



A Web-Based Survey of Patients Dispensed Viagra Connect[®] Behind the Counter in UK: An Evaluation of Effectiveness of Additional Risk Minimization Measures

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Purpose: A national additional risk minimization measures (aRMMs) program was implemented to train pharmacists for safe supply of non-prescription Viagra Connect[®] (VC) to erectile dysfunction (ED) patients in United Kingdom (UK). A survey aimed to evaluate the effectiveness of aRMMs.

Methods: A cross-sectional, web-based survey enrolled ED patients who purchased at least 1 supply of VC in UK, using a structured self-administered questionnaire. Patients were assessed for the suitability of VC and received appropriate advice from pharmacists. Descriptive statistics were used.

Results: The final sample had 297 patients, who reported that pharmacists inquired about blood pressure and heart comorbidities (91.9%), relevant illnesses (87.9%), medications (86.5%), ED diagnosis (82.2%), and were advised to consult their doctor regarding ED (51.2%). Furthermore, 85.5% of patients were advised on how to take VC correctly, 82.2% on possible side effects for which they might have to discontinue taking VC and consult their doctor, 80.1% on being informed that ED could be caused by underlying conditions. About 65.0% reported that they had visited (19.2%) or planned to visit (45.8%) their doctor. A majority (68.7%) also indicated that they had received advice on lifestyle modifications to manage their ED-related health risks.

Conclusion: This survey provided a reasonable confirmation of the effectiveness of the VC aRMMs program and assurance that ED patients, when requesting and purchasing VC in UK pharmacies, are assessed appropriately for suitability of VC and receive the appropriate advice from pharmacists.

Plain Language Summary: A national additional risk minimization measures (aRMMs) program was implemented to train pharmacists for safe supply of non-prescription VC to erectile dysfunction (ED) patients in United Kingdom (UK).

A cross-sectional, web-based survey enrolled ED patients who purchased at least 1 supply of VC in UK, using a structured self-administered questionnaire. Patients were assessed for the suitability of VC and received appropriate advice from pharmacists.

The final sample had 297 patients, who reported that pharmacists inquired about blood pressure and heart comorbidities, relevant illnesses, medications, ED diagnosis, and were advised to consult their doctor regarding ED. Additionally, most of the patients had consulted or planned to consult their doctors, on how to take VC correctly, on possible side effects for which they might have to discontinue taking VC and consult their doctor, on being informed that ED could be caused by underlying conditions, and on lifestyle modifications. A majority also indicated that they had received advice on lifestyle modifications to manage their ED-related health risks.

This survey provided a reasonable confirmation of the effectiveness of the VC aRMMs program and assurance that ED patients, when requesting and purchasing VC in UK pharmacies, are assessed appropriately for suitability of VC and receive the appropriate advice from pharmacists.

Keywords: aRMM, erectile dysfunction, pharmacist, sildenafil citrate

Introduction

Erectile dysfunction (ED) is the inability to achieve or maintain an erection that is sufficient for satisfactory sexual performance.¹ The overall prevalence of self-reported ED in men across aged 40–70 years has been estimated to be 45.2%.² Organic (ie, neurogenic, endocrinological, vasculogenic, or drug-induced), psychogenic, or mixed causes may attribute to ED.^{3,4}

ED may be a presenting symptom of undetected or underlying cardiovascular disease (CVD) in men.⁵ ED and CVD share several risk factors including advanced age, tobacco use, excessive alcohol consumption, diabetes mellitus, hyperlipidemia, obesity, depression among others.^{6,7} Additionally, ED is also known to cause substantial negative effects on the patient's self-esteem, quality of life and emotional status.^{8,9}

There are several treatment options recommended by European guidelines for ED management including intracavernosal injection, vacuum device, oral therapy with phosphodiesterase type 5 (PDE-5) inhibitors, topical/intra-urethral alprostadil along with lifestyle modification and patient education. Amongst all the treatment options, pharmacological treatment with oral PDE-5 inhibitors remain the main stay of treatment of ED.¹⁰ Sildenafil citrate is a potent and selective inhibitor of cyclic- guanosine monophosphate-specific phosphodiesterase enzyme which causes relaxation of smooth muscle in the corpus cavernosum.¹¹ Eventually, sildenafil restores the natural erectile response to sexual stimulation and has been effectively used in the treatment of patient population with ED of varying etiologies and with diverse comorbidities.^{3,4,12}

Sildenafil citrate (Viagra®), supplied via prescription, was approved in the European Union (EU) in 1998 for treatment of ED. A Decentralized Procedure (DCP) application for non-prescription (ie, behind the counter) 50 mg sildenafil (marketed as Viagra Connect® [VC] 50 mg film-coated tablets) was approved in the UK in November 2017 and became available in pharmacies in the UK in April 2018.¹³

This launch of VC in the UK, and its availability as a “behind the counter” (pharmacist-supervised) medicine augments the availability of pharmacists to help men to deal with both the physical and emotional impact of ED, and other wider potential health concerns associated with ED.

