
REVIEW ARTICLE

Willingness to Counsel HIV Pre-Exposure Prophylaxis to Clients among Pharmacists: A Systematic Review

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ABSTRACT

Introduction	The successful implementation of PrEP as a prevention program is also associated with the willingness of the healthcare provider to counsel, especially among the pharmacists. We aimed to summarize and synthesize the evidence on level of willingness to counsel HIV Pre-exposure prophylaxis (PrEP) clients among pharmacists for the past ten years.
Methodology	We conducted a systematic search to assess the level of willingness to counsel HIV Pre-exposure prophylaxis (PrEP) clients from five databases; PubMed, SagePub, Science Direct, Web of Science (WOS), and Springer in May 2023. The eligibility criteria are cross-sectional study designs, published in English language, availability of full-text articles, and articles published before the year 2014. The Quality of all seven articles was assessed using Joanna Briggs Institute checklist for Analytical Cross-sectional studies. The results of each study were recorded in the data extraction form.
Results	Of an initial 474 potential studies identified, 7 cross-sectional studies met the inclusion criteria. Five out of seven studies showed that willingness among pharmacists to counsel HIV PrEP is more than 50%. Four studies concluded that willingness among pharmacists are influenced by level of knowledge and experience in HIV and PrEP counselling
Conclusion	The review adds new evidence about the level of willingness among pharmacists to counsel clients for HIV pre-exposure prophylaxis. However, due to limited high quality studies, the findings are inconclusive.
Keywords	HIV PrEP; Pharmacists' Willingness; PrEP Counselling; Pharmacists

Article history:

Received: 14 December 2023

Accepted: 16 August 2024

INTRODUCTION

Willingness to Counsel HIV Pre-Exposure Prophylaxis (PrEP) to Clients Among Pharmacists Human Immunodeficiency Virus (HIV) remains a prominent global public health concern, particularly in developing countries, and is widely recognized as a sexually transmitted infection (STI).¹ The World Health Organization (WHO) reported that by the end of 2020, approximately 37.7 million individuals were living with HIV, with 1.5 million new diagnoses worldwide. Alarming, the African region accounted for 60% of global new HIV infections, with a staggering 25.4 million people affected.² To address this pressing issue, WHO established the 90-90-90 targets, aiming for 90% of people living with HIV to be aware of their status, 81% to receive treatment, and 73% to achieve viral suppression. While these targets have not yet been fully achieved, it is noteworthy that among the 81% of people living with HIV who received antiretroviral therapy (ART), 90% achieved viral suppression, indicating the effectiveness of this treatment approach.³

Pre-Exposure Prophylaxis (PrEP) has emerged as a widely utilized strategy for the treatment and prevention of HIV globally. The combination of Tenofovir and Emtricitabine (Truvada) has demonstrated a significant reduction in the risk of HIV infection among high-risk populations.⁴ The approval of this drug combination by the U.S. Food and Drug Administration (FDA) in 2012 paved the way for many countries to endorse PrEP as a method of HIV prevention.

New Zealand was the first country to publicly fund PrEP in 2018, marking a significant step in promoting its use.⁵ However, in the United States, where an estimated 1.2 million individuals in the United States and Puerto Rico could benefit from PrEP, only 25% of them were prescribed the medication in 2020. Furthermore, among those prescribed PrEP, 66% were white, 16% were Hispanic/Latino, while Black/African American and other racial groups accounted for 9% each.⁶ In England, the government has developed a strategic plan, "Prompt Treatment and Retaining People in HIV Care," with the aim of achieving zero new HIV infections, AIDS, and HIV-related deaths by 2030. Ensuring equitable access and uptake of HIV prevention programs, including the investment in PrEP, is one of the key objectives. The government has allocated over 3.5 million Pounds to implement a National HIV Prevention Program from 2021 to 2024, encompassing prevention campaigns, innovation promotion activities, cross-system support, and improved access to sexual and reproductive health services.⁷

The successful implementation of PrEP as part of HIV prevention programs necessitates collaborative efforts among healthcare providers. Pharmacists play a vital role in the successful

implementation of PrEP as part of HIV prevention programs. They are uniquely positioned within the healthcare system as accessible and trusted healthcare providers. Pharmacists' expertise in medication management and patient education makes them essential in identifying potential PrEP candidates, providing medication adherence support, addressing side effects, and offering continuous monitoring and support. By providing confidential and non-judgmental counseling, pharmacists can help reduce the stigma associated with HIV prevention and treatment, thus fostering a more supportive environment for patients seeking PrEP.⁸

Despite the critical role pharmacists can play in PrEP counseling, there is a lack of comprehensive understanding of their willingness to engage in this practice. "Willingness" was defined as the readiness, disposition, or inclination of pharmacists to engage in PrEP counseling activities. This included factors influencing their willingness, such as knowledge, attitudes, and perceived barriers. Terms such as "confident to counsel" and "comfortable to counsel" are also considered broader aspects of willingness to counsel. These terms reflect a pharmacist's readiness to engage in counseling, with comfort indicating ease in the role and confidence reflecting self-assurance in their ability. Both factors contribute to the overall willingness to provide counseling on PrEP. This systematic review aims to fill this gap by summarizing and synthesizing evidence on the level of willingness to counsel HIV Pre-Exposure Prophylaxis (PrEP) clients among pharmacists over the past ten years. Understanding pharmacists' willingness to counsel on PrEP is essential to enhance the successful implementation of PrEP programs. This review can inform policymakers, educators, and healthcare administrators to design targeted interventions that improve pharmacists' engagement in PrEP counseling. Furthermore, increasing PrEP uptake through pharmacist counseling has significant public health implications, especially in regions with high HIV incidence rates.

Study objective

In this systematic review, our objective is to summarize and synthesize evidence on level of willingness to counsel HIV Pre-Exposure Prophylaxis (PrEP) to clients among pharmacists conducted during the past decade.

