relaxation. Alternatives include observation, external palpation, ultrasound or pressure measurement when available. Red flags such as haematuria, recurrent infection, urinary retention, severe pelvic pain, suspected fistula or neurological symptoms warrant medical evaluation.

6.2 Programme design and progression

Evidence does not identify one universally optimal postpartum protocol. A reasonable programme begins only after individualized assessment and respects tissue healing, pain and medical advice. Women should learn an inward lift and closure around the urethral, vaginal and anal openings while breathing normally. A common strength-oriented approach uses sets of controlled near-maximal contractions with complete relaxation, supplemented by shorter rapid contractions. Dose should be adjusted to the woman's verified capacity rather than prescribed identically to all participants.

Progression can involve longer holds, more repetitions, more challenging positions and integration into tasks such as lifting the infant, sit-to-stand, coughing and graded return to exercise. The aim is not endless repetition; it is improved performance with good technique. Women with pain, delayed relaxation or suspected overactivity may require down-training and coordination work instead of additional strengthening.

6.3 Supervision, adherence and education

Supervision allows correction of bearing down, substitution and breath-holding, and it enables the exercise dose to be progressed. Adherence can be supported through written plans, diaries, reminders, scheduled review and linkage to personally meaningful goals. Education should set realistic expectations: improvement usually requires sustained practice, and symptoms may not resolve immediately. Biofeedback may help selected women recognize contraction and relaxation, but it is an adjunct rather than a substitute for skilled assessment and active training.

7. Practical Evidence Summary

Evidence source	Population/focus	Main finding	Clinical meaning
Boyle et al., 2012	Antenatal/postnatal women	Evidence favoured prevention in some first-time mothers; treatment certainty was limited.	Separate prevention from treatment questions.
Hilde et al., 2013	Primiparous postpartum women	No significant reduction in UI prevalence after supervised group PFMT plus home training.	Not every broadly offered programme outperforms instruction.

Evidence source	Population/focus	Main finding	Clinical meaning
Fritel et al., 2015	Pregnant nulliparous women	Supervised prenatal training was not superior to written advice at 12 months postpartum.	Control care and long-term adherence influence results.
Dumoulin et al., 2018	Women with UI	PFMT improved cure and improvement outcomes versus inactive controls.	Supports PFMT as first-line conservative care.
Sigurdardottir et al., 2020	Postpartum women	Individualized PFMT reduced UI and bother and improved muscle function.	Assessment and tailored supervision may enhance benefit.
Woodley et al., 2020	Antenatal/postnatal women	Prevention evidence was stronger than evidence for postpartum treatment.	Counsel women honestly about uncertainty and expected response.

8. Safety, Referral and Scope

PFMT is generally low risk, but postpartum rehabilitation must be individualized. Exercise should not provoke persistent pain, pressure, bleeding or urinary difficulty. Physiotherapists should work within local professional scope and coordinate with obstetric, gynaecological or urological services when diagnosis is uncertain or conservative treatment fails. Referral is also appropriate when symptoms suggest significant prolapse, fistula, infection, retention or neurological disease.

A woman-centred approach requires privacy, culturally sensitive communication and explicit consent for internal assessment. Treatment goals should reflect the woman's priorities, whether these involve continence during childcare, return to work, sexual activity or sport. Symptom improvement, functional participation and quality of life are all valid outcomes.

9. Limitations of the Evidence

The evidence base is limited by heterogeneous definitions, mixed samples, variable timing after delivery and inconsistent intervention reporting. Some trials enrolled continent and incontinent women together, while others combined antenatal and postnatal training. Controls ranged from usual care to detailed exercise instruction. Blinding participants and therapists is rarely possible, and self-reported adherence can overestimate actual training. Many studies measured short-term outcomes, leaving uncertainty about long-term maintenance.

This article is a narrative rather than systematic review and does not claim exhaustive study capture or perform formal risk-of-bias scoring. Its conclusions should therefore be interpreted as a clinically oriented synthesis of selected evidence from 2010–2020, not as a new pooled estimate.

10. Future Directions

Future trials should distinguish prevention from treatment, define postpartum timing clearly and report exercise dose, supervision, adherence and adverse events in reproducible detail. Stratification by baseline UI type, levator injury, delivery characteristics and ability to contract correctly may identify responders. Research should also test pragmatic models such as tele-rehabilitation, stepped care and integration of pelvic-floor assessment into routine postpartum services, while retaining meaningful outcomes beyond leakage counts.

11. Conclusion

Pelvic-floor muscle training remains an appropriate first-line conservative option for postpartum urinary incontinence because it is non-invasive, functionally relevant and supported by the broader female continence literature. Between 2010 and 2020, postpartum-specific evidence was mixed: structured programmes were beneficial in some studies, while other trials found no significant advantage over instruction or usual care. The most defensible clinical approach is individualized physiotherapy that confirms correct contraction, prescribes progressive training, addresses adherence and monitors symptoms and function. Women should be informed that response varies and that persistent or complex symptoms warrant further assessment.

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