To facilitate this, before and after launch of behind the counter VC, a pharmacist education program of additional risk minimization measures (aRMM, as defined by EMA [European Medicines Agency]), comprising a training guide and a checklist regarding the safe use of VC was implemented. Using online resources, printed materials and in-store face-to-face sessions, pharmacists were trained to assess ED patients' suitability of VC including an assessment of comorbidities and concomitant medications and to advise ED patients to consult their doctors within 6 months in order to assess any underlying health issues and the risk of misdiagnosis.

This exploratory patient survey was conducted as part of the aRMM evaluation to assess patients' experience while purchasing VC in a pharmacy without a prescription. This was achieved by knowing whether patients reported that they were assessed by a pharmacist for their suitability to receive VC and if they were advised by pharmacist to consult their doctor within 6 months of first supply. The survey also ascertained if patients reported having visited their doctor or planned to visit their doctor in the near future, being advised about the safe use of VC, potential causes of ED and lifestyle modifications by their pharmacist.

Materials and Methods

Study Design

This was a cross-sectional, web-based survey conducted in the UK between October 2020 and June 2021. A pre-testing of survey questions was conducted in a sample of 29 patients prior to the implementation of the survey. This user-testing assessed the clarity of survey questions for interest and acceptance of the polls amongst the participants, as well as the flow and ease of completing the surveys. The findings and recommendations from the survey pre-testing were

incorporated into the final version and tested in two pilot surveys for further refinement.^{8,14} This patient survey was administered online anonymously and expected to take approximately 5 minutes to complete by the participants.

Study Setting

The survey was conducted in select Boots pharmacy stores, independent pharmacy stores and regional multiple pharmacies. Pharmacies were invited to participate in the study based on their monthly VC sales data during the months of March, April, and May 2020. Also, Pharmacies throughout the UK selected, to maximize patient representativeness.

All those patients who purchased VC from the participating pharmacies, received an invitation to partake in the survey. Pharmacists distributed survey invitation leaflets to all the patients during the survey period, according to a standard script. The recruitment of patients was carried out by the pharmacist at the point of supply of VC. The invitation leaflet had details regarding website address, introduction, and purpose of the survey, how and to whom the data would be reported, and the measures taken to preserve their confidentiality.

To begin with, screening questions were asked to determine if patients were eligible to participate in the study and those who met the inclusion criteria were allowed to complete the full survey. Patients who completed the survey were offered a small voluntary monetary compensation of £25.00 to compensate for the time and effort taken to complete the survey. To receive payment, the patients were required to provide their consent to share their billing address. This step helped to minimize the risk of duplicated (ie, more than one) surveys taken by one patient.

Inclusion Criteria

Male patients who were willing and consented to participate in this self-administered survey and reported that they purchased at least one supply of VC from the pharmacist for their own use were included in the study.

Exclusion Criteria

Patients who reported that they or an immediate family member were currently employed with Pfizer, Upjohn, United BioSource (UBC, the survey vendor) or the UK Medicines and Healthcare products Regulatory Agency (MHRA) were excluded from the study.

Study Variables

The survey included questions/statements that inquired about the patient's experience at the point of VC supply in the pharmacy, including whether they were:

1. Assessed for suitability for VC (eg, for cardiovascular and other health conditions),
2. Advised by a pharmacist to consult their doctor within 6 months of first supply,
3. Visited their doctor or planned to visit their doctor very soon,
4. Advised by their pharmacist about the safe use of VC, and
5. Advised by their pharmacist about potential causes of ED and offered lifestyle advice.

Specifically, the variables collected included:

- a. Screening questions (ie, consent, gender, patient, or family member employed by Pfizer, Upjohn, UBC or UK MHRA, purchase of VC and for whom).
- b. Pharmacy and pharmacist characteristics (ie, urban vs rural and chain vs independent pharmacy; gender of the pharmacist).
- c. Patient characteristics (ie, age, confirmation of ED symptoms, history of prescribed ED medications).
- d. Patient's experience when requesting VC for the first time (ie, when was the first purchase of VC, the types of questions that the pharmacist asked a patient, type of counselling received from the pharmacist, whether the patients were advised to contact their doctor, receipt of a patient record tear-off slip from a pharmacist, how comfortable the patient was with counselling from the pharmacist).

- e. Patient's experience with or intention to see, a doctor (ie, has a patient seen a doctor, or intends to consult a doctor in the near future).
- f. Source of patient's knowledge about VC.

Data Source and Measurement

A structured and self-administered questionnaire comprising of close-ended questions or statements with multiple response choices was used to collect the survey data. The survey was designed to be completed voluntarily and was programmed to encrypt all identifiable information and respondent identifiers, which were stored separately within the database.