METHODOLOGY

Search Strategy

A systematic approach to searching, screening, reviewing and data extraction was applied based on the Preferred Reporting Items for Systematic Review (PRISMA) 2020 Guidelines⁽⁹⁾. The search strategy was designed using the PICO framework

(Population, Intervention, Comparison, Outcome) to identify relevant studies. We employed a comprehensive set of search terms to capture a wide range of studies related to pharmacists' willingness to counsel on PrEP. For example, for the term "pharmacist," we used truncation (e.g., pharmacist*) to ensure all relevant variations were considered. For PrEP, additional terms such as "HIV Pre-Exposure Prophylaxis," "Pre-Exposure Prophylaxis," and all synonyms were included, however, the drug names like "Truvada," and "Tenofovir/Emtricitabine" were not included in the search strategy. The search was conducted across multiple databases, including PubMed, Scopus, and Web of Science, covering the period from 2014 to 2023.

Research Question

The PICO (Patient, Intervention, Comparison, Outcome) framed by this systematic review is shown in Table 1 below.

The research questions for this systemic review will be:

Do pharmacists willing to counsel HIV Pre-Exposure prophylaxis (PrEP) to clients?

Alternative terms and formulation of keywords

Sources of Information and Literature Searching

By applying a multi-stage process, the first step was a highly sensitive search with multiple hits to identify relevant literature. A comprehensive search strategy was done by searching databases from five main medical databases: SAGEPub, PubMed, SpringerLink, Science Direct and World of Science (WoS). To identify the related articles, the researchers used search terms like as mentioned

above. The terms were modified as necessary to collect more related sources to the interested topics. The researchers also tried to find the latest published articles to get the best finding for the research. While reading the relevant articles, the researchers also categorized those articles into the types of study designs and the research finding. Relevant articles were summarized electronically in End Note, Version X9. The databases were fully accessible. Articles were searched within the period of 10 years, between January 2014 – April 2023 (there are limited study found when limit to 5 years thus researchers decided to expand the time to 10 years). The manual search was generated from references found in the electronic search. Predefined search terms determined by the Medical Subject Headings (MeSH) and keywords were used. The combination of keywords used can be found in *alternative terms and formulation of keywords* as well as a Boolean search that was performed in each database using the search terms as stated in our Search Strategy. A total of 474 articles were obtained from the search of the mentioned databases.

Inclusion Criteria

Type of studies

Inclusion criteria for studies were articles published in the English language that focused on willingness and comfort to counsel HIV Pre-Exposure Prophylaxis (PrEP) to clients among pharmacists with full text and published as journal articles or peer-reviewed journals only. Search for studies was performed for articles that published in the past 10 years only (reference range from January 2014 – April 2023). This study aimed to examine articles that use cross-sectional studies. Table 3 summarized all the inclusion and exclusion criteria used in this study.

Table 1 PICO table

Criteria	Description
P: Population	Pharmacist
I: Intervention/Exposure	HIV Pre-Exposure prophylaxis (PrEP)
C : Comparison	None
O : Outcome:	Level of willingness and comfort to counsel PrEP to clients among pharmacists.

Table 2 List of alternative terms for PICO

PrEP	Pharmacists' Willingness	PrEP counselling	Pharmacists
HIV PrEP	Pharmacist' Readiness	HIV prevention counselling	Drug Dispensers

Type of participants

Articles that included pharmacist population.

Type of interventions / exposures

HIV Pre-Exposure Prophylaxis (PrEP).

Type of outcome measures

The exposure of interest was willingness to counsel HIV Pre-Exposure Prophylaxis (PrEP) to clients among pharmacists.

Exclusion Criteria

Not-peer-reviewed documents (ie. protocols, abstracts, news, reports, short communication, letters to editor, methodology papers, conference papers, commentaries, opinions, and editorials) were excluded. Studies were excluded if they focused solely on community and patient populations without addressing pharmacists directly. Studies that have investigated comfort to counsel as outcome without mentioning willingness to counsel were also excluded. After exclusion of articles (n= 459) according to the criteria mentioned above, a total of 7 articles were obtained from this review.

Search Strategy

We selected five main medical databases: SAGEPub, PubMed, SpringerLink, Science Direct, and Web of Science (WoS) . The search was done using the keywords below:

"PrEP" **OR** "HIV PrEP "
AND
 "Pharmacists' willingness" **OR** "Pharmacist'
 readiness"

AND
 "PrEP counselling" **OR** "HIV prevention
 counselling"
AND
 "Pharmacists" **OR** "Drug dispensers"

Selection based on the mentioned inclusion criteria. When the title did not appear to be clear, the abstract was retrieved and screened by the authors. The summary of this process is depicted in Table 5. Articles were selected if they met the following criteria: (1) published in a peer-reviewed journal between 2014 to 2023. (2) focused primarily on PrEP in the article and presented data on the potential impact of pharmacies on PrEP acquisition and/or adherence. (3) no limit to study designs and (4) only English articles were included. (5) exclude editorial pieces, opinions, and commentary.

Potential articles were collected for study collection based on titles, and abstracts were reviewed for relevance. Those articles that did not meet the criteria were excluded, and a full-text review was then performed. During the first stage of the search, the researcher obtained 474 records by searching databases. After removing the duplicated records, there were remaining 105 articles. The remaining journals were screened, and approximately 90 records were eliminated based on titles and abstracts. The remaining full-text articles were evaluated for eligibility, and 8 were eliminated. Two of the articles lack relevant data and not measure the outcome and the remaining six do not focus on pharmacists. Following the completion of the process, seven articles were chosen to be included in this study as shown in Figure 1.

