

REVIEW

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Rehabilitation strategies for managing urinary incontinence in COPD: a review of literature

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Abstract

Background Urinary incontinence (UI) is linked to an increase in social disengagement, fractures and falls, depression, lack of concentration, elevated anxiety, and nursing home admissions, which has a significant negative impact on quality of life and the economy. Respiratory illness is regarded as a risk factor for urinary incontinence as coughing, and dyspnea raises the intra-abdominal pressure and results in an additional strain on the bladder. If the pelvic floor muscles (PFM) are weak, this might then cause leaking.

Methods A literature search was conducted using multiple databases for physiotherapeutic treatment options for urinary incontinence in COPD for the present review.

Results A keyword search yielded 9081 articles of which 11 articles were included in the present review according to the inclusion and exclusion criteria.

Conclusion There is a lack of studies involving both conditions; for treatment, we can combine some physiotherapy interventions of UI with COPD to achieve the desired result and as suitable for the patient.

Keywords Urinary incontinence, COPD, Pelvic floor exercise, Biofeedback

Background

Over 200 million individuals are thought to be living with urinary incontinence (UI) globally. UI is associated with a rise in social withdrawal, fractures, and falls, as well as sadness, reduced focus, increased anxiety, and nursing home admissions, leading to significant economic and quality-of-life disadvantages. Additionally, it is believed that chronic obstructive pulmonary disease (COPD) or smoking-related persistent coughing increases the likelihood of experiencing UI [1]. However, there is not enough published data to determine the precise etiology

of urinary incontinence in COPD patients. Furthermore, the pathophysiological mechanism remains unknown. Based on the available information, it would be logical to hypothesize that continuous coughing in COPD patients causes an increase in intra-abdominal pressure, which in turn leads to stress urinary incontinence. However, the exact cause or mechanism is not yet apparent. Other physiological, pharmacological, and anatomical factors could potentially be at play in the formation of UI in COPD patients. Several investigations have found that individuals with UI produce more phlegm and experience symptomatic coughs [2]. Urinary incontinence might also be a side effect of several medications. Research suggests that tiotropium inhalation therapy for COPD may result in discomfort in the urinary system. However, it is unlikely that inhaled medication use directly causes UI [3]. According to several studies, COPD patients with UI

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and chronic cough may experience a decreased quality of life [4, 5].

In the Netherlands and Italy, it was observed that the rate of UI in COPD increased by a ratio of 1.53 and 1.49, respectively [6]. Swedish research indicates a significant prevalence of UI among COPD patients, both in males (30%) and females (49%). Women with UI experience symptomatic coughing more frequently than women without UI, with median scores of 3 vs. 2, respectively (measured on a 7-point scale) [7]. Related Australian research [8] found that women with COPD had a relatively high prevalence of UI (70% vs. 55% in healthy controls). Most COPD patients are unaware that UI is a symptom.

In comparison to UI, other symptoms such as airflow restriction are considered more significant [9]. This lack of awareness may lead to delayed treatment and worsening of the illness.

The course of treatment for COPD patients with simple urinary incontinence is mostly determined by the severity of the problem, the expertise of the doctor, and the underlying cause of the condition. Individualized

care must be provided. In addition to taking preventative measures, doctors should frequently check and rule out the occurrence of UI in COPD patients. Data on the rehabilitation of UI in respiratory disorders are not widely available. The incidence of wet episodes among COPD patients has decreased as pelvic floor muscle strength has increased [10]. According to data, early UI therapy in COPD patients may enhance the quality of life [11].

Methodology

A literature search was conducted using Google Scholar, PubMed, CINAHL, NARIC, and PEDro databases. Keywords used for the search were as follows; ‘incontinence COPD’, ‘urinary incontinence respiratory conditions’, ‘stress urinary incontinence smoking’, and ‘stress urinary incontinence cough’. The articles included were in the English language, from the years 2000 to 2023, and involved both COPD and incontinence (Fig. 1). Articles registered for trials, conference papers, and abstracts were excluded.

