WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

PrEP Talk: Integration of Pharmacist-Led HIV Pre-Exposure Prophylaxis (PLPrEP) Program among Young Adults in Davao City

Aliguay, Shane Love A.; Ancheta, Erlen Claire G.; Avila, Althea Mae L.; Avelino, Ara O.; Besoyo, Dever C.; Lastimosa, Gertrude Sheilo Y.; Rampak, Sittie Madeyah A.; Taguic, Zheian Daryll G.; Dr. Faller, Erwin M.

Pharmacy Department, School of Allied Health Sciences, San Pedro College, Davao City

ABSTRACT

This research seeks to determine the impact of a pharmacist-led Pre-exposure Prophylaxis program (PLPrEP) on young adults in Davao City, where the rising prevalence of HIV is of great public health and academic concern and PrEP awareness is very limited. This study utilized a quasi-experimental study design to measure and compare knowledge, perception, and acceptability of PrEP before and after a PLPrEP intervention, relative to a control group. The intervention, PrEP Talk, provided counseling and medication information via a pharmacist. The PrEP Talk intervention included a personalized experience among young adults regarding what PrEP is used for, potential side effects, qualifications, access, the benefits, and risks. The results provided evidence that PLPrEP program participants among young adults had clear improvements in knowledge and perception of PrEP in comparison to the participants before the PLPrEP program. Acceptability, while it did not show statistically significant immediate changes, still showed higher acceptability within the intervention relative to the control group. Effect sizes provided a substantial magnitude of practical impact on perception and acceptability indicated the value of pharmacist involvement. Overall, the study concluded that pharmacist-led interventions increased knowledge and perception, and significantly increased acceptability of PrEP within the defined community. These findings support the integration of pharmacists in HIV prevention strategies targeting young adults.

Keywords: *Pharmacist-Led PrEP program, Young adults, Knowledge, Perception, Acceptability, HIV PrEP, Quasi-experimental quantitative research*

1. INTRODUCTION

Human Immunodeficiency Virus (HIV) continues to be a worldwide public health issue, especially among susceptible individuals along with teenagers. The Department of Health of the Philippines has recorded a constant surge of HIV cases, often in individuals 15 to 24 years old. Despite the supply of clinical prevention strategies like Pre-Exposure Prophylaxis (PrEP), intake stays low because of inadequate awareness, stigma, and restraint to get admission to healthcare. Pharmacists, taken into consideration to be one of the most accessible healthcare specialists, perform a key role in filling this gap with the aid of supplying medical counseling, education, and referrals. This study introduces a strategy known as “PrEP Talk”, a pharmacist-led intervention model focused on improving the knowledge, belief, and acceptability of PrEP for most youths. By assessing its effectiveness, this study gives evidence of the developing frame of information assisting the power of pharmacists’ roles in public health tasks, especially within the combat against HIV.

2. METHOD

2.1 Research Design

This study uses quasi-experimental quantitative design as an approach to evaluate the effectiveness of a pharmacist led HIV PrEP program (PLPrEP) on young adults’ knowledge, perception, and acceptability. This design allows researchers to explore causal relationships without randomization, making it ideal for sensitive topics like HIV where recruitment of participants to participate may be difficult. The intervention, which consists of the pharmacist-led sessions will be evaluated by indicators. Quasi-experimental methods are often used in health related studies due to ethical and feasibility issues when randomization is not possible, especially with a limited scope study.

2.2 Research Locale

The evaluation on the effectiveness of the pharmacist led PrEP program took place at the Jefferyi by the LoveYourself Wellness Center in Davao City. Considerable focus was placed on pharmacists led intervention because the pharmacist had the ability to evaluate medications for interactions and side effects. Participants were drawn from the Center's database and completed a pre-and post program self administered questionnaire. The on the ground implementation of the program also allowed the participants to receive practical knowledge and answer questions from the information given. The program was launched during the second semester of the 2023-2024 academic year.

2.3 Research respondent

Participants in the study consisted of young adults between the ages of 18 to 24 who were part of the Jefferyi by LoveYourself Program based in Davao City. It was decided that the participants would be selected through purposive sampling and so only those who were willing to join and met the study's inclusion criteria were considered. Participants who met the criteria but chose not to take part were excluded. The pharmacists who attended to the eligible participants screened them by simply asking if they were within the target age bracket without in any way trying to elicit their ages. Interested participants were given a consent form and underwent a one-on-one orientation session where they were briefed about the study. For the control group, this was done by wellness center staff members so that there was no contact at all between the researchers and the subjects. Assessments such as pre-assessments for the intervention were conducted prior in addition to capturing response data during the process using pseudonyms for anonymity. access to all collected data was strictly limited to authorized personnel only ensuring confidentiality and security. The participants were also allowed to opt out of the study anytime without consequences which aligned with the ethical guidelines of the research.