Table 3 Inclusion and Exclusion Criteria

PICO	Inclusion Criteria	Exclusion Criteria
Population : Pharmacist	Pharmacist and Student pharmacist	Other types of healthcare workers ex: doctor, medical assistant
Intervention/Exposure : PrEP	Pre-Exposure Prophylaxis (PrEP)	None
Comparison	None	None
Outcome : Willingness to counsel HIV Pre-Exposure Prophylaxis (PrEP) to clients	Willingness to counsel HIV Pre-Exposure Prophylaxis (PrEP) to client	Comfort to counsel HIV PrEP without mentioning willingness to counsel
Study Design	Reviewed and published cross-sectional articles	Not-peer-reviewed documents such as protocols, abstracts, news, reports, short communication, letters to editor, methodology papers, conference papers, commentaries, opinions, and editorial

Table 4 Findings from search strategy

Databases	Articles Screened	Relevant Articles with Full Text
SAGEPub	131	3
PubMed	27	1
Science Direct	33	4
Springer	256	6
World of Science (WoS)	27	1

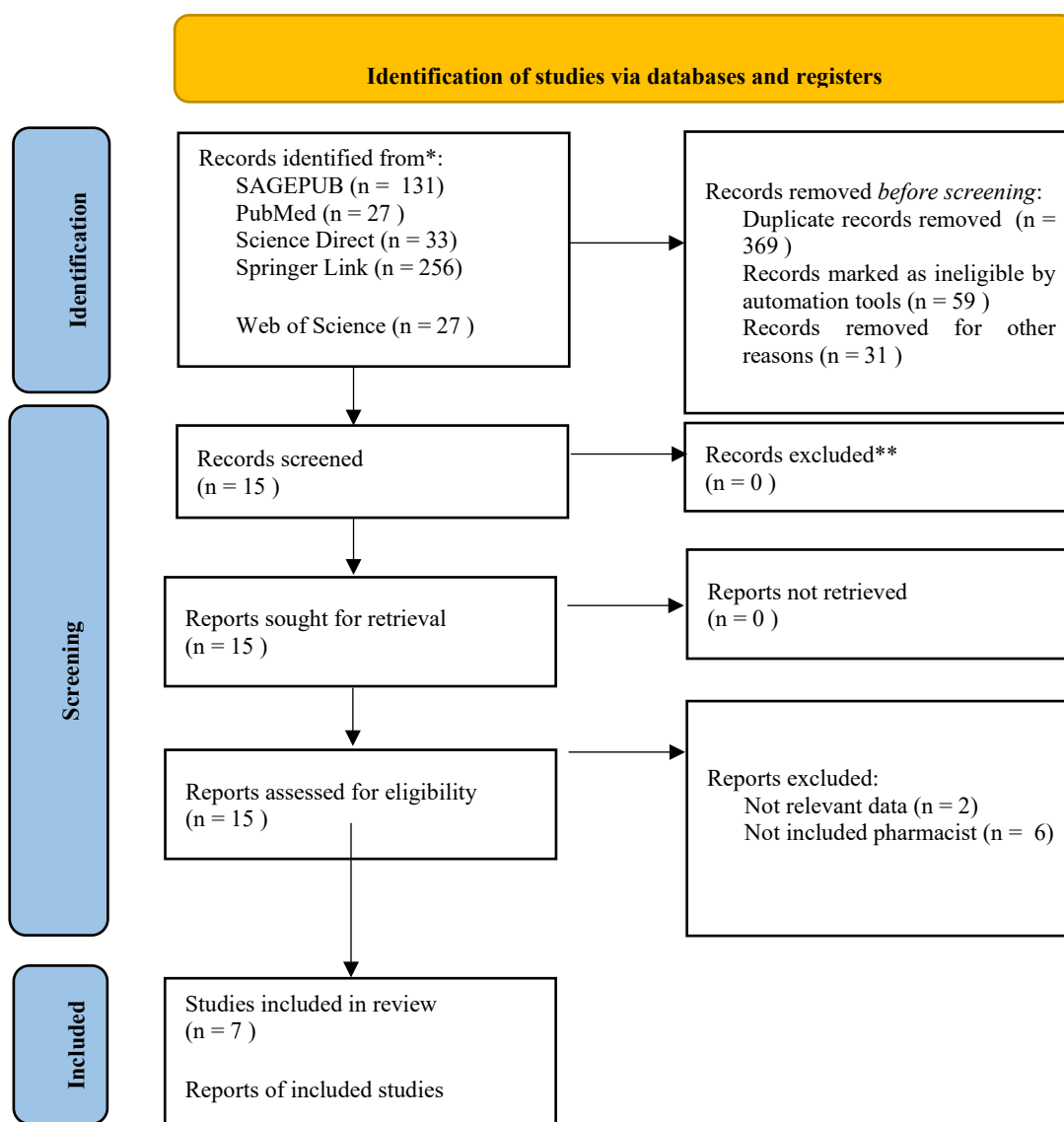


Figure 1 PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers only⁹

Grey Literature

In the systematic review, we have made the decision to exclude grey literature from our study. The rationale behind this decision is based on the ongoing and continuously expanding nature of grey literature, which makes it challenging to establish conclusive findings.

Study Screening and Selection

The results of the search were managed using EndNote Version X9. EndNote was used to export references from databases, store full text articles, insert citations into Word documents, format referencing style, and identify duplicate articles from different databases. After removing 369 duplicates and 98 articles that were removed for not fulfilling the criteria, seven (7) abstracts and full

texts of articles that potentially met the inclusion criteria were reviewed. The titles and abstracts were screened according to the inclusion and exclusion criteria.

Extraction and Management Data

Five reviewers independently conducted the data extraction and analysis. Any discrepancies between the reviewers were resolved through discussion among them. This process ensured the accuracy and consistency of the data extraction. The finalized articles underwent a process of data extraction and was tabulated in Microsoft Excel. Data were extracted using a standardized data extraction form soliciting data on key details: (author, country of origin, publication year), study design, study duration, sample size, participant characteristics (pharmacist), type of exposure or intervention in this study which is HIV pre exposure prophylaxis (PrEP), and measures of outcome (willingness to counsel on HIV PrEP to client), main findings, and study quality.

