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# The Role of Physical Activity in Preventing and Treating Erectile Dysfunction

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**Abstract**

**Introduction and aim:** Erectile dysfunction has a significant impact on quality of life, substantially reducing both the mental and physical well-being of the affected men. This study examines the role of physical activity in the prevention and treatment of erectile dysfunction.

**Methods and materials:** A comprehensive literature review was undertaken using the PubMed and Google Scholar databases, focusing on studies published between 2010-2025. The search strategy aimed to gather anextensive range of research on the role of physical

activity on the course of ED. Key search terms included “impotence”, “erectile dysfunction”, “physical activity”, “exercise”.

**Results and conclusion:** Regular physical activity plays a key role in preventing and treating erectile dysfunction by improving cardiovascular health, managing obesity and diabetes, regulating testosterone, and enhancing overall well-being. The review highlights aerobic exercise as the most effective, with added benefits from strength training and pelvic floor exercises. Even low-intensity activity like walking can help. Long-term, consistent training is essential, and exercise plans should be tailored to individual needs and abilities. For best results, physical activity should be part of a broader lifestyle change.

Keywords

impotence, erectile dysfunction, physical activity, exercise

## Introduction

Erectile dysfunction (ED), formerly known as impotence, is defined as the inability to achieve or maintain an erection of the penis at a level that allows for satisfactory sexual intercourse [1] . The frequency of occurrence in different age groups ranges from around 12.9% (11,5–14,3) in Southern Europe to 20.6% (18,8–22,4) in English-speaking countries. More recent longitudinal studies indicate that the incidence rate ranges from 32% to 80%, depending on the age of the patients at the time of their enrollment in the study. [2].

Erectile dysfunction has a significant impact on quality of life, substantially reducing both the mental and physical well-being of the affected men. Studies on the global burden of disease have shown that individuals with ED more frequently experience deterioration in their psychophysical health. [3,4]

The causes of erectile dysfunction are multifaceted and its frequency rises with advancing age, especially beyond 60 years. Factors and concurrent conditions linked to erectile dysfunction encompass cardiovascular disease, high blood pressure, diabetes mellitus, tobacco consumption, high cholesterol levels, low testosterone, urinary tract issues or metabolic syndrome. [5] These conditions can impair hemodynamic processes underlying penile erection, including arterial inflow and venous outflow. Obesity itself is also thought to have a direct

impact on erectile function by causing chronic inflammation, oxidative stress and ultimately endothelial dysfunction. [6]

Although most patients with erectile dysfunction will have an organic etiology, some may have a primary psychological component, especially younger men. Even when the underlying cause is organic, ED often leads to psychological consequences, such as marital and relationship difficulties, concerns about cultural norms and expectations, loss of self-confidence, feelings of shame, anxiety and depression. [1]

This study examines the role of physical activity in the prevention and treatment of erectile dysfunction. The main assumptions include an assessment of the impact of regular physical exercise on the physiological mechanisms associated with erectile function. Furthermore, the results of studies on the relationship between physical activity and the improvement of sexual function, as well as potential recommendations regarding optimal forms of physical activity supporting the sexual health of men, will be presented.

## Materials and Method of Research

A comprehensive literature review was undertaken using the PubMed and Google Scholar databases, focusing on studies published between 2010-2025. The search strategy aimed to gather anextensive range of research on the role of physical activity on the course of ED. Key search terms included “impotence”, “erectile dysfunction”, “physical activity”, “exercise”. To ensure quality, the selected studies were evaluated based on their relevance, methodology, and significance.

## The Relationship Between Physical Activity and Sexual Health - the impact of exercise

### 1. Cardiovascular Disease

Physical activity plays a pivotal role in the prevention and management of cardiovascular diseases. Regular engagement in physical exercise contributes to the maintenance of optimal cardiac function and vascular health, significantly reducing the risk of conditions such as hypertension, atherosclerosis, coronary artery disease, and myocardial infarction. [7] In addition, physical activity enhances vascular elasticity, which mitigates the likelihood of endothelial damage and facilitates improved circulation. Erectile dysfunction (ED) is often an early manifestation of endothelial dysfunction, a condition that frequently precedes the onset of cardiovascular events. Regular physical activity exerts a beneficial effect on cardiovascular

