



HIV pre-exposure prophylaxis (PrEP) knowledge, familiarity, and attitudes among United States healthcare professional students: A cross-sectional study

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ARTICLE INFO

Keywords:

HIV/AIDS
HIV prevention
Pre-exposure prophylaxis
Education
Students

ABSTRACT

The United States' initiative to End the HIV Epidemic by 2030 includes a primary goal to reduce new HIV infections by 90 percent. One key contributor to this plan is HIV pre-exposure prophylaxis (PrEP). While knowledge and acceptance of PrEP among clinicians is growing, few studies have assessed knowledge and awareness among future healthcare professionals in academic training programs. The present study aimed to assess and compare healthcare trainees' awareness, knowledge, and familiarity with PrEP prescribing guidelines to better understand and prevent gaps in academic training regarding PrEP. A cross-sectional web-based survey of medical, nurse practitioner, and pharmacy students enrolled at two universities was conducted between October 2017 and January 2018. The study assessed participants' awareness, knowledge, and familiarity with PrEP prescribing guidelines and willingness to prescribe PrEP and refer to another healthcare provider. The survey was completed by 744 participants (response rate = 36.2%). Overall, PrEP awareness was high though PrEP knowledge was low. There were significant differences among student groups in domains of interest. Pharmacy students had the greatest PrEP knowledge, awareness, and familiarity with prescribing guidelines. However, medical students reported the greatest comfort with performing PrEP-related clinical activities and willingness to refer a candidate to another provider. Study findings enhance our understanding of healthcare professional students' perspectives of PrEP as a biomedical prevention strategy for HIV. The gaps in students' knowledge offer opportunities for the development of educational strategies to support HIV prevention among future healthcare professionals.

1. Introduction

Clinical trials have repeatedly demonstrated the effectiveness of daily oral pre-exposure prophylaxis (PrEP) (Baeten et al., 2012; Grant et al., 2010; Thigpen et al., 2012) for HIV prevention among at-risk individuals. PrEP provides a significant public health opportunity to decrease HIV incidence. Indeed, uptake of PrEP in the United States is

associated with decreases in HIV diagnoses (Sullivan et al., 2018); however, uptake has not kept pace with original expectations. It is estimated that 1.2 million Americans meet clinical guidelines for PrEP; yet, only 18.1% were prescribed the medication in 2018 (Harris et al., 2019). The United States' initiative to End the HIV Epidemic by 2030 includes the primary goal of reducing new infections by 90 percent. The opportunity for PrEP to make a meaningful impact on HIV incidence is

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<https://doi.org/10.1016/j.pmedr.2021.101334>

Received 10 August 2020; Received in revised form 24 November 2020; Accepted 24 January 2021

Available online 23 February 2021

2211-3355/© 2021 The Authors.

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dependent on both large-scale adoption among eligible populations and identifying gaps in PrEP awareness and knowledge among healthcare providers. This second impact avenue warrants attention as clinician-directed efforts to increase PrEP uptake need to consider training experiences that have the potential to maximize PrEP implementation (Hurt, 2018).

Since 2012, overall PrEP awareness has grown, with clinician surveys demonstrating awareness between 64% and 93% (Bacon et al., 2017; Hart-Cooper et al., 2018; Walsh and Petroll, 2017; Wood et al., 2018). Clinician willingness to prescribe PrEP has also increased, particularly among infectious disease (ID) specialists, relative to primary care and internal medicine providers (Petroll et al., 2017; Blackstock et al., 2017; Zablotska and O'Connor, 2017; Desai et al., 2016; Conniff and Evensen, 2016; Krakower and Mayer, 2016; Terndrup et al., 2019). However, a key concern is that this growth in awareness has not corresponded with an increase in the number of providers who prescribe PrEP. Importantly, knowledge translates to behavior; PrEP knowledge has been consistently associated with actual prescribing practices (Mullins et al., 2017; Blumenthal et al., 2015; Krakower and Mayer, 2015).

To date, there is limited data regarding healthcare professional students' knowledge of PrEP. Studies were often limited to medical students (Calabrese et al., 2014, 2018a, 2018b; Armstrong et al., 2018) and rarely included other students who may play an active role in PrEP care, such as nurse practitioner and pharmacy students. Calabrese and colleagues surveyed medical students regarding the influence of patient race (Calabrese et al., 2014), sexual orientation (Calabrese et al., 2018b), and sexual behavior (Calabrese et al., 2018b) on clinical decision-making related to PrEP. Results demonstrated high awareness (85%), with half reporting PrEP education during medical school. In another study of 112 medical students, 50% reported some PrEP knowledge and approximately three-quarters reported willingness to recommend PrEP to patients (Armstrong et al., 2018). A recent editorial written by medical students articulated their desire for widespread PrEP implementation as a key element for HIV prevention (Eweka et al., 2018). Findings from empirical studies coupled with medical students' commentary point towards the need for greater knowledge of PrEP and prescribing and referral intentions.