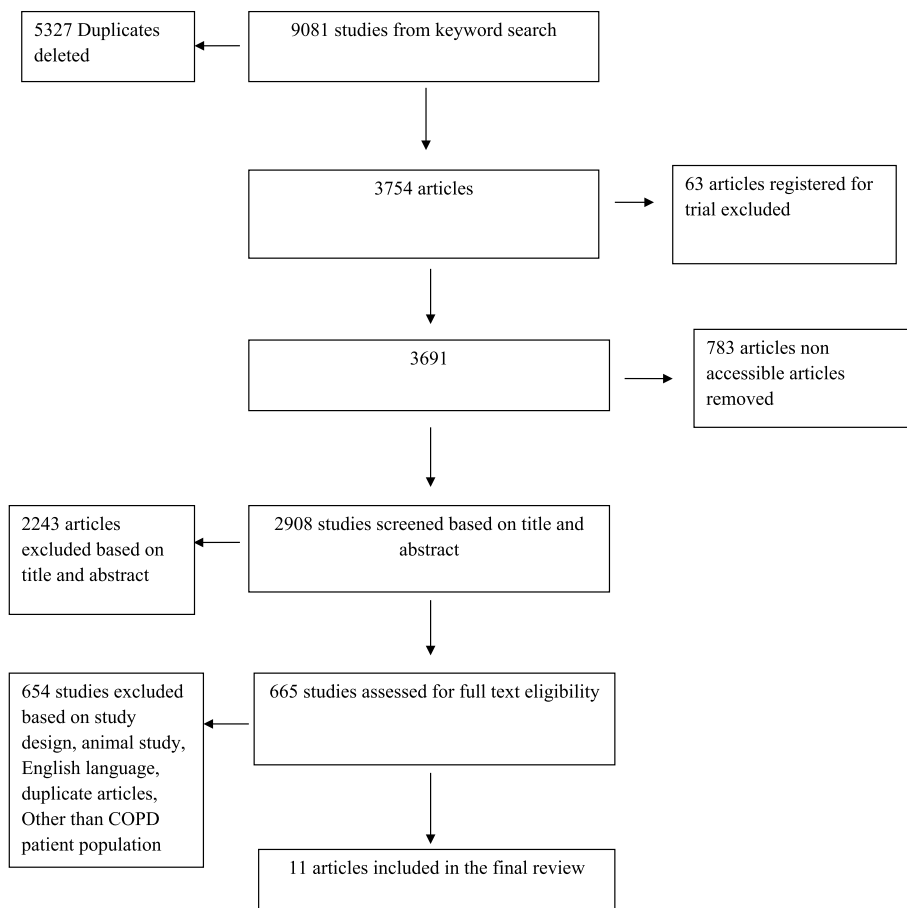


Fig. 1 Flowchart of the methodology

Physiotherapy management of urinary incontinence in COPD

There is a lack of clinical research on the physiotherapy treatment of UI in COPD patients. To provide the best possible care to patients, a comprehensive strategy may be employed. Numerous studies have investigated various physiotherapy treatment modalities for UI patients. Pelvic floor strengthening is frequently used and has proven to be quite successful. Additionally, other techniques, including biofeedback and electrical stimulation, have been employed.

Pelvic muscle floor training

Evidence from randomized clinical trials has concluded that supervised pelvic floor muscle training, often referred to as 'Kegel exercises,' is an effective treatment for stress urinary incontinence. In a comprehensive review of the research, the Cochrane Incontinence Group contends that pelvic floor muscle training should be the first-line conservative treatment for stress incontinence in women, as it consistently outperforms no treatment or a placebo.

According to research [12], biofeedback did not offer any additional advantages over pelvic floor muscle exercise alone for women with stress urinary incontinence. The effectiveness of pelvic muscle training is also influenced by several other factors. All recommended exercises should be performed with proper form, regularly, and for a sufficient duration. Many physical therapists recommend training sessions three to four times per week, with three sets of eight to ten consecutive contractions each. This recommendation is supported by data on skeletal muscle exercise training in other parts of the body [13].

Pelvic Floor Muscle Exercise (PFME) along with biofeedback

Biofeedback or physical palpation are two methods for confirming proper contraction. Women can obtain biofeedback by inserting small electrodes around the anus or an internal vaginal electrode. By using biofeedback, women can nearly instantaneously monitor their muscle output during exercises. Based on the research, it appears that pelvic floor muscle exercise (PFME) alone is not any more efficient than PFME combined with biofeedback. However, for some women, PFME in combination with biofeedback may be a clinically effective and well-tolerated therapy. Biofeedback can also be helpful in teaching the correct technique of PFME. It may be a practical approach to start PFME using biofeedback for individuals who may struggle to understand how to contract the pelvic floor muscles or are unable to do so [14].

Pelvic Floor Muscle Exercise (PFME) and Electrical Stimulation (ES)

Another strategy employed by physiotherapists to reduce UI is electrical stimulation (ES). The physiological goals of ES include inducing muscular hypertrophy, normalizing the reflex activity of the lower urinary tract, and improving blood flow to the capillary system and muscles. Electrical stimulation of the pudendal nerve enhances urethral closure by stimulating the pelvic floor muscles. It may also enhance the ability to produce voluntary muscular contractions by increasing awareness of how these muscles are functioning. In a recent comprehensive study, the improvement in UI with ES was comparable to that with sham stimulation or PFME. ES is a priority for women who initially have difficulty contracting the pelvic floor muscles [15].

Evidence-based intervention categories of physiotherapy treatment are noted in the table (Table 1).

Discussion

Various physiotherapy treatment approaches for UI patients have been the subject of numerous investigations. Pelvic floor strengthening is widely used and very effective in treating urinary incontinence patients. Additionally, other intervention strategies, such as electrical stimulation and biofeedback have also been used. It has also been noted that a combination of pelvic floor muscle exercise with biofeedback or electrical stimulation yields better results, which might result in better management of urinary incontinence in patients suffering from COPD.