health, thereby decreasing the incidence of ED. Enhanced exercise tolerance is associated with a reduction in the severity of erectile dysfunction and a lower risk of cardiovascular diseases. Physical activity serves not only as a prophylactic measure against cardiovascular pathology but also contributes to the improvement of sexual health, thereby lowering the risk of ED and other cardiovascular-related health complications.[8] The hemodynamics of the penis are closely tied to endothelial function, and studies have demonstrated that aerobic exercise positively influences cardiac performance, exercise tolerance, and the regulation of cardiovascular risk factors. This is achieved through a reduction in oxidative stress and an increase in the bioavailability of nitric oxide within the penile vasculature [9], which directly enhances erectile function. Aerobic exercise, in particular, plays a critical role in improving erectile function in men with cardiovascular comorbidities. Both moderate-intensity exercise and high-intensity interval training have shown efficacy in ameliorating erectile dysfunction in individuals with cardiovascular-related ED [10]

**2. Obesity**

Physical exercise is a fundamental factor in managing body weight by influencing metabolic processes that support the maintenance of a healthy weight. Regular physical activity enhances calorie expenditure, contributing to the reduction of excess body fat and the improvement of body composition [11]. Furthermore, exercise plays a critical role in promoting sexual health, particularly in individuals with obesity. Men with erectile dysfunction (ED) often exhibit higher body weight and increased waist circumference compared to those without ED. Research indicates that men with a body mass index (BMI) greater than 28.7 have a more than 30% higher risk of developing ED compared to men with a BMI under 25. [12] Although obesity is frequently associated with conditions such as diabetes and hypertension, it remains an independent risk factor for ED [5]. Studies indicate that low levels of physical activity combined with a high BMI significantly elevate the likelihood of developing ED. Men with a higher BMI and lower physical activity levels at age 25 are more likely to experience ED as they age. The connection between obesity, physical inactivity, and sexual health is clear: individuals with higher BMI and lower activity levels face a greater risk of sexual dysfunction. For instance, research shows that engaging in moderate physical activity (over 2 hours per week) between the ages of 30 and 39 reduces the risk of ED by about 30%. These findings suggest that reducing sedentary behavior and maintaining regular physical activity can lower the risk of ED and other reproductive health issues, particularly among

those at risk for obesity [6]. In cases of obesity, physical activity is crucial for improving overall fitness, reducing body weight, and mitigating the risk of ED. A study utilizing the International Index of Erectile Function (IIEF-5) demonstrated that a 1-point improvement in exercise tolerance was associated with a 1.62-point increase in IIEF-5 scores, indicating a reduction in the severity of ED. Regular exercise can facilitate weight loss, which directly benefits sexual function in men with overweight or obesity. [8] Engaging in regular moderate to vigorous aerobic exercise is essential for addressing ED related to obesity and can significantly improve erectile function in men with ED associated with a sedentary lifestyle and excess weight. [10]

### 3. Diabetes

Physical exercise can also improve insulin sensitivity and aid in regulating blood glucose levels, which is critical in the prevention of type 2 diabetes. [13] Diabetes represents a significant risk factor for the development of erectile dysfunction (ED) in men. Diabetes is a well-established risk factor for erectile dysfunction (ED), particularly because it can lead to a variety of physiological changes that impair erectile function. One of the primary mechanisms through which diabetes contributes to ED is through its effect on blood vessels. Chronic high blood sugar levels, a hallmark of diabetes, can damage the blood vessels and nerves that are essential for the normal erectile process. Over time, elevated glucose levels can lead to atherosclerosis, or the hardening of the arteries, which reduces blood flow to the penis and makes it more difficult to achieve or sustain an erection. In addition to vascular damage, diabetes can also cause nerve damage (neuropathy), which further disrupts the signals needed for an erection. This nerve damage can impair the communication between the brain, spinal cord, and penis, affecting the ability to achieve sexual arousal and resulting in difficulties with erectile function. Another contributing factor is the negative impact of diabetes on the endothelium, the inner lining of blood vessels. Men with diabetes often experience ED 10-15 years earlier than the general population, with the condition typically presenting in a more severe form, substantially affecting their quality of life. Erectile dysfunction associated with diabetes is more resistant to treatment with standard therapies, such as phosphodiesterase type 5 (PDE5) inhibitors. Research has shown that inadequate glycemic control in individuals with type 2 diabetes plays a crucial role in the onset and exacerbation of ED. Hyperglycemia generates reactive oxygen species, which negatively impact the physiological mechanisms underlying erection. Chronic complications of diabetes, such as microcirculatory changes,