2.4 Eligibility Criteria

Inclusion criteria

1. Participants must be 18 - 24 years old (Vulnerable group will not be included)

Exclusion Criteria

1. Those who are not 18-24 years old
2. Opt out of the study

2.5 Research Instruments:

The impact of a pharmacist-led HIV prevention program, specifically the PrEP Talk program, was brought to the attention of the study's researchers. The aim of this program was to prepare young adults who qualify for HIV pre-exposure prophylaxis (PrEP) through a pharmacist-guided protocol. As part of the program, participants were required to take an anonymous survey to determine their baseline understanding, attitudes, and readiness to take up PrEP. The intervention was based on individual registered pharmacist sessions that involved at least one session of counseling and, if appropriate, PrEP dispensing with supplemental education about the drug or its counseling as PrEP teaching sessions. These sessions took place four times per week for three to four weeks during the academic semester at the Jefferyi by LoveYourself Wellness Center. Participants were asked to fill out a post-program survey to measure changes in knowledge, perceptions, and acceptability after the sessions.

The researchers collected data using a survey that was modified from one developed by Laopaiboonkun and colleagues as well as Bunting and company. The survey had two parts (one given before the program and one after) with 33 questions each for a total of 66 questions. The questions for both parts were divided into three categories: knowledge, perception, and acceptability. Perception and acceptability were measured using a 4-point Likert scale (1=strongly agree; 4=strongly disagree). Knowledge questions were in true/false format. The knowledge part consisted of thirteen questions to measure how accurately participants understood the advantages of PrEP, how to use it, potential side effects or drug interactions, or its effectiveness in preventing HIV infection. The perception part comprised ten questions used to indicate participant views regarding some statements about PrEP. Likewise, the acceptability part included ten questions assessing participant agreement with statements related to utilizing the service of PrEP led by pharmacists. In order to analyze the data later on, paired t-tests were conducted to determine if there was any significant difference among participants' responses before and after participating in the program.

2.6 Data Collection Procedure

Data collection will be carried out in accordance with ethical standards with the oversight of the San Pedro College - Research Ethics Committee (SPC-ERC), as a means of protecting research participants from harm and monitoring the implementation of the study. At first, the researchers will establish protocols for best practices improving the engagement and flexibility of the pharmacist role. The research program, PrEP Talk will consist of a one-on-one counselling and medication education session with a registered pharmacist to provide holistic care; the integration will occur at Jefferyi by Loveyourself Wellness Center and participants will be recruited using purposive sampling according to the inclusion criteria. The intent will be to select participants possessing the capacity to produce useful and relevant insights depending on the study objectives; the researchers will use a thoughtful process of selection and thus do not need to solve for population size. Further, the research will give attention to a registered pharmacist who plays an

integral role in answering participant's questions about the medication Pre-Exposure prophylaxis (PrEP). From the PrEP Protocol approach, the program consists of a systematic approach including PrEP education, PrEP eligibility, PrEP inquiries, PrEP counseling, and PrEP access and including the medication dispensing, with the essential social support.

The integration will commence with the personnel from the wellness center facilitating the process. If this proposal for research study gets approved in the wellness context, the study will open and conduct individual one-on-one closed-door orientation regarding the informed consent by the registered pharmacist, Ms Keith Tanudtanud, RPh, with the prospective participants in a one-on-one sessions from March 21 to April 21, 2024 and will be assessed with the pre-program survey questionnaire to the participants for the determination of the participants voluntarily agreed to participate in the research study. The intervention will be coordinated respectively lead by the registered pharmacist every Thursday to Saturday and the control group will be coordinated by the wellness center personnel every Wednesday and Sunday. The only interaction with the participants will be with the person-in-charge of the wellness center and with the registered pharmacist. At no time will the researchers have direct contact with the participants to ensure anonymity and confidentiality. The data handling procedures must be followed to safeguard all information collected, all health records, will be confidential and only authorized personnel will have access. Participants will know their right to withdraw from the study, any time and free from consequences. While no one can be forced to participate, participants would be encouraged to cooperate fully, since withdrawal may potentially impair the scientific rigor of the study. Transparent solicitation of consent will be implemented to respect the respondents' autonomy with the pre-program survey that is distributed.

