International Journal of Pharmacy Practice, 2025, **33**, 369–377
https://doi.org/10.1093/ijpp/riaf039
Advance access publication 12 June 2025
Review Article

IJPP International Journal of Pharmacy Practice

OXFORD

Pharmacists' acceptability of provision of sexually transmitted infection services: a scoping review

Kathleen M. Bergin[1], Emily K. Black[1], Andrea L. Murphy[1], Deborah V. Kelly[2], Kyle John Wilby[1,*]

[1]College of Pharmacy, Faculty of Health, Dalhousie University, PO Box 15000, Halifax, Nova Scotia, Canada
[2]Memorial University of Newfoundland School of Pharmacy, St. John's, Newfoundland and Labrador, Canada
[*]Corresponding author. College of Pharmacy, Faculty of Health, Dalhousie University, PO Box 15000, Halifax, Nova Scotia, Canada. E-mail: kyle.wilby@dal.ca

Abstract

Objective: Pharmacists are taking on more roles in helping to close the gap in care for sexually transmitted infection (STI) management services. The acceptability of pharmacists to perform these services is not yet well understood. The objective of this review was to map, characterize, and explicate the acceptability of pharmacist-delivered STI services.

Methods: A scoping review was conducted. Three databases (PubMed, Embase, and CINAHL) were searched up to July 2024 for articles relating to the acceptability of pharmacists to independently assess and manage issues relating to STIs. The results were then mapped to the theoretical framework of acceptability (TFA).

Key findings: A total of 2181 publications were identified. 22 studies met inclusion criteria and assessed at least one outcome aligning within the constructs of the TFA. Services relating to pre-exposure prophylaxis prescribing, point-of-care testing, chlamydia (and gonorrhea) testing and treatment, and human papillomavirus vaccine prescribing were identified. The overall acceptability of pharmacist-delivered STI services was high across the constructs of the TFA.

Conclusions: This review outlines that the acceptability of pharmacists to provide STI management is high and pharmacists are willing to take on accountability for these services. Pharmacists believe that they have a moral obligation to improve the health and wellbeing of their patients, while, decreasing the burden on the broader health care system.

Keywords: sexual health; sexually transmitted infection; pharmacy

Introduction

Sexually transmitted infections (STI) are a global burden on the health and wellbeing of many individuals [1]. It is estimated that more than 1 million STIs are acquired every day around the world and rates continue to increase [1]. In the United States, more than 2.5 million cases of syphilis, gonorrhea, and chlamydia were reported, and 13 million cases of human papillomavirus (HPV) in 2022 [2, 3]. Globally, 1.8 million cases of human immunodeficiency virus (HIV) were identified in 2022 [4]. If left untreated, many of these STIs can lead to devastating sequalae [4]. For example, Chlamydia and gonorrhea can both lead to pelvic inflammatory disease in individuals with female anatomy and can negatively impact fertility in both men and women [5]. Syphilis can lead to many complications with the central nervous system, cardiovascular complications, and congenital syphilis, which can lead to stillbirths and congenital deformities [6]. Moreover, all three of these infections can lead to an increased risk of acquiring HIV [5]. There are over 40 strains of HPV, with 13 of those known to be oncogenic [3]. HPV is responsible for over 90% of cervical and anal cancers, and up to 70% of oropharyngeal cancers [3]. HIV attacks the body's immune system and if left untreated, can lead to acquired immune deficiency syndrome (AIDS) [7], which increases the individual's risk of acquiring opportunistic infections or cancers [7].

Comprehensive management of STIs includes testing, treating, and preventative measures. However, many of these services are only offered in specialized primary care centers and sexual health clinics, which are increasingly overburdened and lacking appointment availability, specifically since the COVID-19 pandemic [8]. An alternative to accessing these services could be through community pharmacies, which are embedded within communities and are highly accessible to patients [5]. The role of pharmacists in health care is ever-changing and expanding, and pharmacists are well positioned to help close the gap in STI management. Pharmacists globally have been taking on new roles as leaders in the health care setting and are accessible to individuals who many do not have a primary care provider [9]. In various areas of the world, pharmacists are providing contraception management, assessment and prescribing for common ailments, chronic disease management, and sexual health management is well within the realm of their clinical abilities [5]. Several studies have been conducted to assess pharmacy-delivered clinical services for STI prevention and management (e.g. screening and treatment, HIV prevention) [5, 10, 11]. Generally, these studies have found that pharmacy-based STI services are feasible and acceptable to both patients and pharmacists [5, 10, 11]. However, an in-depth understanding of pharmacist' acceptability to deliver these services is not well known.

Received: 27 August 2024 Accepted: 6 May 2025
© The Author(s) 2025. Published by Oxford University Press on behalf of the Royal Pharmaceutical Society.
This is an Open Access article distributed under the terms of the Creative Commons Attribution License (https://creativecommons.org/licenses/by/4.0/), which permits unrestricted reuse, distribution, and reproduction in any medium, provided the original work is properly cited.

Downloaded from https://academic.oup.com/ijpp/article/33/4/369/8161154 by Dalhousie University user on 24 September 2025

Acceptability of health care interventions has become increasingly important when determining the feasibility of implementing new health care services [12]. Understanding the acceptability outcomes of the service providers may offer insight into the adoption practices of new services [13] and if acceptability is low, the implementation and adoption of the intervention may be inadequate or fail [12]. Assessing the acceptability of pharmacist delivery, either prospectively (before service implementation) or retrospectively (after service implementation) can improve overall implementation and possibly, sustainability. To adequately assess and understand the nature of pharmacists' acceptability of these practices, the theoretical framework of acceptability (TFA), with eight constructs of acceptability, can be used to map the perspectives of pharmacists in the context of STI management [12, 14].

