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PROGRAMME DESCRIPTION

Student perceptions of PrEP in an advanced HIV elective

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Abstract

Background: The United States (U.S.) Centres for Disease Control and Prevention estimated that over one million U.S. adults could benefit from human immunodeficiency virus (HIV) pre-exposure prophylaxis (PrEP), but only 90,000 PrEP prescriptions are being filled annually. Pharmacists are well-positioned to offer PrEP, but a lack of awareness and knowledge about HIV PrEP has been a limitation. This study was designed to evaluate the knowledge, confidence, and perceptions of pharmacy students towards the use of HIV PrEP in high-risk populations before and after receiving a PrEP and PEP module in a two-credit hour Advanced HIV Elective course. **Methods:** Faculty in an Advanced HIV Elective course implemented a PrEP module and evaluated the impact on pharmacy student knowledge, confidence, and attitudes in 2020. **Results:** Participation led to a significant increase in student pharmacist confidence in offering patient education regarding the use of PrEP, risk mitigation counselling, accurately ordering labs, monitoring patients taking PrEP, and HIV medication therapy management. Additionally, HIV education shows decreased stigma and negative attitudes towards high-risk individuals. **Conclusion:** Integration of a PrEP module increased student pharmacist knowledge and confidence in providing PrEP services while reducing stigma towards those with HIV.

Introduction

In recent years, human immunodeficiency virus (HIV) incidence rates have decreased from 50,000 infections per year to approximately 36,400 new HIV infections in the United States (U.S. Statistics, 2021). Recent progress in stalling the rates of new HIV diagnosis is partly attributed to the approval of HIV pre-exposure prophylaxis (PrEP). PrEP option tenofovir disoproxil fumarate/emtricitabine (Truvada) was approved in 2012, tenofovir alafenamide/emtricitabine (Descovy) was approved in 2019, and in 2021, the first long-acting injectable for HIV prevention was approved with the introduction of cabotegravir (Apretude). Despite the advances in therapeutics for HIV prevention, PrEP remains highly underutilised in practice (Centers for Disease Control and Prevention, 2019). In 2015, CDC estimated that over one million U.S. adults could potentially benefit from PrEP, with only 90,000 PrEP prescriptions being filled (Smith *et al.,* 2015). This dramatic difference is in part attributed to financial barriers, stigma, infrequent evaluation by medical providers, low awareness of PrEP, and lack of healthcare provider knowledge on PrEP (Hubach *et al.,* 2017; Ojikutu *et al.,* 2018; Hirschhorn *et al.,* 2020; McKeirnan *et al.,* 2021).

Pharmacists are some of the most accessible healthcare providers, with patients seeing their pharmacist an estimated 1.5 to 10 times more frequently than their primary care physician (Dalton & Byrne, 2017; Tsuyuki *et al.,* 2018). In the community setting, pharmacists often dispense prescriptions for sexually transmitted

infections and substance misuse and provide point-of-care tests for HIV. In conjunction with personalised medication and risk-mitigation counselling, pharmacists are in a unique position to identify patients who would benefit from PrEP (Kherghehpoush & McKeirnan, 2021). A recent legislature has expanded the opportunities for pharmacists to support patients with HIV. In Washington State, pharmacists are allowed to engage in the management of acute and chronic disease states like HIV under a Collaborative Drug Therapy Agreement (CDTA), which has demonstrated success in increasing access to care and improving patient outcomes (Washington State Department of Health, 2020, Bott *et al.,* 2019). In California, Senate Bill 159 passed in 2019 allows pharmacists to furnish up to a 60 days-supply of PrEP and PEP to patients without a written prescription following testing and adequate counselling after the pharmacist completes a 1-hour CE approved by the California State Board of Pharmacy (California Legislative Information, 2019). California was the first state to expand the scope of pharmacy practice to include PrEP and PEP services without the need for a CDTA, with Colorado (Colorado General Assembly, 2020) and Oregon (Oregon Legislative Information, 2021) following closely behind.