Table 1 Physiotherapeutic treatment options for urinary incontinence [16]

Modalities	Heat Ice PFM biofeedback PFM electrical stimulation
Manual physiotherapy procedures	Soft tissue mobilization Joint mobilization
Exercises	PFME Core stabilization Flexibility exercises
Education	Body mechanics/posture Bladder/bowel schedule Diet modification Relaxation techniques to decrease muscle tension UI strategies such as PFM contraction before the increase in intra-abdominal pressure Soft tissue massage such as abdominal massage, scar massage, and self-stretching for introitus

Conclusion

There is a low level of knowledge about respiratory-related conditions associated with urinary incontinence (UI). Rehabilitation is necessary for a complete cure and the early recovery of the patient. Many physiotherapy interventions are available for both UI and COPD. Discussing urinary incontinence symptoms with patients will help in early diagnosis. In COPD patients, UI assessment should be done separately. Since there is a lack of studies involving both conditions, for treatment, we can combine some physiotherapy interventions for UI with those for COPD to achieve the desired result that is suitable for the patient [17].

Abbreviations

UI	Urinary incontinence
COPD	Chronic obstructive pulmonary disease
PFM	Pelvic Floor muscle
PFME	Pelvic floor muscle exercise
ES	Electrical stimulation

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References

- Landefeld CS, Bowers BJ, Feld AD. National Institutes of Health state-of-the-art science conference statement: prevention of fecal and urinary incontinence in adults. *Ann Intern Med.* 2008;148:449–58.
- Battaglia S, Benfante A, Principe S, Basile L, Scichilone N. Urinary incontinence in chronic obstructive pulmonary disease: a common co-morbidity or a typical adverse effect? *Drugs Aging.* 2019;36(9):799–806.
- Hashimoto M, Hashimoto K, Ando F, Kimura Y, Nagase K, Arai K. Prescription rate of medications potentially contributing to lower urinary tract symptoms and detection of adverse reactions by prescription sequence symmetry analysis. *J Pharm Health Care Sci.* 2015;1:7.
- Burge AT, Lee AL, Kein C, Button BM, Sherburn MS, Miller B, et al. Prevalence and impact of urinary incontinence in men with chronic obstructive pulmonary disease: a questionnaire survey. *Physiotherapy.* 2017;103:53–8.
- Newman DK. In men and women with COPD the presence of urinary incontinence is associated with poorer quality of life. *Evid Based Nurs.* 2014;17:22–3.
- van Gerwen M, Schellevis F, Lagro-Janessens T. Co morbidities associated with urinary incontinence: a case-control study from the second Dutch national survey of general practice. *J Am Board Fam Med.* 2007;20:608–10.
- Hrisanfow E, Haggglund D. The prevalence of urinary incontinence among women and men with chronic obstructive pulmonary disease in Sweden. *J Clin Nurs.* 2011;13:1895–2190.
- Button BM, Holland AE, Sherburn MS, Chase J, Wilson JW, Burge AT. Prevalence, impact and specialised treatment of urinary incontinence in women with chronic lung disease. *Physiotherapy.* 2019;105:114–9.
- Hrisanfow E, Haggglund D. Impact of cough and urinary incontinence on quality of life in women and men with chronic obstructive pulmonary disease. *J Clin Nurs.* 2013;22(1–2):97–105.
- Newman DK. In men and women with COPD the presence of urinary incontinence is associated with poorer quality of life. *Evid Based Nurs.* 2014;17:22–3.
- Kwak Y, Kwon H, Kim Y. Health-related quality of life and mental health in older women with urinary incontinence. *Aging Ment Health.* 2016 Jul;20(7):719–26. <https://doi.org/10.1080/13607863.2015.1033682>. Epub 2015 Apr 15. Erratum in: *Aging Ment Health.* 2016 Nov;20(11):1229. PMID: 25876190.
- Donovan G, Terrell SL. Exercise strategies for improving quality of life in women with stress urinary incontinence. *ACSMs Health Fit J.* 2018;22(1):28–32.
- Ghaderi F, Oskouei AE. Physiotherapy for women with stress urinary incontinence: a review article. *J Phys Ther Sci.* 2014;26(9):1493–9.
- Morkved S, Bo K, Fjortoft T. Effect of adding biofeedback to pelvic floor muscle training to treat urodynamic stress incontinence. *Obstet Gynecol.* 2002;100(4):730–9.
- Bø K. Physiotherapy management of urinary incontinence in females. *J Physiother.* 2020;66(3):147–54.
- Bernards AT, Berghmans BC, Slieker-ten Hove MC, Staal JB, de Bie RA, Hendriks EJ. Dutch guidelines for physiotherapy in patients with stress urinary incontinence: an update. *Int Urogynecol J.* 2014;25(2):171–9.
- Dumoulin C, Cacciari LP, Hay-Smith J. Pelvic floor muscle training versus no treatment, or inactive control treatments, for urinary incontinence in women. *Cochrane Database Syst Rev.* 2018;10(10):CD005654.

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