The TFA consists of seven constructs [12], with an eighth construct identified by Payntor *et al*. [14] to determine the acceptability of a service, as acceptability is multifaceted [12]. The TFA is reflexive in nature as it allows the acceptability to be determined both retrospectively and prospectively through the various domains [12]. The domains include Affective Attitude, Burden, Ethicality, Intervention Coherence, Opportunity cost and gains, Perceived effectiveness, Self-efficacy [12], and Perceived risks [14]. These categories encompass many aspects of acceptability and can help identify facilitators and barriers to services as perceived by the deliverer of the service and aid in strengthening the delivery once reviewed [12]. There is a gap in the existing literature regarding the acceptability of pharmacist-delivered STI screening and treatment. Therefore, a scoping review was conducted to map, characterize, and explicate the acceptability of pharmacist-delivered STI services using a preexisting theoretical framework.

Methods

This scoping review was completed following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-Sc) guidelines.

Search strategy

A search of the electronic databases CINAHL, EMBASE, and PubMed was conducted up to July 2024 using search terms related to pharmacists, acceptability, sexual health service provisions, and full-scope practices. The search was limited to title/abstract and keywords. The full search strategy for one database is provided in the Supplementary Material. A citation search was also conducted to identify a known article that would fit the inclusion criteria.

Inclusion criteria

Articles were included if they assessed pharmacists' acceptability of expanded/full-scope practices relating to assessing (including testing when relevant), prescribing, and preventing STIs. Acceptability could have been assessed as part of a primary or secondary outcome of the study. For the purpose of this study, expanded scope of practice is defined as clinical activities related to assessing and performing tests for STIs (when relevant), prescribing, or treating STIs. This did not include studies that only assessed pharmacists' willingness to dispense, counsel, or educate on sexual health topics. Studies had to include at least one construct of the TFA as per Sekhon *et al*. and Paynter *et al*. [12, 14].

Exclusion criteria

Conference abstracts, commentaries, opinion pieces, editorials, and all reviews were excluded. All other paper types were considered eligible if they met the inclusion criteria listed above. Articles not published in English were not eligible and there were no restrictions on date of publication for exclusion. Acceptability of STI services by pharmacists from the perspectives of others (e.g. general public, other health care professionals, and students) were excluded if they did not include pharmacists' perceptions. Articles assessing multiple key informants, including pharmacists' acceptability were included, however, only the data pertaining to the pharmacist's perspective was extracted from these studies.

Study selection

The final search conducted from the three databases was exported into Covidence systematic review software (Veritas Health Innovation, Melbourne, Australia, 2023) [15], where duplicates were removed automatically. Two investigators independently screened all articles for inclusion based on titles and abstracts. Conflicts were resolved through discussion. The same two investigators then assessed each article that passed screening by full text for final inclusion in the review. Again, conflicts were resolved through discussion.

Data extraction and synthesis

Extracted data included the main author, year and country of publication, study aims and design, participant numbers, and recruitment methods. It also included the main results of the study, as well as if the study was assessing acceptability prospectively or retrospectively. Acceptability data from pharmacists were extracted from the study results and mapped to the TFA constructs by assigning a code in the form of a word or phrase to represent meaning. Codes within each construct were reviewed and combined into broader themes to represent the outcomes and results pertaining to the TFA constructs. Codes were assigned by one investigator and subsequent grouping and analysis were conducted by two investigators. All investigators agreed on the final interpretation of the data within each TFA construct. Studies were not critically appraised as the objective of this review was primarily to map study outcomes and findings to the theoretical framework.

Results

Characteristics of included studies

A total of 2821 articles were identified by the electronic search with one additional article identified by citation searching. After 808 duplicates were removed, 2014 articles were screened based on title and abstract with 68 progressing to full text screening. A total of 22 primary articles (publication dates ranging from 2007 to 2023) were included in this review based on the eligibility criteria (Fig. 1), with a total of 2230 pharmacists involved across all included studies. Twenty-one articles were identified in the search strategy outline, and one was identified through citation searching. Table 1 provides an outline of the study characteristics. Countries of publication include United States of America (USA) (n = 12) [21, 27, 18, 31, 32, 24, 20, 23, 29, 33, 35, 28], United Kingdom (UK) (n = 3) [17, 26, 22], Australia (AUS) (n = 3) [36, 34, 16], Canada (n

Downloaded from https://academic.oup.com/ijpp/article/33/4/369/8161154 by Dalhousie University user on 24 September 2025