The timing is now ideal to shift the conversation to training experiences for the next generation of healthcare providers. To maximize PrEP efficacy, researchers, clinicians, and public health officials must recognize the importance of increasing PrEP training and engagement among healthcare professional groups who have the potential to serve as gatekeepers to PrEP. Given the limited evidence on future healthcare professionals' awareness of PrEP, a better understanding of PrEP knowledge and familiarity may inform the development of educational interventions to increase training and thus, implementation. The present study sought to assess healthcare trainees' PrEP awareness, knowledge, familiarity with prescribing guidelines, and willingness to prescribe and refer PrEP within three healthcare professional training programs.

2. Methods

2.1. Study participants and procedures

Between October 2017-January 2018, students enrolled in medical (MD), nurse practitioner (DNP), and pharmacy (PharmD) programs at the University at Buffalo and DNP and MD programs at the University of Rochester (n = 2,053) were invited to participate in a web-based, cross-sectional survey. All potential participants received an email inviting them to participate with a cover letter explaining study procedures. A unique link was embedded in the email invitation to access the survey, which prevented multiple completions per person. Non-responders were sent weekly prompts with a maximum of three reminder emails. The overall response rate was 36.2%. Survey length averaged 15.4 min and deidentified data were stored in a password-protected datafile. Upon

survey completion, participants received a \$10 Amazon e-gift card. All procedures were in accordance with the ethical standards of the 1964 Helsinki declaration and its later amendments. The study protocol was approved by the universities' institutional review boards with a waiver of written informed consent.

2.2. Measures

Participant demographic characteristics were collected along with academic training program (i.e., MD, DNP, PharmD) and current year of study. Survey items were developed using previous studies among clinicians as a template (Blackstock et al., 2017; Desai et al., 2016). *PrEP Awareness* was determined by a yes (1)/no (0) response to: "Prior to this survey, were you aware of the concept of HIV PrEP (pre-exposure prophylaxis), which is prescribing regularly-scheduled oral HIV medications to HIV-uninfected individuals to help prevent them from getting HIV?" *Familiarity with PrEP Prescription* was assessed with one item that asked, "Please rate how familiar or unfamiliar you consider yourself with regard to prescribing PrEP" on a Likert scale ranging from (1) very unfamiliar to (5) very familiar. Adapted from a prior study with clinicians (Walsh and Petroll, 2017), *PrEP Knowledge* was measured with six items assessing knowledge of PrEP dosing frequency, approved FDA medications, HIV antibody testing prior to PrEP initiation, HIV testing frequency while on PrEP, contraindications to prescribing PrEP, and routine standard of care practices for patients taking PrEP. Responses were scored as correct (1) or incorrect (0) and summed to create a total knowledge score. Participants who responded with no familiarity with prescribing guidelines were assumed to lack knowledge and therefore were coded as zero. *Comfort Performing PrEP-Related Clinical Activities* was measured with three items assessing foundational tasks to PrEP provision (e.g., discussing sexual activities) (Petroll et al., 2017). Items were rated on a Likert scale ranging from (1) completely uncomfortable to (5) completely comfortable, and scores were averaged across items. The primary dependent variables of interest included respondents' willingness to prescribe PrEP and willingness to refer a PrEP candidate to another healthcare provider, both of which were measured on a Likert scale ranging from (1) completely unwilling to (5) completely willing.

2.3. Data analytic plan

Data were analyzed in three stages. First, descriptive analyses were conducted to characterize the sample. Second, analysis of variance (ANOVA) was used to compare key variables (e.g., PrEP awareness, PrEP knowledge, familiarity with prescribing guidelines) across the three student groups. Post-hoc pairwise comparisons were conducted using Scheffe's test (Scheffe, 1956). Finally, linear regression models were conducted to compare differences across groups in: a) willingness to prescribe PrEP, and b) willingness to refer a PrEP candidate to another provider. In the former model, comparisons were made between MD (1) and DNP (0) students, given that pharmacists are unable to prescribe PrEP in most states. In the latter model, comparisons were made across student groups. All models controlled for participant sex, race, ethnicity, program year, familiarity with PrEP prescription guidelines, PrEP knowledge, experience with HIV-infected populations, and knowing someone who has used PrEP. Descriptive statistics indicated that the assumption of normality was not violated for all but one of the criterion variables examined—willingness to refer a PrEP candidate to another provider. Non-normality of this variable was addressed by adjusting outliers to the value of 3 standard deviations below the mean (Kline, 2015). All analyses were conducted using IBM SPSS Statistics (Version 25).

