



Recent Trends Used in Pelvic Floor Rehabilitation to Improve Maternal Wellbeing – A Narrative Review

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Abstract

Background: Pelvic Floor Dysfunction (PFD) is a silent issue in women's health care in recent era among women of all ages [1]. Patients with PFD usually present with symptom of incontinence, pelvic organ prolapses [2]. Recent trends are practiced in training the pelvic floor [7] in improving physical fitness, muscular strength, endurance, flexibility and body composition [4]. A standardized principal FITT can aid as a baseline level of fitness. Modern trends like Intra-vaginal Ultrasound imaging shows specific measurement based on the action of the pelvic floor muscles and provide as feedback during various maneuvers.

Objective: The purpose of the study is to know the recent trends that are being practiced in PFR.

Methodology: Study design: A narrative review were Goggle scholar and PubMed, Embase, Cochrane Library were used as search engine. Total article selected were n = 186 amongst 45 articles were included, based on CASP >7, 8 articles were selected for study.

Result: The result concluded Pelvic Floor Muscle Training (PFMT) is level 1 evidence-based treatment for urinary incontinence (UI). Systematic review and Meta-analysis of the available evidence suggests that PFMT with well-designed strategies can improve Quality of life in women health. Recent emerging techniques like Trans-vaginal Ultrasound, EMG, vaginal instruments, Biofeedback, Pelvic trainer, E-health care system and behavioral therapy plays an integral part of Pelvic floor Rehabilitation (PFR).

Conclusion: There is evidence for the widespread recommendation that PFR helps women with all types of urinary incontinence. Recent trends and evidence-based techniques helps to improve the quality of life in women health by reducing the burden of pelvic floor dysfunction prevalence.

Keywords: Incontinence; Pelvic Floor; Training; Physical Therapy; Rehabilitation; Pelvic Floor Equipment's; Recent Trends

Introduction

Pelvic Floor Dysfunction (PFD) is one of the largest silent issues in women's health care in recent era affecting women of all ages [1]. The pelvic floor is made up of a layer of muscles covering the bottom of the pelvis that support the bladder and bowel in men and bladder, bowel and womb in women. The muscles acts like a hammock with origin from the front of the pelvis up to the tail-bone (coccyx) as insertion, and side-to-side. Delancey and Norton quoted that when the pelvic floor muscles have normal strength and tone, pelvic organs are supported with limited tension on the ligaments and fascia of the pelvis [7]. During Childbirth and aging

the pelvic floor muscles stretches and undergo physical and structural changes leading to weakness. Hypertonicity of the muscles is also seen due to myofascial pain, dyspareunia, vaginismus, and vulvodinia associated with stress. Strain on the pelvic connective tissues can lead to various pelvic floor disorders. Pelvic floor physical therapy (PFPT) targets to reverse the muscle and connective tissue damage that are caused due to various reasons and restore normal pelvic muscle strength, endurance, power, resting tone.

Pelvic floor dysfunction patients usually present with symptom of incontinence, pelvic organ prolapse, nonspecific low back pain,

diminution in sexual life [2]. Urinary Incontinence is being common condition that is frequently being untreated. It is estimated about 50% of adult women and 31% of adult men have urinary incontinence, but only 25% of those seek care may be due to embarrassment, lack of knowledge about treatment options or a perception that urinary incontinence is a regular inevitable part of aging. Several epidemiological studies have shown an association of SUI (Stress Urinary Incontinence) with nonspecific low back pain (NSLBP). The improvement of Pelvic ground Dysfunction is multifaceted and may be prompted with the aid of using a couple of elements like neurological, emotional, behavioral and environmental [7]. A survey conducted in the year 2010 by National Health and Nutrition Examination Survey (NHNES) reported that the prevalence of pelvic floor dysfunction in women to be 38.7% [2] globally and in India 21.32% [3]. They also stated the association between nutritional or dietary components in relation to healthy life style modifications is required to reduce stress incontinence.