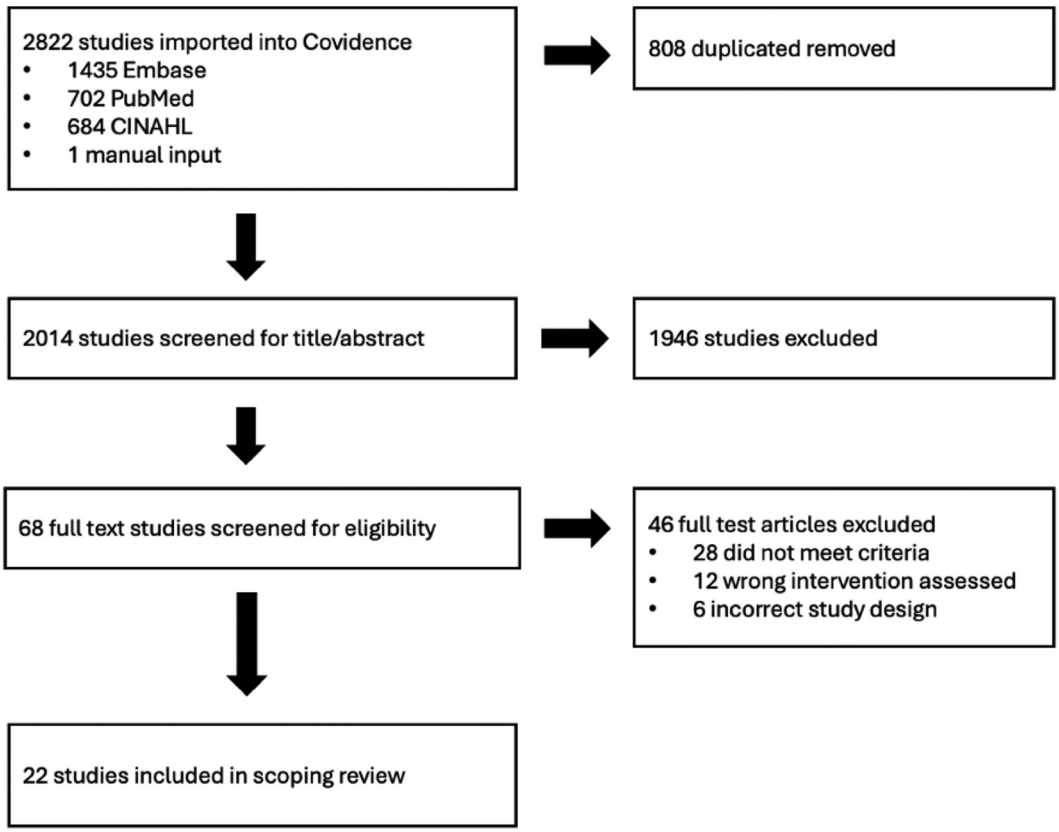

Figure 1. PRISMA flow chart.

= 2) [10, 19], Switzerland (*n* = 1) [16], France (*n* = 1) [30], and Portugal (*n* = 1) [25]. Studies were primarily cross-sectional in design, conducted either by interviews (*n* = 7) [18, 31, 32, 17, 19, 24, 33, 26, 28], focus groups (*n* = 2) [10, 25], surveys (*n* = 10) [27, 32, 36, 34, 30, 20, 35, 23, 16, 22], or mixed methods (*n* = 3) [21, 19, 29]. Four of these studies assessed acceptability retrospectively after a pilot study [10, 27, 17, 33], and the rest were prospectively assessed for acceptability [21, 18, 31, 32, 34, 36, 19, 20, 24, 29, 30, 35, 16, 22, 23, 25, 26, 28]. All studies investigated the pharmacists' experiences and acceptance of providing expanded-scope sexual health clinical services [16–36].

In total, nine studies assessed pharmacist-led HIV-pre-exposure prophylaxis (PrEP) prescribing [21, 27, 32, 18, 19, 20, 29, 23, 28]. Most of these studies were conducted within the USA [21, 27, 18, 31, 20, 29, 23, 28], with one in Canada [19]. There were seven studies assessing HIV point of care testing (POCT) [10, 32, 34, 24, 35, 33, 25], and all were conducted within USA [32, 34, 24, 35, 33, 25] and Canada [10]. Five of the included studies assessed screening for chlamydia in community pharmacies [36, 17, 16, 26, 22], with one of those also including screening for gonorrhea [26]. These studies were conducted in Australia [36, 34, 16], Switzerland [16], and the UK [17, 22]. One study from France assessed pharmacists' acceptance to prescribe for the HPV vaccine [30].

Acceptability of pharmacists

Table 2 outlines the overarching themes identified in this review mapped to each construct of the TFA for STI services provided by pharmacists.

Affective attitude—How an individual feels about taking part in the intervention [12, 15]

Pharmacists expressed a high willingness to provide STI-related services and they perceived their participation as important in providing care for their patients [10, 16–36]. Bellman *et al.* reported that pharmacists believed that providing PrEP was a valuable expansion as part of their scope [18], with one pharmacist stating they felt providing service was a "moral imperative in keeping transmission to a minimum" [18]. Pharmacists also believed they had a responsibility to provide HIV POCT to patients and that it was well within their scope of practice [10, 32, 18, 34, 24, 35, 33, 25]. Barrister *et al.* reported that the pharmacists who participated in chlamydia testing highly recommended that their colleagues participate in this practice as well [17]. One pharmacist in the study said, "You feel like a professional. It's morally satisfying that you're providing a proper service," [17]. Negative attitudes were documented in one study addressing HPV vaccination and found pharmacists were less willing to take part in the service and believed it was better for physicians to assess and prescribe the vaccines [30].

Burden—the perceived amount of effort that is required to take part in the intervention [12, 15]

Some pharmacists believed that the increased time and workload necessary to complete these services would be a burden to them. For PrEP prescribing, the main concerns related to the increased time and workload it would take to conduct this service [21, 27, 18, 31, 19, 20, 29, 23, 28]. However, Havens *et al.* noted that while there was some time burden with providing this service, it did not cause major disruption

Downloaded from https://academic.oup.com/ijpp/article/33/4/369/8161154 by Dalhousie University user on 24 September 2025

