



## Integrative review on the indiscriminate use of medications for erectile dysfunction in young and adult individuals: A view of the last 20 years

ANDRADE, Sâmia Moreira de<sup>(1)</sup>; ALMEIDA, Marcos Lima<sup>(2)</sup>; ROSA, Luís Marcelo Vieira<sup>(3)</sup>; TAMINATO, Rodrigo Luís<sup>(4)</sup>; SANTOS, Gustavo Alves Andrade dos<sup>(5)</sup>; RODRIGUES, Ítalo Sávio Mendes<sup>(6)</sup>; SOUSA, Jailson Carmo de<sup>(7)</sup>

<sup>(1)</sup> 0000-0002-2310-2515; Centro Universitário Santo Agostinho. São Luís, Maranhão (MA), Brasil. E-mail: samia.andrade27@hotmail.com

<sup>(2)</sup> 0000-0002-6631-9216; Centro Universitário UniFacid Wyden. Teresina, Piauí (PI), Brasil. E-mail: [marcosallmeida.mla@gmail.com](mailto:marcosallmeida.mla@gmail.com)

<sup>(3)</sup> 0000-0002-8960-6871; Universidade Federal do Maranhão. São Luís (MA), Maranhão, Brasil. E-mail: marcelorosa.ma@gmail.com

<sup>(4)</sup> 0000-0001-9685-557X; Universidade Federal do Goiás. Goiânia (GO), Brasil. E-mail: rodrigorltjapa@gmail.com.br

<sup>(5)</sup> 0000-0002-2949-2382; São Leopoldo Mandic School of Medicine. Araras, São Paulo (SP), Brasil. E-mail: gusfarma@hotmail.com

<sup>(6)</sup> 0000-0002-9311-9443; Universidade Federal do Ceará. Teresina, Piauí (PI), Brasil. E-mail: italosavio@hotmail.com

<sup>(7)</sup> 0000-0002-0196-0295; Faculdade Maurício de Nassau. Teresina, Piauí (PI), E-mail: jailson51462@gmail.com

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### ABSTRACT

Erectile dysfunction is defined as the loss of the ability to obtain and maintain a satisfactory erection for a certain period of time. To solve this problem, a series of medications have been developed for this purpose. However, a major problem has emerged in society, the irrational use of medications for erectile dysfunction. Therefore, this study aims to carry out a bibliographical search of the literature specifying the abusive use of medications for erectile dysfunction by the young and adult population. To do this, we carried out a literature review including complete original studies published in the last 10 years. Only studies conducted in individuals aged 18 to 59 years were selected. Articles that were not available in full text, as well as repeated articles, editorials, articles in other languages, and studies that were not related to the object of study were excluded. Marital status has not been shown to be a determining factor for the consumption of medications for erectile dysfunction. An unusual point among all the studies was the fact that, in most cases, the medicine was purchased without a prescription. Among the main reasons that induce and promote the irrational use of medications that increase sexual potency, curiosity, fun, stress or even a new partner stand out. Furthermore, the drugs Sildenafil (Viagra), Tadalafil (Cialis) and vardenafil (Levitra) were the most used by young people and adults, even without erectile dysfunction problems. In conclusion, the data presented here serve to clarify the reasons why young and adult individuals indiscriminately use medications for erectile dysfunction even when they do not have this problem.

