



# The Conservative Management of Erectile Dysfunction and Effectiveness of Physiotherapy Interventions; A Mini Review

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## Mini Review

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## Abstract

Erectile dysfunction is one of the most common male sexual disorders affecting 3% to 76.5% of men globally. Lack of active intervention in the recovery period of the affected penile muscles results in flaccidity, and prolonged flaccid state is known to cause irreversible damage to the cavernous tissue.

Several relevant articles were searched in Google scholar, PubMed and Research gate, individual Physiotherapy/Conservative treatment approach were found and documented in this study.

In this study we aimed at briefly reviewing and compiling relevant literatures on the effectiveness of Physiotherapy/Conservative interventions on the management of erectile dysfunction.

Different Physiotherapy/conservative management of erectile dysfunction was found to be promising and combination of different treatment methods will be more beneficial.

Finally, it was concluded that Physiotherapy/conservative management of erectile dysfunction has been shown to be effective and should be considered as a first-line approach for men with erectile dysfunction.

**Keywords:** Conservative Management, Erectile Dysfunction, First-Line Approach, Male Sexual Disorders, Physiotherapy Management

**Abbreviations:** NIH: National Institute of Health; ED: Erectile Dysfunction; ES: Electrical Stimulation; PFM: Pelvic Floor Muscle; NO: Nitric Oxide; TCM: Traditional Chinese Medical.

## Introduction

National Institute of Health (NIH) Consensus Development Panel defined Erectile dysfunction (ED) as “persistent failure to reach and maintain erections of sufficient hardness for penetration during sexual intercourse” [1].

Sexual dysfunction such as ED can affect patients' lives in a different ways, including problems in interpersonal relationships, interference with sex life, problems with partners, and increased mental stress, making ED a major quality of life issue.

Physiotherapy/Conservative interventions involve the use of noninvasive methods that are painless, inexpensive, and easy to perform. A positive result has been shown for with men with ED who received Physiotherapy/Conservative management [2].

## Etiological Factors

The etiological factors of ED can be either psychogenic (like performance anxiety, stress, and mental disorders, that can potentially reduce the awareness of sensory experience) or organic (such as vasculogenic and neurological abnormalities), iatrogenic factors (caused by surgical injury), and increasing age (aging). However, it has been recognized that the major cause of ED is atherosclerosis which prevents blood flow into the cavernosal tissues thereby affecting the pelvic vasculature [3].

## Prevalence/Epidemiology

Several studies found that the global prevalence of erectile dysfunction varies widely, which ranges from 3% to 76.5% and would rise to 322 million by 2025 globally [4].

According to another published data, the prevalence of ED is 5.1% in men aged 29–30 years, 14.8% in men aged 40–59 years, 44% in men aged 60–69 years [5], these show that ED increases with age. Annually, more than 50% of men over 70 years are diagnosed with ED [6].

ED is a common problem that may affect 10% of healthy men and significantly greater numbers of men with existing comorbidities such as diabetes (28%), hypertension (15%), and heart disease (39%) [7].

In Nigeria, a published study showed a high prevalence of ED (66.4%) among 378 male adults, with most of the participants unable to seek medication and management due to associated stigmatization in the society [8].

## Clinical Diagnosis

Presently, the clinical diagnosis methods of ED mainly include the use of questionnaire, laboratory, psychological assessments, and equipment examinations [9] and experts suggested the use of questionnaire surveys and physical examinations for patients with ED [10]. The most widely used questionnaire is the International Index of Erectile Function (IIEF)-5 [11].

## Treatment Approach

At present, the current treatment methods for ED include lifestyle changes, psychotherapy, pharmacotherapy, Physiotherapy/conservative intervention, and surgical therapy. Several treatment options for men with ED are mainly administration of phosphodiesterase type 5 inhibitors, intracavernous injections of vasoactive agents (such as prostaglandin E<sub>1</sub>, triple-drug, or papaverine/phentolamine), intra-urethral administration of prostaglandin E<sub>1</sub>, and

administration of centrally acting drugs [12,13].

However, all of these therapeutic methods treat the patient's problem temporarily at that instance, and patients are not cured of impotence. The patients remain dependent on these drugs for the remainder of their sexually active lives and for these reasons, alternative effective treatment options such as Physiotherapy/Conservative management are needed for the treatment of ED, as the prevalence of ED is increasing [13].