Personal identifiable information of the participants was stored separately and only were used for processing the respondents' honorarium, where applicable. Each participant was randomly assigned a unique code to access the survey. This code was deactivated upon its use to prevent the code from being used repeatedly and complete the survey multiple times. Once the participant started the survey, it had to be completed and there was no opportunity to return to the survey later. The participant was permanently logged out of the survey following 30 minutes of inactivity. Once the survey was completed, it was not possible to link the survey to an individual. The participants did not have to actively decline to complete the survey. Therefore, the study operator had no ability to track which participants actively decided to not complete the survey. This survey design encouraged participation and answering honestly by ensuring that the responses were completely anonymous.

Following a question to obtain the patient's consent to participate, the survey included a screening module with questions to confirm eligibility. Depending on the answers to the screening questions, survey participation was either terminated or continued. If ineligible, the participant was immediately notified with a "thank you" message that survey participation has ended.

In this study, the aim was to obtain at least 300 completed surveys, which considers statistical and practical considerations of participation in this type of surveys. With a sample size of 300, the statistical precision around the estimate will be $\pm 5.8\%$. The precision of the estimate calculations is based on the assumption that 50% of the participating patients report that they were assessed by a pharmacist for suitability for Viagra Connect and 50% report that they were advised by a pharmacist to consult their doctor. Basing the sample size estimate on this assumption that 50% patients reporting the desired outcome related to the primary objectives is the most conservative approach, since either a higher or lower percentage than 50% will lead to higher statistical precision.

Statistical Analyses

Data collected from the survey were summarized with descriptive statistics and no statistical comparisons were made using hypothesis testing. Patient responses were considered for frequency distributions with 95% confidence intervals (CIs) and survey data were stratified based on pharmacy and patient characteristics.

Subgroup analyses for participants responses to the questions regarding pharmacists' assessment of their suitability for VC, and advice on appropriate use of VC and on their need to see doctors were performed by the stratification of the following variables:

- Age-group (18–40 years, 41–60 years, or 61 years or older);
- Having symptoms of ED (Yes or No);
- Having been prescribed sildenafil or other ED medication by the doctor (Yes or No);
- Type of pharmacy (chain pharmacy, or independent pharmacy);
- Gender of pharmacist (male, or female);
- Survey completion status (completers, or non-completers);
- Whether the pharmacists asked the patient if he has ED (Yes or No).

Results

Participants

A total of 5144 pharmacies, covering a wide geography of UK, were invited to participate in this study. This included 1552 (30%) of Boots Pharmacies, 2040 (40%) of independent pharmacies and 1552 (30%) of regional multiple pharmacies. Of these, 430 pharmacies agreed to participate in the study.

For enrollment of Participants in the survey, 33,690 patient survey invitation leaflets were sent to 130 registered pharmacies between 18 September 2020 and 08 October 2020 in wave one (ie, 1st batch of mailing) and 58,258 invitation leaflets were sent to 300 registered pharmacies between 17 May 2020 and 15 June 2021 in wave two (ie, 2nd batch of mailing). Wave two mailing was added because the number of participants did not reach the 300 targets in wave one. A total of 412 patients were screened for eligibility, of which 73.5% ($n = 303$) of them met the inclusion criteria. About 98.0% ($n = 297/303$) of the study participants completed the survey while 2.0% of them ($n = 6$) initiated the survey but did not complete it.

The average time to complete this web-based survey was 4.2 minutes, with 72.1% ($n = 214$) of the participants completed the survey in less than 5 minutes.

Patient and Pharmacy Characteristics

Patient demographics showed that 45.5% ($n = 135$) and 41.4% ($n = 123$) of the participants were in the age group of 41–60 years and 18–40 years, respectively. Symptoms of ED was reported by 86.2% ($n = 256$) of the participants, 13.8% ($n = 41$) reported that they were prescribed sildenafil or other ED medication by their doctor and 28.3% ($n = 84$) reported first purchase of VC from their pharmacist within the last month.

Most of the participants reported that the pharmacy they purchased VC for the first time was in an urban area (75.4%; $n = 224$), was an independent pharmacy (56.2%; $n = 167$), and the pharmacist was male (61.3%; $n = 182$). Further details on patient demographics, pharmacy and patient characteristics are shown (Table 1).

Assessment for Suitability for VC by Pharmacist

Participants reported that their pharmacist asked questions about their blood pressure (BP) and heart conditions (91.9%; $n = 273$), any other illnesses (87.9%; $n = 261$), or concomitant medications usage (86.5%; $n = 257$). About 82.2% ($n = 244$) of the participants reported being asked if they had ED, and 71.7% ($n = 213$) reported of being asked whether their doctor had advised them about their physical/sexual fitness. Overall, 61.3% ($n = 182$) of the participants reported being assessed for suitability for VC on all 5 items. The participants' experience of whether they were assessed for suitability for VC use by their pharmacist the first time they asked for VC is shown (Table 2).

