European Journal of Applied Physiology
https://doi.org/10.1007/s00421-025-05734-0

ORIGINAL ARTICLE

Influence of physical activity practice on sexual function in men: a systematic review

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Received: 21 November 2024 / Accepted: 8 February 2025

Abstract

Background While the health benefits of regular physical activity are well-documented, there is limited evidence specifically addressing its impact on male sexual function.

Methods A systematic review was conducted to investigate the influence of physical activity practice on sexual function in men. The studies were sourced from PubMed, Embase, Virtual Health Library, Scopus, Web of Science and Cochrane through May 2024.The recommendations and criteria described in the preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines and Cochrane Handbook were followed. Two independent reviewers assessed the quality of the literature.

Results A total of 15 studies were eligible. According to the studies, physical exercise is highly associated with better sexual function in patients without comorbidities, patients with diabetes mellitus, patients with chronic heart failure, and patients of different races. Exercise influences the production of nitric oxide, improves insulin sensitivity, reduces levels of pro-inflammatory cytokines, and increases testosterone levels. These effects can help maintain arterial stiffness, improve vascular function, support the maintenance of male erection, and improve sexual dysfunctions.

Clinical implications Healthcare professionals might consider prescribing exercise for men with sexual dysfunction.

Conclusion This systematic review provides evidence that physical activity practice improves sexual function.

Keywords Physical activity · Exercise · Sexual activity · Erectile dysfunction · Men's health

Introduction

A healthy sexual response involves four phases: desire, arousal, orgasm, and resolution. Sexual dysfunctions are characterized by alterations in one or more of these phases

Communicated by Michalis G Nikolaidis.

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Published online: 26 February 2025

or by pain associated with the act. The most commonly reported issue is erectile dysfunction (ED), which refers to the difficulty in achieving or maintaining an erection sufficient for satisfactory sexual performance (Anderson et al. 2022). Around the world, about 100 million men live with ED. Studies indicate that sexual dysfunction has become a global public health issue, as it significantly impacts the psychosocial health and quality of life of individuals (Sarris, et al. 2016).

The probability of erectile dysfunction (ED) in 50- and 75-year-old individuals is 20% and 68% for healthy men, and 41% and 85% for those with hypertension, obesity, and diabetes, respectively (Pellegrino et al. 2023). Factors such as diabetes, hypertension, cardiovascular diseases, and dyslipidemias contribute to the emergence of comorbidities, which directly affect penile vascularization and nitric oxide bioavailability, consequently influencing the maintenance of penile function (Diaconu et al. 2020; Lowy and Ramanathan 2022).

Various studies indicate that regular physical activity promotes better systemic vascularization. It is well-established that male sexual function is regulated by vascular health, and when vascular function is impaired—whether due to a sedentary lifestyle or specific comorbidities—it poses a risk factor for the development of ED (Lowy and Ramanathan 2022; Mollaioli et al. 2020).

Although the health benefits of regular physical activity are well-documented, there is limited evidence specifically addressing its impact on male sexual function. Therefore, the objective of this study was to systematically review the literature investigating the influence of physical activity on sexual function in men.

Method

The method of knowledge synthesis adopted for this investigation was a systematic review. The recommendations and criteria described in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines and the Cochrane Handbook were followed (Page et al. 2020). This review was registered in PROSPERO (https://www.crd.york.ac.uk/prospero/) CRD42023392027.

The guiding question of this integrative review was: "What is the available evidence in the literature on the influence of physical activity on sexual function in men?" To construct this question, the PICO strategy was employed: P as the population (men), I as the intervention (physical activity), and O as the outcome (sexual function). It is noteworthy that the C element, for comparison, was not considered and is therefore not implicit in the guiding question (Santos et al. 2007).