Pharmacist and pharmacy student awareness and knowledge about HIV PrEP must be addressed for a more significant impact on the HIV care continuum in the community pharmacy. Numerous studies assessed pharmacist knowledge and perceptions towards PrEP in the community setting. Overall, the existing literature demonstrates that the level of HIV prevention knowledge may affect the perception of HIV. However, it also highlights how pharmacists are well-positioned to offer HIV PrEP to patients (Meyerson *et al.,* 2019; Myers *et al.,* 2019). In a cross-sectional survey of managing pharmacists in Indiana published in 2019, 16% of responding pharmacists had dispensed PrEP, and only 12% had consulted on PrEP (Meyerson *et al.,* 2019). Another study evaluating Nebraska and Iowa pharmacists in 2018 revealed that 42% of respondents were familiar with HIV PrEP, with only 25% being familiar with PrEP guidelines (Broekhuis *et al.,* 2018). Given the suboptimal state of pharmacist knowledge and awareness of HIV PrEP, the present study focuses on preparing future pharmacists to take on a broader role in expanding HIV PrEP services in a less stigmatised clinical setting, such as community pharmacies.

Current literature identifies the lack of pharmacy student awareness and knowledge of HIV PrEP and how well-positioned pharmacists are in their practice settings to engage patients in HIV PrEP, whether in a community setting or on an interdisciplinary team. A study among Doctor of Pharmacy (Pharm.D.) students at a U.S. college of pharmacy found that better knowledge and attitudes towards PrEP were strongly correlated with confidence in counselling on PrEP (Przybyla *et al.,* 2019). In a separate survey conducted to examine the HIV curricular content in pharmacy schools across the United States, over 75% reported that their schools had less than 10 hours of content related to HIV (Rathbun *et al.,* 2020). Data from international pharmacy students show even lower rates of awareness of HIV prevention strategies and even hostile attitudes toward HIV (Ahmed, Hassali & Aziz, 2009).

An Advanced HIV elective was implemented in the College of Pharmacy and Pharmaceutical Sciences at Washington State University (WSU) in 2018 (Crutchley *et al.,* 2022). This elective has been modified in recent years to include a module specifically about PrEP written for future pharmacists. The objectives of this research are to describe the implementation of the PrEP module in the Advanced HIV elective and to evaluate the efficacy of the PrEP module on student pharmacist knowledge, confidence, and attitudes in providing HIV PrEP services to at-risk populations.

Description of course and module

Course description

The Advanced HIV elective course was implemented in the Fall of 2018. This elective is offered to professional year two (PY2) and professional year three (PY3) students at Washington State University (Crutchley *et al.,* 2022). This two-credit hour course was delivered as one two-hour in-person class session per week during the 16-week term. Consistent with the active learning model adopted by WSU several years ago, students in this course were expected to watch pre-recorded lectures and complete any recommended reading assignments prior to in-class instruction (Remsberg *et al.,* 2017). In-class time was dedicated to active learning activities designed to build on and apply the pre-class material.

A module was developed for the Advanced HIV elective course to train student pharmacists to prescribe PrEP. It included pre-class material and a 110-minute active learning in-class session. Its learning objectives were: 1) Identify key counselling points for patients initiating PrEP; 2) Explain the risks and benefits of PrEP; 3) Summarise the evidence supporting the use of PrEP in different patient populations; 4) Define and identify indications for PrEP; and 5) Differentiate between HIV PrEP and HIV post-exposure prophylaxis (PEP). These learning objectives were developed in accordance with the University of Washington National HIV Curriculum (National HIV Curriculum, n.d).

For the PrEP module, the pre-class readings included the 2017 Centres for Disease Control and Prevention HIV PrEP guidelines excerpts "Evidence of the Safety and Efficacy of Antiretroviral Prophylaxis" and "Identifying Indications for PrEP & Providing PrEP" (US Public Health Service, 2017). Students also watched a pre-recorded 42-minute video created by an HIV-expert pharmacist who was the guest instructor for that week. The active learning in-class session was designed to reinforce and apply concepts taught in the pre-class material. During the active learning session, students were provided numerous opportunities to apply therapeutic principles to different patient case scenarios regarding PrEP and PEP. Active learning sessions included a mix of large group discussions involving the whole class and small breakout group patient case activities. Students completed the patient cases in small groups first, and then the instructor led the large group discussion of the cases, engaging each small group to share their answers for discussion. Students were expected to be engaged and participative in both the large and small group activities. An overview of the active learning session content is shown in Table I.

