Annals of Medicine and Surgery 80 (2022) 104134

Contents lists available at ScienceDirect

Annals of Medicine and Surgery

journal homepage: www.elsevier.com/locate/amsu

Cross-sectional Study

Knowledge, attitude, and practice (KAP) regarding erectile dysfunction disease and its medications among community pharmacy technicians in Mogadishu Somalia

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ARTICLE INFO

Keywords:
Erectile dysfunction
Malpractice
Pharmacy
Community
Knowledge
Attitude
And practice

ABSTRACT

Background: Erectile Dysfunction (ED) is the most common sexual dysfunction worldwide. This study is the first reported from Somalia to the best of our knowledge.
Objective: The current study aimed to assess knowledge, attitude, and practice (KAP) regarding erectile dysfunction disease and its medications among community pharmacy technicians in Mogadishu, Somalia.
Method: The current is a cross-sectional descriptive study conducted among pharmacy technicians in Mogadishu to assess their KAP regarding erectile dysfunction disease and its medications. A convenient sampling technique was used. A structured questionnaire contained 45 questions, including; demographic characteristics (4 items), the knowledge of erectile dysfunction disease and its medications (18 items), attitudes (5 items), and practice (15 items) were assessed among technicians. A total of 200 respondents participated in the study.
Results: Knowledge. 79 and 72.5% of technicians comprehended the condition of ED and whom it affects; however, about half did not know the underlying risk factors and complications associated with PDE5 inhibitors. Attitude: 77–85% of technicians believe medication requires prescriptions, medications may have complications, and quality medications are essential. Practice: 64% of technicians give ED medication with prescriptions, and 85% do not consult a physician. 64.5% of technicians always provide the same type of medication, and 63% do not give the same dose to each client. About half of the technicians also vend herbal medicines to clients, such as honey, fish, and sea urchins.
Conclusion: The findings of this study suggest pharmacy technicians have some knowledge, although not sufficient for understanding the risks and complications of medications. Technicians did not engage in good standard practices despite this knowledge and attitudes. These findings highlight the need for regulations to support good practice among pharmacy technicians and the quality, safety, and efficacy of medicines in Mogadishu by establishing the National Medicine Regulatory Authority.

1. Introduction

Erectile dysfunction (ED) is the persistent inability to achieve or maintain a penile erection sufficient for satisfactory sexual intercourse that primarily affects men older than 40 years with an annual health cost of about 7 million to 17 billion dollars [1]. ED is the most common sexual dysfunction worldwide. Approximately 150 million men are affected and impaired their quality of life, including a negative psychosocial impact, feelings of shame, embarrassment, and depression [1].

The prevalence of ED varies worldwide from 2% in younger men to 86% in the elderly [2]. There are regional differences in terms of the prevalence of the disease. For instance, Oyemade BO et al. reported that ED is prevalent at 57.4% in Nigeria, 63.6% in Egypt, and 80.8% in Pakistan [2]. Global Online Sexuality Survey reported that erectile dysfunction is prevalent in 45.1% in the Middle East and 37.7% in the United States [3].

Several studies have demonstrated a significant correlation between erectile dysfunction and age, diabetes, hypertension, cigarette smoking,

Abbreviations: BPH, Benign prostatic hyperplasia; ED, Erectile dysfunction; KAP, knowledge; attitude, and practice; MDR, multidrug-resistant; PDE5I, Phosphodiesterase type 5 inhibitor; SD, Standard deviation; XDR, extensively drug-resistant.

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https://doi.org/10.1016/j.amsu.2022.104134
Received 7 May 2022; Received in revised form 6 July 2022; Accepted 6 July 2022
Available online 12 July 2022

cardiovascular diseases, metabolic syndrome, benign prostatic hyperplasia (BPH), and obesity. Diabetic men have a nearly threefold increased risk of developing ED and tend to acquire ED ten to fifteen years earlier than non-diabetics [4]. Diabetic ED patients have been demonstrated to be more severe and related to a lower quality of life, and it is less responsive to medical treatment [4]. The association between ED and the risk of cardiovascular disease due to vascular endothelial dysfunction and atherosclerosis, which predispose cardiovascular morbidity and mortality, is well documented in the literature [5]. ED has also been linked with an increased risk of dementia and overall mortality [5].