### RESUMO

A disfunção erétil é definida como a perda da capacidade em obter e manter ereção satisfatória por um determinado tempo. Para resolver esse problema, uma série de medicamentos foram desenvolvidos com esse propósito. Entretanto, um grande problema vem surgindo na sociedade, o uso irracional de medicamentos para disfunção erétil. Dessa forma, este estudo tem como objetivo realizar uma pesquisa bibliográfica da literatura especificando sobre o uso abusivo de medicamentos para disfunção erétil pela população jovem e adulta. Para isso, realizamos uma revisão de literatura incluindo estudos originais completos, publicados nos últimos 10 anos. Foram selecionados apenas estudos realizados em indivíduos de 18 a 59 anos. Foram excluídos artigos que não estavam disponíveis na íntegra, bem como artigos repetidos, editoriais, artigos em outros idiomas e estudos que não tivessem relação com o objeto de estudo. O estado civil não demonstrou ser um fator determinante para o consumo de medicamentos para disfunção erétil. Um ponto incomum entre todos os estudos foi o fato de, na maioria dos casos, o medicamento ser adquirido sem prescrição médica. Dentre os principais motivos que induzem e promovem o uso irracional de medicamentos que aumentam a potência sexual, destaca-se a curiosidade, diversão, estresse ou ainda um novo parceiro. Ainda, os medicamentos Sildenafil (Viagra), Tadalafila (Cialis) e vardenafila (Levitra) foram os mais utilizados por jovens e adultos, mesmo sem problemas de disfunção erétil. Em conclusão, os dados aqui apresentados servem para esclarecer os motivos pelos quais os indivíduos jovens e adultos fazem uso indiscriminado de medicamentos para disfunção erétil mesmo não apresentando este problema.

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## Introduction

There was a time in history when "sexual impotence" was seen as a weakness of the individual. However, today we know that it is caused by various factors (COSTA, 2021), such as depression, aging, sedentary lifestyle, diabetes, hypertension, high cholesterol, obesity, coronary artery disease, Parkinson's disease, prostate cancer treatment, use of anabolic steroids, drug addiction, alcoholism, smoking, as well as stress and anxiety. Over time, this problem ceased to be considered purely psychological or an inevitable part of aging, and instead, it was recognized as a health issue called erectile dysfunction (REZENDE, 2021; SALES RODRIGUES, 2021; CIACCIO & DI GIACOMO, 2022).

Erectile dysfunction is defined as the inability to achieve and maintain a satisfactory erection for a certain period of time, allowing for satisfactory sexual activity (MAZZILLI, 2022; COUTO, 2023). Data from the World Health Organization (WHO) corroborate that sexual health is the most significant factor impacting the quality of life of the male population. Although not fatal, it is crucial to note that erectile dysfunction can indicate the presence of underlying medical conditions and be associated with histories of cardiovascular diseases, diabetes, and depression across various age groups (GODOI & FACIO JUNIOR, 2024; REZENDE & SILVA COIMBRA, 2021). To address this problem, a series of medications have been developed for this purpose, as impotence can be daunting to male pride. However, a significant issue has arisen in society, something that can be considered even more serious than impotence: the irrational use of erectile dysfunction medications. Among the reasons related to the irrational use of medications that enhance sexual potency are curiosity, entertainment, stress, or even a new partner (TEIXEIRA JÚNIOR, 2019).

Currently, the most commonly used medications for erectile dysfunction are sildenafil (Viagra), tadalafil (Cialis), vardenafil (Levitra), avanafil (Stendra), and alprostadil (Caverject, Edex). These products are being marketed with great ease, often in an unregulated manner and from unreliable sources, via the internet, without any restriction from public health systems. This certainly contributes to the increasingly frequent occurrence of adverse effects due to their misuse, even among young individuals without erectile dysfunction (MARANHÃO-FILHO, 2014; SOUZA ROMÃO, 2022).

Therefore, there is an association of the use of such medications with various adverse effects that can affect young individuals without comorbidities, implying that recreational use may lead to headache, facial flushing, nasal congestion, dyspepsia, and nausea. Additionally, recent studies also point to auditory alterations, such as the risk of sudden hearing loss, suggesting a potential ototoxicity of these medications (SOUZA ROMÃO, 2022). Considering the problems caused by self-medication, this study aims to conduct a literature review specifying the abusive use of erectile dysfunction medications by the young and adult population.

## **Methodology**

This literature review was conducted in the integrative modality, aiming to answer the following research question: "Which medications for erectile dysfunction are being used irrationally by young adults and adults?" The databases used were the Scientific Electronic Library Online (SciELO), the Medical Literature Analysis and Retrieval System Online (MEDLINE), and the Latin American and Caribbean Health Sciences Literature (LILACS). The descriptors used for the search were: erectile dysfunction, sildenafil, tadalafil, vardenafil, avanafil, and caverject.