Database search and search procedure

This systematic review aimed to identify all relevant studies evaluating the impact of physical activity on sexual function in men. Original studies published up to May 2024 in the National Library of Medicine (Medline® via PubMed®), Embase, Virtual Health Library (VHL), Scopus, Web of Science (WOS), and Cochrane were examined. The search strategy was based on controlled descriptors indexed in the Medical Subject Headings (MeSH) and their synonyms in the Health Sciences Descriptors. These descriptors were carefully selected to broaden the search and address the research question formulated using the PICO strategy. For each component of the strategy, one or more keywords were chosen. The Boolean operators OR and AND were used to cross-reference these keywords (supplementary material).

Study selection

We included clinical trials and observational studies that examined the impact of physical activity on sexual function in men. Studies that included women in their samples, as well as reviews, posters, dissertations, and case reports, were excluded.

The studies identified through the search strategies were exported to Rayyan®, where duplicates were removed. Two independent reviewers then screened the studies by title and abstract. In cases of uncertainty, a third collaborator was consulted.

Data analysis

During the full paper review, data related to the author, year of publication, country of origin, age range, body mass index (BMI), associated comorbidities, assessment instruments, intervention, and outcomes were descriptively organized in the online version of Microsoft Excel®. To systematize the article inclusion process, we chose to use the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) methodology (Page et al. 2020).

Evaluation of the quality of studies

For non-randomized clinical trials, the ROBINS-I tool was used, while the Newcastle–Ottawa scale was applied for evaluating observational studies.

Study selection and outcomes

The main outcome, sexual function, was assessed using sexual questionnaires that measured both affective (satisfaction,

pleasure, importance, pain, discomfort) and functional (touch, pressure, thermoreception, nipple erection) sexual domains.

Results

A total of 6259 studies were identified in the electronic searches. Of these, 1546 duplicates were removed, resulting in 4713 unique studies. After reviewing the titles and abstracts, 28 studies were selected for full reading. Among these, 15 studies were included in this review (Kumagai et al. 2019; Kumagai et al. 2020; Minami et al. 2017; Balasubramanian, et al. 2020; Simon et al. 2015; Belardinelli et al. 2005; Parazzini et al. 2019; Maio et al. 2010; Pitta et al. 2022; Mialon et al. 2012; KHOO, J. et al. 2013; Grygierzec, et al. 2023; Cormie et al. 2013; Kim et al. 2011; Rosen et al. 2009), while the others were excluded due to being reviews, posters, and proceedings ($n=7$) or including women in their samples ($n=6$). The study selection process is illustrated in Fig. 1.

A total of 29,750 men participated in the selected studies, all of which were published in English. These studies were conducted in various countries, including Japan (Kumagai et al. 2019; Kumagai et al. 2020; Minami et al. 2017), USA (Balasubramanian, et al. 2020; Simon et al. 2015; Rosen et al. 2009), Italy (Belardinelli et al. 2005; Parazzini et al. 2019; Maio et al. 2010), Brazil (Pitta et al. 2022), Switzerland (Mialon et al. 2012), Singapore (Khoo et al. 2013; Kim et al. 2011), Poland (Grygierzec, et al. 2023) and Australia (Cormie et al. 2013). Table 1 provides the characteristics of the included studies.

The sample consisted of adult men aged 18–82 years with BMI ranging from 17.3 to 34.6 kg/m^2. The primary dysfunction evaluated was erectile dysfunction, followed by premature ejaculation. Six studies included samples with associated comorbidities, the most frequent being systemic arterial hypertension (SAH), diabetes mellitus (DM), and

