

The Effect of Pelvic Floor Rehabilitation on Males with Sexual Dysfunction: A Narrative Review

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ABSTRACT

Introduction: Increasing evidence has suggested that pelvic floor exercises and manual physical therapy may improve premature ejaculation (PE) and erectile dysfunction (ED) in males.

Objectives: To examine the effects of pelvic floor physical therapy treatment in men suffering from PE and ED.

Methods: We searched Google Scholar, PubMed, Medline, PEDro databases from inception till January 2020 applying the following keywords: pelvic floor, erectile dysfunction, impotence, physiotherapy, exercises, rehabilitation, and pelvic floor muscle exercises.

Results: The review included 37 papers reporting on PE and ED, of which 5 were randomized controlled trials, 2 meta-analyses, and 4 observational studies. Pelvic floor physical therapy treatment included education and rehabilitation. The rehabilitation part encompassed manual therapy techniques that contribute to the normalization of muscle tone and improvement of muscle relaxation. Moreover, exercises, according to the patients' clinical assessment were presented. Most of the studies reported that by strengthening the pelvic floor muscles (PFMs), ED and PE can be improved if manual physical therapy treatments are combined with PFM training.

Conclusions: A multifaceted approach should be chosen by physical therapists when evaluating and treating ED and PE and contending with both musculoskeletal dysfunction and behavioral contributions. It is recommended that exercises be monitored and situations involving, that is, hyperactivity/increased tone of the PFMs should be avoided. PFM training is simple, safe, and noninvasive; therefore, it should be a preferred approach in the management of ED and PE.

This paper presents narrative reviews with a potential bias that systematic reviews or meta-analyses do not have, however, we strove to be all-encompassing and unbiased. There is a demand for high-quality scientific reviews examining the effectiveness of PFM training, manual therapy, and the rationale of pelvic floor physical therapy, in general, in treating individuals with PE and ED.

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Key Words: Pelvic Floor Muscles; Physical Therapy; Erectile Dysfunction; Premature Ejaculation; Manual Therapy; Exercises

INTRODUCTION

Sexual dysfunctions have been described as disturbances and psychophysiological changes associated with the sexual response cycle in men and women.¹ Sexual dysfunctions are extremely prevalent in men, ranging from 10% to 52%, and are associated with demographic attributes such as age and educational

attainment.¹ Sexual function is believed to be an indispensable and integral part of men's overall health and wellness. Moreover, male sexual dysfunctions have been found associated with a poor quality of life and negative interpersonal relationships.²

The most prevalent sexual impairments in men are erectile dysfunction (ED) and premature ejaculation (PE).^{3,4} Sexual impairment can be psychological, muscular, neurological vascular, or a combination of all. Acceptable drug treatment for ED and PE can be accompanied by adverse effects, that is, headache, flushing, indigestion, and rhinitis. Moreover, visual adverse disturbances include temporary changes in color vision, increased sensitivity to light, and blurring of vision.⁵ In previous studies, male pelvic pain and dysfunction were observed in individuals suffering from PE, and ED.^{2,6} Pelvic floor muscles (PFMs) are important in improving sexual function. It has been reported

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that contractions/relaxation of the PFM in males is associated with mechanisms of erection and ejaculation.⁷ It has been ascertained that male PFMs increase penile rigidity and hardness in those suffering from ED, potentially enabling vaginal penetration during thrusting.² Therefore, one may assume that improving the PFM's function, would enable an individual to improve his sexual performance and outcome. Our aim was to investigate the effect of physical therapy pelvic floor rehabilitation on men suffering from PE and ED.

METHODS

Google Scholar, PubMed, Medline, PEDro databases from inception till January 2020 were searched using the following keywords: pelvic floor, erectile dysfunction, impotence, physiotherapy, exercises, rehabilitation, and pelvic floor muscle exercises. The results were collated, and replicas removed. Titles and abstracts were reviewed. Inclusion criteria included studies investigating physical therapy treatments for males suffering from sexual dysfunction, excluding dysfunction secondary to surgery. All published material emphasizing randomized controlled trials (RCTs) were analyzed. Reference lists of all articles retrieved in full were also searched. We are attentive to the fact that this traditional approach has more of a potential for bias than systematic reviews or meta-analyses, however, we strove to be inclusive and open-minded.

The review included 37 papers reporting on PE and ED, of which 5 randomized controlled trials, 2 meta-analyses, and 4 observational studies.