Table 1. Characteristics of included Studies

Author, Year	Country	Infections	Aim	Design/data collection	Number	Main findings
Arnet, 2018 [16]	AUS, SWZ	Chlamydia	To assess willingness of pharmacy-based chlamydia testing	Cross-sectional (survey)	385	Willingness to provide chlamydia testing was high in both countries among pharmacists. Level of knowledge about the STI positively correlated with willingness to provide services
Baraitser, 2007 [17]	UK	Chlamydia	To assess acceptability to pharmacist of chlamydia testing	Pilot study (interviews)	2	Pharmacists are willing to complete this service and community pharmacies are a suitable location for testing and treatment
Bellman, 2022 [18]	USA	HIV	To assess the implementation (facilitators and barriers) of pharmacist-provided PrEP and PEP	Cross-sectional (interviews)	7	Barriers and facilitators to PrEP and PEP furnishing were consistent across pharmacies
Booker, 2021 [19]	CAN	HIV	To determine pharmacists' willingness to provide and prescribe PrEP	Mixed methods (survey and interviews)	233	Pharmacists had mixed acceptance of PrEP prescribing
Broekhuis, 2018 [20]	USA	HIV	To characterize the willingness of pharmacists to provide PrEP services	Cross-sectional (survey)	140	Pharmacists were willing to provide PrEP services Pharmacists were more likely to provide PrEP with prior experience counseling HIV-infected patients on antiretroviral therapy
Burns, 2023 [21]	USA	HIV	To determine the acceptability and feasibility of pharmacists prescribing PrEP in South Carolina	Cross-sectional (survey and focus groups)	150	Pharmacists view PrEP as both beneficial and effective and most were willing to prescribe it.
Cameron, 2007 [22]	UK	Chlamydia	To determine pharmacists' willingness to introduce chlamydia testing and treatment services	Cross-sectional (Survey)	50	Pharmacists were willing to provide free test kits for chlamydia and were willing to dispense treatment if the positive test was apparent
Crawford, 2020 [23]	USA	HIV	understand pharmacists' perception of PrEP delivery among pharmacists	Cross-sectional (survey)	6	Pharmacists supported PrEPdelivery to MSM in pharmacies
Dowling-McClay, 2021 [24]	USA	HIV	To describe community pharmacists' HIV prevention barrier, attitudes and beliefs	Cross-sectional (interviews)	15	Positive for cognitive services such as education, less willingness for clinical services
Figueira, 2022 [25]	POR	HIV	To understand facilitators and barriers perceived by pharmacists for POCT for HIV	Cross-sectional (focus groups)	15	Pharmacists identified speed, confidentiality, counseling provided to users, pharmacists' initial training to perform the tests, and trust in the pharmacist as facilitators of these tests.
Gauly, 2020 [26]	UK	Chlamydia and gonorrhea	To explore pharmacists' experiences delivering sexual health services	Cross-sectional (interviews)	9	Pharmacists were motivated to provide sexual health services; however, pharmacist interpersonal skills are a barrier to delivery
Havens, 2019 [27]	USA	HIV	To investigate the acceptability and feasibility of a pharmacist-led HIV screening and PrEP program (P-PrEP) for individuals at risk for HIV acquisition	Pilot study (Survey)	7	Implementation of a pharmacist-led PrEP program is feasible and associated with high rates of patient satisfaction and pharmacist acceptability.
Hopkins, 2021 [28]	USA	HIV	to assess pharmacists' perspectives on the implementation of prep screening and dispensing	Cross-sectional (interviews)	7	Pharmacists and pharmacy technicians expressed strong willingness and support for screening and dispensing PrEP in pharmacies.
Hunter, 2023 [29]	USA	HIV	To assess pharmacist prescribing PrEP	Cross-sectional (survey and focus groups)	919	Despite pharmacist-initiated PrEP/PEP and supportive attitudes among pharmacists, current levels of implementation fall short of the vision for significantly expanded access.

Downloaded from https://academic.oup.com/ijpp/article/33/4/369/8161154 by Dalhousie University user on 24 September 2025

Table 1. Continued

Author, Year	Country	Infections	Aim	Design/data collection	Number	Main findings
Julia, 2023 [30]	FR	HPV	To understand acceptability of community pharmacists of HPV vaccination pathways	Cross-sectional (survey)	9	Training of community pharmacists and public information campaigns on HPV vaccination could strengthen their confidence
Kelly, 2020 [10]	CAN	HIV	To develop and assess HIV POCT in community pharmacies and describe pharmacist experiences	Pilot study-(focus groups)	Not reported	Pharmacists felt prepared, confident, and expressed professional satisfaction with offering HIV POCT
Koester, 2020 [31]	USA	HIV	To assess attitudes among key stakeholders about a California policy to allow community pharmacists to furnish HIV PrEP and PEP	Cross-sectional (interviews)	7	Characterization of the types of benefits and challenges that can be expected when PrEP and PEP prescribing privileges are extended to community pharmacists
McKeirnan, 2021 [32]	USA	HIV	To investigate pharmacists' opinions for addressing previously reported barriers to the implementation of HIV testing services in a community pharmacy	Cross-sectional (Survey)	26	Pharmacists can increase access to HIV testing by implementing appropriate strategies such as adequate training, protocols, and using appointment-based models to decrease barriers.
Ryder, 2013 [33]	USA	HIV	To assess the feasibility, readiness, and acceptability of offering rapid human immunodeficiency virus (HIV) testing in community pharmacies	Pilot study (interviews)	17	Pharmacists accepted the idea of pharmacy-based HIV testing as a service that pharmacies could offer to the public.
Santella, 2016 [34]	AUS	HIV	To determine willingness to offer rapid HIV testing in community pharmacies	Cross-sectional (survey)	133	Pharmacists are prepared to deliver POCT for HIV
So, 2019 [35]	USA	HIV	To identify pharmacist-perceived barriers and their level of confidence in performing community pharmacy-based POCT for HIV	Cross-sectional (survey)	113	Pharmacist support for the implementation of HIV POCT. Barriers identified include the level of confidence, staffing, time, and cost to the patient.
Taylor, 2007 [36]	AUS	Chlamydia	To determine the acceptability of a community pharmacy-based Chlamydia screening program	Cross-sectional (Survey)	25	Chlamydia screening program in community pharmacies would be strongly supported by pharmacists

AUS= Australia, CAN= Canada, FR= France, POR= Portugal, SWZ= Switzerland, USA= United States of America,.
HIV= human immunodeficiency virus, HPV= human papilloma virus, PrEP= pre-exposure prophylaxis, PEP= post-exposure prophylaxis, STI= sexually transmitted infection, MSM= men who have sex with men, POCT= point of care testing.

to their workflow [27]. One pharmacist noted in the study by Booker *et al*. that PrEP prescribing, "will likely increase the workload, but I think it is something that is necessary and probably can be fit into most pharmacists' workload" [19]. In the study by Kelly *et al*. assessing the acceptability retrospectively after a pilot project for pharmacists conducting HIV POCT, the pharmacists found that workload was not overly disrupted and that this was avoided by booking appointments [10]. The same was found for the studies assessing chlamydia testing, in that there were concerns relating to time and workflow, but the retrospective studies demonstrated that these can easily be minimized for the pharmacists by booking appointments [36, 17, 16, 26, 22]. Pharmacists who were assessed in the study by Barrister et al. noted that it was not difficult to conduct chlamydia testing once one or two tests were completed. One pharmacist said, "once you have done a few, you get the confidence, and it takes much less time [17]."