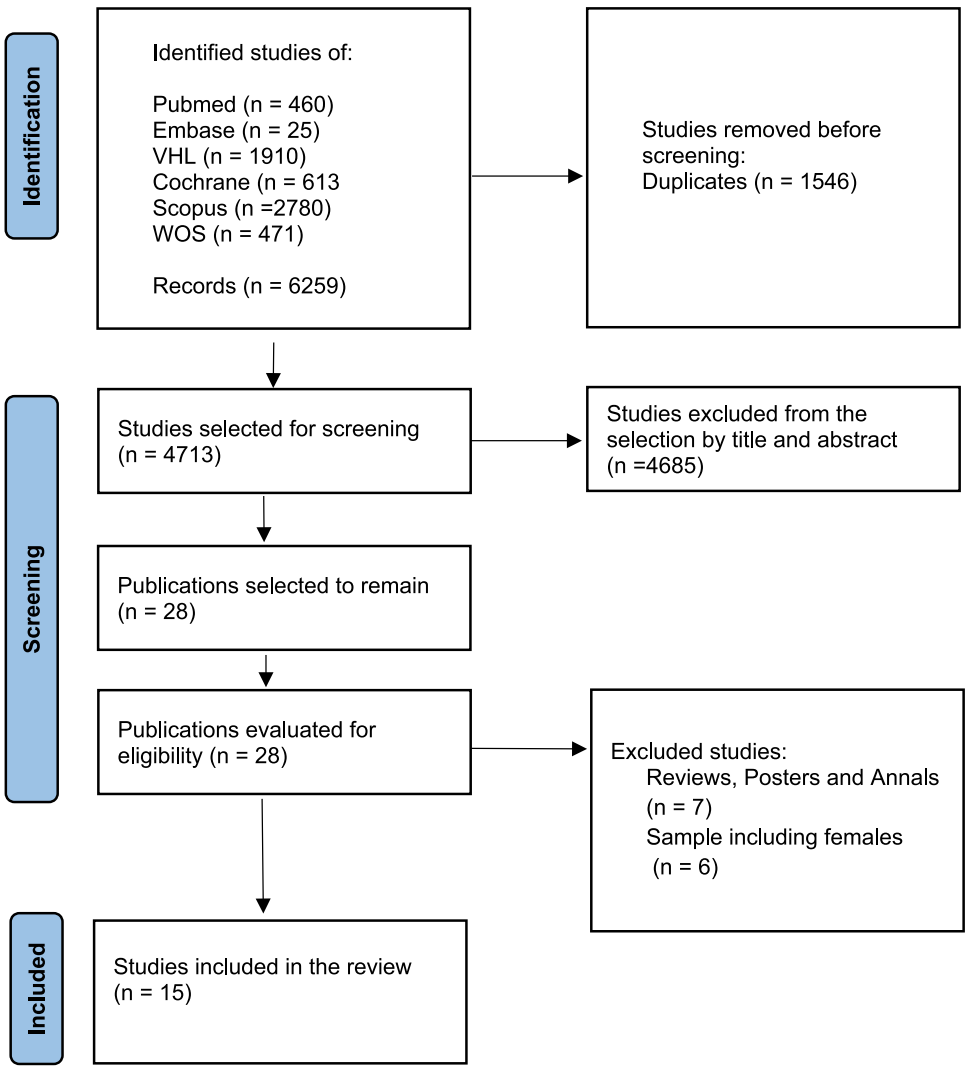

Fig. 1 Flowchart of the selection process

Table 1 Characteristics of the included studies

References	Sample	Year	Country	Study design
Kumagai et al. 2019	177	2019	Japan	Cross-Sectional
Balasubramanian et al. 2020	1.635	2020	USA	Cross-Sectional
Belardinelli et al. 2005	59	2004	Italy	Clinical trial
Kim et al. 2011	39	2011	Korea	Cross-Sectional
Mialon et al. 2012	2.507	2012	Switzerland	Cross-Sectional
Minami et al. 2017	460	2017	Japan	Cohort
Parazzini et al. 2019	2.786	2019	Italy	Cross-Sectional
Rosen et al. 2009	373	2009	USA	Cross-Sectional
Kumagai et al. 2020	169	2020	Japan	Cross-Sectional
Khoo et al. 2013	90	2016	Singapure	Clinical trial
Maio et al. 2010	60	2010	Italy	Clinical trial
Mandera-Gygierzec et al. 2023	254	2023	Poland	Cross-Sectional
Pitta et al. 2022	20,789	2022	Brazil	Cross-sectional
Cormie et al. 2013	57	2013	Australia	Clinical trial
Simon et al. 2020	295	2020	USA	Clinical trial