RESULTS

Anatomy and Physiology of Male's PFMs

The pelvic floor is a complex multifunctional structure consisting of muscular and tendon components and is responsible for regulating intra-abdominal pressure, static, and dynamic postural stability. Furthermore, PFMs are an essential element in urinary, bowel, and sexual functions.⁷ This muscular complex connects the pubic bone anteriorly to the coccyx posteriorly, subsequently, laterally extending towards the ischial spine and tendinous arch of the levator ani.⁸ The male pelvic floor is composed of a deep and superficial pouch: the deep part encompasses an external urethral sphincter, compressor urethrae, embedded bulbourethral gland, and deep transverse perineal muscles, thus, supporting the abdominopelvic viscera and resisting increased intra-abdominal pressure. The superficial pouch includes ischiocavernosus, bulbospongiosus, superficial transverse perineal muscles, the anus, and the external anal sphincter.⁹

The bulbospongiosus and ischiocavernosus muscles actively contract during an erection, thus, increasing rigidity. The ischiocavernosus muscle facilitates an erection. The bulbospongiosus muscle surrounds 33–50% of the base of the penis and comprises 3 functions: (1) contraction, hindering the blood from

escaping by pressing on the deep dorsal vein of the penis; (2) active pumping during ejaculation and; (3) emptying the bulbar urethra after micturition.¹⁰ One theory holds that ejaculation can be inhibited by improving PFM control, with an emphasis on the ischiocavernosus and bulbospongiosus muscles, even though ejaculation is a neural reflex.⁸ These superficial PFMs are essential for normal urination, ejaculation, and impact urinary continence.² On this basis, it was postulated that certain changes in erectile and ejaculatory function may be secondary to anatomical and functional perineal muscle alteration.⁷

Male Sexual Impairment

Erectile Dysfunction (ED). *Definition:* ED was defined (by the fourth International Consultation on Sexual Medicine [ICSM4]), as a “consistent or recurrent inability to attain and/or maintain penile erection sufficient for sexual satisfaction.” It was recommended that a minimum of one of the following symptoms must be experienced ~75–100% during sexual activity: (1) a discernible marked difficulty in achieving an erection during sexual activity, (2) a marked difficulty in maintaining an erection until the conclusion of sexual activity, or (3) a marked decrease in erectile rigidity.¹¹

Prevalence and risk factors: The prevalence of ED ranges between 3% and 75.6%. This sizeable gap may be due to the diverse definitions and evaluation methods, and study populations (age, geographical area, and background diseases). Genetic, environmental, and lifestyle factors are most probably also involved in ED development.¹² ED risk factors are mainly related to advanced age and comorbidities (diabetes, cardiovascular disease, obesity (BMI>30), prostate cancer, depression, and anxiety treatment). Lifestyle factors, that is, excessive alcohol consumption and smoking have also been positively linked to ED. Men who are single, separated, divorced, unemployed, or of a low socioeconomic status, are at a higher risk for ED.^{12,13}

Premature Ejaculation (PE). *Definition:* This disorder was defined by the ICSM4 as a persistent or recurrent pattern of ejaculation during partnered sexual activity within ~1 minute after vaginal penetration or before the individual desired the ejaculation to happen. Although the diagnosis of PE can be applied to individuals engaged in nonvaginal sexual activities, specific duration criteria have as yet not been established.¹¹

Prevalence and risk factors: PE prevalence amongst sexually active men has been shown to reach 20–75%.^{14–16} It has been estimated that the global prevalence of PE rates is ~30–40%.¹⁵ The extensive variation in PE prevalence could be related to differences in study methodology, assessment tools, ethnic groups, failure to report, and age distribution. When suffering from PE, self-confidence and the relationship with a partner erodes, causing emotional distress, anxiety, embarrassment, and depression. Nonetheless, most men suffering from PE do not explore other

avenues for help. Risk factors associated with PE are generally unknown, although, according to Corona et al,¹⁷ PE can be an age-dependent symptom. Patients complaining of PE are usually younger and healthier and suffer from an elevated degree of anxiety and hyperthyroidism. The link between the ejaculation mechanism and the thyroid hormones is unclear. One hypothesis is that the manifestations of thyrotoxicosis and the sympathetic nervous system activation are similar. The etiology of PE is divided into psychogenic and biogenic factors. Psychogenic factors comprise psychodynamic theories, early experience, sexual conditioning, anxiety, technique, and frequency of sexual activity. Biogenic factors take into account penile hypersensitivity, hyperexcitable ejaculatory reflex, hyperarousability, endocrinopathy, genetic predisposition, and a 5-hydroxytryptamine receptor dysfunction.¹⁴