neuropathy, and endothelial dysfunction, not only increase the risk of ED but may also exacerbate erectile dysfunction in individuals with metabolic syndrome. [5] For men experiencing sexual dysfunction, particularly those with advanced diabetes or obesity, physical activity plays a protective and preventive role. Regular physical exercise has been shown to reduce the incidence of ED in men with diabetes. [12] One study found that higher levels of physical activity were independently associated with a lower risk of moderate to severe ED. Men who engaged in regular physical activity were less likely to experience significant erectile problems, and increased physical activity (e.g., frequent walking or brisk walking) further reduced the risk of ED. [14]

### 4. Hypertension

Hypertension is a significant risk factor for erectile dysfunction (ED). Elevated blood pressure can damage blood vessels over time, leading to reduced blood flow to the penis, which is essential for achieving and maintaining an erection. Chronic high blood pressure can impair endothelial function, which is crucial for the relaxation of blood vessels during arousal. This impairment, in turn, compromises the physiological process of erection. Additionally, hypertension is often associated with other cardiovascular conditions, such as atherosclerosis, which further exacerbate the risk of ED. Thus, managing hypertension effectively is essential not only for overall cardiovascular health but also for maintaining sexual health. Physical activity is widely recommended as a vital lifestyle modification for the prevention of hypertension. Recent epidemiological studies have consistently demonstrated a time-dependent and dose-dependent association between physical activity and the onset of hypertension. Furthermore, experimental evidence derived from intervention studies has robustly corroborated the relationship between physical activity and blood pressure reduction, with the beneficial effects of exercise on lowering blood pressure being well-documented in recent literature. [15] Hypertension is a significant risk factor for erectile dysfunction (ED). Chronic elevation of blood pressure can lead to vascular damage, impairing blood flow to the penis, which is essential for the initiation and maintenance of an erection. Prolonged hypertension also negatively affects endothelial function, which is crucial for vasodilation during sexual arousal. This dysfunction undermines the physiological processes involved in erection. Moreover, hypertension is frequently associated with other cardiovascular conditions, such as atherosclerosis, which further exacerbate the risk of ED. Consequently, effective management of hypertension is critical not only for overall cardiovascular health but also for

the preservation of sexual function. Physical activity exerts a positive effect on sexual health in men with hypertension. Regular engagement in moderate to vigorous aerobic exercise has been shown to mitigate erectile dysfunction in men with hypertension and metabolic syndrome. Exercise regimens that incorporate both aerobic and resistance training have been demonstrated to enhance erectile function in individuals with hypertension-induced ED. [10] In hypertensive patients experiencing erectile dysfunction, participation in a structured physical exercise program resulted in significant improvements in erectile function compared to a control group that did not engage in any physical activity during the same period. [12]

**5. Depression**

Physical activity plays a vital role in supporting mental health, particularly in mitigating symptoms of depression. Empirical evidence suggests that regular exercise stimulates the release of endorphins, commonly referred to as "feel-good" hormones, which contribute to the alleviation of sadness, anxiety, and stress. These biochemical mechanisms not only enhance mood but also promote emotional stability and overall psychological well-being. Furthermore, physical activity facilitates the production of key neurotransmitters such as serotonin and dopamine, which are integral to mood regulation and may counteract the neurochemical imbalances frequently associated with depressive disorders. Beyond its general benefits for mental health, physical activity is also instrumental in the treatment of depression and the enhancement of overall well-being. In the context of erectile dysfunction (ED), affected individuals often perceive the condition as a complex biopsychosocial issue that adversely impacts not only their physical health but also their interpersonal relationships and self-perception of masculinity. Regular aerobic exercise has been identified as particularly beneficial in improving mental health outcomes, reducing depressive symptoms, and fostering self-esteem among men experiencing ED. Moreover, interdisciplinary approaches such as sexual rehabilitation, which integrate physical activity with psychoeducational interventions, have demonstrated efficacy in equipping individuals with coping mechanisms to manage both psychological and sexual health concerns. These interventions contribute to enhanced self-efficacy and an improved overall quality of life. [16] Notably, research has shown that increased exercise tolerance correlates with a reduction in Beck’s Depression Inventory scores, indicating a measurable decrease in depressive symptomatology. Engaging in structured physical exercise not only promotes psychological well-being but also enhances sexual