dyslipidemia or hyperlipidemia. (Kumagai et al. 2019; Minami et al. 2017; Balasubramanian, et al. 2020; Pitta et al. 2022; Khoo, et al. 2013; Grygierzec, et al. 2023; Rosen et al. 2009), as presented in Table 2. The International Index of Erectile Function (IIEF) questionnaire was the most commonly used in the studies (Kumagai et al. 2019, 2020; Maio et al. 2010; Pitta et al. 2022; Grygierzec, et al. 2023; Kim et al. 2011). The Sexual Health Inventory for Men (SHIM) was also utilized to assess male sexual dysfunction (Minami et al. 2017; Balasubramanian, et al. 2020). The Premature Ejaculation Diagnostic Tool (PEDT) and the Premature Ejaculation Prevalence and Attitudes (PEPA) were the least used questionnairesn (Mialon et al. 2012; Kim et al. 2011). Additionally, these studies employed questionnaires specifically designed for the research to gather information about lifestyle habits, height, weight, physical activity, and sexual activity in healthy men (Mialon et al. 2012; Kim et al. 2011).

BMI body mass index. *SAH* systemic arterial hypertension, *DM* diabetes mellitus, *CHF* Chronic heart failure, *AIDS* acquired immunodeficiency syndrome. *CAD* coronary artery disease, *SHIM* Sexual Health Inventory for Men, IIEF International Index of Erectile Function, N/I Not Informed, *CPET* Cardiopulmonary exercise testing, *US* ultrasonography, *MLHFQ* Minnesota Living With Heart Failure, *BDI* Beck's Depression Inventory, IPSS International Prostate Symptom Score, *OABSS* Overactive Bladder Symptom Score, PEDT Premature Ejaculation Diagnostic Tool, *PSA* Prostate Specific Antigen, *PVR* Post-void residual volume, *PEPA* the premature ejaculation prevalence and attitudes, *IPAQ* International Physical Activity Questionnaire, *SF* Short-Form Health Survey, *MDI* Major Depression, Inventory, *BRIEF* Behavior Rating Inventory of Executive Function, *ATP* Adult Treatment Panel, *SF-36* Social Functioning Health Index, *MCS* Memory Complaint Scale, *PCS* Physical Component Scale, *ED* Erectile Dysfunction, *AMS* Aging Males' Symptoms questionnaire, *LV* Low Volume. *PDE5i* phosphodiesterase type 5 inhibitor. MET Metabolic equivalent of Task, *AUDIT* Alcohol Use Disorders Identification Test, *AST*Androgen suppression therapy, *QLQ* Quality of life Questionary, *MET* Metabolic equivalents.

The duration, load and frequency of physical activity practice were analyzed, as shown in Table 3. The participants' activity duration varied from 8 weeks to over 10 years, indicating significant variability in both the time and type of activities practiced. Regarding the type of physical activity, walking (Minami et al. 2017; Kumagai et al. 2020; Cormie et al. 2013) and cycling (Kumagai et al. 2019, 2020; Balasubramanian, et al. 2020; Belardinelli et al. 2005; Kim et al. 2011) were identified as the most frequent, as indicated by several studies. Other activities were either not specified or were assessed as "level of physical activity/physical exercise".

Two studies present contrasting views on the practice of cycling. One study concluded that certain specific characteristics of cycling can influence comfort and sexual function, leading to complaints such as pelvic pain and numbness, and predisposing practitioners to the onset of erectile dysfunction (Balasubramanian, et al. 2020). In contrast, another study found that recreational cycling does not harm urinary or sexual function in men (Kim et al. 2011). This discrepancy may be due to the protocols used. Table 3 shows the intervention protocols.