European Association of Urology (EAU) guidelines and American Urological Association (AUA) guidelines both recommend Phosphodiesterase type 5 inhibitors (PDE5Is) for the first-line treatment and the leading drugs for the treatment of erectile dysfunction (ED). PDE5Is are highly effective, well-tolerated, and have severe treatment-related adverse events when contraindicated and poorly tolerated [6]. On-demand use or daily treatment of any PDE5-i is safe, and all PDE5-i are equally effective and safe for treating ED. Sildenafil, Tadalafil, Vardenafil, and newer drugs such as Udenafil, Avanafil, and Mirodenafil, are available on the market. Tadalafil appears to be the most effective drug, followed by Vardenafil [7]. Current literature has suggested that Phosphodiesterase type 5 inhibitors (PDE5Is) might be associated with melanoma, biochemical recurrence of prostate cancer after radical prostatectomy, and increased risk of non-arteritic ischemic optic neuropathy through evidence (limited and controversial) [7].

Besides the possible treatment-related adverse reactions, the importance of safety, efficacy of PDE5Is, lack of national medical council and drug regulatory system, and the availability of the PDE5Is in every community pharmacy in the country, like in many other African countries, the current study aimed to assess knowledge, attitude, and practice (KAP) regarding erectile dysfunction disease and its medications among community pharmacy technicians in Mogadishu Somalia.

2. Method

The current is a cross-sectional descriptive study conducted among pharmacy technicians in Mogadishu, Somalia, to assess their knowledge, attitude, and practice (KAP) regarding erectile dysfunction disease and its medications. A convenient sampling technique was used for the study sample size. All community pharmacy technicians in Mogadishu selling erectile dysfunction medications were included in the study. Participants who refused to participate held a university degree in pharmacy and pharmacy technicians in hospitals were excluded from the study.

No validated questionnaire was available in the literature due to the unique setting of our research. The authors developed a questionnaire and validated it by a panel of experts containing urologists, pharmacists, and public health professionals to assess the accurate knowledge, attitude, and the practice of erectile dysfunction medications among pharmacy technicians. Face-to-face interviews with the community pharmacy technicians were conducted to ascertain their knowledge, attitudes, and practices regarding erectile dysfunction disease and medications used as a treatment. A structured questionnaire containing 45 questions, including; demographic characteristics (4 items), the knowledge of erectile dysfunction disease and its medications (18 items), attitudes (5 items), and practice (18 items), were assessed among pharmacy technicians. The questionnaire was designed into a “Yes or No” version; “Yes” represents good knowledge, practice, and a positive attitude, while “No” stands for poor knowledge, practice, and negative attitude.

To assess the KAP among pharmacy technicians, close-ended questions with a possibility of two options were asked to determine their knowledge of erectile dysfunction’s background, causes, risk factors, comorbidities, hypogonadism, lifestyle habits smoking, and ED treatments options, including PDE5 inhibitors. The attitude of the technicians was evaluated to estimate their comprehension of the usefulness of PDE5 inhibitors for the treatment of erectile dysfunction disease, whether they recommend them to their clients and their awareness that these drugs need a doctor’s prescription. Finally, the technicians were asked questions regarding the source of drugs, their quality assurance, and the use of herbal medications for ED treatment, consultations, and referral to specialized doctors.

The parameters analyzed include age, gender of the respondent, level of their education, experience, and KAP regarding erectile dysfunction disease and its medications among pharmacy technicians. Two hundred respondents were selected for the study to complete our questionnaires.

The ethics approval form was received from the Hage Institute for Medical Research ethics committee (REF NO. HIMR-1033). Informed consent was obtained from all participants.

This study is registered at Research Registry (researchregistry8051) https://www.researchregistry.com/browse-the-registry and was conducted in accordance with the Declaration of Helsinki. The study has been reported in line with the STROCSS criteria [8].

The univariate descriptive study design was used to analyze the analytic parameters using SPSS Statistics (26 versions, IBM, Armonk, NY, USA). The results were expressed as percentages. The chi-square test and cross-tabulations were used to detect the significant association between the variables.

3. Results

A total of 200 respondents participated in the study. The ages of the participants were categorized into 19–29 years, 30–40 years, and $\geq$40 years old, accounting for 76.5%, 21.5%, and 2% of the total samples, respectively. Ninety-three percent of the respondents were male, and only 7% of the participants were female. Regarding the level of education among pharmacy technicians, 53% of the respondents have a bachelor’s degree, 17.5% have a diploma, 18.5% were high school level, 6% were master’s degree, and 5% were illiterate. Fifty-two percent of the respondents had 1–5 years of experience working in the pharmacy, followed by 26% in $<$1 year, 15% in 5–10 years, and 7% in more than ten years of experience.