3. Results

3.1. Preliminary analyses

The analytic sample was composed of 744 participants with a mean age of 25.1 years ($SD = 4.25$). Descriptive statistics for covariates included in regression models for the full sample, as well as broken down by student group, are presented in Table 1. Differences in these variables across groups were examined using Chi-squared tests of independence. Participants were primarily female (61%), White (66%), and non-Hispanic (92%); however, the distribution varied across student groups for these variables. The majority (61%) had experience with HIV-infected populations, but this varied by group.

Table 1
Descriptive statistics for covariates used in regression models and comparisons across health professional student group.

	Full Sample (N = 744)	MD Students (N = 376)	DNP Students (N = 79)	PharmD Students (N = 289)	
Variable	% (N)	% (N)	% (N)	% (N)	χ^2 (df)
Sex					16.03 (6)*
Male	39% (287)	44% (165) _a	23% (18) _a	36% (104)	
Female	61% (454)	56% (209) _a	77% (61) _a	64% (184)	
Nonbinary	0.1% (1)	0.3% (1)	0% (0)	0% (0)	
Race					49.67 (10)***
White	66% (479)	68% (247) _{a,b}	85% (67) _{a,c}	58% (165) _{b,c}	
Asian	24% (176)	19% (70) _{a,b}	6% (5) _{a,c}	36% (101) _{b,c}	
Black	4 (30)	5% (17) _b	4% (3)	4% (10)	
American Indian or Alaska Native	0.4% (3)	1% (3)	0% (0)	0% (0)	
Native Hawaiian or other Pacific Islander	0.1% (1)	0% (0)	0% (0)	0.4% (1)	
Other Ethnicity	5% (39)	8% (28) _a	5% (4)	3% (7) _b	12.77 (4)*
Hispanic	6% (41)	8% (31) _a	5% (4)	2% (6) _a	
Non-Hispanic	92% (687)	90% (338) _a	94% (74)	95% (8) _a	
Class year					0.49 (6)
1st year	25% (186)	25% (95)	28% (22)	24% (69)	
2nd year	24% (174)	25% (91)	22% (17)	23% (66)	
3rd year	25% (182)	25% (94)	27% (21)	23% (67)	
4th/5th year	27% (198)	25% (94)	21% (19)	30% (85)	
Experience with HIV-infected populations					94.84 (2)***
Yes	61% (454)	70% (263) _{a,b}	92% (73) _{a,c}	41% (118) _{b,c}	
Know someone who has used PrEP					0.34 (2)
Yes	28% (203)	28% (106)	27% (21)	27% (76)	

Note. Due to some participants choosing not to respond to certain questions, numbers may not add up to the total. Totals across categories within variables may sum to more than 100% due to rounding. Values with the same subscripts differ significantly at $p < .05$. * $p < .05$. *** $p < .001$.

3.2. Focal analyses

Results of ANOVAs comparing student groups on key variables are presented in Table 2. There were significant group differences in PrEP awareness, knowledge, familiarity with prescription guidelines, and comfort with performing PrEP-related clinical activities. Scheffe's post-hoc comparisons revealed that PharmD students had greater awareness than DNP students ($M_{diff} = 0.12, p = .017$). PharmD students had greater knowledge than MD students ($M_{diff} = 0.55, p < .001$). PharmD students had greater familiarity with prescription guidelines than MD students ($M_{diff} = 0.82, p < .001$) and DNP students ($M_{diff} = 1.08, p < .001$). However, MD students were more comfortable with performing PrEP-related clinical activities than PharmD students ($M_{diff} = 0.17, p = .05$).

In the first regression model, we examined differences in willingness to prescribe PrEP (Table 3). Results revealed significant main effects of program year and familiarity with prescription guidelines, as well as a marginal main effect of knowing someone who has used PrEP. Willingness to prescribe PrEP was lower among participants further along in their respective programs. However, greater familiarity with prescription guidelines and knowing someone who has used PrEP was associated with greater willingness to prescribe PrEP. There were no differences in willingness to prescribe PrEP between MD and DNP students.