Six studies did not specify the type of exercise evaluated, as they performed a retrospective evaluation (Kumagai et al. 2020; Simon et al. 2015; Parazzini et al. 2019; Maio et al. 2010; Mialon et al. 2012; Grygierzec, et al. 2023). To evaluate training intensity, one study used a physical activity questionnaire that classified participants into low, moderate,

Table 2 Sociodemographic data, assessment instruments, and outcomes

Reference	Age	BMI	Comorbidities	Assessment Tool	Outcomes
Kumagai et al. 2019	23–82	17,3—33,6 kg/m^2	SAH(6,8%); Dyslipidemia(7,3%); DM(1,7%)	Dynamometer; Sit-and-reach test; IIEF	Maintenance of muscle strength and aerobic capacity were related to improved male sexual function
Balasubramanian et al. 2020	≥ 18	N/I	Arthritis(205); Depression(136); Hyperlipidemia(282); SAH(194)	SHIM	Cycling can impair the sexual function of cyclists, predisposing them to develop ED
Belardinelli et al., 2005	56	N/I	CHF(59); SAH(16); Smoker(19); DM(5);	CEPT; Brachial artery US; MLHFQ	Cycloergometer training provided improvements in sexual activity
Kim et al., 2011	40–57	22,8—34,6 kg/m^2	None	IPSS; IIEF; OABSS; PEDT; PSA; PVR; Transrectal Ultrasound for Prostate	Cycling has not been identified as detrimental to urinary or sexual function in men who practice the activity recreationally
Mialon et al., 2012	18—25	20.2 kg/m^2	None	PEPA; IIEF; IPAQ; SF-12; MDI	Physical activity and health are directly associated with the prevention of erectile dysfunction and premature ejaculation
Minami et al., 2017	60	24.9 kg/m^2	DM; SAH (305); Dyslipidemia (331); CAD(47)	SHIM; BRIEF	Physical activity was associated with improved erectile dysfunction
Parazzini et al., 2019	55,1	25 kg/m^2	Smokers (343)	N/I	Healthy lifestyle habits including physical activity prevent prostate enlargement and ED
Rosen et al., 2009	45–75	25 kg/m^2	DM	IIEF; ATP; Ergometric Test; BDI; SF-36; MCS; PCS	ED can be prevented by cardiorespiratory fitness
Kumagain et al., 2020	53–69	22.5 kg/m^2	History of cardio/cerebrovascular disease	AMS	Physical activity improves AMS score
Khoo et al., 2013	30–60	32.8 kg/m^2	Obesity	Diet, moderate-intensity exercise of LV	Moderate-intensity HV aerobic exercise > 200 min/week produces greater improvements in sexual Function, testosterone, weight, WC, and fat mass than smaller exercise volume
Maio et al., 2010	N/I	N/I	Erectile Dysfunction	IIEF; TT, PDE5i	PDE5i plus physical activity is more effective than PDE5i alone in the treatment of ED
Mandera-Gygierzee et al., 2023	56.54 ± 5.47	28.1 ± 3.73	Post-Myocardial Infarction, DM (103), SAH (200), smokers (14), Dyslipidemia (149)	IIEF, BDI, MET	Exercise tolerance can be an early and simple marker at the onset of ED disorders
Pitta et al., 2022	50.06 ± 7.52	27.77 ± 4.01	With ED: SAH (39.6%); DM (16.1%); Dyslipidemia (57.1%); Use of hypolipemiant (27.8%); Metabolic syndrome (15.5%)	AUDIT, BDI, PSS, IPAQ, IIEF	Physical activity was associated with more than 20% reduction in the risk of ED in men aged ≥ 40

Table 2 (continued)

Reference	Age	BMI	Comorbidities	Assessment Tool	Outcomes
Cormie et al., 2013	N/I	N/I	Prostate Cancer	QLQ-PR25	Participation in short-term exercise helps in the maintenance of sexual activity despites AST
Simon et al., 2020	N/I	N/I	Prostate Cancer factors risk	Self-reported questionnaires	Do more than 18 MET/hours per week is associated with better sexual function despites of race

Source: Survey data

or high activity levels (Mialon et al. 2012) Another study used a similar questionnaire where participants self-reported their physical activity as none, low, moderate, or intense (Parazzini et al. 2019). In some studies, variables such as frequency, load, and duration were not clarified and were replaced by "N/I, not informed" (Minami et al. 2017; Rosen et al. 2009). There was a predominance of cross-sectional studies (Kumagai et al. 2019, 2020; Balasubramanian, et al. 2020); (Parazzini et al. 2019; Pitta et al. 2022; Mialon et al. 2012; Grygierzec, et al. 2023; Kim et al. 2011) and in these, the evaluation was conducted retrospectively using questionnaires to identify the level of physical activity of the participants.