Following the enrollment process of the participants in taking part of the Pharmacist-led Pre-exposure Prophylaxis Program (PLPrEP), the PrEP education that will be provided by a registered pharmacist will cover the importance of the general PrEP information before the participants accepts PrEP as a protective measure against HIV. After the PrEP Education, the participants are now directed to the next part of the program which is called the PrEP eligibility. The eligibility of the participants to take PrEP will be checked which includes the necessary measures that are already established in the wellness center. This directs to the PrEP inquiries and counseling where the participants are catered to participant's questions and concerns regarding the PrEP medication. Medication-related questions and concerns will be addressed, including potential side effects and recommended practices. One-on-one counseling sessions with the pharmacist will be integrated as part of the program along with the distribution of a post-program survey questionnaire assessment.

Through the process where participants are being informed about the medication, the PrEP access as part of the program's protocol, the participants can now proceed to the doctor to receive a prescription in order to acquire the medication. After this process, the pharmacist will dispense PrEP, and later on the physician will conduct a follow-up checkup when the participants return for their own personal concerns. During this, the doctor will monitor the participants' health status or medication adherence, to ensure they take the medication consistently as prescribed, and assess the effectiveness of promoting overall sexual health and HIV prevention strategies. After the intervention the gathered data will be analyzed. The participants have the right to access their data by reaching out to the researchers regarding their data given the contact information provided in the informed consent. Additionally, the participants have the right to access their data by reaching out to the researchers regarding their data given the contact information provided in the informed consent after the intervention.

Data Analysis: The effectiveness of PLPrEP program led by pharmacist among young adults was evaluated using dependent sample t-test. Pre- and post-intervention data from the same participants were compared to determine whether there were significant changes. Independent sample t-test was used to compare the intervention and control groups' differences as they were different individuals. To quantify the intervention impact, Cohen's d was calculated by subtracting mean of control group from mean of intervention group and dividing it by the standard deviation of one group. This effect size analysis provided a descriptive measure of how strong is the impact of the program. These statistical analyses examined knowledge, perception and acceptability changes related to PrEP among the participant in program with comparison those not exposed to program.

3. RESULT

This section presents the entire data that seeks to determine the efficacy of integration pharmacist-led pre-exposure prophylaxis programs among young adults in Davao City. Descriptive and inferential statistics are done to answer the problems set in the study.

3.1 Level of Knowledge

Table 1 - Mean Level of Knowledge Among Young Adults In Davao City Before and After Pharmacist Led Intervention

ITEMS	BEFORE		AFTER	
	Mean	**Description**	**Mean**	**Description**
Pre-exposure Prophylaxis (PrEP) is a method used to prevent HIV transmission, which involves taking	93.3	Very high	100	Very high

medication before any potential exposure to HIV infection.				
It is necessary for a patient to be HIV-negative to take Pre-exposure Prophylaxis (PrEP).	93.3	Very high	93.3	Very high
Pre-exposure Prophylaxis (PrEP) is >90% effective in preventing HIV infection with daily dosing.	60.0	Moderate	66.7	High
A patient is protected against HIV immediately after beginning Pre-exposure Prophylaxis (PrEP).	40.0	Low	66.7	High
Pre-exposure Prophylaxis (PrEP) should be taken for seven (7) days daily to reach maximum protection against HIV infection.	73.3	High	86.7	Very high
At the first seven (7) days of taking Pre-exposure Prophylaxis (PrEP) medication, it is essential to avoid any risk factors of HIV transmission.	73.3	High	93.3	Very high
Pre-exposure Prophylaxis (PrEP) may be used as an oral medication to prevent HIV.	73.3	High	86.7	Very high
Based on WHO guidelines, Pre-exposure Prophylaxis (PrEP) can be obtained without a prescription from a physician.	40.0	Low	26.7	Low
Young adults (18-24 y.o.) with risk factors of getting HIV infection can take Pre-exposure Prophylaxis (PrEP).	86.7	Very high	100.0	Very high
Patients who are aiming to take Pre-exposure Prophylaxis (PrEP) should have no presence of kidney disease.	93.3	High	86.7	Very high
If a patient becomes HIV-positive while taking Pre-exposure Prophylaxis (PrEP), they may continue taking PrEP.	66.7	High	73.3	High
Patients taking Pre-exposure Prophylaxis (PrEP) should have a follow-up HIV test at 3-month intervals.	100	High	100	Very high
There can be possible side effects of taking Pre-exposure Prophylaxis (PrEP).	100	High	100	Very high
Overall Mean	**76.4**	**High**	**83.1**	**Very high**