Ethicality—the extent to which the intervention has a good fit within the individual's belief system [12, 15]

Studies reporting outcomes related to ethicality were few and mostly related to sensitivity, linkages to care, and privacy. Pharmacists did note concerns over having difficult and uncomfortable conversations with patients that were of a sensitive nature and were concerned about linkage to care if there was a positive test result [10, 36, 32, 17, 24, 34, 35, 33, 16, 25, 26, 22]. Many pharmacists across all service types noted that there needed to be adequate private spaces to have sensitive conversations with patients [21, 27, 18, 31, 32, 34, 29, 23, 25, 28]. Additionally, some pharmacists were concerned about the ability to reach all the possible clients who would benefit from the service they were providing [16]. Pharmacists did, however, feel a sense of duty to be able to offer these services to patients to help manage STI concerns [18, 17, 19, 29, 33].

Intervention coherence—the extent to which the participant understands the intervention and how it works [12, 15]

It was noted across all studies that adequate training for pharmacists and clear protocols would be required before offering STI management services [10, 16–36]. Training needs were mentioned for both conducting the service as well as how to have sensitive conversations such as a positive test result [28]. Pharmacists believed that offering

Downloaded from https://academic.oup.com/ijpp/article/33/4/369/8161154 by Dalhousie University user on 24 September 2025

Table 2. Themes mapped to the TFA for each service provided

Construct	PrEP prescribing	HIV POCT	Chlamydia/gonorrhea testing	HPV vaccine prescribing
Affective Attitude *How an individual feels about taking part in the intervention* [15]	Willingness Perceived as important service Public duty to prevent HIV	Willing and motivated Sense of responsibility	Willingness Important to be able to offer this service Pharmacists Keen to provide service	Low willingness from French pharmacists
Burden *The perceived amount of effort that is required to take part in the intervention* [12]	Time and workload perceived as possible burdens	Time and workload perceived as possible burdens	Time and workload perceived as possible burdens Lack of adequate facilities to conduct testing	Not reported
Ethicality *The extent to which the intervention has a good fit within the individual's belief system* [12]	Discomfort discussing sensitive topics/Privacy	Concerns over continuation of care if positive result	Hard to reach all possible clients	Not reported
Intervention Coherence *The extent to which the participant understands the intervention and how it works* [12]	Proper training and protocols needed Appointment booking	Proper training and protocols needed Appointment booking	Proper training and protocols needed Appointment booking	Not reported
Opportunity Costs and Gains *The extent to which benefits, profits or values may be given up or received to participate in the intervention* [12]	Adequate reimbursement	Adequate reimbursement	Adequate reimbursement	Not reported
Perceived Effectiveness *The extent to which the participant perceived the intervention to achieve its desired purpose* [12]	Helps prevent HIV Improved access	Improved access	Improved access	More training needed
Self-Efficacy *The participants confidence that they can perform the behaviors require to participate in the intervention* [12]	Confidence increased with proper training	Preparedness Within scope of practice	Comfortable preforming tests	Not reported
Perceived safety and Risks *The participants perceived threats or safety issues encountered when participating in the intervention* [15]	Concerns of non-adherence Increase the risk of perceived coverage from HIV	Lack of psychological training on delivering positive results	Lack of psychological training on delivering positive results	Lack of pharmacist awareness

TFA = theoretical framework of acceptability, HIV = human immunodeficiency virus, HPV = human papilloma virus, PrEP = pre-exposure prophylaxis, POCT = point of care testing.

appointment-based services would be the best way to address increased workload [10, 21, 32, 18, 19, 35] and various studies noted that some pharmacies are already implementing clinical days into their workflow [17, 19]. Pharmacists believed that these clinical days would facilitate appointment times, specifically for PrEP prescribing and monitoring [19]. The need for patient education to ensure adherence to medications was a primary concern with respect to PrEP prescribing [21, 19, 20].

Opportunity costs and gains—the extent to which benefits, profits, or values may be given up or received to participate in the intervention [12, 15]

All pharmacists within the studies included in this review believed that there needed to be adequate reimbursement and compensation for the time they spent providing STI management services [10, 16–36]. Pharmacists largely believed that they did not have to give up providing other services because of taking on these new responsibilities; however, they noted that when using appointment-based models, the new services would take time that could be used for other services [17, 19].

Perceived effectiveness—the extent to which the participant perceived the intervention to achieve its desired purpose [12, 15]

Pharmacists believed these services are essential for preventing and managing HIV and STIs [10, 16–36]. Many pharmacists believed that PrEP was very effective when taken correctly and noted that adequate and thorough patient education was needed when providing PrEP to patients to maximize its effectiveness [21, 19]. Pharmacists also believed that access to pharmacy-based STI services would increase and help to minimize the burden on the health care system [10, 17, 18, 31, 34, 19, 20, 29, 30, 16, 25, 26]. A study by Figueria *et al.* conducted in Portugal assessed facilitators and barriers for implementing an HIV POCT testing service and pharmacist perceived their role as "one of the most important facilitators" for patients to access these services [25]. Although pharmacists from the identified studies perceived pharmacy-based services to be effective, it was clear that a strong linkage to a care plan and to other health care professions was necessary for cases that may be beyond the pharmacist's scope [10, 16–36].