The Newcastle–Ottawa scale was used to assess the quality of each study based on three domains: selection, comparability, and outcome (Table 4). The articles were graded on a star basis, ranging from zero to ten stars, with a higher number of stars indicating better quality. In this study, we chose to represent the scale in absolute numbers. All the studies scored higher than seven, classifying them as high-quality studies according to the scale.

Non-randomized clinical trials were evaluated using the ROBINS-I tool. The articles exhibited a low risk of bias across all evaluated domains, as shown in Fig. 2.

Discussion

According to studies, physical exercise is highly associated with better sexual function in patients without comorbidities, patients with diabetes mellitus (Minami et al. 2017), patients with chronic heart failure (Belardinelli et al. 2005) and patients of different races (Simon et al. 2015). In the study by Simon et al. (2015) regular exercise was positively associated with both erectile and sexual function in men, regardless of race. Minami et al. (2017) related that regular physical activity might be inversely associated with erectile dysfunction in patients with type 2 diabetes mellitus. Belardinelli et al. (2005) concluded that exercise significantly improves brachial artery endothelial dysfunction, suggesting a systemic effect of leg exercise that is correlated with improvements in sexual activity. Mandera-Gygierzec et al. (2023) confirmed that the increase in exercise tolerance is associated with a decrease in the incidence of erectile dysfunction (Grygierzec, et al. 2023).

Aerobic capacity and muscular strength are linked to male sexual function through vascular function. In the study by Kumagai et al. (2019), VO2 peak was significantly correlated with both male sexual function and arterial stiffness. The findings suggest that high physical fitness can potentially mitigate the negative impact of aging on male sexual function by improving vascular health and maintaining arterial stiffness at healthier levels (Kumagai et al. 2019).

Table 3 Intervention protocols

Reference	Exercise type	Duration	Load	Frequency
Kumagai et al., 2019	Cycling ergometer	1 day	20 W for the first 2 min, increasing by 10W (> 50 years) or 20W (< 50 years) every minute until VO2 peak is reached	No repeats
Balasubramanian et al., 2020	Cycling	Under and over 10 years	N/I	< 6 h/week; 6–8 h/week; 8–11 h/week; > 11 h/week
Belardinelli et al., 2005	1st group: supervised cycloergometer. 2nd group: not exercised	60 min a session, for 8 weeks	Intensity: 60% of VO2 peak	3 times a week
Kim et al., 2011	Cycling	60 to 240 min per session, for 1 to 10 years	N/I	3 to 6 times a week
Mialon et al., 2012	Physical activity not specified	N/I	N/I	N/I
Minami et al., 2017	Exercise or Walk	Exercise: 30 min (> 1 year); Walking: 60 min	N/I	Exercise: 2 times/week; Walking: daily
Parazzini et al., 2019	Physical activity not specified	N/I	N/I	No repeats
Rosen et al., 2009	Walking	Until voluntary exhaustion	N/I	No repeats
Kumagain et al., 2020	Aerobic physical activity no specified	N/I	N/I	N/I
Khoo et al., 2013	stationary cycling, treadmill, elliptical cross-training, brisk walking, jogging, cycling, and swimming	24 weeks	2nd group: 90–150 min increased by 10–15 min/week and two sessions/week increased by 1/week	1st group: < 150 min/week. 2nd group: 200–300 min/week
Maio et al., 2010	Aerobic physical activity no specified	3 months	N/I	Group A: not exercised Group B: ≥ 3 h/week
Mandera-Gygierzee et al., 2023	Physical activity not specified	N/I	N/I	No repeats
Pitta et al., 2022	Physical activity not specified	NI	N/I	Highly active: 30 min of VA 5 days/week or 20 min of VA 3 days/week + 30 min of MA 5 days/week active: 20 min of VA 3 days/week or any exercise 150 min 5 times/week Moderate active: any tipe of exercise not included in other categories Sedentary: does not do any type of exercise
Cormie et al., 2013	1st group: resistance exercises and aerobic exercises like walking, jogging and/or cycling 2nd group: not exercised	12 weeks	Resistance: 12 repetition maximum to 6 repetition maximum with two to four sets per exercise Aerobic: aim of 150 min exercise each week	Only aerobic specified: 15–20 min/session
Simon et al., 2020	Physical activity not specified	NI	NI	Sedentary: < 3; mildly active: 3–8.9; moderately active: 9–17.9, highly active: ≥ 18 metabolic equivalents (MET) hours/week