Quality Appraisal and Risk of Bias in Individual Studies

Joanna Briggs Institute (JBI) Critical Appraisal tools is often used as a tool to critique or perform appraisal for articles that meet the inclusion criteria that was set. The tool was utilized to determine the quality of the study and to examine the potential risk of bias in terms of study design, methodology and analysis. The outcomes of this appraisal can be used to describe the interpretation of this review.

In this review we have used the JBI Checklist for Analytical Cross- Sectional Studies that contains eight (8) questions that guided the appraisal process. The questions assess the inclusion criteria, description of subjects and settings, measurement of the exposures, measurement of the condition, identification of confounders, strategies to overcome confounders, measurement of the outcome and statistical analysis used in the study.

Additional Analysis

We conducted descriptive analysis of the included articles. The characteristics of the articles included were described in detail. The characteristics include author, year of publication, location and duration of the study, tools used, mean age of the respondents, gender, ethnicity, study design, sample size, knowledge on PrEP, and experience handling HIV patient. The factors associated with the outcome; the level of knowledge and experience of the participants (mode and frequency), outcome (willingness to counsel HIV PrEP to client and tools of measurement) and the summary of the studies' main findings were summarised. All of these were tabulated in "Characteristics in included studies", Table 6.

RESULT

Description of search and screening

An initial search was conducted in May 2023 using five main medical databases: SAGEPub, PubMed, SpringerLink, Science Direct and Web of Science (WoS). The search yielded a total of 474 publications. A total of 369 duplicates and 98 articles were excluded due to not meeting the eligibility criteria. Editorials, non-scientific commentaries, reports, articles other than English language were excluded at this stage, which yielded 15 articles. Then, 8 articles were removed due to not relevant data, outcome and study population. Finally, seven (n=7) articles were included in this systematic review. The selection process and the number of articles excluded at each stage were shown in the flow diagram (Figure 1). Reasons as to why articles were excluded after reviewing are also stated in Figure 1.

Characteristics of Included Studies

Study designs and aims

A total of seven (n=7) studies with a total of 2348 participants were included in this systematic review. The data extracted on the study characteristics include author, year of publication, location and duration of the study, tools used, sociodemographic mean age of the respondents, gender, ethnicity, knowledge on PrEP, experience handling HIV patient, study design, sample size, and funding of the respondents' studies. As depicted in Table 5, the factors associated with the outcome; the level of knowledge and experience of the participants (frequency), outcome (willingness to counsel HIV PrEP to client and tools of measurement) and the summary of the studies' main findings were summarised.

Among the seven included studies, there were four studies from the United States (n=4)^{10, 13, 15, 23} one from Zimbabwe (n=1),¹⁴ one from Canada (n=1),¹⁶ and another one from Indonesia (n=1).²¹ All the studies were cross-sectional (analytical) studies.

Two studies were conducted between four to five months.^{12,21} The remaining five studies were conducted within two months.^{10, 13-16} Six out of seven studies aimed to determine the level of knowledge, experience, and perception of pharmacists and their willingness to counsel clients about HIV PrEP. However, only one study assessed and compared the willingness of pharmacy and pharmacy students in counseling HIV PrEP to the clients.

Participants

Sociodemographic background

Different research articles highlighted the diversity in socio-demographic characteristics of the participants in each respective study, including age, gender distribution, practice settings, experience levels, and ethnicities. The age range of respondents

varied across different studies. Some studies reported a mean age below 25 for their participants.^{10, 11} On the other hand, Shaer et al and Broekhuis et al reported mean ages of 45.7 and 45.3, respectively.^{12, 13} Another study indicated that 52% of their respondents were aged 30 years or older.¹⁴

Overall, the gender distribution among the participants varied, with some studies showing a higher representation of females which account for 63.7% to 80%^{10, 11} others showing a higher proportion of males; 61% to 66%.^{15, 16} In some studies reporting a relatively equal distribution between the two genders.^{12, 13}

When considering ethnicity, the majority of the studies included in the review reported Caucasian as the predominant ethnicity among the respondents. This was evident in the studies conducted by Przybyla et al, Shaer et al and Broekhuis et al.^{10, 12, 13} However, it is worth noting that Shaer et al¹² study also included a minority group of Asian respondents, accounting for 9% of the participants. Similarly, Przybyla et al study reported a representation of 34.6% Asian participants.¹⁰

Several studies provided information regarding the years of experience of the respondents in the field of pharmacy. 3 studies reported that 43% to 52% of their participants had less than five years of working experience.^{12, 14, 15} On the other hand, Broekhuis et al¹³ reported the mean years of practice for their participants as 19 years. However, the remaining three studies did not provide specific details regarding the years of experience of their study participants.^{10, 11, 16}

Among the included studies, a notable portion of the study participants were pharmacists working in community settings which reported percentages ranging from 25% to 58%.¹²⁻¹⁵ In

contrast, other studies focused on pharmacists primarily employed in hospital settings, with percentages ranging from 20% to 35.9%.^{10, 16}

Study outcomes

The outcome measured in our review is willingness to counsel HIV PrEP to client. Of the 8 studies analysed, 7 studies used various questionnaires to assess elements such as knowledge in HIV PrEP, experience, perception and finally the intended outcome of this study that is the willingness to counsel for PrEP. Five studies have used questionnaires developed or modified for this study as pilots. (10, 12-14, 16) Two other studies used questionnaires that adapted from previous studies.¹¹ The study outcomes are summarised in Table 5.