Table I: Active Learning Session Content and Approximate Time Spent on Each Activity

Class content	Time
Complete pre-class survey	5 minutes
Instructions, introduction of first case	5 minutes
Students discuss PrEP Case 1 in small, breakout groups	10 minutes
Large group discussion of PrEP Case 1	10 minutes
Students discuss PrEP Case 2 in small, breakout groups	10 minutes
Large group discussion of PrEP Case 2	5 minutes
Students discuss PrEP Case 3 in small, breakout groups	10 minutes
Large group discussion of PrEP Case 3	5 minutes
Students discuss PEP Case 4 in small, breakout groups	10 minutes
Large group discussion of PEP Case 4	5 minutes
Students discuss PEP Case 5 in small, breakout groups	10 minutes
Large group discussion of PEP Case 5	5 minutes
Student question and answer time, group discussion	5 minutes
Students complete post-class survey	5 minutes
Summary of main points, future directions of PrEP discussion	10 minutes
Total	**110 minutes**

PrEP=pre-exposure prophylaxis; PEP=post-exposure prophylaxis

Evaluation of student knowledge, confidence, and perceptions

Student pharmacists were required to meet competency on an examination to evaluate their knowledge of prescribing and administering PrEP. The WSU College of Pharmacy and Pharmaceutical Sciences used a competency-based examination grading model in which students demonstrated achievement of defined learning objectives by attainment of a score of at least 80% on course examinations (Remsberg *et al.,* 2017). Students not reaching the competency of 80% on the initial attempt were required to take a remediation examination within one week with similar question items covering the same learning objectives. Examinations were administered using a computer-based testing platform, ExamSoft® (ExamSoft Worldwide, Inc., Boca Raton, FL). Questions were in multiple-choice format and were coded to course learning objectives and Bloom's Taxonomy level outcomes.

A 24-question survey was developed and conducted among students in the 2020 cohort to further evaluate their knowledge and also assess confidence and attitudes. Students were asked to respond to four multiple-choice knowledge questions, which reflected the learning objectives for the lecture, ten Likert-scale questions regarding their confidence in providing PrEP services, and ten Likert-scale questions regarding attitudes and beliefs about the various aspects of prescribing PrEP to individuals at risk for acquiring HIV. The knowledge-based and stigma-related survey questions were based on the original learning objectives developed by researchers at the University of Washington National HIV Curriculum. The survey was piloted and refined by three HIV expert pharmacists who had achieved the American Academy

of HIV Pharmacist credentials (National HIV Curriculum, n.d.).

The survey was administered before and after the PrEP module using the Qualtrics XM Survey Platform (Qualtrics, Provo, UT). For the pre-class survey, a link was posted in the class learning management software, Blackboard (Blackboard Learn Inc., Washington DC), at the top of the page with the pre-class material. Students were asked to complete the survey before accessing any of the pre-class information, so that baseline knowledge, confidence, and perceptions could be determined. They were informed that completion of the survey was optional and would take approximately ten minutes to complete. Students were given a separate link and asked to complete the post-class survey immediately after the in-class PrEP activities ended.

Data analysis

Students were asked to link their pre- and post-course anonymous survey data by using an answer to a basic preliminary question that did not include any directly identifiable or confidential information. A Wilcoxon Signed Rank Test was used to calculate statistical significance for the changes in responses between pre- and post-survey confidence and attitude questions. Fischer's Exact test was utilised to analyse knowledge question survey results. Data analyses for this study were performed using IBM SPSS Version 26 (Chicago, IL). This study received exemption status from the Washington State University Institutional Review Board (#18524-001).

Results

Examination results

A total of 60 students were enrolled in the elective course in 2020, of whom 59 took the PrEP module examination, and one received an excused absence. Student performance on the examination for each course learning objective was as follows: 1) Identify key counselling points for patients initiating PrEP: 98% correct responses; 2) Explain the risks and benefits of PrEP: 95% correct responses; 3) Summarise the evidence supporting the use of PrEP in different patient populations: 88% correct responses; 4) Define and identify indications for PrEP: 88% correct responses; and finally, 5) Differentiate between HIV PrEP and PEP: 92% correct responses. Six students did not meet the competency score of 80% or greater on the initial examination. Those six students and the student who was absent during the initial examination took the retake examination at a later date, and all successfully met the 80% competency level.