An extensive literature search indicated scarcity of studies that gather all the Physiotherapy/conservative management of ED in a single literature.

Therefore, the aim of this study is to briefly review and compile relevant literatures on the effectiveness of Physiotherapy/Conservative interventions for the management of patients with erectile dysfunction.

## Physiotherapy/Conservative Management of Ed

### Electrical Stimulation

Electrical stimulation (ES) is one of the emerging technologies in clinical practice today. ES is a technique that depends on the output of low frequency pulsed current by placing conductive electrodes over the skin which is controlled by a unit. Several recent studies have demonstrated the effectiveness of penile electrical stimulation in the management of ED [14-16]. ES can be very beneficial treatment protocol option when the cause of ED is related to atrophy of ischiocavernosus muscle.

According to some studies, it reported that ES induces the proliferation of penile endothelial and cavernous smooth muscle regeneration; it promotes nitric oxide (NO) release from cavernous endothelial cells [17], and producing cycloguanosine monophosphate, which can relax cavernous smooth muscle and raise cavernous body pressure [18].

Some scholars believed that stimulation of peripheral nerve regeneration can be achieved through ES [19], which can improve the recovery of nerve function, and in turn will improve ED symptoms. The parameters shown to be effective are as follows; 30 minutes at frequency of 5 Hz, a pulse width of 150µs, and contraction time of 3 seconds [20].

### Pelvic Floor Training

Pelvic floor muscle (PFM) training causes hypertrophy of the pelvic floor muscles; it increases the strength of muscle and connective tissue at the pelvic floor, it enhances muscles

awareness in the brain, and leads to greater recruitment of active motor neurons.

The PFM found in men are fully active during sexual intercourse for penile erection and ejaculation, these are mainly the ischiocavernosus and the bulbocavernosus muscles, the bulbocavernosus muscle encircles 33–50% of the base of the penis [21,22] it was shown that atrophy of ischiocavernosus muscle partly contributes to erectile dysfunction [22].

Dorey et al. Suggested that pelvic floor exercises should be considered as a first-line approach for men seeking long-term resolution of their erectile dysfunction [23]. PFM Exercises should be performed 5–10 times a day, several times a week. The results are often tangible after 6–12 weeks [24].

### Physical Activity and Exercise

Physical activity is defined as any bodily movement produced by skeletal muscles that results in increased energy expenditure, whereas exercise is defined as planned, structured, and repetitive bodily movement for the purpose of improving or maintaining one or more components of physical fitness [25].

In a systematic review done by Silva et al. It was indicated that physical activity and exercise improve erectile dysfunction symptoms particularly aerobic exercise with moderate-to-vigorous intensity, there was an increase in the erectile function parameter of the IIEF questionnaire of 3.85-point [26].

Aerobic exercise has been known to strengthen the cardiovascular system by making the heart stronger and the lungs more efficient. Thus, the physiological basis of the therapeutic effect of aerobic exercise on ED could be as a result of both acute and long-term changes in the blood vessel walls [20].

The speedy vascular relaxation following physical activity is due to body warming effects; reduced nerve activities; local production of certain chemicals such as lactic acid, and nitric oxide (NO), and changes in certain hormones and their receptors [27]. The repetitive physical activity-induced increased blood flow and vascular shear stress causes substantial remodeling of the vascular system.

### Low-Intensity Extracorporeal Shock Wave Therapy (Li-ESWT)

Li-ESWT is a therapeutic modality that primarily stimulate tissue repair and vascular regeneration, this is

widely used in the clinical treatment of ED. Studies have shown that Li-ESWT can promote the expression of neuronal nitric oxide synthase in endothelial cells, nerve cells and smooth muscle cells [28] but However, according to some studies, Li-ESWT does not rely on neuronal nitric oxide synthase and guanosine cyclic phosphate to clinically improve erectile function [29]. Till now, no study has confirmed the specific mechanism of Li-ESWT in the treatment of ED.

A study was carried out, in which 50 ED patients were treated with Li-ESWT once a week for 6 weeks. It was considered a successful treatment if the IIEF-5 score increased by  $\geq 5$  points or the erectile hardness score increased by  $\geq 3$  points. Among them, 56% of patients were shown to be treated effectively; 50% of patients were improved in the first 3 months, and in which 16% continued for 6 months. Another 3 cases had improved erectile function 6 months after the treatment. In addition, the effect was significantly improved for patients with cardiovascular risk factors ( $p = .026$ ) [30].