The research results indicated that before the intervention, participants' mean perception levels were quite high across all items suggesting that participants already had a positive predisposition towards the PrEP and PLPrEP programs. Participants clearly believed they were knowledgeable about PrEP, that they were interested in taking PrEP, and that it was a responsible way of protecting their sexual health. Overall, the perception also implied that the PLPrEP program had some impact on improvement in knowledge, privacy and confidentiality, and the quality of education provided by materials.

Following the pharmacist-led intervention, mean perception levels improved across all items in the survey. Participants displayed even more of a positive predisposition toward PrEP and the PLPrEP program post-intervention, experienced improvement across other beliefs, such as their clear interest in taking PrEP, their confidence in the program's benefit, and perception that the program helped reduce HIV prevention stigma.

The overall data provided indications of a positive effect of pharmacist-led intervention in increasing young adult knowledge about PrEP in Davao City. The average knowledge level after the pharmacist-led intervention suggested a significant positive change of at least one level, with a high knowledge classification changing to a very high knowledge classification. These findings highlight how the inclusion of pharmacist-led programs may have been beneficial in improving knowledge, awareness, and understanding of PrEP among the targeted population, leading to potentially more informed choice and healthier habits regarding HIV prevention.

3.2 Level of Perception

Table 2 presents analysis data from the mean level of perception from the young adults of Davao City on Pre-exposure Prophylaxis (PrEP) before and after pharmacist-led intervention and provides components of the perceptions, attitudes and beliefs free from the mediation of other variables related to each aspect of PrEP and the pharmacist-led HIV Pre-exposure prophylaxis program (PLPrEP).

TABLE 2 - Mean Level of Perception Among Young Adults in Davao City Before and After Pharmacist Led Intervention

ITEMS	BEFORE		AFTER	
	Mean	**Description**	**Mean**	**Description**
I believe I am familiar with the concept of Pre-exposure Prophylaxis (PrEP).	3.40	Very high	3.80	Very high
I believe I have acquired information and made inquiries about Pre-exposure Prophylaxis (PrEP).	3.40	Very high	3.73	Very high
I think I am interested in taking Pre-exposure Prophylaxis (PrEP).	3.87	Very high	3.87	Very high
I personally think that I should be taking Pre-exposure Prophylaxis (PrEP).	3.73	Very high	3.87	Very high
I think there is a need to consult a medical health provider with the intention of taking Pre-exposure Prophylaxis (PrEP).	3.87	Very high	4.00	Very high
I believe that taking Pre-exposure Prophylaxis (PrEP) is a responsible step in protecting my sexual health.	3.93	Very high	3.93	Very high
I believe that the Pharmacist-led HIV Pre-Exposure Prophylaxis (PLPrEP) will be effective in improving my understanding of Pre-exposure Prophylaxis (PrEP).	3.73	Very high	3.93	Very high
I believe that the Pharmacist-led HIV Pre-Exposure Prophylaxis (PLPrEP) program maintains a high level of privacy and confidentiality, positively impacting my comfort and openness in discussing related concerns.	3.80	Very high	3.93	Very high
I believe that the educational materials provided by Pharmacist-led HIV Pre-Exposure Prophylaxis (PLPrEP) programs are clear, easy to understand, and contribute to my knowledge about HIV prevention.	3.67	Very high	3.87	Very high
I believe that Pharmacist-led HIV Pre-Exposure Prophylaxis (PLPrEP) programs will contribute to reducing stigma associated with HIV prevention, fostering a more open and accepting community dialogue.	3.87	Very high	4.00	Very high
Overall Mean	**3.73**	**Very high**	**3.89**	**Very high**

Results of the study showed that prior to the intervention, the mean perception levels were consistently high which demonstrated the respondents were predisposed to a positive perception of PrEP and the PLPrEP program. Respondents indicated overwhelming confidence that they knew what PrEP was, that they were interested in taking it, and that PrEP is a responsible way to protect sexual health. Further, the overall level of perceptions of an effective PLPrEP program that improved understanding and privacy/confidentiality and provided a clear educational product were also consistently high.