Patients' Experience Regarding the Advice from the Pharmacist to Consult Their Doctor Within 6 Months of First Supply of VC

About 35.4% ($n=105$) of the participants reported being advised to consult their doctor within 6 months of their first supply of VC. Likewise, 11.1% ($n = 33$) of them reported that they were advised to see their doctor within one month of the first supply, 2.4% ($n = 7$) of them were advised to see their doctor immediately, and another 2.4% ($n = 7$) of them were advised to see their doctor within a year of the first supply. About 16.5% ($n = 49$) of them reported that they were not advised by their pharmacist to see their doctor and 32.3% ($n = 96$) of them could not recall if they were advised. Patient's experience of whether they were advised by the pharmacist to consult their doctor during their first request for VC is shown (Table 3).

In addition, of the 297 participants, 39.1% ($n = 116$) reported receiving the tear-off slip with a reminder of when to see their doctor, 23.2% ($n = 69$) could not remember, and 37.7% ($n = 112$) stated that they did not receive any tear-off slip.

Patients' Experience with Visiting or Planning to Visit Their Doctor

Approximately two-thirds of participants (65.0%; $n = 193$) reported that they either had seen (19.2%; $n = 57$) or planned to see (45.8%; $n = 136$) their doctor. Of the 19.2% ($n = 57$) participants who reported having seen their doctors, majority

Table 1 Characteristics of the Patients and the Pharmacies They Visited

Patient Characteristics	Patients (N=297) n (%)
Age group of participants (years)	
Less than 18	0
18–40	123 (41.4)
41–60	135 (45.5)
61–65	19 (6.4)
More than 65	19 (6.4)
Prefer not to answer	1 (0.3)
Participants with symptoms of ED	
Yes	256 (86.2)
No	41 (13.8)
Participants prescribed with sildenafil or other ED medication by their doctor	
Yes	41 (13.8)
No	234 (78.8)
I do not know	5 (1.7)
I prefer not to answer	17 (5.7)
Timeline for the First-time purchase of VC	
Within the last week	48 (16.2)
Within the last month	84 (28.3)
Within the last 3 months	74 (24.9)
Within the last 6 months	39 (13.1)
Within the last 12 months	24 (8.1)
Within the last 18 months	9 (3.0)
More than 18 months ago	19 (6.4)
Characteristics of the pharmacies and pharmacists visited	
Location of pharmacy	
Urban (city, large town or suburban area)	224 (75.4)
Rural (small town, village, countryside)	73 (24.6)
Type of pharmacy	
Chain pharmacy (eg, Boots)	121 (40.7)
Independent Pharmacy	167 (56.2)
Not sure	9 (3.0)
Gender of the pharmacist	
Male	182 (61.3)
Female	109 (36.7)
I do not remember	6 (2.0)

Abbreviations: ED, Erectile dysfunction; VC, Viagra connect®.

of them (16.8%; n = 50 [12.8–21.6]) were told by their doctors that they could continue with VC by buying it at the pharmacy without a prescription, while rest of them (n = 7) were not advised to do so. Among the remaining 35% (n = 104) of the participants, 28.3% (n = 84) of them reported not having seen their doctor and had no plans to discuss VC with their doctor. Patients' experience with visiting or planning to visit their doctor in the near future are shown (Table 4).

Table 2 Proportions of Patients Reported Whether Pharmacists Asked Them the 5 Questions Assessing Their Suitability for VC

Question	Yes ^ψ n (%) [95% CI] [^]	No n (%)	I Do not Know n (%)
Question: The FIRST time you purchased VC from your pharmacist, did the pharmacist ask you about any of the following?			
Whether you have ED	244 (82.2) [77.3–86.3]	29 (9.8)	24 (8.1)
Questions about your BP and heart	273 (91.9) [88.2–94.8]	11 (3.7)	13 (4.4)
Whether your doctor has advised you that you are not fit enough for any physical and/or sexual activity	213 (71.7) [66.2–76.8]	56 (18.9)	28 (9.4)
Whether you had any other illnesses	261 (87.9) [83.6–91.4]	19 (6.4)	17 (5.7)
Whether you were taking any other medications (for ED or any other medical condition)	257 (86.5) [82.1–90.2]	23 (7.7)	17 (5.7)

Notes: ^ψTotal number of participants (N)=297; [^]95% exact two-sided confidence intervals were calculated using the Clopper-Pearson method.

Abbreviations: BP, Blood pressure; ED, Erectile dysfunction; VC, Viagra connect®.