A comprehensive Pelvic floor muscle evaluation is needed for the diagnosis and management of pelvic floor associated conditions. Identifying can help us to create awareness and treat the condition associated with pelvic floor dysfunctions. PFPT is a first line of conservative treatment for many pelvic floor disorders [1]. Pelvic Floor Physical Therapy aims in delivering pelvic muscle strengthening, relaxation and coordination exercises that is performed by a trained physical therapist [2]. The recent techniques used to train the pelvic floor muscles are manual therapy, biofeedback or electrical stimulation, behavioral education and conception of structured home exercise programs [3]. PFPT has strong evidence-based support as a first-line therapy where minimally invasive option is existing to treat many pelvic floor conditions like pelvic organ prolapse (POP), fecal or urinary incontinence, peripartum and postpartum pelvic floor dysfunction and nonspecific low back pain [4,6].

Recent trends are practiced in training the pelvic floor which includes different components improving physical fitness, muscular strength and endurance, flexibility and body composition [4]. A standardized FITT principle can help in achieving threshold levels of frequency (days per week), intensity (level of effort) and duration (time per session), which may vary based on the individual's function and level of fitness [5]. The vaginal weighted cone works as bio-feedback mechanism where the patient is instructed to insert the cone into the vagina and hold in place by pelvic muscle contractions during activity. It works on theories like inhibiting

bladder muscle contraction and improve conscious control by activating the frontal cortex of the brain, that is accountable for the voluntary urinary inhibition reflex. A second theory also suggests that pelvic floor activation of the puborectalis and the external urethral and anal sphincters can lighten up the detrusor muscle via mechanisms of reciprocal inhibition.

Electro diagnostic and therapy like Intra-vaginal Ultrasound imaging show specific measurement of the lifting action of the pelvic floor muscles and provide feedback information in pelvic floor muscles during various maneuvers.

Objective:

The purpose of the study is to know the recent trends and techniques that are being practiced in the field of pelvic floor rehabilitation.

Procedure

The Study design is a narrative review where a wide range of randomized controlled trial, systematic reviews, meta-analysis, non-randomized controlled trail, cohort studies, observational studies, prospective studies and cross-sectional studies were reviewed using search engine strategy like Goggle scholar, PubMed, Embase and Cochrane Library. The articles published in English with a time limit (5years) was reviewed using keywords like Incontinence, pelvic floor training, physical therapy, rehabilitation, FITT principle, pelvic floor equipment's, recent trends with Boolean operators "AND" and "WITH".

Population involved

Pelvic floor dysfunction conditions.

Protocol of review

The process of searching and selecting articles was directed by (PRISMA) guideline by using the following steps.

- **Step 1: Source:** PubMed, Google scholar, Science Direct, WHO regional data base, Wikipedia, papers.
- **Step 2: Study selection:** Randomized control studies, Systematic reviews and Meta-analysis, cohort, observational, cross sectional, prospective study reviews from 2015 to 2022 on pelvic floor exercises in postpartum urinary incontinence, reviews on LMICs and recent trends are included.

- **Step 3: Data Extraction:** Total article selected were n=186, filters duplicate and based on Boolean operator 45 articles were included, based on full article and CASP>7, A total of 8

articles were selected for review. The following data were extracted and entered in table 1 (Level 1 Evidence only) for all included studies. The results are reviewed by the 2 reviewers separately and final data summary made by consensus.