The inclusion criteria adopted were: complete original studies that included at least one of the descriptors in the title or abstract, published in Portuguese, English, or Spanish between February 2004 and February 2024. Only studies conducted in individuals aged 18 to 59 years were selected. Articles that were not available in full text, as well as repeated articles, editorials, articles in other languages, and studies that were not related to the object of study were excluded.

This methodological approach allowed for a comprehensive and systematic search of the literature related to the irrational use of medications for erectile dysfunction, ensuring the inclusion of relevant studies and the exclusion of information not pertinent to the topic at hand (SOUSA PINHEIRO, 2021).

## **Results and discussion**

According to a study conducted by Couto (2023), the highest consumption of Tadalafil occurred among married men (55%), with a high school education level (54%), in which 79% of cases obtained the medication without a medical prescription. Factors related to its consumption included feelings of well-being and increased self-confidence, with reported adverse effects such as headache and facial flushing. However, the study by Teixeira Júnior (2019) found that 52.2% of men who consumed medications for erectile dysfunction were single with a completed higher education degree (39.3%), predominantly acquired without a medical prescription (59.9%). These findings are similar to those reported by Abdo and colleagues (2014). Marital status does not seem to be a determining factor for the consumption of medications for erectile dysfunction. An uncommon point among all studies was the fact that, in most cases, the medication was obtained without a medical prescription. This is a concerning issue because irrational medication use can have serious consequences for the individual. Furthermore, there is no evidence that it leads to increased sexual potency in these individuals (Teixeira Júnior, 2019). This is because healthy men, when using erectile dysfunction medications, show lower sexual performance compared to those who have erectile

dysfunction problems and use medications. Therefore, it is evident that the use of these medications by young individuals is not recommended, as there is no evidence of improvement in sexual performance (FEITAS, 2008). Additionally, even in cases of actual erectile dysfunction, it is important for the patient to identify the underlying cause of this problem, such as alcoholism, sexual identity conflicts, and obesity (PINHEIRO, 2018; MOLLAIOLI, 2020; DIAS, 2024).

Regarding university students, 40% of academics reported obtaining erectile dysfunction medication from pharmacies, and in 95% of cases, without a medical prescription, with the main motivation being curiosity (NUNES, 2021). This motive was also pointed out by Freitas and colleagues in 2008, along with other reasons such as enhancing erection, controlling premature ejaculation, increasing pleasure, or insecurity. In the study by Freitas (2008), 14.7% reported having used PDE-5 inhibitors medications, stating that they obtained them without a medical prescription or any diagnosis of erectile dysfunction. The majority of users interviewed reported using out of curiosity (70%), to enhance erection (12%), to control premature ejaculation (12%), and to increase pleasure (6%). Indeed, among the main reasons that induce and promote the irrational use of medications that enhance sexual potency, curiosity, recreation, stress, or a new partner stand out (Teixeira Júnior, 2019). Similar data were reported among university students in Kenya, with 10% of students having used some form of erectile dysfunction medication and/or sexual enhancers (KAYOSE, 2023; DIAS, 2024).

When analyzing the profile of individuals who actually sought medical attention to address the problem, Souza and colleagues (2024) found that the majority of participants were of mixed race (57.81%), married (65.63%), and overweight or obese (73.44%). One of the studies with a larger number of participants was conducted in China by Lin et al (2020), with 92,620 interviewed young individuals. The data show that the majority of individuals (58.14%) searched online for information related to erectile dysfunction, and among the 24,535 who took medication for erectile dysfunction, 50.89% took it without the advice of a doctor or pharmacist. Interestingly, these individuals were more willing to seek information from doctors, pharmacists, friends, and relatives rather than online sources. The most common comorbidities among these patients were hyperlipidemia, cardiovascular diseases, prostate diseases, and diabetes mellitus, which makes consultation with a qualified professional even more necessary.