In subsequent regression models, we examined group differences in willingness to refer a PrEP candidate to another provider (Table 4). Results revealed a significant main effect of student type indicating that MD students were more willing to refer a PrEP candidate to another provider than were PharmD students. However, there were no differences between DNP and PharmD students, nor between MD and DNP students ($b = 0.53, p = .49$). There were no significant main effects for any of the covariates in these models.

4. Discussion

PrEP uptake is dependent on healthcare provider awareness, knowledge of eligibility criteria, and ability to prescribe or provide a referral. The purpose of this investigation was to assess awareness, knowledge, and familiarity with PrEP guidelines and their relation to PrEP prescription and referral intentions among healthcare professional students representing three disciplines. This study is part of an emerging body of literature that seeks to examine students in academic training programs who have the capacity to become engaged in the PrEP prescribing process. Overall, PrEP awareness was uniformly high, although PrEP knowledge was low. Findings indicate that PrEP awareness, knowledge, and familiarity with prescribing guidelines differ by discipline, with PharmD students reporting the highest levels of each. Medical students reported the greatest comfort prescribing PrEP and familiarity with PrEP. These findings enhance our understanding of the factors that influence future healthcare providers' knowledge and attitudes toward the provision of PrEP and can be interpreted within the

Table 2
Differences in PrEP awareness, knowledge, familiarity with prescribing guidelines, and comfort performing PrEP-related tasks.

	MD students	DNP Students	PharmD Students	ANOVA
Variable	M (SD)	M (SD)	M (SD)	F (df)
PrEP awareness	0.86 (0.35)	0.78 _a (0.35)	0.91 _a (0.29)	4.42 (2,741)*
PrEP knowledge	1.38 _a (1.39)	1.53 (1.58)	1.93 _a (1.62)	11.03 (2,738)***
Familiarity with PrEP prescription guidelines	2.51 _a (1.31)	2.25 _b (1.36)	3.33 _{a,b} (1.24)	41.61 (2,739)***
Comfort performing PrEP-related clinical activities	4.05 _a (0.85)	3.86 (0.98)	3.88 _a (0.92)	3.64 (2,739)*

Note. Values with the same subscripts differ significantly at $p < .05$. * $p < .05$. *** $p < .001$.

Table 3
Participant characteristics associated with willingness to prescribe PrEP.

Variable	<i>b</i>	<i>SE</i>	<i>B</i>	<i>t</i>
Intercept	4.30	0.32	0.00	13.43***
Student type (MD = 1, DNP = 0)	0.16	0.10	0.08	1.52
Sex (female = 1, male = 0)	0.00	0.00	-0.02	-0.42
Race (White = 1, non-white = 0)	-0.10	0.09	-0.06	-1.19
Ethnicity (Hispanic = 1, non-Hispanic = 0)	0.11	0.14	0.04	0.81
Program year (1-4/5)	-0.08	0.04	-0.11	-2.07*
Familiarity with PrEP prescription guidelines	0.09	0.03	0.15	3.01**
PrEP knowledge	0.02	0.03	0.04	0.77
Experience with HIV-infected populations (yes = 1, no = 0)	-0.16	0.10	-0.09	-1.62
Know someone who has used PrEP (yes = 1, no = 0)	0.16	0.09	0.09	1.75 [†]

Note. [†]*p* < .10. ***p* < .01. ****p* < .001.

Table 4
Participant characteristics associated with willingness to refer a PrEP candidate to another provider.

Variable	<i>b</i>	<i>SE</i>	<i>B</i>	<i>t</i>
Intercept	4.50	0.20	0.00	22.17***
Student type (MD = 1, PharmD = 0)	0.12	0.06	0.10	2.21*
Student type (DNP = 1, PharmD = 0)	0.07	0.09	0.04	0.78
Sex (female = 1, male = 0)	0.00	0.00	-0.02	-0.45
Race (White = 1, non-white = 0)	0.05	0.05	0.04	0.92
Ethnicity (Hispanic = 1, non-Hispanic = 0)	0.03	0.09	0.01	0.35
Program year (1-4/5)	0.02	0.02	0.04	0.92
Familiarity with PrEP prescription guidelines	0.02	0.02	0.05	1.20
PrEP knowledge	0.02	0.02	0.05	1.06
Experience with HIV-infected populations (yes = 1, no = 0)	-0.04	0.06	-0.03	-0.65
Know someone who has used PrEP	-0.02	0.05	-0.02	-0.40

Note. **p* < .05. ****p* < .001.

context of the PrEP care continuum.