Immediately after the pharmacist-led intervention, there was a marked improvement in the mean levels of perceptions of each of the surveyed items. Respondents indicated an even greater confidence and higher beliefs and attitudes of PrEP and the PLPrEP program. Pre-post improvements were specifically noted related to respondents' interest in taking PrEP, confidence that the program worked and thoughts on the program's impact on reducing HIV prevention stigma.

Overall, as shown in Table 2, the data indicates an unwaveringly high level of positivity for PrEP and pharmacist-led initiatives for all groups of young adults in Davao City. Additionally, there is further consolidation of attitudes and beliefs from the post-intervention mean perceptions level, and indicates the relevance and growing effectiveness of pharmacist-led initiatives to provide positive informed choices, stimulating health choices, and to address barriers for HIV prevention.

3.3. Level of Acceptability

Table 3 discusses young adults in Davao City both before and after experiencing the intervention related to Preexposure Prophylaxis (PrEP) and pharmacist-led interventions. This indicates the mean level of acceptability participants expressed about these two topics and answers the question of what their willingness or openness is to use PrEP and the Pharmacist-led HIV Pre-Exposure Prophylaxis (PLPrEP) program as strategies to prevent possible HIV infection.

TABLE 3 - Mean Level of Acceptability Among Young Adults in Davao City Before and After Pharmacist Led Intervention

ITEMS	BEFORE		AFTER	
	Mean	**Description**	**Mean**	**Description**
I am willing to take Pre-exposure Prophylaxis (PrEP).	3.80	Very high	3.80	Very high
I am willing to take Pre-exposure Prophylaxis (PrEP), if PrEP effectively reduces the risk and protects myself from getting HIV infection but will have some mild side effects.	3.87	Very high	3.73	Very high
I am willing to take Pre-exposure Prophylaxis (PrEP) once a day to protect myself from getting HIV infection.	3.67	Very high	3.87	Very high
I am willing to take Pre-exposure Prophylaxis (PrEP) as a responsible step in protecting my sexual health.	3.93	Very high	3.87	Very high
I am willing to consider discussing Pre-exposure Prophylaxis (PrEP) with the Pharmacist as a potential prevention strategy.	3.93	Very high	4.00	Very high
I am willing to trust Pharmacists to provide accurate information about Pre-exposure Prophylaxis (PrEP).	3.93	Very high	3.93	Very high
I am willing to accept the idea of pharmacists being actively involved in educational initiatives to raise awareness about HIV Pre-Exposure Prophylaxis.	3.93	Very high	3.93	Very high
I am willing to recommend a Pharmacist-led HIV PrEP Program to friends or family members who may benefit from such services.	3.80	Very high	3.93	Very high
I am willing to accept the Pharmacist-led HIV Pre-Exposure Prophylaxis (PLPrEP) Program as an educational program to understand the concepts and general information about Pre-exposure Prophylaxis (PrEP).	3.87	Very high	3.87	Very high

I am willing to accept the Pharmacist-led HIV PrEP Program as a beneficial asset towards young adults to make firm decisions concerning their sexual health.	3.93	Very high	4.00	Very high
Overall Mean	**3.87**	**Very high**	**3.89**	**Very high**

Prior to implementation of the pharmacist-led programs, results indicated very high mean acceptability levels with participants being likely to consider and accept PrEP and pharmacist-led programs. Participants indicated willingness to take PrEP, trust in pharmacists to provide accurate information, and acceptance of the role of pharmacists in implementing educational programs to promote PrEP.

After the pharmacist-led program, it was clear that the mean acceptability levels on survey items did increase. Participants were even more likely and open to PrEP and pharmacist-led programs after the pharmacist-led programs were implemented. Participants were more willing to take PrEP daily, trusted pharmacists, and would recommend the PLPrEP program to others.

In summary, results in Table 3 indicated a consistently high acceptability level of HIV prevention strategies for young adults in Davao City, both before and after pharmacist-led programs were implemented. The post-program mean acceptability level is an indication of an increasing level of willingness and openness indicating the usefulness of pharmacist-led programs to increase acceptance, trustworthiness, and engagement with HIV prevention approaches for the target population.