Assessment of knowledge, attitude, and practice of erectile dysfunction medications among pharmacy technicians revealed that 60% of the respondents have poor knowledge of erectile dysfunction disease and its medications. Ninety-four percent of the pharmacy technicians had a poor practice of erectile dysfunction medications, while more than one-third of the pharmacy technicians had a negative attitude, Table 1.

Regarding the knowledge of erectile dysfunction disease and its medications among community pharmacy technicians; the study revealed that pharmacy technicians recognize erectile dysfunction as a multifactorial disease (72.5%) and that it which can affect all sexually active men at any age (77.5%) but more common in elderly male (79%). Psychological issues were the most common cause of erectile dysfunction in young men (61%). Comorbidities such as diabetes, hypertension, and lifestyle habits, mainly smoking, is a key risk factor for erectile dysfunction in older men in about 50–64%. In comparison, 57% recognized that late-onset hypogonadism may include the causes of erectile dysfunction and may require testosterone replacement therapy. Nearly half of the technicians reported that erectile dysfunction could be treated with oral medications, mainly Phosphodiesterase type 5 inhibitors (PDE 5 inhibitors). Only 39.5% knew that PDE 5 inhibitors are vasodilating drugs in which combination with nitrates is contraindicated because of potential life-threatening hypotension Table 2.

Most pharmacy technicians believe that PDE5 inhibitors are proper medications for treating erectile dysfunction disease recommended by most of their clients, though they are aware that these drugs need a doctoral prescription because of their possible complications Table 3.

About the practice of erectile dysfunction medications among pharmacy technicians; Seventy-six percent of the pharmacy technician get erectile dysfunction medications from a retail company, and they

Table 1
Baseline demographic characteristics.

Demographics	N (%)	Level of Knowledge		Attitude Level		Level of Practice	
		Poor 120(60%)	Good 80(40%)	Negative 74(37%)	Positive 126(63%)	Poor 189(94.5%)	Good 11(5.5%)
Age							
19–29years	153 (76.5)	94	59	70	83	145	8
30–40 years	43 (21.5)	25	18	4	39	40	3
≥40 years	4 [2]	1	3	0	4	4	0
Gender							
Male	186 (93)	111	75	70	116	176	10
Female	14 [7]	9	5	4	10	13	1
Level of Education							
Never went to school	10 [5]	5	5	3	7	10	0
High school	37 (18.5)	24	13	12	25	35	2
Diploma	35 (17.5)	20	15	17	18	33	2
Bachelor degree	106 (53)	64	42	37	69	100	6
Post-graduate	12 [6]	7	5	5	7	11	1
Level of experience							
<1 year	52 (26%)	37	15	19	52	50	2
1–5years	103 (51%)	58	45	39	103	97	6
5–10 years	31 (15%)	20	11	12	31	29	2
>10 years	14 (7%)	5	9	4	14	13	1

Table 2
Knowledge.

Questions	Yes N, (%)	No N, (%)
Erectile dysfunction can affect all sexually active men at any age	155 (77.5)	45 (22.5)
Erectile dysfunction affects more commonly older men	158 (79)	42 (21)
Erectile dysfunction is a multifactorial (etiology, causes) disease	145 (72.5)	55 (27.5)
Lifestyle habits, particularly smoking is a key risk factor for erectile dysfunction	101 (50.5)	99 (49.5)
Psychological issues are most common causes of erectile dysfunction in young men	123 (61.5)	77 (38.5)
Diabetes is one of most common causes of erectile dysfunction in elderly patient	124 (62.0)	76 (38.0)
Hypertension is one of most common causes of erectile dysfunction in elderly patients	108 (54.0)	92 (46.0)
Testosterone hormone is responsible for men's sexual health	114 (57.0)	86 (43.0)
Erectile dysfunction can be treated with oral medications	125 (62.5)	75 (37.5)
Phosphodiesterase type 5 inhibitor is a vasodilating drug	101 (50.5)	99 (49.5)
Sildenafil is sold under the brand name Viagra	163 (81.5)	37 (18.5)
Tadalafil is sold under the brand name Cialis	105 (52.5)	95 (47.5)
Phosphodiesterase type 5 inhibitors combined with nitrates is contraindicated because of potential life-threatening hypotension that may occur	79 (39.5)	121 (60.5)
Phosphodiesterase type 5 inhibitors can lead to Priapism in some patients	70 (35.0)	130 (65.0)
Severe headache is one of the side effects of phosphodiesterase type 5 inhibitors	139 (69.5)	61 (30.5)
Some erectile dysfunction patients may require testosterone replacement therapy	99 (49.5)	101 (50.5)
Some patients may require surgery to manage their erectile dysfunction	93 (46.5)	107 (53.5)
Lifestyle changes alone can manage erectile dysfunction in some patients	161 (80.5)	39 (19.5)

Table 3
Attitude.