Quality of Included Studies

The specific checklist for analytical cross-sectional studies was used to assess the quality of each study which is Joanna Briggs Institute Tools for Critical Appraisal.¹⁷ Since all selected articles were cross-sectional studies; hence checklist for analytical cross-sectional was used to assess the quality of all the studies. The checklist contains eight questions to detect potential bias, and the study quality will be rated at the end of the assessment. The studies were rated by high quality (scores of 7-8/8), medium quality (scores of 5-6/8), low quality (scores of 3-4/8) and exceptionally low quality (scores of 0-2/8). All authors appraised the seven articles, and the rates were given based on the average scores.

Three studies were classified as medium quality^{15, 18, 21} and the remaining four studies were scored as low-quality studies.^{10, 12, 14, 16} The result of the assessment was summarized in Table 6.

Table 5 Characteristics of included studies, summary of findings and outcomes

Author	Title	Study design	Inclusion participants	Sample size	Finding/outcomes
(Shaer et al., 2014)	Exploratory survey of Florida pharmacists' experience, knowledge, and perception of HIV pre-exposure prophylaxis	Cross-sectional study	Pharmacist in Florida	225 participants	<ul style="list-style-type: none"> 63% were unaware about CDC (Centers for Disease Control) PrEP guideline 47% feel uncomfortable to counsel PrEP 56% pharmacists expressed concern that the use of PrEP will promote risky behavior
(C MJ Matyang a, S Khoza, 2014)	HIV Pre-exposure Prophylaxis: Pharmacists Knowledge, Perception and Willingness to	Cross-sectional study	Community and hospital pharmacists in Harare including referral hospitals	112 participants	<ul style="list-style-type: none"> 65% were knowledgeable about PrEP. No significant association between age, gender, and years of experiences with the knowledge about PrEP

	Adopt Future Implementation in a Zimbabwean Urban Setting		namely Parirenyatwa and Harare Hospitals.		<ul style="list-style-type: none"> • 77% disagreed with the use of HIV PrEP. • 73% concerned that people will abandon safe sex practices if PrEP is available. • 73% agreed that cost of PrEP would be a significant barrier to clients.
(Yoong et al., 2016)	PrEParing for pre-exposure prophylaxis: perceptions and readiness of Canadian pharmacists for the implementation of HIV pre-exposure prophylaxis	Cross-sectional study	Canadian pharmacists who were members of the Canadian HIV/AIDS Pharmacists Network or the Ontario HIV Professional Specialty Group	59 participants	<ul style="list-style-type: none"> • 69% respondents willing to counsel PrEP • 56% agreed that insufficient knowledge about PrEP is the barriers in counsel PrEP
(Unni et al., 2016)	Understanding community pharmacist perceptions and knowledge about HIV preexposure prophylaxis (PrEP) therapy in a Mountain West state	Cross-sectional study	Community pharmacists in Utah	251 participants	<ul style="list-style-type: none"> • The intention to counsel was statistically significantly higher for the pharmacists with less than 10 years of experience and for pharmacists with a PharmD. • The significant predictors of the pharmacist's intention to counsel were beliefs about capabilities and social influence • The knowledge about HIV PrEP therapy was significantly higher than their perceptions about PrEP and influence their intention to counsel PrEP
(Broekhuis et al., 2018)	Midwest pharmacists' familiarity, experience, and willingness to provide pre-exposure prophylaxis (PrEP) for HIV	Cross-sectional study	Pharmacists practicing in Nebraska and Iowa	147 participants	<ul style="list-style-type: none"> • 54% respondents indicated that they were fairly or very likely to provide PrEP services • 88% feels comfortable to counsel PrEP • 87% agreed that lack of PrEP knowledge is the barriers to counsel PrEP
(Przybyla et al., 2019)	Awareness, knowledge, and attitudes towards human immunodeficiency virus (HIV) pre-exposure	Cross-sectional study	Students enrolled in a doctor of pharmacy (PharmD) at the University at Buffalo	291 respondents	<ul style="list-style-type: none"> • Greater PrEP knowledge, attitudes towards PrEP, and familiarity with prescribing guidelines were significantly associated with confidence in PrEP counseling ($p < 0.01$ for all).

	prophylaxis (PrEP) among pharmacy students				<ul style="list-style-type: none"> 64% feel confident to counsel patient about PrEP Males had significantly higher odds of reporting confidence in PrEP counseling relative to females
(Sianturi et al., 2022)	Knowledge, empathy, and willingness to counsel patients with HIV among Indonesian pharmacists: a national survey of stigma	Cross-sectional study	Pharmacists working with patients with HIV within 33 provinces and the final-year pharmacy students of 9 universities in Java, Indonesia	Pharmacist = 250 respondent. Pharmacy students = 1013	<ul style="list-style-type: none"> Pharmacists have better knowledge on HIV treatment compared to students. Two-thirds of respondents had good knowledge on HIV treatment. Stigma was significantly associated with poor knowledge and less empathy Increasing HIV treatment knowledge as well as increasing empathy may be a way to reduce the level of stigma and improve services for patients.

Table 6 JBIT Table Willingness to Counsel HIV Pre-Exposure Prophylaxis to Clients Among Pharmacists