N/I Not Informed, *W* watts, *VO2 peak* peak oxygen consumption, *VA* vigorous activity, *MA* Moderate activity

Table 4 Methodological quality of the studies based on the Newcastle—Ottawa scale

Author	Representativeness of the sample	Comparability	Outcome	Total score
Kumagai et al., 2019	5	1	3	9
Balasubramanian et al., 2020	4	1	3	8
Kim et al., 2011	4	1	2	7
Mialon et al., 2012	5	1	2	9
Minami et al., 2017	5	1	3	9
Parazzini et al., 2019	4	1	3	8
Rosen et al., 2009	5	1	3	9
Kumagai et al., 2020	5	1	3	9
Mandera-Gygierzec et al., 2023	5	1	2	8
Pitta et al., 2022	4	1	3	8

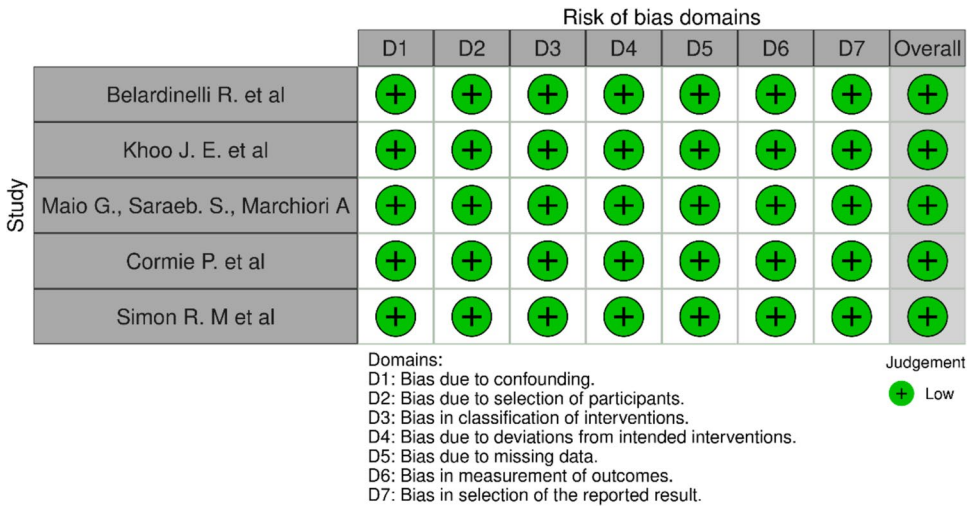

Fig. 2 Risk of bias assessed using the ROBINS-I

Kumagai et al. (2020) suggested that engaging in regular aerobic exercise can enhance sexual health, likely due to improvements in vascular function and overall physical fitness.

Regarding the profile found in the studies, among the 15 articles, 4 included participants with arterial hypertension, 6 with diabetes mellitus, 5 with dyslipidemia, and 2 with smokers. These comorbidities share a common factor: the deterioration of vascular function (Kumagai et al. 2019) This is because they directly influence the production of nitric oxide, reducing tissue perfusion and, consequently, impacting the maintenance of male erection (Rosen et al. 2009). A sedentary lifestyle contributes to the emergence of non-communicable chronic diseases, which in turn reduce peripheral venous return and the production of the enzyme responsible for synthesizing endothelial nitric oxide. These changes inhibit the relaxation process of the smooth muscles of the penile corpus cavernosum, leading to decreased vessel contractility and negatively impacting the vascular tumescence necessary for an erection (Defeudis 2021; Adams et al. 2011; Stein 2000).