Pelvic Floor Evaluation and Assessment

The first step when assessing the type of physical therapy treatment begins by collecting the patient's history and observing his breathing, posture, and gait. A musculoskeletal evaluation encompasses trunk and pelvic palpation, external genital assessment, and an inter-rectal pelvic floor evaluation.⁶ The basic principles in history-taking are to allow the patient to feel in control, less stigmatized, provide explanations to his questions, encouragement, support, and initiate a conversation dealing with delicate issues. The therapist should be aware of the patient's cultural background, guarantee the patient's confidentiality, and avoid being judgmental.⁵ The anamnesis assists in defining the patient's main complaint, the presence of the comorbid symptoms related to urinary frequency, urgency, or constipation, and its overall effect on sexual function. Consequently, the therapist determines and discusses treatment goals as well.⁶

By carefully observing the patient, the therapist can discern differences in his posture, breathing, gait, body language, and movement patterns. For example, an ineffective excursion of the diaphragm creates an increased muscle tone of the abdominal oblique muscles, thus, amplifying intra-abdominal pressure on the pelvic floor, and creating dyssynergistic breathing patterns and dysfunction of the PFMs.⁶ According to Rosenbaum and Owens,⁶ the musculoskeletal examination should include an assessment of the bones, muscles, joints, and connective tissue structures in order to evaluate the trunk, pelvis, extremity mobility, length, and strength. Hypermobility may suggest joint laxity, thus, necessitating core stabilization exercises. Muscles are tested for length, strength, and trigger points in both the viscoelastic and contractile mechanisms.

It is important to evaluate the length and strength of the piriformis and iliopsoas muscles. Palpating the PFMs (ie, the coccygeus, iliococcygeus, and puborectalis), as well as the obturator internus and piriformis muscles with the aim of detecting certain trigger points, areas of tightness, decreased mobility, and sensory perception was performed. Muscle strength testing can be accomplished by subjectively assessing the force of contraction

felt around the palpating finger. Temperature, color, tissue elasticity, and mobility were jointly assessed with an overall sensitivity to light touch and pressure.⁶

Physical Therapy Assessment for ED

Self-reported questionnaires have been employed by physical therapists when evaluating the patients' quality of life and as a measurable reproducible clinical indicator of a patient's condition. The International Index of Erectile Function (IIEF), a self-administered questionnaire, was established to identify treatment effects in clinical trials.¹⁸ The questionnaire encompasses 15 items sorted via five domains of sexual functioning. Other questionnaires are the five-item version of the IIEF (IIEF-5) or the Sexual Health Inventory for Men (SHIM), with high sensitivity and specificity in detecting ED in a clinical trial.¹⁹ Derby et al²⁰ developed a simple tool for evaluating ED in population-based studies. A single-item questionnaire was developed and shown to be valid compared to the IIEF in the Massachusetts Male Aging Study (MMAS). The IIEF and MMAS-derived questionnaires are the most common instruments used in detecting ED in population based-studies.

Physical Therapy Assessment for PE

The literature often mentions the use of intravaginal ejaculatory latency time (IELT), measured by a stopwatch. IELT is defined as the time between vaginal intromission and intravaginal ejaculation. There is no standard cut-off for ejaculatory latency. When defining PE, latency values can range from ≥ 1 to 3 minutes.^{21,22} Other questionnaires have also assessed PE quantitatively, such as the Index of Premature Ejaculation (IPE),²³ the Male Sexual Health Questionnaire Ejaculatory Dysfunction (MSHQ-EjD)²⁴ and the Premature Ejaculation Diagnostic Tool (PEDT).²⁵

Physical Therapy Treatment for ED

Physical therapy focuses on function, aims, and correcting impairments that have caused ED. Although many patients suffer from ED, its cause may differ thereby, warranting different treatment approaches.⁸ Physical therapy treatment comprises 2 parts: (1) educational, providing anatomical information, suggestions, guidance as to pain management, which functional activities to follow or avoid, and behavioral changes, that is, varying sexual positions;^{6,7} (2) rehabilitation encompassing manual therapy techniques, normalization of the muscle tone, and improving muscle relaxation. Patients are instructed to perform various exercises at home.⁶⁻⁸ Furthermore, physical therapists may utilize other tools, that is, electromyographic biofeedback and functional electrical stimulation in order to improve the function of the PFMs.