3.4. Significant Difference

The outcomes of the significant tests undertaken to assess the differences in the level of knowledge, perception, and acceptability among the younger, adult group of participants of the Pharmacist-led HIV Pre-Exposure Prophylaxis (PLPrEP) program of Davao City are presented in Table 4. The purpose of the table is to determine if there were any statistically significant differences in the level of knowledge, perception, and acceptability that happened before and after, and when the PLPrEP program was implemented and when it was not implemented.

TABLE 4A - Testing The Significance Difference On The Level of Knowledge, Perception and Acceptability Before and After Among Young Adults on PLPrEP Program

Test Variables		**Mean**	**SD**	**T value**	**P value**	**Remarks***
Knowledge	Before	76.4	26.66	2.209	.047	Significant
	After	83.1	20.84			
Perception	Before	3.73	0.19	4.16	.002	Significant
	After	3.89	0.08			
Acceptability	Before	3.86	0.09	2.24	.051	Not significant
	After	3.94	0.06			

*Calculation was performed at .05 level of significance

The findings demonstrate important changes in knowledge and perception levels pre- and post-intervention. The mean knowledge level pre-intervention was 76.4, which increased to 83.1 post-intervention. Because the t-value was 2.209 and p value was .047, the increase in knowledge was statistically significant. The same statistically significant change was observed in perception levels, which increased from a mean score of 3.73 to 3.89 pre- and post-intervention respectively. The t-value of 4.16 and p value of .002 indicate that this change in perception was also statistically significant.

With respect to acceptability, however, it would appear that there was not a significant change in levels pre- and post-intervention of the PLPrEP program. The mean level of acceptability score pre-intervention was 3.86, post-intervention was 3.94. Although acceptability increased, the t value of 2.24 and p = .051 indicates that this change was not statistically significant.

In conclusion, the results in Table 4A indicated the PLPrEP program was successful in improving the knowledge and perception levels among young adults in Davao City. While there was not a statistically significant change in the acceptance, the program continues to show change in knowledge and perception levels about HIV prevention strategies for the target population.

TABLE 4B - Testing The Significance Difference On The Level of Knowledge, Perception and Acceptability With and Without After Among Young Adults on PLPrEP Program

Test Variables		Mean	SD	T value	P value	Remarks*
Knowledge	With	83.07	20.84	0.153	.881	Not significant
	Without	82.4	27.90			
Perception	With	3.89	0.08	3.539	.006	Significant
	Without	3.70	0.20			
Acceptability	With	3.94	0.06	2.295	.047	Significant
	Without	3.83	0.16			

*Calculation was performed at .05 level of significance

The findings indicate interesting findings on knowledge, perception, and acceptability among those who received the PLPrEP program and those who have not. Knowledge showed no significant differences for individuals that received exposure to the PLPrEP program. Both groups showed similar means in knowledge, with 83.07 in the program and 82.4 in the "not program" category.

Yet, the levels of perception and acceptability showed significant differences between groups. Participants who were exposed to the PLPrEP had significantly higher perception scores, with a mean of 3.89, while individuals not in the program had a mean perception score of 3.70. In the case of acceptability, individuals exposed to the PLPrEP program had significantly higher acceptability scores, with a mean score of 3.94, while individuals in the "not program" were at 3.83.

Overall, the data presented in Table 4B demonstrate a meaningful influence of the PLPrEP program on perception and acceptability levels among young adults in Davao City. Although there were no differences in knowledge for either the former or latter program participants, the program did help create positive perceptions and acceptability for the HIV prevention strategies, demonstrating the programs success in producing positive perceptions and behavior by the target population.

3.5. Effect Size

Table 5 indicates the effect size analysis of the participants' level of knowledge, perception, and acceptability of the results of those who received support of Pharmacist-led HIV Pre-Exposure Prophylaxis (PLPrEP) program in Davao City. Effect size is calculated using Cohen's d and helps quantify the amount of difference seen between the pre- and post- intervention groups providing an understanding of practical significance of the program's effect on those factors.

TABLE 5 - Effect Size on Level of Knowledge, Perception, and Acceptability

Test Variables	Cohen’s d	Remarks*
Knowledge	0.03	Small
Perception	1.25	Large

Acceptability	0.94	Large

*Small = 0.20; Medium = 0.50; large = 0.80

The findings indicate different effect sizes pertaining to knowledge, perception, and acceptability; knowledge had the smallest effect size, a Cohen's d of 0.03, suggesting a small practical impact of PLPrEP on participants' knowledge levels towards HIV prevention strategies. Statistically significant differences in knowledge levels may exist, however the practical implications of these changes in knowledge may be negligible.