	Article	Type of Study	Reviewer	Checklist from Joanna Briggs Institute (JBI) Critical Appraisal Tools								Total Score	Result of
				Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8		
1	Broekhuis et al, 2018	Cross sectional (observational)	MT	Y	Y	NA	Y	Y	N	NA	Y	5/8	5/8
			SI	Y	Y	NA	Y	Y	N	N	Y	5/8	
			NH	Y	Y	NA	Y	N	N	N	Y	5/8	
			AD	Y	Y	NA	Y	N	N	N	Y	4/8	
			UA	Y	Y	NA	Y	NA	NA	N	Y	4/8	
2	Sianturi et al, 2021	Cross sectional (observational)	MT	Y	Y	NA	Y	N	N	Y	Y	5/8	5/8
			SI	Y	Y	NA	Y	N	N	Y	Y	5/8	
			NH	Y	Y	NA	Y	N	N	Y	Y	5/8	
			AD	Y	Y	NA	Y	N	N	Y	Y	5/8	
			UA	Y	Y	NA	Y	NA	NA	Y	Y	5/8	
3	Matyanga et al, 2014	Cross sectional (observational)	MT	Y	Y	NA	Y	NA	NA	NA	NA	3/8	3/8
			SI	Y	Y	NA	Y	NA	NA	N	N	3/8	
			NH	Y	Y	NA	Y	NA	NA	N	N	3/8	
			AD	Y	Y	NA	Y	NA	NA	N	N	3/8	
			UA	Y	Y	NA	Y	NA	NA	N	N	3/8	
4	Przybyla et al, 2019	Cross sectional (observational)	MT	Y	Y	NA	Y	NA	NA	NA	Y	4/8	4/8
			SI	Y	Y	NA	Y	NA	NA	N	Y	4/8	
			NH	Y	Y	NA	Y	NA	NA	N	Y	4/8	
			AD	Y	Y	NA	Y	NA	NA	N	Y	4/8	
			UA	Y	Y	NA	Y	NA	NA	N	Y	4/8	
5	Shaeer et al, 2014	Cross sectional (observational)	MT	Y	Y	NA	Y	NA	NA	NA	Y	4/8	4/8
			SI	y	y	NA	Y	NA	NA	N	Y	4/8	
			NH	Y	Y	NA	Y	NA	NA	N	Y	4/8	
			AD	Y	Y	NA	Y	NA	NA	N	Y	4/8	
			UA	Y	Y	NA	Y	NA	NA	N	Y	4/8	
6	Unni et al, 2016	Cross sectional	MT	Y	Y	NA	Y	NA	NA	Y	Y	5/8	5/8
			SI	y	y	NA	Y	NA	NA	Y	Y	5/8	
			NH	Y	Y	NA	Y	NA	NA	Y	Y	5/8	

		(observational)	AD	Y	Y	NA	Y	NA	NA	Y	Y	5/8	
			UA	Y	Y	NA	Y	NA	NA	Y	Y	5/8	
7	Yoong et al, 2015	Cross sectional (observational)	MT	Y	Y	NA	Y	NA	NA	N	Y	4/8	4/8
			SI	Y	Y	NA	Y	NA	NA	N	Y	4/8	
			NH	Y	Y	NA	Y	NA	NA	N	Y	4/8	
			AD	Y	Y	NA	Y	NA	NA	N	Y	4/8	
			UA	Y	Y	NA	Y	NA	NA	N	Y	4/8	
			UA	Y	Y	NA	Y	NA	NA	N	Y	4/8	

DISCUSSION

Willingness to Counsel HIV Pre-Exposure Prophylaxis (PrEP) to Clients among Pharmacists
 The effective implementation of HIV Pre-Exposure Prophylaxis (PrEP) relies on the willingness of healthcare professionals, including pharmacists, to counsel clients about its benefits, risks, and proper usage. Pharmacists play a vital role in patient care, including medication counseling, monitoring, and support. This systematic review reveals a wide range of willingness among pharmacists to counsel clients on HIV PrEP, with levels varying from 47% to 88%.^{10, 12, 13, 15, 16} The variation on the level of willingness might related to multiple factors in which by understanding the factors that influence pharmacists' willingness to provide PrEP counseling is crucial for optimizing PrEP uptake and adherence.¹⁸

Multiple factors that contribute to or hinder a pharmacist's willingness to counsel clients on HIV PrEP include lacked knowledge and training, attitudes and beliefs, comfort and confidence, time and workload constraints, communication and counseling skills, collaborative practice, professional guidelines.^{19, 20} Furthermore, the level of willingness may also be associated with the extend of education that pharmacist have received about PrEP. Those with more extensive training and have more experience might feel more confident as familiarity with the medication can increase more comfort and thus more willing to counsel.¹⁵ Additionally, the level of willingness to counsel for PrEP might be influenced by the demographics of the community they serve.¹³ For instance, pharmacist who work in areas with concentrated numbers of HIV patients might be more proactive in counselling about PrEP.

Stigma remains a barrier for patients to access healthcare.²¹ HIV stigma among healthcare providers has been defined as the irrational feeling and negative behavior and attitude towards patients because of their HIV status.²² In a study conducted among Florida community and hospital pharmacists found that 22% reported having dispensed PrEP, 68% believed PrEP use would lead to risky behaviors, and 65% believed it would lead to increased rates of sexually transmitted infections (STIs).²³ This is because some pharmacist might have personal values or religious beliefs that conflict with the use of PrEP. For example, they might perceive the act of prescribing or advocating for PrEP which is often used by individuals at higher

risk of HIV, as implicitly endorsing behaviours they personally disapprove of, such as certain sexual practices. This internal conflict can diminish their willingness to counsel on PrEP, despite its recognized medical benefits. Moreover, it is also important to note that pharmacist who influenced by personal beliefs or stigma might unconsciously project their biases during counselling sessions and this could limit the effectiveness of PrEP education and reduced patient uptake.

Improving pharmacist willingness to counsel on PrEP can lead to better client education, increased PrEP awareness, and improved health outcomes for individuals at risk of HIV infection. Through collaborative efforts, pharmacists can play a pivotal role in promoting PrEP as an essential preventive tool in the fight against HIV/AIDS. By understanding these aspects, healthcare organizations and policymakers can develop targeted interventions to address barriers and enhance pharmacist engagement in PrEP counselling such as continuous medical education and implementing a clear guideline on PrEP counselling for pharmacist to follow which taking into consideration their personal beliefs and perceived stigma of their professional duties.²⁴

Knowledge on HIV PrEP

Multiple large-scale clinical trials involving men who have sex with men (MSM), heterosexual men and women, and transgender women have demonstrated that pre-exposure prophylaxis (PrEP) is highly effective for HIV prevention, reducing the risk of sexual transmission of HIV by 99% when taken daily.²⁵⁻²⁷ However, PrEP prescriptions have not yet attained the level required to meet the public health need for reducing HIV incidence. One of the reasons contributing to this low uptake is limited healthcare practitioners' knowledge of PrEP, making PrEP education a priority.