Survey results

Sixty student pharmacists were enrolled in the Advanced HIV elective during the Fall of 2020. The pre- and post-class surveys were completed by 52 and 31 students, respectively. Only the 28 students (47%) who completed both the pre- and post-course surveys were included in the data analysis. Responses to the questions regarding confidence and perceptions are displayed in Table II. There was a statistically significant increase in all ten confidence domain questions but only two of the attitude, perception, and stigma questions. Survey results for the knowledge questions are shown in Table III. Statistically, significant change was observed in questions 1 and 4.

Discussion

This study sought to provide training to student pharmacists about prescribing PrEP beyond what they receive in general course material and evaluate the knowledge, perceptions, and confidence of student pharmacists regarding prescribing PrEP. The study results demonstrated that integration of advanced HIV PrEP content led to a statistically significant increase in student pharmacist confidence in identifying FDA-approved PrEP regimens, required laboratory monitoring parameters and immunisations, and providing appropriate counselling for a patient starting PrEP, as is expected with a university lecture. Trained pharmacists taking on a broader role in the management of HIV prevention may reduce the frequency of routine office visits and increase the uptake and accessibility of PrEP for high-risk individuals.

The overwhelming majority of student pharmacist survey respondents agreed that pharmacists should have the ability to prescribe, dispense, and monitor the ongoing use of PrEP (93% agree or strongly agree) and PEP (96% agree or strongly agree) in the community pharmacy setting, as shown in survey questions 18 and 19. Although there was not a statistically significant change from pre- to post-class for these questions, researchers believe this is because of the robust agreement pre-class. As pharmacy practice expands to include more clinical services in outpatient settings, suitable preparation of pharmacy students is pivotal in the sustainability and success of these HIV prevention programs. The pharmacist's role in increasing the accessibility and acceptability of PrEP is vital in reducing the rate of new HIV infections, and survey responses reflect that sense of urgency among pharmacy students.