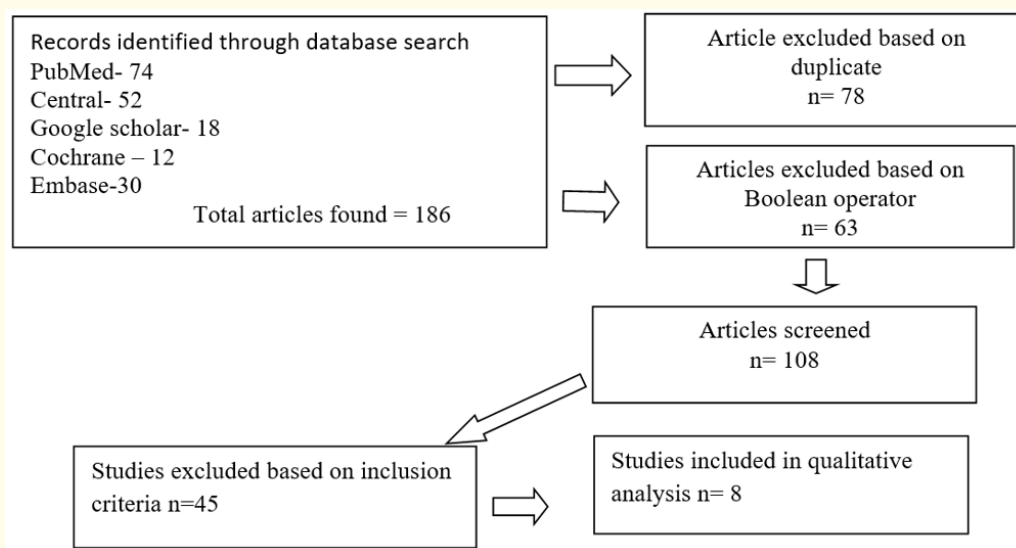


Figure 1: Flow chart of methodology.

Result

Sl No	Author	Title	Result and Conclusion	Level of evidence
1	Cathy L. Melvin Melanie S. Jefferson 2017	A systematic review of lifestyle counseling for diverse patients in primary care [8]	The systematic review compiled existing evidence from randomized trials to inform primary care providers about which lifestyle and behavioral change interventions are shown to be effective for changing patients' diet, physical activity and weight outcomes. Searches identified 444 abstracts from all sources out of which 106 studies were considered. Many studies had reliable findings among various populations which showed that weight and physical activity related outcomes were more prone to change via lifestyle and behavioral counseling interventions than those associated with diet modification. Evidence to support specific interventions for racial and ethnic minorities was promising.	Level1
2	Samuel Fernandez carnero, Jose leuis A riasBuria-2019	Rehabilitative Ultrasound imaging evaluation in physiotherapy: Piloting a Systematic review [9]	The search provided 1029 references about the lumbar region on ultrasound scans of which 996 studies were screened. RCT and study with a validity and reliability references were considered. The most appropriate points were novice versus expert, ultrasound versus electromyography (EMG) which included one RCT, observational, cohort and case reports. The lines of investigation increasingly endorsed the validity of using ultrasound imaging in field of physiotherapy. Post acquisition image analysis could be a future line of research.	Level 1

3	Kathryn Burnett, Elizabeth Kelsch-2019	How fitting is F.I.T.T. A perspective on a transition from the sole use of frequency, intensity, time, and type in exercise prescription [10].	Current guidelines for exercise prescription are characterized by the FITT Principle: Frequency, Intensity, Time, and Type but many studies have focused on the manipulation of FITT components. The study concluded exercise prescription is needed using satisfactory changes in FITT components for better health to overcome the high rates of physical inactivity.	Level 2
4	Gustavo F. S. Latorre, Rogériode Fraga-2019	An ideal e-health system for pelvic floor muscle training adherence: Systematic review [11].	The systematic review showed primarily based on modern-day adherence to literature 12 variables were recognized to create the most beneficial m-App for PFMT. I-Pelvis, m-App and websites were constructed for PFMT which showed as essential part of first-line of management. The patient can be self-involved in efficient interventions of UI and have potentials variables related to adherence to PFMT.	Level 1