function and mental health, thereby serving as a valuable adjunct in the management of depressive disorders. [8]

### 6. Testosterone Level

Testosterone levels have a significant influence on erectile dysfunction (ED). As the principal male sex hormone, testosterone is essential for regulating sexual function, including libido, erectile capacity, and overall sexual satisfaction. A deficiency in testosterone, known as hypogonadism, is commonly associated with ED. Testosterone affects erectile function through multiple mechanisms, such as promoting the production of nitric oxide in the endothelial cells of blood vessels, which is critical for the relaxation of smooth muscle in the penis and the subsequent increase in blood flow necessary for achieving an erection. Moreover, testosterone plays a role in maintaining the sensitivity of nerve receptors in the penis, which are essential for sexual arousal and the ability to attain an erection. Low testosterone levels can lead to diminished sexual desire (low libido), difficulties in achieving or sustaining an erection, and, in some instances, an inability to achieve an erection entirely. Physical activity has a considerable impact on testosterone levels. Regular exercise has been shown to elevate serum testosterone concentrations. Interventions aimed at modifying lifestyle factors, particularly physical activity combined with dietary control, have demonstrated efficacy in enhancing testosterone levels. Exercise acts as a protective mechanism against ED by increasing endothelial progenitor cell counts, improving endothelial function, and raising serum testosterone levels, all of which contribute positively to male sexual health. [14] In clinical settings, testosterone replacement therapy (TRT) is frequently prescribed for men with low testosterone levels to improve erectile function. However, TRT may not be effective for all individuals with ED. Evidence suggests that combining physical activity with TRT results in notable improvements in both serum testosterone levels and the symptoms of testosterone deficiency syndrome, compared to testosterone therapy alone. Furthermore, these improvements were sustained in individuals who combined TRT with regular exercise, even after discontinuing TRT. Physical activity appears to enhance the long-term effectiveness of TRT following the cessation of treatment, while also reducing the duration of therapy and mitigating associated risks. [17]

## Specific Types of Physical Activity

### 1. Aerobic Exercise

Participation in regular aerobic exercise not only enhances overall physical fitness but also exerts a substantial positive impact on the cardiovascular system, which plays a pivotal role in the physiological mechanisms underlying erectile function. Adequate cardiac performance and vascular integrity are essential for maintaining optimal blood flow to all peripheral tissues, including the penile vasculature. Chronic engagement in aerobic training has been shown to improve cardiovascular parameters by increasing cardiac output, enhancing endothelial function, and reducing systemic blood pressure. Furthermore, it contributes to favorable metabolic changes, including reductions in serum cholesterol, blood glucose levels, and overall body mass—particularly visceral adiposity. Modification of these established risk factors for erectile dysfunction leads to a decrease in oxidative stress, a known contributor to vascular damage, and promotes the endogenous synthesis of nitric oxide, a key mediator of vasodilation. Increased nitric oxide bioavailability facilitates the relaxation of smooth muscle within the corpus cavernosum, thereby supporting the hemodynamic processes required for penile erection. [9] Collectively, these physiological adaptations associated with regular aerobic exercise contribute to improved sexual function and a reduced prevalence of erectile dysfunction, particularly in individuals with underlying metabolic or cardiovascular comorbidities. Studies have found that among adult men residing in the US, with an average age of 43.7 years, those who were recommended to engage in aerobic exercise had a 34% lower risk of developing erectile dysfunction compared to those who did not meet these guidelines. [18] For men with erectile dysfunction rooted in obesity, hypertension, metabolic syndrome, and/or cardiovascular disease, a training regimen consisting of 40 minutes of moderate to high-intensity aerobic exercise 4 times a week, for a total of 160 minutes per week over 6 months, seems appropriate for improving sexual function. However, some authors suggest implementing aerobic training as a permanent lifestyle change rather than a short-term intervention. Resistance training can also complement aerobic exercise as part of a comprehensive exercise program. [10,19] For individuals who face limitations in performing more intense aerobic activities, the routine of engaging in regular walks may be a beneficial alternative. Longer bouts of walking can effectively support and improve cardiovascular health. [20] A healthy cardiovascular system, in turn, can translate to proper erectile functions. This type of physical activity seems to be a better solution than a sedentary lifestyle. According to research, the habit of walking is inversely related to the occurrence of moderate and severe erectile dysfunction. Regular walking, at a level of at least 21 METs/h per week,