Table II: Results of pre- and post-class survey Likert-scale questions

Question	Survey	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	*p*-value
Confidence domain questions							
1. I am confident in accurately identifying individuals that would benefit from the use of PrEP.	Pre	1 (4%)	7 (25%)	6 (21%)	10 (36%)	4 (14%)	<.001*
	Post	5 (18%)	21 (75%)	0 (0%)	0 (0%)	2 (7%)	
2. I am confident in identifying immunizations and baseline testing required for a patient before they start taking PrEP.	Pre	0 (0%)	2 (7%)	8 (29%)	12 (43%)	6 (21%)	<.001*
	Post	8 (29%)	18 (64%)	0 (0%)	1 (4%)	1 (4%)	
3. I am confident in effectively educating a patient who is starting PrEP with medication-related and risk-mitigation counseling.	Pre	0 (0%)	2 (7%)	8 (29%)	13 (46%)	5 (18%)	<.001*
	Post	5 (18%)	17 (61%)	5 (18%)	0 (0%)	1 (4%)	
4. I am confident in ordering the correct laboratory parameters required to monitor a patient that is taking PrEP.	Pre	0 (0%)	3 (11%)	9 (32%)	10 (36%)	6 (21%)	<.001*
	Post	8 (29%)	18 (64%)	1 (4%)	0 (0%)	1 (4%)	
5. I am confident in providing MTM services and ongoing patient care to a patient who is taking PrEP.	Pre	0 (0%)	1 (4%)	9 (32%)	10 (36%)	8 (29%)	<.001*
	Post	5 (18%)	19 (68%)	3 (11%)	0 (0%)	1 (4%)	
6. I am confident in prescribing, dispensing, and monitoring the use of PrEP in my patients.	Pre	0 (0%)	2 (7%)	8 (29%)	12 (43%)	6 (21%)	<.001*
	Post	5 (18%)	18 (64%)	3 (11%)	1 (4%)	1 (4%)	
7. I am confident in identifying patients that would require PEP given a clinical scenario.	Pre	0 (0%)	7 (25%)	7 (25%)	9 (32%)	5 (18%)	<.001*
	Post	7 (25%)	18 (64%)	2 (7%)	0 (0%)	1 (4%)	
8. I am confident in identifying ARV regimens used for PEP and when these agents need to be started and stopped.	Pre	0 (0%)	4 (14%)	6 (21%)	13 (46%)	5 (18%)	<.001*
	Post	6 (21%)	18 (64%)	2 (7%)	0 (0%)	1 (4%)	
9. I am confident in ordering laboratory tests used to monitor a patient who is taking PEP.	Pre	0 (0%)	2 (7%)	12 (43%)	8 (29%)	6 (21%)	<.001*
	Post	7 (25%)	19 (68%)	1 (4%)	0 (0%)	1 (4%)	
10. I am confident in prescribing, dispensing, and monitoring a patient who is taking PEP.	Pre	0 (0%)	2 (7%)	9 (32%)	12 (43%)	5 (18%)	<.001*
	Post	6 (21%)	18 (64%)	3 (11%)	0 (0%)	1 (4%)	
Belief domain questions							
11. Men who have sex with other men (MSM), and people with multiple sexual partners who require PrEP should adjust their sexual life and/or use protection instead of taking medication.	Pre	3 (11%)	3 (11%)	5 (18%)	11 (39%)	6 (21%)	.275
	Post	2 (7%)	2 (7%)	4 (14%)	12 (43%)	8 (29%)	
12. People who share needles for injection drug use and need PrEP should seek treatment for their substance misuse instead of taking medication.	Pre	5 (18%)	2 (7%)	9 (32%)	9 (32%)	3 (11%)	.66
	Post	1 (4%)	4 (14%)	6 (21%)	10 (36%)	7 (25%)	
13. People use PrEP as an excuse to continue their poor sexual and/or drug use behaviors with limited consequences.	Pre	0 (0%)	5 (18%)	3 (11%)	14 (50%)	6 (21%)	.21
	Post	1 (4%)	2 (7%)	2 (7%)	9 (32%)	14 (50%)	
14. PrEP should not be covered by state insurance to discourage individuals from engaging in risky sexual/drug use behaviors.	Pre	1 (4%)	1 (4%)	2 (7%)	11 (39%)	13 (46%)	.107
	Post	0 (0%)	0 (0%)	2 (7%)	10 (36%)	16 (57%)	
15. PrEP should only be considered in individuals that are at least attempting to make lifestyle changes to reduce their risk of acquiring HIV.	Pre	2 (7%)	5 (18%)	7 (25%)	7 (25%)	7 (25%)	.007*
	Post	0 (0%)	3 (11%)	6 (21%)	4 (14%)	15 (54%)	
16. If an individual who is HIV-negative is in a relationship with someone who is HIV-positive, they should leave their partner instead of having to take PrEP.	Pre	1 (4%)	1 (4%)	2 (7%)	8 (29%)	16 (57%)	.285
	Post	0 (0%)	1 (4%)	2 (7%)	6 (21%)	19 (68%)	
17. Individuals who are HIV-positive should only be allowed to be in a sexual relationship with other HIV-positive individuals.	Pre	1 (4%)	1 (4%)	2 (7%)	10 (36%)	14 (50%)	.059
	Post	1 (4%)	1 (4%)	2 (7%)	5 (18%)	19 (68%)	

Question	Survey	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	*p*-value
18. Increasing the availability of PrEP does more harm than good from a public health perspective.	Pre	0 (0%)	2 (7%)	1 (4%)	10 (36%)	15 (54%)	.029*
	Post	0 (0%)	0 (0%)	0 (0%)	8 (29%)	20 (71%)	
19. Pharmacists should have the ability to prescribe, dispense and monitor the ongoing use of PrEP in a community pharmacy setting.	Pre	14 (50%)	11 (39%)	3 (11%)	0 (0%)	0 (0%)	.861
	Post	15 (54%)	11 (39%)	1 (4%)	0 (0%)	1 (4%)	
20. Pharmacists should have the ability to prescribe, dispense and monitor the ongoing use of PEP in the community setting.	Pre	10 (36%)	11 (39%)	2 (7%)	0 (0%)	1 (4%)	.398
	Post	17 (61%)	10 (36%)	0 (0%)	0 (0%)	1 (4%)	

HIV=human immunodeficiency virus; MTM=medication therapy management; ARV=antiretroviral therapy; PrEP=pre-exposure prophylaxis; PEP=post-exposure prophylaxis. * indicates a statistically significant change