Downloaded from https://academic.oup.com/ijpp/article/33/4/369/8161154 by Dalhousie University user on 24 September 2025

Self-efficacy—the participants confidence that they can perform the behaviors require to participate in the intervention [12, 15]

Pharmacists were confident in performing the services. In the studies assessing prospective acceptability, many pharmacists felt confident they would be able to conduct the services with the proper training [21, 18, 31, 32, 34, 36, 24, 19, 20, 29, 35, 16, 23, 25, 26, 28]. In the studies assessing acceptability retrospectively, all pharmacists were confident in conducting these services after receiving the training and believed that the services fit well within their scope of practice [10, 27, 17, 33]. A pilot study by Barrister *et al*. assessing the acceptability of chlamydia testing demonstrated that pharmacists were confident in their ability to conduct this service and that it was easy to perform [17]. For HIV POCT testing, the retrospective studies noted that the training prepared pharmacists well and they were comfortable and confident in performing the tests [10].

Perceived safety and risks—the participants perceived threats or safety issues encountered when participating in the intervention [15]

There were minimal perceived risks from pharmacists in providing these services. Some pharmacists did note that they were concerned over linkages to care if there were positive test results received, and they did not have the ability to prescribe or directly link patients to other primary care providers [32, 18, 25]. Other perceived risks included the opportunity for harm if the pharmacist was not comfortable having sensitive conversations with patients [27, 20, 23, 25, 33, 35, 26].

Discussion

The objective of this study was to map, characterize, and explicate the acceptability of pharmacist-delivered STI services using a preexisting theoretical framework. A total of 22 studies were identified in this scoping review that assessed at least one outcome aligning within the constructs of the TFA for services relating to PrEP prescribing, HIV POCT, chlamydia (and gonorrhea) testing and treatment, and HPV vaccine prescribing [10, 16–36]. The overall acceptability of pharmacist-delivered STI services was high, and they were mostly accepting and willing to provide these services outlined in this review.

The strengths of this study include the use of a theoretical framework (the TFA) to assess acceptability in a methodological way. The use of the framework allowed the conceptualization of the TFA constructs within a pharmacy practice context specifically. While this was difficult at times to map outcomes to constructs, the TFA provided a well-defined framework for understanding the acceptability of implementing these pharmacy services. There are also limitations to this review. It should be noted that most of the studies identified did not use a framework or tool for assessing acceptability. This resulted in limited data for some of the constructs assessed as part of the TFA. Many of the included studies also addressed acceptability from other key informants, such as patients, physicians, and other health care providers, and these perspectives were not included in the review. Another limitation was the availability of data within the studies. Many studies did not assess acceptability as their primary outcome and may have only briefly reported acceptability data as part of a survey or interview. It is therefore possible that some studies were missed in the screening process. Selection bias may also be a relevant factor to consider for STI services and studies in this area. Not all pharmacists may desire to offer this service and therefore may encourage a selection bias towards those who were interested in participating. A search for unpublished data was not conducted, which may have missed some studies not yet published or data available outside of the published literature. Despite these limitations, this review provides a comprehensive assessment of pharmacists' acceptability for the provision of STI services and allows for better conceptualization of the constructs of the TFA within the realm of pharmacy practice.

The domains of affective attitude, burden, intervention coherence, and self-efficacy were most often represented in the data set. Pharmacists were highly motivated and willing to conduct these services [10, 17–19, 21, 24, 27, 31, 32, 34, 36, 16, 20, 22, 23, 25, 26, 28, 29, 33, 35], with workflow disruptions and increased burden being minimized with appointment bookings and adequate training and protocols [10, 21, 32, 18, 19, 35]. Pharmacists were confident in their abilities to safely and effectively conduct these services [10, 17–19, 21, 24, 27, 31, 32, 34, 36, 16, 20, 22, 23, 25, 26, 28, 29, 33, 35], demonstrating that service implementation within pharmacies may be a viable way to improve access to patient care and reduce the burden on the broader healthcare system.

This review highlighted gaps in the existing literature. Minimal data were available to assess the constructs of ethicality, opportunity costs and gains, perceived effectiveness, and perceived safety and risks. Ethicality data were especially sparse, and findings were largely related to pharmacists' moral obligations to provide these services. It is noted that many studies focused on affective attitude and burden, while neglecting to assess acceptability across all constructs. For opportunity costs and gains, almost all pharmacists were concerned over the reimbursement aspect of providing these services [10, 17–19, 21, 24, 27, 31, 32, 34, 36, 16, 20, 22, 23, 25, 26, 28, 29, 33, 35]. This is an important finding, as sustainability and scalability of services may be dependent on the ability for adequate compensation and to provide for adequate human resource needs to compensate for increased workload or workflow adjustments (e.g. appointments). The construct of perceived effectiveness was not commonly reported in the studies identified, likely because many of the studies were conducted prior to the implementation of the service as part of clinical practice or research. Although many pharmacists hypothesized that providing these services would increase access to care [18, 31, 32, 36, 17, 24, 30, 20, 16, 23, 25] and PrEP prescribing will help prevent HIV [21, 27, 18, 31, 19, 20, 29, 23, 28], actual perceptions of service effectiveness remain largely unknown. Perceived safety and risks also were not highly evident in the results, likely for similar reasons. The main differences between the prospective and retrospective studies were that the prospective studies perceived some issues (such as time and adequate training) to be more of a concern [21, 27, 19, 20, 29, 23, 28] than what was documented in the retrospective studies [10, 27, 17, 33].

The findings of this review align with findings from the literature pertaining to the implementation of pharmacy-based sexual health services. A scoping review by d'Entremont-Harris *et al*. assessed implementation considerations for pharmacy-based STI services, which included assessing pharmacists' perspectives [5]. While d'Entremont-Harris *et al*. did not include studies addressing services related to HIV (PrEP provisions and HIV POCT), the findings in this review

Downloaded from https://academic.oup.com/ijpp/article/33/4/369/8161154 by Dalhousie University user on 24 September 2025

outlined that pharmacists also expressed the need for comprehensive training but felt confident in their competencies [5]. Another systematic review was conducted by Gauly *et al*. that aimed to determine the experiences and attitudes of pharmacy users and staff towards pharmacy-based sexual health services [11]. This study also noted pharmacists' support for services (e.g. chlamydia screening) and noted the need for adequate privacy and concerns about workload [11]. Although these reviews provide data relating to the constructs of affective attitude and burden, this current review provides a broader and more in-depth understanding of pharmacists' acceptability across all TFA constructs and expands the literature beyond limited sexual health services. Future research on acceptability should be encouraged to use a framework such as the TFA to ensure that all important information is captured and synthesized to fully understand the concept being addressed.