5	Shannon L. Wallacea, Lucia D. Millerb, and Kavita Mishra 2019	Pelvic floor physical therapy in the treatment of pelvic floor dysfunction in women [12].	Pelvic floor dysfunction can cause voiding and defecation problems, Pelvic organ prolapse, sexual dysfunction, and pelvic pain. PFPT acts like a functional retraining program to increase pelvic floor muscle strength, endurance, power, and relaxation techniques in patients with PFD. Based on the evidence, PFPT without or with supplemental modalities can decrease the symptoms of urinary incontinence, POP, fecal incontinence, peripartum, postpartum pelvic floor dysfunction, vaginismus and vulvodynia. Currently, there may be conflicting proof concerning the effectiveness of perioperative PFPT.	Level 1
6	Kyannie Risame Ueda da Mata & Rafaela Cristina Monica Costa et.al 2020	Telehealth in the rehabilitation of female pelvic floor dysfunction: a systematic literature review [13].	The systematic review included four studies with 2 RCT which compared telehealth with face-to-face treatment and telehealth with postal treatment. A 2 follow-up and cost analysis reports on telehealth versus postal evaluation was considered where data showed that women who received the intervention remotely presented significant improvement in their incontinence episodes, voiding frequency compared to women who had the face-to-face treatment. Telehealth encouraged an improvement in symptoms of urinary and fecal incontinence, PFM function and quality of life. Telehealth is still emerging but recommendations of the governmental authorities, physical therapy councils of each country need to be considered.	Level 1
7	Gianluca Giordani, Sara De Angelis., et al. 2022	Manual Physiotherapy Combined with Pelvic Floor Training in Women Suffering from Stress Urinary Incontinence and Chronic Nonspecific Low Back Pain: A Preliminary Study [14].	The Randomized study done on twenty-six patients showed combining manual therapy and PFM training with the postural rehabilitation or spinal mobilization may be useful for improving both SUI and NSLBP. It also reflected increase in quality of life of women suffering from SUI associated with NSLBP.	Level 1
8	Xu P, Wang X, Guo P, et al. 2022	The effectiveness of eHealth interventions on female pelvic floor dysfunction: a systematic review and meta-analysis [15].	Twenty-four RCTs were included in this meta-analysis that included 3691 women. The meta-analysis showed that eHealth interventions were not only vital for preventing PFD but also for reducing the severity of PFD. Compared with traditional care, eHealth interventions showed significant positive effects on several outcome indicators like quality of life, pelvic floor type I, type II muscle strength, sexual function, satisfaction and self-efficacy. This study concluded e-Health interventions are an effective upcoming and preventive mode of treatment for female suffering from PFD. Higher quality, larger scale and strictly designed RCTs are warranted to evaluate the effectiveness of eHealth interventions on management of PFD.	Level 1