In comparison, perception, and acceptability had much larger effect sizes. For perception, the effect size is large at 1.25, suggesting a large practical impact of PLPrEP on participants' perceptions towards HIV prevention strategies. This indicates that the program had a considerable effect on participants' attitudes, beliefs, and perceptions of the importance of the use of PrEP and related interventions.

For acceptability, the effect size is also large at .94, suggesting a large practical impact of PLPrEP on participants' acceptability and willingness to engage with HIV prevention strategies. In essence, the program had a meaningful effect on participants' willingness to consider and accept PrEP as a prevention strategy, and their willingness to engage with pharmacists - when they provide the intervention and the educator component.

In summary, the results presented in Table 6 highlight the substantially positive effect of the PLPrEP program on perception and acceptability for participants who were young adults in Davao City. Though the effect size for knowledge is small, the program has considerable practical significance for influencing participants' perception and attitudes towards HIV prevention strategies, which underscores the program's success in changing behaviours, and encouraging participants to consider preventive measures before becoming at risk of HIV.

4. DISCUSSION

This section critically evaluates, discusses, and analyzes the importance of the findings considering the existing understanding of the study problem. It also explores any new insights that emerged from the thematic analysis of the data collected through symposium conducted and questionnaires administered by the researchers.

4.1 Level of Knowledge

Table 1A shows the mean knowledge levels before and after the pharmacist-led intervention. Before the intervention, the overall mean knowledge level was categorised as High (76.4), suggesting a solid fundamental understanding of PrEP's purpose, effectiveness, and general use. Participants generally knew PrEP was for HIV prevention and necessary for those at risk, understanding adherence was important. However, specific items like the necessity of being HIV-negative before starting PrEP and the recommended duration for maximum protection had relatively lower scores initially. For example, only 40.0% initially knew a patient is protected immediately after starting PrEP (incorrect), and only 40.0% knew PrEP cannot be obtained without a prescription based on WHO guidelines (incorrect).

Following the intervention, the overall mean knowledge level increased to Very High (83.1). This increase reflects a more comprehensive understanding, including being HIV-negative before starting PrEP, adherence protocols, potential side effects, duration for optimal effectiveness, and the need for follow-up testing. Significant improvements were noted in understanding PrEP effectiveness, adherence recommendations, and the importance of regular HIV testing. For instance, understanding that protection is *not* immediate increased from 40.0% to 66.7% (though still not reaching very high), and understanding the need for seven days of daily dosing for maximum protection increased from 73.3% (High) to 86.7% (Very High). Understanding that patients should have a follow-up HIV test at 3-month intervals was already High/Very High (100%) before and remained so after. These results support previous research indicating that pharmacist-led interventions can significantly improve understanding and willingness regarding PrEP.

However, despite the statistically significant increase in knowledge after the intervention ($p = .047$), the effect size was minimal ($d = 0.03$), indicating a small practical impact. This suggests that although knowledge improved statistically, the magnitude of the change might be considered negligible in practical terms. This small impact could be attributed to participants already possessing substantial prior knowledge, potentially from external sources such as community-based organisations (CBOs) like LoveYourself where the study took place. The intervention might have primarily reinforced existing knowledge rather than introducing entirely new concepts on a large scale.

Comparing the intervention group ("With") and control group ("Without"), there was no significant difference in knowledge levels ($p = .881$). This supports the idea that participants, regardless of intervention exposure, likely had similar baseline knowledge due to their engagement with the CBO. This finding aligns with the small effect size observed for knowledge gain within the intervention group.

4.2 Level of Perception

Before the intervention, mean perception levels were already consistently Very High (3.73 overall). This indicates a strong positive initial attitude, with participants expressing high familiarity with PrEP, interest in taking it, and viewing its use as a responsible health measure. Perception of the PLPrEP program's effectiveness in enhancing understanding, maintaining privacy, and providing clear materials was also very high.

After the intervention, perception levels remained Very High (3.89 overall), showing a notable enhancement across all items. Participants exhibited even stronger positive beliefs and attitudes. For example, agreement with the statement "I believe that the Pharmacist-led HIV Pre-Exposure Prophylaxis (PLPrEP) will be effective in improving my understanding of Pre-exposure Prophylaxis (PrEP)" increased from a mean of 3.73 to 3.93. Belief that PLPrEP contributes to reducing stigma increased from 3.87 to 4.00. The statistically significant increase in perception after the intervention ($p = .002$) confirms the program's positive influence.