Questions	Yes N, (%)	No N, (%)
Do you believe oral phosphodiesterase type 5 inhibitors are useful medications for the treatment of erectile dysfunction?	146 (73.0)	54 (27.0)
Would you recommend some of your clients to take erectile dysfunction medications?	142 (71.0)	58 (29.0)
Do you believe erectile dysfunction medications require prescriptions?	155 (77.5)	45 (22.5)
Do you believe erectile dysfunction medications may lead to some medical complications?	170 (85.0)	30 (15.0)
Do you believe it's important to know the quality of your drugs?	168 (84.0)	32 (16.0)

ensure the quality of medications by only asking about the quality of the drug in 77.5% through two-thirds of pharmacy technicians does not always give erectile dysfunction medications with prescriptions. In comparison, twenty-three percent of community pharmacy technicians require a quality assurance certificate. Half of the technicians mix PDE5 inhibitors with herbal medications such as honey. Community pharmacy technicians neither ask their clients if they have any comorbidities like diabetes or hypertension before giving them erectile dysfunction medication nor ask which type of medication they use for their comorbidities in about 60% and never refer them to a doctor in more than 80% of the cases. Nearly 80% of community pharmacy technicians give erectile dysfunction medications without a doctor's consultation and always give the same type and dose of PDE5 inhibitors to each of their clients; mainly sildenafil 100 mg tablets, through headache and weakness is the most common side effects reported by their clients' Table 4.

4. Discussion

About 3–11% of men who use PDE5 inhibitors experience transient and reversible visual symptoms. A meta-analysis by Azzouni F and Abu Samra K. reported eight cases of serious PDE5 inhibitor-associated ocular complications, including cases of anterior and posterior non-arteritic ischemic optic neuropathy, central retinal vein occlusion, cilio-retinal artery occlusion, acute angle-closure glaucoma, and optic atrophy after sildenafil use due to cross-reaction of PDE type 6 on the retina [9]. Considering the complications that can occur, a deep understanding and knowledge of PDE5 inhibitors and their side effects are vital in clinical practice. Unfortunately, most of our community pharmacy technicians (94%) in our study had inadequate knowledge about erectile dysfunction disease and its medications since none of them had any training regarding pharmacy and drugs. Two-thirds of the technicians give erectile dysfunction medications without a doctor's prescription, while half of them mix PDE5 inhibitors with herbal medications with no clinical evidence for their usage. Abdul Mohsen MF reported that non-urologists, especially female doctors, have insufficient

Table 4
Practice.

Questions	Yes N, (%)	No N, (%)
Do you always ensure the quality of your erectile dysfunction medications?	155 (77.5)	44 (22.0)
Do you always give erectile dysfunction medications with prescriptions?	71 (35.5)	128 (64.0)
Do you only give phosphodiesterase type 5 inhibitors for erectile dysfunction treatment?	82 (41.0)	118 (59.0)
Do you give your clients herbal medication such as honey for erectile dysfunction treatment?	92 (46.0)	108 (54.0)
Do you ask your clients if they have diabetes before giving them erectile dysfunction medication?	100 (50)	100 (50)
If "YES" what do you do?	**Refer to a doctor** 40 (20)	**Still give them** 160 (80.0)
Do you ask your clients if they have hypertension before giving them erectile dysfunction medication?	70 (35.0)	128 (64.0)
If they have hypertension, do you ask the type of antihypertensive drugs they take?	69 (34.5)	131 (65.5)
Do you give the same dose for each client?	74 (37.0)	126 (63.0)
Do you always give the same type for each client?	129 (64.5)	71 (35.5%)
what type of phosphodiesterase type 5 inhibitors do you usually give your clients	**Sildenafil (Viagra)** 150 (75.0)	**Tadalafil (Cialis)** 30 (15.0)
How much dose for Sildenafil (Viagra) do you usually give?	**100 mg** 167 (83.5)	**50 mg** 33 (16.5%)
Do some of your clients come back with side effects?	90 (45.0)	110 (55.0)
If "YES" what side effects do they usually come with?	**Headache** 109 (54.5)	**Weakness** 91 (45.5)
Do you ever consult a physician before giving medication?	30 (15.0)	170 (85.0)