Conclusion

The findings of this study suggest that the acceptability of pharmacists to provide full-scope management of STI services is high, and pharmacists are willing to take on the responsibility of providing these services. Pharmacists believed that they have a moral obligation to improve the health and wellbeing of their patients while decreasing the burden on health care systems. This review therefore provides an initial understanding of the acceptability of pharmacists to perform these services across eight theoretical constructs of the TFA.

Supplementary Material

Supplementary data are available at *International Journal of Pharmacy Practice* online.

Author contributions

The authors confirm their contribution to the paper as follows: study conception and design: K.M.B., K.J.W., E.K.B.; data collection: K.M.B., K.J.W.; analysis and interpretation of results: K.M.B., K.J.W., E.K.B., A.L.M., D.V.K.; draft manuscript preparation: K.M.B., K.J.W., E.K.B., A.L.M., and D.V.K. All authors reviewed the results and approved the final version of the manuscript.

Data access statement

The authors confirm that the data supporting the findings of this study are available within the article and its supplementary materials. All authors had access to data in this review.

Data availability

The data underlying this article are available in the article and in its online supplementary material.

Conflict of interest

The authors have no conflicts of interest to declare

Funding

The graduate student stipend for Kathleen Bergin was funded by an unrestricted research grant provided by Shoppers Drug Mart.

Ethical statement

This was not required as this was a literature review.

References

1. World Health Organization. Sexually transmitted infections (STIs). https://www.who.int/news-room/fact-sheets/detail/sexually-transmitted-infections-(stis). (8 May 2024, date last accessed).
2. Centers for Disease Control and Prevention. Sexually Transmitted Infections Surveillance. https://www.cdc.gov/sti-statistics/index.html. Published 2022. (9 May 2024, date last accessed).
3. Centers for Disease Control and Prevention. Human papillomavirus (HPV) infection. https://www.cdc.gov/hpv/about/?CDC_AAref_Val=https://www.cdc.gov/hpv/parents/about-hpv.html. Published 2023. (9 May 2024, date last accessed).
4. World Health Organization. HIV data and statistics. https://www.who.int/teams/global-hiv-hepatitis-and-stis-programmes/hiv/strategic-information/hiv-data-and-statistics. (9 May 2024, date last accessed).
5. d'Entremont-Harris M, MacNabb K, Wilby KJ *et al*. Pharmacy-based sexually transmitted infection service implementation considerations: a scoping review. *J Am Pharmacists Assoc : JAPhA* 2024;**64**:186–96.e2. https://doi.org/10.1016/j.japh.2023.10.029
6. Centers for Disease Control and Prevention (CDC). Syphilis - CDC Fact Sheet (Detailed). https://www.cdc.gov/syphilis/about/index.html. Published 2021. (9 May 2024, date last accessed).
7. Government of Canada. HIV and AIDS: Symptoms and treatment. https://www.canada.ca/en/public-health/services/diseases/hiv-aids.html. 18 December 2023. (9 May 2024, date last accessed).
8. Ryu H, Blaque E, Stewart M *et al*. Disruptions of sexually transmitted and blood borne infections testing services during the COVID-19 pandemic: accounts of service providers in Ontario, Canada. *BMC Health Serv Res* 2023;**23**:29. https://doi.org/10.1186/s12913-023-09028-z
9. Navarrete J, Yuksel N, Schindel TJ *et al*. Sexual and reproductive health services provided by community pharmacists: a scoping review. *BMJ Open* 2021;**11**:e047034. https://doi.org/10.1136/bmjopen-2020-047034
10. Kelly DV, Kielly J, Hughes C *et al*. Expanding access to HIV testing through Canadian community pharmacies: findings from the APPROACH study. *BMC Public Health* 2020;**20**:639. https://doi.org/10.1186/s12889-020-08719-0
11. Gauly J, Ross J, Hall I *et al*. Pharmacy-based sexual health services: a systematic review of experiences and attitudes of pharmacy users and pharmacy staff. *Sex Transm Infect* 2019;**95**:488–95. https://doi.org/10.1136/sextrans-2019-054096
12. Sekhon M, Cartwright M, Francis JJ. Acceptability of healthcare interventions: an overview of reviews and development of a theoretical framework. *BMC Health Serv Res* 2017;**17**:88. https://doi.org/10.1186/s12913-017-2031-8
13. Mettert KD, Lewis C, Dorsey C *et al*. Measuring implementation outcomes: an updated systematic review of measures' psychometric properties. *Implement Res Pract* 2020;**1**:2633489520936644. https://doi.org/10.1177/2633489520936644
14. Paynter C, McDonald C, Story D *et al*. Application of the theoretical framework of acceptability in a surgical setting: theoretical and methodological insights. *Br J Health Psychol* 2023;**28**:1153–68. https://doi.org/10.1111/bjhp.12677
15. Covidence Systematic Review Software. Melbourne, Australia: Veritas Health Innovation, 2022. www.covidence.org. (20 March 2024, date last accessed).
16. Arnet I, Gudka S, Salter S *et al*. Readiness of pharmacists and consumers for pharmacy-based chlamydia screening in Australia and Switzerland. *Sex Reprod Healthc* 2018;**16**:138–53. https://doi.org/10.1016/j.srhc.2018.03.006
17. Baraitser P, Pearce V, Holmes J *et al*. Chlamydia testing in community pharmacies: Evaluation of a feasibility pilot in south east London. *Qual Saf Health Care* 2007;**16**:303–7. https://doi.org/10.1136/qshc.2006.020883