The beneficial effects of exercise on enhancing sexual function are attributed not only to managing traditional risk factors but also to increasing the systemic availability of nitric oxide (NO) derived from the endothelium. Additionally, exercise improves insulin sensitivity, which stimulates vascular NO release, reduces serum proinflammatory cytokine levels, and boosts testosterone levels (Pitta et al. 2022). Results by Pitta et al. (2022) showed that physical activity serves as a robust independent protective factor against sexual dysfunction, effective even at low levels. This holds true regardless of age and comorbidities, making it highly recommended for the treatment and prevention of erectile dysfunction and therefore should be strongly encouraged during the treatment and prevention of this condition (Pitta et al. 2022).

One study reported a negative impact on sexual function associated with cycling. This study found that the structural characteristics of the saddle increase pressure on the perineal region, potentially leading to pain and pelvic numbness, which may favor the onset of erectile dysfunction (Balasubramanian, et al. 2020). As in this study, there

are controversies in the literature regarding the practice of cycling. The pressure exerted by the saddle during cycling is associated with pudendal nerve compression and/or reduced vascularization. However, this association has not yet been clearly established (Gan et al. 2021).

In relation to sexual activity, humans have an energy expenditure of between 2 to 4 METs, with lower caloric expenditure in the pre-orgasmic phase and potentially reaching peak exhaustion during orgasm. This indicates that individuals with good aerobic capacity have a greater chance of achieving healthy and satisfactory sexual function (Belardinelli et al. 2005). Other research has shown that energy expenditure during sexual activity can benefit cardiovascular health, considering the increase in heart rate and oxygen consumption after the activity (Adams et al. 2011; Mafra et al. 2013). Additionally, there is consistent evidence supporting the benefits of exercise training in preventing and/or counteracting the impairment of testicular function caused by age (Matos et al. 2019).

This study reiterated the relevance of physical activity to sexual dysfunction. Despite the limited number of primary studies and certain weaknesses in methods, sample sizes, and differing protocols, it is suggested that physical activity has a positive influence on sexual function in men, regardless of the presence of comorbidities. Physical activity influences the production of nitric oxide, improves insulin sensitivity, reduces levels of pro-inflammatory cytokines, and increases testosterone levels. These effects can help maintain arterial stiffness, improve vascular function, support the maintenance of male erection, and enhance sexual function.

It is important to note that the main limitation of this study was the insufficient description of the physical activity protocol used, particularly regarding the intensity and frequency of the physical activity. While both studies indicated positive effects of physical activity on sexual function in men, the limited number of studies highlights the need for more comprehensive research in this area.

Conclusion

This systematic review provides evidence that physical activity practice improves sexual function in men. Moreover, research should focus on detailing the mechanisms through which physical activity influences sexual function.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s00421-025-05734-0.

Acknowledgements None.

Authors contributions Marianne Lucena da Silva performed the conceptualization, project administration, supervision, and writing. Liana Barbaresco Gomide Matheus performed update, writing, and editing, and served as the corresponding author. Ana Claudia de Souza Alves Braga performed data acquisition, data selection, data analysis, and data interpretation. Miguel Luciano Rodrigues da Silva Junior managed data acquisition, data selection, data analysis, and data interpretation. Lucas Alves Jaques was responsible for data acquisition, data selection, and data analysis. Diego Vieira de Mattos contributed to methodology, conceptualization, and design. Katiane da Costa Cunha performed conceptualization, project administration, supervision, and writing. Aline Teixeira Alves made key contributions to the conceptualization and design. All authors saw and approved the final version and no other person made a substantial contribution to the paper.

Funding None.

Declarations

Conflict of interest None.

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