Contributing to the exacerbation of self-medication are generics with much more affordable prices, increasing abusive consumption without a medical prescription, which can lead to undesirable side effects or even drug interactions (REZENDE, 2021). Here we raise an important point, the need for large pharmaceutical companies to take a stand against the irrational use of their products, which can be difficult, as it is extremely profitable. In our study, Viagra (sildenafil) was the most commonly used medication, probably because it was the first drug discovered for this purpose, and also due to the large number of advertisements for this

medication (NUNES, 2021). This medication was launched by the pharmaceutical company Pfizer Inc., quickly becoming one of the best-selling drugs worldwide. Just to illustrate the commercial importance of this substance, around \$1.93 billion in prescriptions was collected in 2008 (BDO, 2014).

Although the side effects are relatively mild and transient for most patients, they tend to worsen with continuous use of the medications. Moreover, these effects are exacerbated in cases of pre-existing coronary artery disease or concomitant use of nitrates, which increase the risk of potentially fatal cardiovascular events (FREITAS, 2008; STRAWN, 2023). In **Table 1**, we exemplify the medications developed for erectile dysfunction treatment, as well as their mechanisms of action and adverse effects.

**Table 1.** Medications developed for the treatment of erectile dysfunction

<b>Commercial name</b>	<b>Active principle</b>	<b>Mechanism</b>	<b>Adverse effects</b>
Cialis®	Tadalafil	Selective inhibitor of cyclic guanosine monophosphate (cGMP) - specific phosphodiesterase type 5 (PDE5)	Headache, facial flushing, tachycardia, headache, excessive sweating and high blood pressure
Viagra®	Sildenafil		
Levitra®	Vardenafil		
Stendra	Avanafil		
Caverject, Edex	Alprostadil	Inhibits alpha-1-adrenergic activity in penile tissue and has a relaxing effect on cavernous smooth muscle	Bleeding at the injection site, inflammation at the injection site, itching at the injection site, edema at the injection site, urethral bleeding, numbness, yeast infection, irritation, and decreased sensitivity

**Source:** Author himself, 2024.

Among the medications listed in Table 1, Sildenafil (Viagra), Tadalafil (Cialis), and Vardenafil (Levitra) were the most commonly used by young adults, even without erectile dysfunction issues. These are classic medications that, due to their ease of acquisition and mode of use (such as tablets), have become the most sought after, unlike Alprostadil (Caverject,

Edex), which is an injection and thus more difficult to administer. Therefore, the pharmacist plays a crucial role in attempting to prevent self-medication and in guiding users on the correct way of use, if indeed necessary, since this professional is the interface between the patient and the medication (MOHAMED, 2023; LIMONCELLA, 2022; SEO, 2022). The role of the pharmacist is crucial in the fight against self-medication. Firstly, the pharmacist is a highly trained healthcare professional capable of providing guidance on the proper use of medications. They have deep knowledge about the different types of medications, their interactions, side effects, and contraindications. Unlike patients, who may lack medical knowledge, the pharmacist can offer an objective assessment of the patient's condition and advise them on the most appropriate treatment. Additionally, pharmacists can identify situations where self-medication may be dangerous or inappropriate, such as in cases of drug interactions, undiagnosed underlying medical conditions, or specific contraindications for certain patients. By providing accurate information and educating patients about the risks of self-medication, pharmacists help promote responsible medication use and protect public health (Alves, 2023; CORDEIRO JUNIOR & ABREU, 2021; ZHENG, 2023).

## Conclusion

The data presented here serve to clarify the reasons why young adults indiscriminately use erectile dysfunction medications even if they do not have this problem. Consequently, public health authorities can take steps to conduct educational campaigns aimed at raising awareness among the population about the risks of this practice. The epidemiological profile of these individuals reveals that there are no common factors, thus the use of erectile dysfunction medications occurs among both single and married individuals, with varying levels of education and race, making it a global issue that deserves more attention. Furthermore, pharmacists play a key role in protecting public health by providing specialized guidance on the proper use of medications and promoting responsible health practices. Their expertise and guidance are essential in ensuring that patients receive the safest and most effective treatment for their medical conditions while avoiding the risks associated with self-medication.

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