Table III: Pre- and post-class knowledge question student performance

Question topic and learning objective	Survey	Correct Response n (%)	Incorrect Response n (%)	*p*-value
1. Accurately identify regimens approved for HIV PrEP	Pre	9 (32%)	19 (68%)	0.001*
	Post	22 (79%)	6 (21%)	
2. Identify required baseline laboratory studies and immunizations for initiating PrEP	Pre	21 (75%)	7 (25%)	0.143
	Post	26 (93%)	2 (7%)	
3. Counseling prior to receiving PrEP /adverse effects of medications used for PrEP	Pre	2 (7%)	26 (93%)	0.143
	Post	7 (25%)	21 (75%)	
4. Monitoring parameters while taking PrEP	Pre	4 (14%)	14 (86%)	0.004*
	Post	15 (54%)	13 (46%)	

HIV=human immunodeficiency virus; PrEP=pre-exposure prophylaxis; PEP=post-exposure prophylaxis. * indicates a statistically significant change

Evidence suggests that education about HIV decreases stigmatising attitudes towards people living with HIV, which further reinforces the benefits of incorporating advanced HIV curriculum into Doctor of Pharmacy programmes (Derose *et al.,* 2014; Geter, Herron & Sutton, 2018; Machowska *et al.,* 2020). HIV-related stigma manifested through inadvertent ideologies and preconceived notions toward high-risk populations can add to already existing barriers to HIV prevention, treatment, and care (Geter, Herron & Sutton, 2018). Student perceptions of those living with HIV and people at risk for HIV showed a lower level of HIV-related stigma post-content delivery compared to pre-content delivery, which is encouraging. The highest level of pre-class stigma in this survey was regarding people who inject drugs, shown by student pharmacist respondents agreeing or strongly agreeing with the statement that people who share needles for intravenous drug use should seek treatment for substance abuse instead of taking medication for HIV, which decreased after the module (pre-class, n = 7 (25%); post-class, n = 5 (18%)). These perceptions towards those struggling with substance misuse and potentially other social determinants of poor health such as homelessness, contribute to existing barriers to care for at-risk individuals.

Although there was a statistically significant change from the pre- to post-class knowledge assessment questions 1 and 4, that was not the case for questions 2 (Identify required baseline laboratory studies and immunisations for initiating PrEP) and 3 (Counseling prior to receiving PrEP /adverse effects of medications used for PrEP). The minimal change observed on question 2 may be explained by the high baseline performance on the pre-class question. However, the results on question 3 were more troubling since the survey indicated a significant increase in student confidence performing this skill from the pre-class survey to the post-class survey. Faculty hypothesise that not enough time was devoted to this objective in class and added additional time and instruction to this learning objectives in 2021 and plan to continue this for future iterations of the course.

Limitations and strengths

The results of this study must be evaluated in the context of its limitations. This study was conducted in a single college of pharmacy with a total of 60 pharmacy students, of whom the researchers could analyse the data of 28 students who had completed both pre- and post-class surveys, representing a 47% response rate. Some disparity, which should be considered, was also noted in the baseline knowledge about HIV between PY2 and PY3 pharmacy students. Moreover, the

development of knowledge-based and stigma-related survey questions was based on original learning objectives developed by the researchers in accordance with the University of Washington National HIV Curriculum, and questions were not validated beyond evaluation by three HIV Pharmacists credentialed by the American Academy of HIV Medicine (National HIV Curriculum, n.d., American Academy of HIV Medicine, n.d.).

Although an improvement in the knowledge-based question scores was expected after content delivery, the improvement in attitudes towards people living with HIV and those at high risk for acquiring HIV and the increased confidence in providing HIV services further enforce the importance of integrating advanced HIV courses into Doctor of Pharmacy programmes. This content could be easily transferred to other universities and maybe even more valuable in countries where HIV rates are higher than in the USA. Future research in countries where HIV rates are higher would be beneficial. Although this elective course continues to be offered, the survey data was only collected during the 2020 school year. The researchers believe this content is worthy of being added as a required course, but current curricular limitations have not allowed for its inclusion at the time of writing. Future research involving pharmacy graduates, in addition to students, could provide more insight on the retention and continued value of this work.

Conclusion

This study evaluated the knowledge, confidence, and perceptions of student pharmacists towards the use of HIV PrEP in high-risk populations before and after receiving a PrEP and PEP module in a two-credit hour Advanced HIV elective course. The findings of this study suggest that integration of an advanced HIV curriculum increases student pharmacist knowledge and confidence in providing PrEP services while reducing stigma towards those with HIV and those at risk for acquiring HIV. Pharmacists are among the most accessible healthcare providers and, as medication experts, can play a significant role in helping to end the HIV epidemic.

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