has a positive impact on erectile function, reducing the risk of ED. [14] Where one metabolic equivalent (MET) represents the amount of oxygen consumed while at rest, which is equivalent to 3.5 milliliters of oxygen per kilogram of body weight per minute. [21] Walking improves blood circulation throughout the body, including the genital area. Additionally, it seems to be a great idea for relaxation and mood improvement. It can also be the beginning and motivation for an overall lifestyle modification.

**2. Muscle Strength Training**

Studies investigating the impact of strength training on erectile dysfunction are limited compared to those focused on aerobic exercise. However, some research suggests a potential positive correlation between muscle strength and male sexual function. (Viken et al. 2024) examined this relationship using the Aging Males' Symptoms scale. Although the AMS scale doesn't directly assess erectile function, the study revealed a correlation between increased muscle strength and improved overall sexual function scores, potentially indicating a link between strength training and erectile function.[22] Many studies on exercise and ED involve combined programs incorporating both aerobic and strength training, making it challenging to isolate the specific contribution of strength training. One of them emphasizes that both aerobic and anaerobic/resistance training can be effective for improving erectile function, with stronger evidence supporting aerobic exercise, particularly at moderate to vigorous intensities.[23] Another one found that combined aerobic and resistance training improved erectile function and provided cardiovascular benefits in men with prostate cancer.[24] In contrast, a study of men with erectile dysfunction who were not taking PDE5 inhibitors found that aerobic exercise alone significantly improved their erectile function. However, the combination of resistance training and aerobic training did not lead to similar improvements in this population. [25] The potential benefits of strength training on ED may be indirect, such as improving body composition, increasing testosterone levels, and enhancing overall well-being, all of which can positively impact sexual health. However, further research is needed to fully understand the independent effect of strength training on ED. Given the available research, combined aerobic and strength training appears superior to strength training alone for addressing ED, as the synergistic effects of the two exercise modalities may be more effective in improving sexual function compared to either approach in isolation.

**3. Pelvic Floor Muscle Training**

Pelvic Floor Muscle Training (PFMT) has emerged as an increasingly recognized, effective, and safe non-invasive intervention for the management of erectile dysfunction (ED). As it does not involve surgical procedures or pharmacological agents, PFMT presents a compelling therapeutic option, particularly for individuals who are contraindicated for the use of phosphodiesterase type 5 inhibitors (e.g., sildenafil) due to underlying medical conditions or adverse side effects. It may serve both as an adjunct to conventional pharmacotherapy—potentially enhancing treatment efficacy—and as a standalone intervention for patients seeking non-pharmacological or more holistic approaches. The pelvic floor musculature plays a vital role in erectile function. Through the effective contraction of these muscles, venous outflow from the penis is restricted, leading to a marked increase in intracavernosal pressure that exceeds systemic arterial pressure.[9] This physiological mechanism underscores the potential of PFMT to directly enhance erectile quality. Furthermore, PFMT may yield additional therapeutic benefits, including improved ejaculatory control, enhanced bladder function, and overall improvement in urogenital health and quality of life. Notably, the simplicity of the intervention, its low cost, and the feasibility of performing exercises independently in a home setting contribute to its accessibility and patient adherence, positioning PFMT as a practical and promising component of contemporary ED management strategies. Research has found PFMT to be effective in treating both ED and premature ejaculation, though the optimal training protocol remains to be definitively established. This is due to considerable variability in the methodologies of the analyzed studies, encompassing factors such as therapist contact time, concurrent interventions, intervention duration, training frequency, and exercise intensity.[26] Despite this heterogeneity, which precluded meta-analysis, the overall findings support the efficacy of PFMT in improving erectile function. Furthermore, a meta-analysis by (Silva et al. 2016) corroborated these findings, demonstrating that physical activity and exercise, including pelvic floor muscle-specific exercises, can improve erectile function in men with ED. The positive impact of exercise on ED may stem from improved endothelial function, increased nitric oxide production, and decreased oxidative stress.[18] A novel pre- and post-operative PFMT program for men undergoing radical prostatectomy was found to improve erectile function and quality of life through targeted exercises engaging both fast- and slow-twitch muscle fibers. This highlights the potential of PFMT as a component of post-prostatectomy rehabilitation. [12] However, as noted in a systematic review by (Wong et al.