Utilizing PrEP as an HIV prevention tool is complex and encompasses tasks beyond prescribing the drug and patient monitoring. The PrEP care continuum is a multi-step process that necessitates intervention focused on PrEP awareness, uptake, adherence, and retention (Nunn et al., 2017). Pharmacists, nurse practitioners, and physicians each play an integral role in these steps. Therefore, understanding gaps in academic training can inform professional education to increase comfort and willingness to intervene across the PrEP care continuum as students transition into their careers.

PharmD students had the greatest PrEP awareness, knowledge, and familiarity with prescribing guidelines. Taken together, this suggests that PharmD programs may provide more PrEP-related education than other healthcare disciplines. Community pharmacists play an integral part in the adherence and retention steps of the PrEP care continuum. While pharmacists do not have prescribing privileges in New York State (NYS), they are uniquely positioned to educate community members about HIV prevention options including PrEP. Additionally, as more large chain pharmacies are moving towards retail health clinic models (e.g., CVS MinuteClinic), there are increasing opportunities for pharmacists to participate as part of the preventive healthcare team, including connecting PrEP candidates to in-house or other affiliated providers for PrEP initiation and ongoing care (RAND Corporation,

2016). Yet, compared to students in other disciplines, PharmD students were less willing to refer a potential PrEP candidate. As such, emphasis on reducing barriers to referrals during academic training may encourage pharmacists to view themselves as significant contributors in the PrEP care continuum beyond the maintenance stages. In addition, the lower willingness to refer may be related to lack of awareness of possible referral avenues which can be addressed in educational training interventions. Further, pharmacists may serve a key role in supporting patient adherence and retention in care due to factors such as advanced knowledge, geographic accessibility to vulnerable populations, and patient trust and rapport building (Farmer et al., 2019). Similar to their role in HIV treatment maintenance, pharmacists have unique access to data on timeliness of PrEP refills as well as periodic patient interactions (Saber et al., 2012; Adams et al., 2019). Delayed refills could prompt pharmacists to discuss PrEP adherence with patients, thereby building rapport to reinforce and optimize PrEP retention. A greater emphasis on PrEP counselling is needed in pharmacy programs to increase confidence in patient education across the PrEP care continuum (Unni et al., 2016).

DNP students reported lower PrEP awareness and lower familiarity with prescribing guidelines. This finding is a disappointing result as the majority of DNP students had at least some experience with HIV-infected patient populations and may continue to interface with vulnerable populations in the future. Previous work has shown prior exposure to HIV-infected populations to be a strong predictor of intentions to prescribe PrEP (Walsh and Petroll, 2017; Blackstock et al., 2017). Additionally, DNPs have a skillset that can be uniquely leveraged to decrease PrEP barriers and increase coverage in high-risk populations. As outlined by Nelson and colleagues (Nelson et al., 2019), nurse-led approaches across the PrEP care continuum are a suitable fit based on discipline-related assets including holistic approaches to patient care, advanced clinical skills to support PrEP uptake, and the ability to translate new evidence into practice in support of adherence and retention. Because DNPs are likely to encounter PrEP candidates, increasing their knowledge of prescribing guidelines is a vital step to increasing self-efficacy to prescribe, and subsequently increasing PrEP prescriptions. Our findings suggest there may be opportunities for interprofessional training and direct patient exposure experiences to counter stigma, whereby students from various health professions co-learn. This collaborative approach may present a unique opportunity for introducing referral and counseling skills that benefit all students. Doctoral nursing education already includes competencies that align with the PrEP care continuum (Unni et al., 2016). Therefore, educational modules could be restructured to include competencies within the context of PrEP.

Despite lower PrEP knowledge and familiarity with prescribing guidelines, MD students were most willing to refer a PrEP candidate to another healthcare provider. While uptake and adherence are natural intervention points for physicians within the context of PrEP care, their important position in awareness-raising and linkage to care should not be discounted. Perhaps lower knowledge and familiarity with prescribing contributes to the desire to refer patients to more knowledgeable providers. In the current sample, program year was inversely related to willingness to prescribe, which may be attributable to declaring a specialty in later program years that is less likely to prescribe PrEP. However, willingness to refer was not associated with program year. Increasing PrEP knowledge and awareness along with one's confidence to discuss sexual risk with patients regardless of specialty, paired with the ability to refer to appropriate PrEP providers has the capacity to increase PrEP coverage at the population level. However, optimal uptake is still dependent on maximizing the number of potential prescribers. Increasing one's ability to prescribe and retain patients on PrEP for medical students embarking on careers beyond infectious disease (e.g., family medicine) is an important point of intervention for physicians. This is especially important since familiarity with PrEP prescribing guidelines is a significant predictor of prescribing the medication.