Table 3 Proportions of Patients Reported, at Their First Purchase of VC, Whether Pharmacists Advised Them to Consult Their Doctors Within 6 Months of Their First Supply of VC

	Patients (N=297) n (%) [95% CI] [^]
Question 15: Think about the FIRST time you purchased VC from your pharmacist and indicate which of the following are true. (Please select one only).	
I was advised to see my doctor immediately	7 (2.4)
I was advised to see my doctor within a month of the first supply	33 (11.1)
I was advised to see my doctor within 6 months of the first supply	105 (35.4) [29.9–41.1]
I was advised to see my doctor within a year of the first supply	7 (2.4)
I cannot recall if I was advised to see my doctor	96 (32.3)
I was not advised to see my doctor	49 (16.5)
Question 16: The FIRST time you purchased VC from your pharmacist did he/she provide you with a specific slip of paper to instruct you to see your doctor?	
Yes	116 (39.1) [33.5–44.9]
No	112 (37.7)
I cannot remember	69 (23.2)

Note: [^]95% exact two-sided confidence intervals are calculated using the Clopper-Pearson method.

Abbreviation: ED, Erectile dysfunction; VC, Viagra connect®.

Patients' Experience of Being Advised About the Appropriate/Safe Use of VC, the Potential Cause of ED, and Offered Lifestyle Advice

Regarding the other additional advice, the participants received from the pharmacists, 85.5% (; n = 254) reported being advised on how to take VC correctly, 82.2% (n = 244) reported that they were advised of possible side effects, for which they might have to discontinue taking VC and consult their doctor. 80.1% (n = 238) reported that their pharmacist informed them that ED can be caused by underlying conditions such as high BP, diabetes, high cholesterol, and heart disease, while 68.7% (n = 204) reported that they had received lifestyle advice from the pharmacist (Table 5).

Table 4 Proportions of Patients Reported Whether They Have Visited Their Doctors Since Their First Purchase of VC or Planned to Visit Their Doctor in the Near Future

Question	Patients (N=297) n (%) [95% CI]^
Question 18: Since purchasing the FIRST supply of VC from your pharmacist, which of the following are true? (Please select one only.)	
I have seen my doctor and the doctor advised I can continue with sildenafil by buying it at the pharmacy without a prescription	50 (16.8) [12.8–21.6]
I have seen my doctor and the doctor advised that I should not continue with sildenafil by buying it at the pharmacy without a prescription	7 (2.4) [1.0–4.8]
I have not seen my doctor to discuss taking VC but plan to do so	136 (45.8) [40.0–51.6]
I have not seen my doctor to discuss taking VC and do not plan to do so	84 (28.3) [23.2–33.8]
I prefer not to answer	20 (6.7)

Note: ^95% exact two-sided confidence intervals are calculated using the Clopper-Pearson method.

Abbreviations: ED, Erectile dysfunction; VC, Viagra connect®.

Table 5 Proportions of Patients Reported Receiving Advice from Pharmacist

Question	Patients (N=297) n (%) [95% CI]^
Question: When your pharmacist gave you VC for the FIRST time did the pharmacist:	
Advise you that ED can be caused by underlying conditions such as high BP, diabetes, high cholesterol and heart disease	
Yes *	238 (80.1) [75.1–84.5]
No	37 (12.5)
I do not remember	22 (7.4)
Offer you advice about lifestyle (eg, losing weight, giving up smoking, cutting back on alcohol/recreational drugs, exercising regularly, reducing stress)	
Yes *	204 (68.7) [63.1–73.9]
No	60 (20.2)
I do not remember	33 (11.1)
Advise you how to take VC correctly	
Yes *	254 (85.5) [81.0–89.3]
No	28 (9.4)
I do not remember	15 (5.1)
Advise you of the possible side effects for which you should stop VC and consult your doctor	
Yes *	244 (82.2) [77.3–86.3]
No	28 (9.4)
I do not remember	25 (8.4)

Notes: ^95% exact two-sided confidence intervals are calculated using the Clopper-Pearson method; *Correct response.

Abbreviations: BP, Blood pressure; ED, Erectile dysfunction; VC, Viagra connect®.

Regarding the sources of the knowledge about VC and ED, 31.3% (n = 93) of the participants reported that their pharmacist was the main source of knowledge, while for 26.6% (n = 79) of them it was the product information leaflets in the VC box.

Finally, regarding the patients' comfort in being questioned by the pharmacist, 91.2% of the respondents replied that they agreed or strongly agreed with the statement that they were comfortable to answer questions from the pharmacist.

Subgroup Analyses

Subgroup analyses for participants responses to the questions regarding pharmacists' assessment of their suitability for VC, and advice on appropriate use of VC and on their need to see doctors were performed by the stratification of few variables.

There was no overlap in the 95% CIs between the subgroups defined by most of the variables, except for the subgroups defined by the two variables, described below.

When stratifying the participants by whether the pharmacists asked them if they had ED (82.2% "Yes" vs 9.8% "No"), between-group differences for the participants' responses to the above-mentioned 4 questions did not overlap between the 95% CIs. In general, if the participants reported having ED, the pharmacists were more likely to assess their suitability for VC and provide advice on appropriate use of VC and on their need to see doctors (Table 6).