The use of pelvic floor exercises in treating ED was proven effective in an RCT comprising 55 men.¹⁰ The intervention group performed pelvic floor exercises augmented by manometric biofeedback and lifestyle changes. Statistically, substantial

improvement was shown in the erectile function domain of the IIEF ($P < .001$) compared with the controls. The pelvic floor exercises were executed in order to tighten their PFMs as strongly as possible (as if to stop flatus from escaping). During PFM exercises, attention is placed on the capability to draw back the penis and lift the scrotum to ensure that the bulbocavernosus and ischiocavernosus muscles were intensely contracting. Emphasis was placed on attaining a few maximum contractions (three in each position: lying prone, sitting, and standing), twice daily, rather than extended repetitions. Exercising the submaximal pelvic floor was suggested while walking in order to help increase muscle endurance. The subjects were also taught to strongly constrict their PFMs after urinating, while still poised above the toilet as a means of successfully working the bulbocavernosus muscle to purge the urine from the bulbar urethra. The control patients who performed the intervention during the crossover phase also exhibited similar improvements in the erectile function domain of the IIEF ($P < .001$).

Another RCT²⁶ comprising 150 males suffering from ED and confirmed venous leakage examined whether a PFM strengthening program was preferable to surgery. The training was offered in 5 weekly sessions, supervised by physical therapists. The authors concluded that surgery was not superior to pelvic floor training. Furthermore, significant improvements were found following the training program; almost half (42%) were pleased with the outcome and declined surgery. An observational study conducted by Lavoisier et al²⁷ included 122 patients suffering from isolated ED. The patients performed 30-minute sessions of voluntary contractions in conjunction with electrical stimulation. Electrodes were placed on the middle of the upper face of the penis shaft to stimulate the dorsal nerve responsible for the ischiocavernosus reflex. This stimulation was applied at 80 Hz, thereby, increasing the ischiocavernosus muscle contraction without fatigue. The authors concluded that PFM rehabilitation is beneficial to patients suffering from ED. Apart from specific pelvic floor exercises, general physical activity can improve ED, as was shown in a recent meta-analysis,²⁸ of 7 RCTs and 478 participants were assigned to aerobic, pelvic, or combined exercise interventions. Follow-up ensued for 8 weeks to 2 years, demonstrating that moderate to vigorous-intensity aerobic exercise may be beneficial to individuals suffering from ED of a non-specific etiology. These findings support the conclusions of an earlier meta-analysis.²⁹ The authors of an RCT comprising 209 participants claimed that an alteration of daily life risk factors might enhance ED.³⁰ Detailed instruction was given as to reducing body weight, improving diet quality, and increasing physical activity. The authors concluded that it is conceivable that an improvement in erectile function can be achieved in men at risk by a nonpharmacological intervention.

Physical Therapy Treatment for PE

Before commencing treatment, it is vital to fully assess patient anticipations as it has been shown that there is a direct

relationship between PE and anxiety.¹⁷ If necessary, physical therapy can be accompanied by a psychological intervention. The “squeeze technique” popularized by Masters and Johnson is a traditional treatment for PE.² Upon imminent ejaculation, the penis is withdrawn and the glans squeezed until the sensation subsides. The supposed mechanism is the elimination of involuntary contractions of the bulbocavernosus muscle. This cumbersome solution is quite problematic since it requires discontinuation of intercourse and a very cooperative partner.³¹

La Pera's study³² included 78 participants suffering from PE (of whom 54% were cured). The study protocol included four stages: the first raised awareness of PFMs; the second taught the patient to perform selective PFMs contractions; the third stage taught the patient to schedule the PFMs' contraction during a pro-orgasmic phase (patients were asked to masturbate at home in order to schedule the PFMs' contractions during the pro-orgasmic phase to prevent ejaculation); the fourth stage aimed at strengthening the PFMs. This technique is based on the assumption that properly timed contractions can inhibit the ejaculation reflex. Accordingly, those who did not succeed failed to learn how to time the contraction of the pelvic floor.³²

Lavoisier et al²⁷ evaluated the influence of PFM training on sexual function among 122 men suffering from ED and 108 men suffering from PE. The authors discovered a significant amelioration in intracavernous pressure and erectile function. Albeit, PFM training can enhance sexual function, including the quality of orgasm in certain patient populations, PFM training can also generate pain in those with hyperactive PFMs. When a muscle is in a state of continuous activation, the connective tissues surrounding the muscle fibers will eventually shorten. When PFMs and the associated connective tissues are shortened, there is also a risk of compressing the structures supported by the connective tissues, including the pelvic nerves.³³ Men with hyperactive PFMs and myofascial trigger points describe a soreness felt in the testicles, crotch, tip of the penis, and abdomen. Some expressed an incapability to reach an erection, suffered from PE, experienced difficulty in attaining climax, or postejaculatory soreness.⁸ Although pain can be caused by the PFMs, it is important to note that the physical therapist must formulate a differential diagnosis, as similar referral pain can also originate from the nerve roots. Therefore, as part of the full examination, the physiotherapist should also evaluate the lumbar spine.