Coursework should work to dismantle racial and other prejudiced stereotypes regarding HIV risk, as such biases impede provider willingness to prescribe PrEP (Castel et al., 2015; Calabrese et al., 2014, 2018a, 2018b). Future work could examine the extent to which hands-on experiences with high-risk populations (e.g., via clinical rotations) impact both willingness to prescribe and refer.

While NYS has the fourth highest HIV incidence in the United States, the state is committed to increasing PrEP coverage as part of its strategy to end the AIDS epidemic. Academic training programs are key points of intervention to help achieve this goal. The 16 medical schools in NYS train approximately 11% of the country's medical students (Associated Medical Schools of New York, 2018). NYS also houses 11 accredited DNP programs and 8 accredited PharmD programs, licensing over 2500 NPs and 1300 doctors of pharmacy in the last 5 years (New York State Education Department, 2014; Accreditation Council for Pharmacy Education; New York State Education Department. License Statistics: Nurse Practitioner, 2019; New York State Education Department. License Statistics: Pharmacy, 2019). Engaging with current students to better understand their PrEP knowledge is critical as prescribing patterns continue to grow in a variety of healthcare settings (Wu et al., 2017). Importantly, increasing knowledge and acceptance of PrEP by training healthcare professionals has the potential to be a cost effective strategy to increase PrEP prescriptions among individuals at heightened risk for HIV infection (Silapaswan et al., 2016).

Findings can inform future interventions in healthcare professional training programs seeking to increase students' capacity to prescribe PrEP directly or refer to other providers. These results echo recommendations in other work suggesting the need to expand healthcare professional students' training on PrEP (Armstrong et al., 2018). As the PrEP continuum of care involves intervention points at patient awareness, uptake, adherence and retention, interdisciplinary workforce training may be key to improving coverage. Case-based learning has been used in other medical school curricula to facilitate active instruction of infectious disease content (Bauler et al., 2018; Nori et al., 2017) and may be a model for other health professional training programs to use when educating students about PrEP. This type of experiential learning would provide students with the opportunity to work synergistically across disciplines and leverage knowledge already present in independent curricula. Importantly, the primary goal of this novel study was to identify gaps to improve awareness, attitudes and willingness to adopt PrEP among future healthcare professionals. While it is optimistic to expect growing PrEP uptake, more research is needed to understand the transition of knowledge into actual prescription or referral behaviors.

5. Limitations

Given that this convenience sample had limited racial/ethnic diversity and was recruited from two universities in the state of New York, results are not generalizable to health professional students broadly. Results may be affected by non-response bias as students with no PrEP knowledge may have chosen not to participate as well as variation in the participant recruitment strategies across the two universities. It is also possible that participants may over-represent those individuals who have professional interests in HIV prevention. Despite these limitations, this study provides one of the first examinations of PrEP knowledge and perceptions among a broad range of future healthcare professionals.

6. Conclusions

As a variety of healthcare providers and support staff are essential to community-wide PrEP provision, it is vital that academic training programs provide resources for future healthcare professionals to provide PrEP to clinically eligible PrEP candidates. Opportunities exist across disciplines to reinforce the importance of biomedical HIV primary prevention at preclinical, clinical, and extracurricular phases of graduate

education in the health professions. Learning about strategies to mitigate HIV risk at multiple touch points could increase confidence in knowledge and therefore willingness to prescribe or refer PrEP to patients who could benefit from its use. Increasing PrEP coverage involves healthcare providers across disciplines; consequently, academic education efforts should increase opportunities for interdisciplinary training.

Funding

Funding for this research was supported in part by the University of Rochester Center for AIDS Research grant P30AI078498 (NIH/NIAID) and the University of Rochester School of Medicine and Dentistry through a grant awarded to Sarahmona Przybyla and Diane Morse. Preparation of this manuscript was partially supported by NIAAA Grant T32AA007583 in support of Jennifer Fillo and Kimberly Kamper-DeMarco and NIAAA Grant K01AA027547.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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