When stratifying the participants by whether they had been prescribed sildenafil or other ED medication by their doctor (13.8% "Yes", 78.8% "No", 7.4% "Do not know/prefer not to answer"), their responses to the question "Since

Table 6 Patients' Experience of Whether They Were Assessed for Suitability for VC and Being Advised About the Safe Use of VC, Potential Causes of ED and Offered Lifestyle Advise in Stratified Population

Question	Whether the Pharmacists Asked the Patient if He has Erectile Dysfunction (ED)	
	Yes N=244 n (%) [95% CI]^	No/I Do not Remember N=53 n (%) [95% CI]^
Question 13: The FIRST time you purchased VC from your pharmacist, did the pharmacist ask you about any of the following?		
Questions about your BP and heart		
Yes *	236 (96.7) [93.6–98.6]	37 (69.8) [55.7–81.7]
No	2 (0.8)	9 (17.0)
I do not remember	6 (2.5)	7 (13.2)
Whether your doctor has advised you that you are not fit enough for any physical and/or sexual activity		
Yes *	194 (79.5) [73.9–84.4]	19 (35.8) [23.1–50.2]
No	32 (13.1)	24 (45.3)
I do not remember	18 (7.4)	10 (18.9)
Whether you had any other illnesses		
Yes *	227 (93.0) [89.1–95.9]	34 (64.2) [49.8–76.9]
No	8 (3.3)	11 (20.8)
I do not remember	9 (3.7)	8 (15.1)
Whether you were taking any other medications (for ED or any other medical condition)		
Yes *	224 (91.8) [87.6–94.9]	33 (62.3) [47.9–75.2]
No	11 (4.5)	12 (22.6)
I do not remember	9 (3.7)	8 (15.1)
Number of items being assessed for suitability		
0 items	3 (1.2)	9 (17.0)
1 item	8 (3.3)	6 (11.3)
2 items	8 (3.3)	9 (17.0)
3 items	43 (17.6)	17 (32.1)
4 items	182 (74.6) [68.6–79.9]	12 (22.6) [12.3–36.2]

(Continued)

Table 6 (Continued).

Question	Whether the Pharmacists Asked the Patient if He has Erectile Dysfunction (ED)	
	Yes N=244 n (%) [95% CI]^	No/I Do not Remember N=53 n (%) [95% CI]^
Question 15: Think about the FIRST time you purchased VC from your pharmacist and indicate which of the following are true. (Please select one only).		
I was advised to see my doctor immediately	7 (2.9)	0
I was advised to see my doctor within a month of the first supply	30 (12.3)	3 (5.7)
I was advised to see my doctor within 6 months of the first supply *	97 (39.8) [33.6–46.2]	8 (15.1) [6.7–27.6]
I was advised to see my doctor within a year of the first supply	6 (2.5)	1 (1.9)
I cannot recall if I was advised to see my doctor	76 (31.1)	20 (37.7)
I was not advised to see my doctor	28 (11.5)	21 (39.6)
Question 16: The FIRST time you purchased VC from your pharmacist did he/she provide you with a specific slip of paper to instruct you to see your doctor?		
Yes*	115 (47.1) [40.7–53.6]	1 (1.9) [0.0–10.1]
No	80 (32.8)	32 (60.4)
I cannot remember	49 (20.1)	20 (37.7)
Question 14: When your pharmacist gave you VC for the FIRST time did the pharmacist:		
Advise you how to take VC correctly		
Yes *	225 (92.2) [88.1–95.2]	29 (54.7) [40.4–68.4]
No	12 (4.9)	16 (30.2)
I do not remember	7 (2.9)	8 (15.1)
Advise you of the possible side effects for which you should stop VC and consult your doctor		
Yes *	222 (91.0) [86.7–94.3]	22 (41.5) [28.1–55.9]
No	11 (4.5)	17 (32.1)
I do not remember	11 (4.5)	14 (26.4)
Advise you that ED can be caused by underlying conditions such as high BP, diabetes, high cholesterol and heart disease		
Yes *	214 (87.7) [82.9–91.5]	24 (45.3) [31.6–59.6]
No	16 (6.6)	21 (39.6)
I do not remember	14 (5.7)	8 (15.1)
Offer you advice about lifestyle (eg, losing weight, giving up smoking, cutting back on alcohol/recreational drugs, exercising regularly, reducing stress)		
Yes *	193 (79.1) [73.5–84.0]	11 (20.8) [10.8–34.1]
No	28 (11.5)	32 (60.4)
I do not remember	23 (9.4)	10 (18.9)

Notes: ^95% exact two-sided confidence intervals are calculated using the Clopper-Pearson method; *Correct response.

Abbreviations: BP, Blood pressure; ED, Erectile dysfunction; VC, Viagra connect®.

purchasing the FIRST supply of VC from your pharmacist, which of the following are true?" 41.5% of the respondents who reported, vs 12.8% who did not report, having previously been prescribed sildenafil or other ED medication selected the answer "I have seen my doctor and the doctor advised I can continue with sildenafil by buying it at the pharmacy without a prescription".