Zewin, et al. [31] in their study investigated the effectiveness of Li-ESWT in penile rehabilitation after nerve-preserving radical prostatectomy in men. The Li-ESWT treatment group in the study showed a significant increase in total IIEF score, overall satisfaction domain score, sexual satisfaction, and EHS score throughout the follow-up period, showing its clinical therapeutic properties [31]. Another study of 350 ED patients Li-ESWT improved phosphodiesterase-5 inhibitor sensitivity in 55% of patients who did not respond to phosphodiesterase-5 inhibitors [32].

### Akupunktur

In Traditional Chinese Medical (TCM), ED is referred to as impotence. Some TCM methods are commonly used to treat ED, and the most frequently used method is Akupunktur. Akupunktur is the broad term for acupuncture and moxibustion.

A procedure that involve the insertion of filiform needles into specific points (acupoints) on the patient's body by using different acupuncture techniques such as twisting and lifting to treat disease is known as acupuncture while Moxibustion is the practice of smoked burning the skin with a burning Ai velvet following certain acupoints and using the heat to stimulate the treatment of diseases.

All the above treatment methods believes that these acupoints can control and regulate the flow of qi, as well as its distribution and excretion in the viscera, in order to maintain the balance between the internal and external environments [33]. It was shown that akupunktur can regulate the release of NO and some neuropeptides involved in the erectile process

and acupuncture particularly improve blood circulation and control the sensitivity of nerves to relieve the symptoms of ED patients [34].

## Discussion

In this study, it was shown that Physiotherapy/conservative intervention is very effective in the management of ED, these treatment approach offer non-invasive methods that are painless, inexpensive, and easy to perform and is one of the current treatment method for ED. It also prevent addiction and side effects of pharmacological substances currently used in the management of patients with ED.

The current study revealed that ED increases with age and also worsened in patients with comorbidities but Patients with hypertension and diabetes has been shown to significantly benefit from Physiotherapy/conservative management. A study demonstrated that exercise of a relatively short period improves ED and reduces BP in older hypertensive men with ED [20].

Electrical stimulation as a non-invasive and painless conservative method was shown to be effective in the management of ED and may superpose aerobic exercise in terms of effectiveness, this was clearly seen in a study by Rislanu, et al. They compared the therapeutic effects of ES and aerobic exercise on ED and found that ES was significantly more effective than aerobic exercise in the treatment of ED [35].

In this current study, it was seen that pelvic floor muscle including ischiocavernosus and the bulbocavernous muscles, the reeducation of these muscles has been shown to improve erectile dysfunction symptoms. This will be effective if the pelvic floor muscles are exercised and well-targeted at a dosage of 5–10 times a day, several times a week for 6–12 weeks, the contraction should be maintained and slowly, usually lasting for 5–10 seconds [24].

The role of exercise has been shown in this study to effectively raise testosterone levels, which has been suggested that the use of anabolic agents in conjunction with pelvic floor exercises might be beneficial in the treatment of erectile dysfunction [36].

In this review, Akupunktur a broad term for acupuncture and moxibustion is another conservative method used for managing ED, it has shown to regulate the release of NO and some neuropeptides involved in the erectile process, improve blood circulation and control the sensitivity of nerves to relieve the symptoms of ED patients [34]. For the individual effectiveness of each physical modality shown, it will be more effective and will show significant positive

result if more than one modality or treatment approach is used in the treatment/ management of patients with ED.

## Conclusion

In conclusion, erectile dysfunction has been shown to be improved when managed conservatively, therefore, Physiotherapy interventions/conservative management is effective in the management of ED and it should be considered as a first-line approach for men seeking long-term resolution of erectile dysfunction.

## Recommendations

Physiotherapy/Conservative management is effective in the management of erectile dysfunction; therefore further clinical trials should be conducted to differentiate the most effective method of physical management of ED.

Physiotherapy/Conservative management of ED should be considered first-line approach for men seeking long-term resolution of erectile dysfunction to prevent pharmacological substance addiction and surgery.

## Conflicts of Interest

Authors declare no conflicts of interest

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