A majority of healthcare providers including pharmacists were lacking knowledge regarding PrEP. They are lacked comprehensive knowledge about PrEP, including its indications, efficacy, dosage, potential side effects, and drug interactions resulting in discomfort in PrEP prescriptions. PrEP is a specialized area of practice within HIV care, and pharmacists who have not received specific training or education on PrEP may feel unsure or inadequately prepared to prescribe it.¹⁹

Limited awareness and understanding of PrEP clinical guidelines also known to be the barriers in prescribing PrEP. Some pharmacists were not aware of the PrEP prescribing guidelines and requirements to manage patients taking PrEP. Guidelines from the Centers for Disease Control and Prevention (CDC) or local health authorities provide recommendations on patient selection, monitoring, and other aspects of PrEP provision.²⁶ Without being familiar with these guidelines, pharmacists may hesitate to prescribe PrEP or may not know how to appropriately manage PrEP patients.^{19, 28-30}

Experience on Handling HIV Patient

When the FDA authorized PrEP in 2012, it was anticipated that it would be prescribed to high-risk patients and extensively used; however, efforts to educate health care providers and the public about HIV PrEP were ineffectual. While the majority of HIV providers believed PrEP to be effective and beneficial for high-risk populations, those who believed it was less effective had less knowledge and expertise with PrEP and were less likely to administer it.³¹

As prescribers receive more training and education, pharmacists will require training and education on PrEP counseling. As one of the most trusted providers of health care, pharmacists play a crucial role in educating patients about PrEP and PrEP therapy adherence. According to the American Society of Health-System Pharmacists' guidelines on pharmacist involvement in HIV care, pharmacists should provide HIV patients with counseling and education.¹⁰ As the last point of contact during drug dispensing, pharmacists can educate and counsel patients about the importance of compliance, in addition to obtaining drugs from legitimate sources, monitoring adverse effects, identifying drug-drug interactions, educating the patient about their options, and notifying the patient's family about the risk of transmission. The ultimate objective is to reduce HIV transmission, resulting in a decrease in HIV incidence.¹⁴

In the study by Unni et al, found that pharmacists with less than ten years of expertise are more likely to recommend PrEP than those with more than ten years of experience.¹⁵ In another study, Broekhuis et al discovered that fewer than half of respondents (42%) were conversant with PrEP and the CDC's recommendations for its use (25%). Only 12% of respondents had experience counseling patients on the use of antiretrovirals for PrEP, while 36% had experience counseling patients on antiretroviral medications for the treatment of HIV infection. Those unfamiliar with PrEP were older (47 vs. 42 years, $p = 0.014$) and had more experience (22 vs. 16 years, $p = 0.004$).¹³

Education and training are essential for the successful implementation of HIV prevention programs such as PrEP. The majority of HIV

providers believed that PrEP was effective and beneficial for high-risk populations.¹⁵ Those who believed it was less effective had less knowledge and experience with PrEP and were less likely to prescribe it. As prescribers receive more education and training, more community pharmacists will require education and training on how to provide PrEP counselling.¹⁶ The most significant predictors were their beliefs regarding their abilities and social influence. This makes it even more crucial to educate community pharmacists on PrEP so they have a greater understanding of what they can do. Using respected professionals such as pharmacists to teach continuing education can have an effect on social influence.¹⁵

HIV care providers require training not only to learn more about PrEP and become better at administering it, but also to eliminate negative stereotypes about individuals who may use PrEP(12). Effective communication between providers and clients regarding homosexual men's sexual health is essential for the non-judgmental administration of PrEP. The individuals who treat HIV are not the only significant group. Training and skill development regarding PrEP would also benefit primary care providers and other clinic personnel.^{10, 11, 13}

Sources of Potential Bias in Studies

We identified sources of potential bias in the studies selected. Some of the studies used nonprobability sampling such as convenient sampling to gather respondents in the study which might lead to selection bias.^{12, 16} Few studies reported gender bias like for example there were higher representation of females which account for 63.7% to 80%,^{10, 11} others showing a higher proportion of males; 61% to 66%.^{15, 16} This could affect the generalizability of the study.

Moreover, all of the studies utilized a small sample size which; 59 to 291 participants except for Sianturi et al¹¹ which used 1013 sample size. Some studies did not use appropriate statistical test to measure association between factors such as experience and knowledge on HIV PrEP and willingness to counsel HIV PrEP to client which could lead to analysis bias.^{12, 14, 15}

Furthermore, it should be noted that while five studies mentioned conducting a pilot study for their questionnaires, they did not explicitly state whether validated questionnaires were used. This raises the possibility of measurement bias, which can result in systematic errors or distortions during the measurement process, leading to inaccurate and inconsistent findings.^{10, 12-14, 16} There were not standardized instrument or questionnaire tools in assessing on willingness to counsel HIV PrEP on client. All of the studies were conducted utilizing self-administered surveys, which may have resulted in reporting bias.

To establish a better causal relationship between knowledge and experience with the outcome, willingness to counsel client on HIV PrEP, a different study method could be adopted as opposed to cross-sectional methods. Mixed methods should be utilized to expand data collection methods to understand the long-term effects of knowledge and experience with the outcome, willingness to counsel client on HIV PrEP. Overall, the biases in the studies should be addressed when future research is conducted.

Strength and Limitations

During the systematic review, it is worth noting that only two of the selected articles mentioned the strengths of their respective studies. The other articles do not describe the strength of their study.