Downloaded from https://academic.oup.com/ijpp/article/33/4/369/8161154 by Dalhousie University user on 24 September 2025

18. Bellman R, Mohebbi S, Nobahar N *et al*. An observational survey assessing the extent of PrEP and PEP furnishing in San Francisco Bay Area pharmacies. *J Am Pharmacists Assoc : JAPhA* 2022;**62**:370–7.e3. https://doi.org/10.1016/j.japh.2021.08.001
19. Booker C, Murphy AL, Isenor JE *et al*. Community pharmacists' acceptance of prescribing pre-exposure prophylaxis (PrEP) for human immunodeficiency virus (HIV). *Canadian Pharmacists Journal : CPJ = Revue des pharmaciens du Canada : RPC* 2023;**156**:137–49. https://doi.org/10.1177/17151635231152218
20. Broekhuis JM, Scarsi KK, Sayles HR *et al*. Midwest pharmacists' familiarity, experience, and willingness to provide pre-exposure prophylaxis (PrEP) for HIV. Smith DK, editor. *PLoS One* 2018;**13**:e0207372. https://doi.org/10.1371/journal.pone.0207372
21. Burns CM, Endres K, Derrick C *et al*. A survey of South Carolina pharmacists' readiness to prescribe human immunodeficiency virus pre-exposure prophylaxis. *J Am Coll Clin Pharm* 2023;**6**:329–38. https://doi.org/10.1002/jac5.1773
22. Cameron S, Melvin L, Glasier A *et al*. Willingness of gynaecologists, doctors in family planning, GPs, practice nurses and pharmacists to adopt novel interventions for treating sexual partners of women with chlamydia. *BJOG* 2007;**114**:1516–21. https://doi.org/10.1111/j.1471-0528.2007.01506.x
23. Crawford ND, Josma D, Morris J *et al*. Pharmacy-based pre-exposure prophylaxis support among pharmacists and men who have sex with men. *J Am Pharm Assoc: JAPhA* 2020;**60**:602–8. https://doi.org/10.1016/j.japh.2019.12.003
24. Dowling-McClay K, Mathis SM, Hagemeier NE. Community pharmacist engagement in HIV and HCV prevention: Current practices and potential for service uptake. *Explor Res Clin Soc Pharm* 2021;**4**:100088. https://doi.org/10.1016/j.rcsop.2021.100088
25. Figueira I, Teixeira I, Rodrigues AT *et al*. Point-of-care HIV and hepatitis screening in community pharmacies: a quantitative and qualitative study. *Int J Clin Pharm* 2022;**44**:1158–68. https://doi.org/10.1007/s11096-022-01444-1
26. Gauly J, Ross J, Parsons J *et al*. Staff and users' experiences of pharmacy-based sexual and reproductive health services: a qualitative interview study from the UK. *Pharmacy* 2020;**8**:206. https://doi.org/10.3390/pharmacy8040206
27. Havens JP, Scarsi KK, Sayles H *et al*. Acceptability and feasibility of a pharmacist-led human immunodeficiency virus pre-exposure prophylaxis program in the Midwestern United States. *Open Forum Infect Dis* 2019;**6**:ofz365. https://doi.org/10.1093/ofid/ofz365
28. Hopkins R, Josma D, Morris J *et al*. Support and perceived barriers to implementing pre-exposure prophylaxis screening and dispensing in pharmacies: examining concordance between pharmacy technicians and pharmacists. *J Am Pharm Assoc: JAPhA* 2021;**61**:115–20. https://doi.org/10.1016/j.japh.2020.10.005
29. Hunter LA, Packel LJ, Chitle P *et al*. Opportunities to increase access to HIV prevention: Evaluating the implementation of pharmacist-initiated pre-exposure prophylaxis in California. *Open Forum Infect Dis* 2023;**10**:ofad549. https://doi.org/10.1093/ofid/ofad549
30. Julia B, Farge G, Mourlat B *et al*. Facilitating human papillomavirus vaccination pathways by extending vaccination competencies to community pharmacists: A cross-sectional survey on the acceptability and expectations among healthcare professionals and parents. *Explor Res Clin Soc Pharm* 2023;**10**:100255. https://doi.org/10.1016/j.rcsop.2023.100255
31. Koester KA, Saberi P, Fuller SM *et al*. Attitudes about community pharmacy access to HIV prevention medications in California. *J Am Pharmacists Association : JAPhA* 2020;**60**:e179–83. https://doi.org/10.1016/j.japh.2020.06.005
32. McKeirnan K, Kherghehpoush S, Gladchuk A *et al*. Addressing barriers to HIV point-of-care testing in community pharmacies. *Pharmacy* 2021;**9**:84. https://doi.org/10.3390/pharmacy9020084
33. Ryder PT, Meyerson BE, Coy KC *et al*. Pharmacists' perspectives on HIV testing in community pharmacies. *J Am Pharm Assoc: JAPhA* 2013;**53**:595–600. https://doi.org/10.1331/JAPhA.2013.12240
34. Santella AJ, Schlub TE, Fagan D *et al*. Australian pharmacists' willingness to conduct rapid HIV testing in community pharmacies. *Sex Health* 2016;**13**:292–4. https://doi.org/10.1071/SH16031
35. So E, Brands M, Suomala E *et al*. Pharmacists' opinions on the implementation of HIV and HepC point-of-care testing in a U.S. pharmacy chain. *Innov Pharm* 2019;**10**:10. https://doi.org/10.24926/iip.v10i1.1425
36. Taylor KL, Clifford RM, Marshall L. Acceptance of a Chlamydia screening program in community pharmacies. *Pharm Pract Res*. 2007;**37**:287–91. https://doi.org/10.1002/j.2055-2335.2007.tb00767.x

Downloaded from https://academic.oup.com/ijpp/article/33/4/369/8161154 by Dalhousie University user on 24 September 2025