La Pera et al³⁴ who examined the effectiveness of PFM rehabilitation in managing PE, and the instructing of patients to recognize and train the muscles to control the ejaculatory reflex, resulted in curing 11 out of 18 patients (61%). Pastore et al³⁵ compared the PFM rehabilitation protocol with the on-demand treatment of selective serotonin reuptake inhibitor dapoxetine. The protocol included physical therapy to achieve awareness, electrical stimulation, and biofeedback. Eleven out of 19 patients (57%) who had undergone PFM therapy were able to attain ejaculatory control. Although dapoxetine treatment resulted in significantly larger increases in intravaginal latency time compared

with individuals treated with PFM training, the authors determined that PFM training is a favorable therapeutic option for individuals suffering from PE.

Pastore et al³⁶ in 2014 examined the effects of PFM rehabilitation on PE. The authors observed an improvement amongst 33 out of the 40 participants. The pelvic floor rehabilitation encompasses 3 stages: (1) physical exercise to raise patient awareness of contraction and motor movement; (2) use of electrotherapy on the nerve pudendal, which causes irritation of the puborectalis muscle, thereby, causing contraction of the urethral sphincter; (3) utilizing biofeedback to teach the patient how to control a PFM contraction. Rehabilitation continued for 12 weeks. The patients received 3 treatments per week with each treatment lasting 60 minutes, 20 minutes per stage.³⁶

Kurkar et al³⁷ examined a combination of drug therapy and PFM strengthening in patients after unsatisfactory drug treatments. The study results showed statistically significant improvement when the drug therapy was combined with PFM strength training practice. The study included 74 participants suffering from PE (IELT 20-110s), after medication (IELT 90-180s), and after medication combined with PFM strengthening lasting 8 weeks (IELT 180-420s). The strengthening protocol consisted of 15 repetitions of contracting the pubococcygeus muscle for 10 seconds, followed by a release for 10 seconds. The second part of the exercise included maximal contraction of the pubococcygeus muscle for 1 second and a release for 1 second (10 repetitions). In order to detect the contraction of the pubococcygeus muscle, participants were asked to cease the flow of urine. In addition, participants were asked to breathe normally and complete 15 practice sessions per day.³⁷

CONCLUSIONS

Current evidence is encouraging, even though, further high-quality evidence is still necessary to attain a better understanding of the effectiveness of PFM training and the part that physical therapy plays in the management of PE and ED. Physical therapists choose a multifaceted approach when assessing and treating PFM dysfunction, focusing on musculoskeletal dysfunction and behavioral involvement. Although research studies have supported PFM training for improving PE,^{27,34,35} it is recommended that therapeutic exercises should be supervised to avoid situations such as hyperactivity/increased tone of the PFMs. Furthermore, soft tissue treatment is occasionally required as part of the complex treatment.

We believe that PFM training, due to its simplicity, safety, and noninvasiveness, should continue to be the preferred approach in the management of ED and PE. Less invasive tactics must always be contemplated before aggressive approaches that are more costly and have further side effects. If the patient does not benefit from conservative management, the options of medical and surgical therapy remain available. Patient education is a vital component of physical therapy intervention. The physical

therapist's role is to ensure that the patient completely comprehends the physiological changes of the body during sexual desire and arousal. The physical therapist can instruct the patient as to additional possibilities for achieving desire and arousal, varying from exploring the senses or exposing the patient to other resource material that is, films or literature.⁸

There is a need for high-quality clinical trials examining the long-term effectiveness of PFM training. Consideration should be given to the development of an optimal PFM training regimen, taking into account the various exercise positions, contraction intensity, contraction time, rest time, number of repetitions, number of sets performed daily, number of training days per week, and duration of the intervention.

In conclusion, conservatively treating men suffering from PE and ED i.e., physical therapy, should be the first line of treatment and a possible solution for whom drug therapy is not possible. This review illustrated that treatment that includes guidance, tissue release, and reinforcements can improve PE and ED.

TAKE-HOME MESSAGES

- Pelvic floor physical therapy should include a complex multi-faceted treatment approach in males with sexual dysfunction.
- Physical therapists should choose a multidimensional methodology when assessing and caring for individuals suffering from ED and PE, focusing on musculoskeletal dysfunction and behavioral involvement.
- PFM training is simple, safe, and non-invasive and should be employed as a preferred approach in the management of ED and PE.

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