Table 1

Components of pelvic floor rehabilitation recent trends

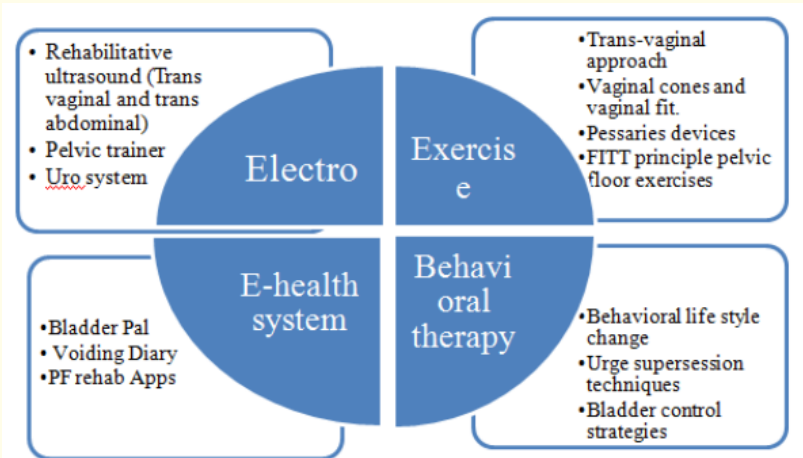


Figure 2

Bladder diary

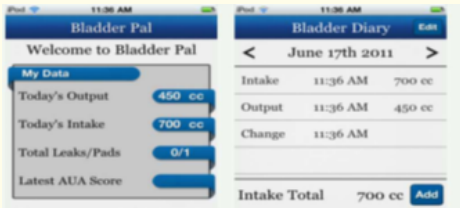


Figure 3

Devices used in recent trends are

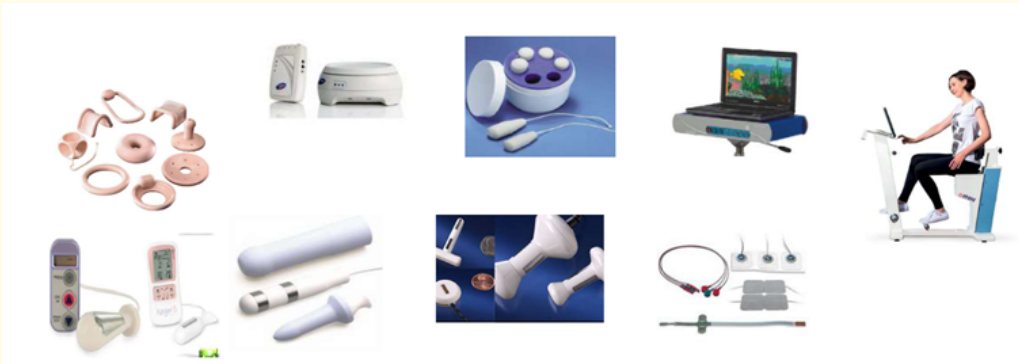


Figure 4

Result

The result of review concludes that Pelvic Floor Muscle Training (PFMT) is a first line management using level 1 evidence-based treatment for urinary incontinence (UI), but adherence to PFMT is often problematic. There are several ways for PFMT, but many lack specific strategies for enhancing adherence. The health care system focuses on efficiency and productivity in giving care and to comfort quality of life. The Systematic review and Meta-analysis are available evidence which suggests that PFMT is the best option, but well-designed strategies can improve quality of life in women health. Recent emerging techniques like Trans-vaginal Ultrasound, surface EMG, vaginal instruments, Biofeedback, Pelvic trainer, E-health care system and behavioral therapy plays an important role in pelvic floor rehabilitation and in improving pelvic floor dysfunctions issues.

In the 2018 Cochrane Review one of the RCTs evaluated improvement in Urinary incontinence in women who underwent PFPT but some individuals also had fewer leakage episodes in 24 h than women without treatment. A 2020 systematic evaluate recognized thirteen RCTs evaluating PFPT with Urge Urinary Incontinence all of which confirmed moderate development in UII with PFPT. These progressed effects of the treatment suggested PFPT is a feasible treatment for UII, but there has been a vast variability in the level of improvement hence use of recent techniques in pelvic floor physical therapy is needed for robust data.

Discussion

Pelvic Floor Muscle Training (PFMT) is a first line level 1 evidence-based treatment, low-risk, minimally invasive therapy in current era for women health. There are several ways for Pelvic floor muscle training but many lack specific strategies for enhancing practice and adherence. PFPT may be the mode of managing for UI through activating primary pelvic floor muscle to inhibit the detrusor over actively and evade from urinary leakage. PFPT can be the mode of management for UI by activating pelvic floor muscle to inhibit the detrusor over actively and avoid urinary leakage. Although PFPT for the managing of pelvic floor disorders is a low-risk therapy with an excessive fulfillment rate, patient education and knowledge on pelvic floor exercises are neglected. Patients may dismiss PFPT because of their discomfort with respect to intra-vaginal examination for which awareness is required. Adherence is often very low due to time-restriction, lack of awareness, socio economic status, apprehension of patient for treatment and traditional

beliefs. Extensive patient education and multiple sessions regarding treatment through physical or ehealth mode will reduce the negative perception and anxiety. Educating medical professional, clinical staff on the treatment and provide information, hand-outs can enhance compliance. In addition, clinicians and pelvic floor physical therapists should have a good working relationship and communicate mutually about treatment goals with patients.

Conclusion

There is evidence for need in extensive therapy to train pelvic floor muscles in order to help women with all types of urinary incontinence and PFD to decrease complications. Recent trends and evidence-based techniques helps to improve the quality of life in women health and can decrease the burden of pelvic floor dysfunction prevalence PFPT. The women health care system focuses on efficiency and productivity in giving care and to comfort the quality of life. Recent trends techniques play an important part of pelvic floor rehabilitation in improving pelvic floor dysfunctions.

There are currently no gold standards for PFPT research, regarding recommended PFPT modalities, therapy session mode, frequency, time, and intensity. Comparisons of different studies can be difficult and vague hence a standardized approach to clinical trials of PFPT would allow for easier therapeutic analysis. Initial research had been very promising but need strong evidence with standardized protocols for forthcoming pelvic floor disorders specifically those that may occur during peripartum and postpartum period. However, the treatment is most beneficial and promising who has participated in a supervised pelvic floor muscle training programme through physical or e-health mode for at least three months.

Conflict of Interest

There is no Conflict of interest.

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