Yoong et al highlighted two strengths in their study. Firstly, their survey was the first of its kind to capture the perceptions and opinions of pharmacists regarding Pre-Exposure Prophylaxis (PrEP) in Canada. This aspect contributes to the novelty and significance of their research. Secondly, they were able to obtain opinions from pharmacists across the entire country, providing a comprehensive representation of views. However, due to the sample size, they acknowledged that more detailed analyses regarding characteristics associated with support for PrEP were not feasible.¹⁶ Sianturi et al identified a strength in their study as well. They successfully included pharmacists working with patients with HIV in 33 provinces in Indonesia, thereby achieving a broad geographical representation. Additionally, they also involved final year pharmacy students who had received training in hospitals within nine universities. Their efforts resulted in a reasonable response rate, further enhancing the validity and applicability of their findings.¹¹

Several limitations were identified in multiple studies. The included studies reported varying response rates, with some studies reporting rates as low as 12.3% and others not specifying the rate due to the anonymous and voluntary nature of participation.¹³ The low response rates may limit the generalizability of findings and introduce nonresponse bias. The response rate also has been identified as a limitation in other study.^{11, 12, 15} The anonymous nature of surveys in multiple studies hindered the researchers from establishing noteworthy distinctions between respondents and non-respondents. The absence of sufficient information may increase the likelihood of nonresponse bias. The authors suggest that individuals who did not respond may have different perspectives or characteristics compared to those who did respond. Therefore, caution should be exercised when interpreting the results of studies with low response rates.

The study by Shaer et al found that there is a limitation with respect to their sampling methods. The use of convenience sampling in their study may have restricted the generalizability of the findings, as it may not have represented the entire population of interest.¹² The studies included in the analysis were limited in their scope, as they primarily focused on specific regions or organizations. This may have resulted in an overrepresentation of certain groups of pharmacists and their perspectives.

This systematic review identified limitations pertaining to the survey instruments employed in the studies analyzed. The present systematic review identified studies that employed non-validated instruments to assess the knowledge or perceptions of pharmacists regarding HIV pre-exposure prophylaxis (PrEP) therapy.^{12, 15} A single study conducted reliability analysis, but the absence of validated instruments may have an impact on the precision and strength of the findings.¹¹

The potential for self-selection bias was identified in several studies. Selection bias may have been present in the study, as participants who self-selected to participate may have had a greater interest in the topic of PrEP. This may have led to an overestimation of positive attitudes, knowledge, and willingness to adopt PrEP among the study population.^{14, 16} An external factor has been found to impact the studies analyzed. A study reported a potential association between poor internet reception and decreased response rates.¹¹

The limitations of the included studies should be taken into account when interpreting the findings. The potential impact of these limitations on the generalizability and reliability of the results should also be acknowledged.

Recommendations

HIV PrEP has been proven to be highly effective in preventing HIV transmission if it is used consistently and correctly. It is crucial for each client to fully understand the requirement for intake of PrEP before consuming it. This is where the role of pharmacists is crucial, especially community pharmacists. Other than assessing their willingness to counsel about PrEP, understanding the barriers that prevent them from counselling the client comfortably is equally essential, especially in a setting with limited resources. Future implementation research exploring the PrEP operations, screening, and dispensing might answer the suggested question above.

Additionally, willingness to counsel is associated with knowledge and awareness among pharmacists about PrEP and the disease. It is also primarily affected by stigma and confidentiality. Future work should also focus on more holistic counselling by strengthening the pharmacists' school curricula

about perception and stigma reduction toward clients.

CONCLUSIONS

The systematic search yielded studies of varying designs. For the purpose of writing a systematic review, researcher have selected only the studies of cross-sectional study design as the relevant articles for this topic. After conducting literature searching, identification, screening, eligibility and another screening, a total of seven (7) published and peer-reviewed articles or journals have been included in this systematic review. These articles and journals focused on the pharmacist's willingness and comfort to counsel PrEP to the clients.

This systematic review summarised and synthesised evidence on the Willingness to Counsel HIV Pre-Exposure Prophylaxis (PrEP) to Clients Among Pharmacists. This review adds new evidence about the willingness of pharmacists to provide PrEP counselling to patients as this a crucial knowledge before any such project can be initiated. This review also shows some factors that may be associated with willingness such as knowledge and experience, and this may provide a significant lead on issue that needs to be tackled to improve willingness among pharmacists. One study which involved the MSM population showed that they are more comfortable in obtaining PrEP from pharmacists rather than from physicians citing waiting time and privacy concerns. This signals the need for PrEP counselling by pharmacists. One of the studies showed that most respondents do not agree with the use of PrEP and another study showed the majority of respondents feel that use of PrEP may lead to unsafe sexual practices.

In conclusion, four out of the seven studies showed that willingness among pharmacists are influenced by level of knowledge and experience in HIV and PrEP counselling. Social beliefs and stigma may influence a pharmacist perception and willingness to perform PrEP counselling. As suggested in 4 of the studies, improving knowledge can be seen as key intervention to improve willingness to conduct PrEP counselling among pharmacists.

All the studies in this review were conducted as cross-sectional study and further interventional study can be done to show if improving knowledge on PrEP and HIV through interventions such as workshops and series of lectures leads to an improvement in willingness of pharmacists towards PrEP counselling. When willingness of pharmacists can be improved more programmes that will make PrEP more accessible to users can be initiated and thus the disease burden may be improved.

Funding

This study did not receive funding from any sources. The authors declare no competing interests.

Acknowledgement

The authors would like to thank the Director-General of Health, Ministry of Health Malaysia for permission to publish this article. We would also like to express appreciation to our Associate Prof. Dr. Rafdzah Binti Ahmad Zaki for all the support and guidance also from all parties that have contributed directly or indirectly in this review.

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