Discussion

One of the key strengths of the present study is that it has the benefits of implications from two previously conducted pilot surveys.^{8,14} The first used a consumer panel and identified significant selection and response biases such that there was a high likelihood that the results would not be representative of the patient population seeking to purchase VC. A second pilot was performed whereby patients were recruited via the pharmacists when the patient was supplied with VC. The survey questions in this second pilot were streamlined to focus only on key questions concerning the advice the pharmacist had provided to the patient, and specifically as to whether the patient was assessed to be suitable for VC and whether he was advised to consult his doctor. Overall, the findings from these pilot surveys aided in restructuring of the methodology including 1) change in recruitment methods, ie through pharmacists, which ensured that only patients who had definitely been supplied with VC were invited, 2) the streamlining of survey questions to focus more specifically on the patients' experiences while interacting with the pharmacist to purchase VC and minimize the burden to patients, and 3) the patients recruited were supplied from various types of pharmacies in wide geographical locations.

The effectiveness of the UK VC aRMMs program has been substantiated by a previous study, a post-authorization safety study (PASS) and regulatory commitment to UK MHRA, which was a cross-sectional survey of pharmacists in the UK who had dispensed VC as a "behind the counter" product to ED patients who purchased it in their pharmacies. It evaluated the pharmacists' knowledge of key risk messages and their compliance with the required dispensing practices which had been communicated to them in the training of the additional risk minimization measures. In this study, 345 community pharmacists completed the survey. The survey revealed that respondents ($\geq 80\%$) demonstrated high level of knowledge of key risk messages through selection of correct answers for 43/51 items in questionnaire. Also, most respondents (90.1%) reported that they were provided with useful/very useful training materials. They also opined it was an affirmative experience to provide patient counselling about VC. In the current study, we evaluated the effectiveness of the aRMMs program in a survey of ED patients about their interactions with pharmacists when they first purchased VC in pharmacies. The pharmacist survey has been published allowing us to compare the findings between the patient survey and pharmacist survey.¹⁴⁻¹⁶

Assessment by Pharmacist for Patient Suitability for VC

Regarding pharmacists' assessment of patients' suitability for VC at the time the patients purchased VC in pharmacies, most patients in the patient survey reported they had been asked about their BP and heart conditions (91.9%), any other illnesses (87.9%) or concomitant medications use (86.5%). In comparison, with the pharmacist survey, the pharmacists' level of knowledge on the need to ask patients about cardiovascular disease, other illnesses and medication was generally over 80%. The results of this patient survey support the fact that the pharmacists' knowledge is being put into practice when a patient presents for the first time to purchase VC.¹⁴⁻¹⁷

Pharmacists' Advice to Patients to Consult Their Doctor Within 6 Months of First Supply

In this patient survey, 51.2% of the patients reported that they were advised, at their first-time purchase of VC, to see their doctor within 6 months or shorter. Approximately, 49% of the patients reported that either they did not recall being advised (32.3%) or were not advised (16.5%) by their pharmacist to see their doctor. In the pharmacist survey, 87.2% of the surveyed pharmacists reported that they were aware that the patients who purchased VC should be advised to visit their doctor within 6 months of the first VC purchase, while 12.8% of them did not have this awareness. In addition, 39.1% of the surveyed patients reported receiving the tear-off slip paper with a reminder of when to see their doctor and 37.7% reported that they did not receive it; however, in the pharmacist survey, 91.3% of the pharmacists had reported that they always provided the tear-off slip when supplying VC. Pharmacist identified those patients who were not appropriate to receive currently approved non-prescription sildenafil 50 mg. These patients were then provided with tear-off slips for further evaluation by their health care providers/general physicians. Also, these tear-off slips served as a remainder for subsequent consultation with their doctor within 6 months. Because the samples of the two surveys were not linked, it is difficult to identify reasons for this divergence of results between the two surveys.

Patients' Reported Experience with Visiting or Planning to Visit Their Doctor

In this patient survey, 65.0% of the patients reported that they either had seen (19.2%) or planned to see (45.8%) their doctors, although only 51.2% of the patients reported being advised by pharmacists to see their doctors.

Of the total 297 patients surveyed, 234 (78.8%) patients reported they had not been prescribed sildenafil or other ED medication by their doctor. Of the 234 patients, 148 (63.2%) reported that they had seen or plan to see their doctors. This finding indicated that (1) majority of ED patients did not receive treatment for ED, and (2) availability of VC in pharmacy can help bring the ED patients who have not seen doctors to see their doctors for their ED condition. In another web-based survey conducted between March 2018 and April 2019, men aged ≥ 18 years with self-reported ED who were dispensed VC reported having higher number of physician/nurse practitioner and pharmacist visits during the one-year period after their first VC dispensation, comparing to those who were not dispensed VC.^{14,17}

Pharmacists' Advice to Patients About the Appropriate/Safe Use of VC

Most of the surveyed patients reported that, during their first purchase of VC, they had been advised by the pharmacist regarding how to take VC correctly (85.5%), of VC's possible side effects which requires the patients to discontinue VC and consult their doctors (82.2%). This is consistent with the results of the pharmacist survey, wherein more than 84% of the pharmacists answered correctly to questions as to which medical symptoms should result in stopping VC and seeking medical advice.