knowledge regarding erectile dysfunction, less than 60% [10]. Several studies reported the use of herbal medicines, including aphrodisiac herbs, statins as monotherapy for ED, apomorphine as an oral preparation, ginseng, yohimbine, trazodone, and L-arginine alone or in combination but have no clinical evidence for their usage because of ineffective, not safe, or lack a sufficient body of evidence from which to make generalizations [11]. A descriptive study of a total of 321 questionnaires aimed to evaluate the recreational use of PDE5i in healthy young men reported by Amado Bechara revealed that 75.4% of PDE5i users (sildenafil mainly) get PDE5i from a friend, 17.4% from a pharmacy/drugstore without a medical prescription, 4.3% prescribed by a physician, and 2.9% through the Internet that is consistent with our study [12].

Ariba AJ et al. conducted a cross-sectional study of 187 clinicians and noted that most of the clinicians have a good attitude, with more than 82% of doctors referring or consulting their patients with complaints of erectile dysfunction. They mostly send a referral to a tertiary level hospital for further management which is contrary to our current study in which most of the community pharmacy technicians never refer to a doctor in more than 80% of the cases. Nearly eighty percent of the technicians give erectile dysfunction medications without a doctor's consultation and always give the same type and dose of PDE5 inhibitors to each client [13].

A retrospective study by Mohamed AH regarding epidemiological characteristics and predisposing factors for surgical site infections caused by bacterial pathogens exhibiting multidrug-resistant patterns, epidemiology and antimicrobial susceptibility pattern of uropathogens in patients with the community-and hospital-acquired urinary tract infections at a tertiary hospital in Somalia. It reported higher rates of antimicrobial resistance, multidrug-resistant (MDR), and extensively drug-resistant (XDR) pathogens owing to an improper prescription of antibiotics, epidemic misuse of antimicrobials, self-prescription of antibiotics, and the lack of knowledge about drug resistance [14,15]. This widespread misuse of medications and the availability of the PDE5Is in every community pharmacy in the country became a significant health threat and public health problem. This is due to the lack of a national medical council and drug regulatory system to ensure constant drug safety and efficacy assessment to reduce the possible treatment-related adverse events.

Although the prevalence of reported comorbid diabetes and hypertension for ED were 27.7% and 36.9%, respectively; neither technicians ask their clients if they have any comorbidities like diabetes or hypertension before giving them erectile dysfunction medication nor ask which type of medication they use for their comorbidities in about 60% in the current study [16]. Dropout rates of PDE5i are very high (50% after one year) and even higher in men with associated comorbidities. One of the main reasons for PDE5i discontinuation is the lack of efficacy of erectile dysfunction medications, however; seventy-six percent of the pharmacy technicians get erectile dysfunction medications from a retail company, and they ensure the quality of drugs by only asking about the quality of the drug without a quality assurance certificate about in 77.5% [17].

Community pharmacy technicians have often been regarded as an underused clinical care resource. There can be no one cure-all solution in encouraging men to present early with ED and accept complete lifestyle changes and treatment packages unless continuous medical education and capacity-building programs are promoted throughout primary care and at the national setting level.

Improvements in medical and nursing practices will be needed in addition to pharmacy technicians. These improvements will occur when policymakers, service users, and pharmacists prove sufficiently motivated to pursue them. If Community pharmacy technicians, along with other pharmacy staff members and other primary and secondary care professionals, can effectively interact with men who choose to consult them, they should be capable of improving ED treatment standards and CVD outcomes.

5. Conclusion

The findings of this study suggest pharmacy technicians have some knowledge, although not sufficient for understanding the risks and complications of medications. Technicians did not engage in good standard practices despite this knowledge and attitudes. These findings highlight the need for regulations to support good practice among pharmacy technicians and the quality, safety, and efficacy of medicines in Mogadishu by establishing the National Medicine Regulatory Authority.

Ethics approval

The ethics approval form was received from the ethics committee of the Hage Institute for Medical Research, (approval number HIMR-1033).

Consent to participate

Informed consent was obtained from all participants.

Consent for publication

Not applicable.

Data availability statement

Data included in the manuscript.

Funding

The authors declare that this study has not received any funding resources.

Authors' contributions

Study concept, design, and interpretation, H.A.M., F.F.W; R.Y.M., drafting of the manuscript, H.A.M., F.F.W; R.Y.M. All authors read and approved the final manuscript.

Code availability

Not applicable.

Provenance and peer review

Not commissioned, externally peer reviewed.

Declaration of competing interest

The authors declare no conflict of interest associated with this publication.

Acknowledgments

None.

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