2020), more rigorous studies with clearly defined exercise protocols are needed to strengthen the evidence base.[27]

In summary, while these reviews offer promising findings regarding the use of PFMT for ED, the lack of a standardized, optimal protocol underscores the need for further, more rigorous research in this area.

**Practical Guidelines for Physical Activity: Intensity and Regularity**

Physical activity is increasingly recognized as a cornerstone in the multidimensional management of erectile dysfunction (ED), not solely due to its acute physiological effects but primarily because of its cumulative and sustained impact on systemic health.[18] Long-term engagement in structured physical activity has been shown to elicit significant improvements in modifiable risk factors—including obesity, hypertension, dyslipidemia, and insulin resistance—as well as to positively influence cardiovascular function and endogenous testosterone production, all of which are integral to the maintenance of normal erectile function.

Moreover, chronic psychological stress, a frequently underappreciated contributor to ED, adversely affects the hypothalamic-pituitary-adrenal axis and autonomic nervous system, thereby impairing both vascular and neurogenic mechanisms of erection. Regular physical activity mitigates these effects by attenuating stress responses, promoting parasympathetic activity, and improving mood states—thus serving as a non-pharmacological intervention with psychophysiological benefits relevant to sexual health. An acceptable level of physical activity that can be considered overall physical well-being can be defined as engaging in physical activity at an intensity of 2.5 MET/min for 30 minutes, 5 times a week, which amounts to 375 MET/min per week.[8]

Empirical data demonstrate a clear inverse relationship between physical activity levels and the risk of ED. Men engaging in ≥150 minutes of moderate-intensity physical activity per week exhibit a significantly lower incidence of erectile dysfunction when compared to those below this threshold. Notably, individuals exceeding 300 minutes per week accrue additional protective effects, supporting a dose-response gradient in the context of physical activity and erectile outcomes.[18]

Nonetheless, the clinical utility of exercise interventions is contingent upon long-term adherence. As such, individualized exercise prescriptions should account for patient-specific

variables, including comorbid conditions, baseline functional capacity, and personal preferences. In the absence of contraindications, tailored physical activity regimens should be implemented to maximize compliance and therapeutic gain.[23]

Furthermore, physical activity may exert synergistic effects when combined with conventional ED therapies, such as phosphodiesterase type 5 inhibitors.[12] By enhancing endothelial function, reducing oxidative stress, and modulating hormonal and metabolic profiles, exercise may potentiate pharmacological efficacy, reduce dosage requirements, and improve overall treatment outcomes.

## Conclusion

This review provides evidence on the beneficial impact of physical activity in the prevention and treatment of erectile dysfunction. Exercise has been shown to positively influence modifiable factors crucial for proper erectile function, such as cardiovascular health, obesity and diabetes management, testosterone regulation, and overall well-being. The study presents proposed physical activity interventions and recommendations emphasizing the importance of long-term, systematic training. The analysis suggests that the greatest benefits can be obtained through the introduction of aerobic exercise, which can be complemented with pelvic floor muscle exercises and strength training. Even lower-intensity activities like regular walking can improve erectile function when more vigorous exercise is not feasible. It is crucial that recommendations regarding physical activity account for the individual's specific needs and limitations, with exercises adapted to their capacities, preferably in conjunction with comprehensive lifestyle modifications.

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