In addition, 80.1% of the surveyed patients also reported being advised by the pharmacist that ED can be caused by underlying conditions such as high BP, diabetes, high cholesterol, and heart disease. This finding is encouraging, because in a previous pharmacist survey, less than 80% of the pharmacists answered correctly to the question regarding hypertension and hypercholesterolemia being a cause of ED. Finally, 68.7% of the patients reported being offered advice by the pharmacist on lifestyle changes (eg, losing weight, giving up smoking, cutting back on alcohol/recreational drugs, exercising regularly, reducing stress). It is reassuring that patients can recall the advice given by the pharmacist, endorsing the crucial role of pharmacists in patient education.

Regarding the patients' comfort in being questioned by the pharmacist, 91.2% of them replied that they agreed or strongly agreed with the statement that they were comfortable to answer questions from the pharmacist. Likewise, in the pharmacist survey, 91.3% of the pharmacists said that they were comfortable with patient counselling and 89.9% of the pharmacists reported that patients had not expressed dissatisfaction with counselling. Previous studies have shown that only one-third of the men with self-reported ED have sought professional help.⁷ The results from both surveys are therefore reassuring that the pharmacists' duties prior to supplying VC do not cause discomfort to either the patient or the pharmacist and emphasizes patient's willingness to seek health care services.

Limitations

This study has several Limitations, some are common to survey studies. The response rate in this survey could not be calculated. Although, a pre-specified number of invitations were distributed to pharmacies, we do not know how many invitations were passed between pharmacist and patient. Also, it was not possible to determine if there were multiple responses from one pharmacy or whether the responses were well distributed across the participating pharmacies. Although, measures were taken to avoid multiple survey completions, there are possibilities of patients receiving and responding to more than one survey invitation in pharmacies.

Due to non-availability of baseline data prior to the pharmacist education program which included training guide and checklist from the VC aRMMs program, the improvement in patient experience cannot be determined or directly attributed to this program. There is a potential for selection bias, which was an inherent limitation to any survey study based on volunteer participation, as those patients who participated the survey might differ in demographic and clinical characteristics from those who chose not to participate.

The patients were asked to recall their encounters with the pharmacist when they received their first supply of VC which introduces a certain amount of recall bias. Additionally, the patient's experience may change with repeated supplies for VC. Furthermore, patients who reported they intend to visit their doctors might not actually make the visits. To ensure consistency, the survey asked patients to answer questions related only to their first purchase of VC.

There is also potential subjectivity and bias in patient responses which are inherent in surveys with self-reported data. Patients may have answered the survey questions in a socially desirable rather than truthful manner thus giving misleading answers to the pharmacist about their health status.

Also, without knowing the exact characteristics of patients requesting VC from the pharmacy, it is not possible to draw concrete conclusions as to whether or the extent to which this sample in this study reflected the general population of ED patients purchasing VC in pharmacies. While participants reported being asked specific questions by pharmacists, the study lacks verification or confirmation of these interactions through direct observation or independent assessment. This absence of objective verification limits the validity of the reported experiences.

Conclusion

Overall, the results from this survey provide reasonable confirmation of the effectiveness of the VC aRMMs program and assurance that ED patients, when requesting and purchasing VC in UK pharmacies, are assessed appropriately for suitability of VC and receive the appropriate advice from pharmacists. Inherent limitations of surveys, including selection bias, reliance of respondent recall and self-reported data, should be considered.

Abbreviations

aRMMs, Additional risk minimization measures; BP, Blood pressure; CIs, Confidence intervals; CVD, Cardiovascular disease; DCP, Decentralized procedure; ED, Erectile dysfunction; EMA, European medicines agency; EU, European Union; MHRA, Medicines and healthcare products regulatory agency; PDE-5, Phosphodiesterase type 5; UBC, United bioSource; UK, United Kingdom; VC, Viagra connect[®].

Ethics Approval and Consent to Participate

This study was conducted in accordance with the principles of good clinical practice and the Declaration of Helsinki. It did not require approval of institutional review boards or ethics committees at the study sites. All patients provided written informed consent before study participation. Following UK Medical Research Council's (MRC) ethics assessment tools or questionnaires, ethics approval was not required.

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Disclosure

Shaantanu S. Donde, and Kelly H. Zou are employees of Viatris who may own stocks/shares, merged between the Upjohn Division of Pfizer Inc and Mylan. Jim Z Li is a former employee of Viatris Inc. Joanna Lem is a former employee of Pfizer Inc. Muhammad Younus is an employee of Pfizer Inc. Janine Collins is an employee of UBC. The authors report no other conflicts of interest in this work.

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