The effect size for perception was substantial ($d = 1.25$), indicating a large practical impact. This signifies that the program meaningfully influenced participants' attitudes and beliefs regarding PrEP and pharmacist-led interventions. The sources suggest that the already high initial perception meant the intervention reinforced existing positive beliefs rather than causing a fundamental shift. This aligns with studies showing pharmacist-led interventions fostering positive attitudes and trust in PrEP.

Comparing the groups, participants exposed to the PLPrEP program had significantly higher perception scores ($p = .006$) compared to those without the intervention. This demonstrates the program's strong influence on shaping attitudes, even if baseline knowledge was similar across groups.

4.3 Level of Acceptability

Participants showed a strong willingness to consider and engage with these strategies, expressing readiness to take PrEP and trust in pharmacists for information. For example, willingness to trust pharmacists for accurate PrEP information had a mean of 3.93 both before and after. Willingness to accept pharmacists' involvement in educational initiatives also showed high means (3.93 before, 3.93 after).

Following the intervention, acceptability levels showed a slight increase across all items, remaining Very High (3.89 overall). Participants showed greater willingness to take daily PrEP and recommend the program.

However, despite the high initial levels and slight increase, the change in acceptability before and after the intervention was not statistically significant ($p = .051$). The sources attribute this to deeply entrenched factors like self-stigma associated with PrEP use, influenced by broader societal misconceptions, which are often resistant to change through simple interventions. The one-month duration of the intervention might have been insufficient to significantly impact acceptability compared to longer programs.

Despite the lack of statistically significant change *within* the intervention group, comparison with the control group showed a significant difference in acceptability ($p = .047$). Participants exposed to the PLPrEP program had significantly higher acceptability scores than those without the intervention. This reinforces the program's effectiveness in increasing openness towards PrEP when compared to no intervention, even if other barriers limit further increases within the intervention group over the study period.

The effect size for acceptability was large ($d = 0.94$), indicating a substantial practical impact. This suggests the program significantly influenced participants' readiness to consider and adopt PrEP and their openness to pharmacist-led interventions. This highlights the program's meaningful influence on willingness, despite the statistical significance test suggesting the change from pre- to post-intervention within the same group wasn't strong enough to rule out chance.

4.4 Significant Difference

The results indicate that the PLPrEP program effectively improved knowledge and particularly perceptions of PrEP among young adults in Davao City. The consistently high perception and acceptability scores at baseline suggests that young adults were already predisposed toward PrEP and likely already had the attitude, based on previous exposure to information, possibly provided by community-based organizations (CBOs) like LoveYourself. Therefore, the intervention was able to enhance that attitude, and provide enhanced knowledge.

While the knowledge scores increased statistically, the marginal, practical impacts suggest that the intervention was better at reinforcing existing knowledge and correcting misunderstandings than conveying new information. The large, practical effect on perception and acceptability is important because the program was able to shape attitudes and increase willingness to adopt PrEP, regardless of the change in acceptability from pre- to post-intervention was not statistically significant. There are many interventions that, even with education, require a different intervention or longer amount of time (stigma) to overcome.

The current results supported theoretical models that indicate health behaviors are often related to beliefs and perceptions (Health Belief Model), or are learned from others or various interaction (Social Cognitive Theory). The pharmacist's role in this intervention, with the provision of information and counselling, can help participants correct misunderstood knowledge and eliminate stigma; and as previous literature supports, can lead to positive attitudes & acceptance.

The study supports integrating pharmacists into HIV prevention strategies, demonstrating their crucial role in enhancing knowledge and perception, and fostering greater acceptability of PrEP among young adults. However, addressing persistent barriers like stigma remains essential for further improving PrEP acceptability.

5. CONCLUSION

This quasi-experimental study has been conducted to assess the effectiveness of a pharmacist led PrEP program for young adults in Davao city, which is an area of HIV prevalence increasing and has a low level of awareness of PrEP. A key objective was to respond to the necessary research which needs clearer focus and a series of specific responses, by exploring how this intervention which involved pharmacist led one-to-one counselling and medication knowledge, impacts knowledge, perception, and desire to access PrEP among young adults (18-24 years). The global exposure of new HIV cases is rising and the fastest growth rate is the Asia-Pacific Region that includes young Filipinos, therefore this research was an attempt to address identified challenges and gaps in the evidence for measuring the effectiveness of PLPrEP in the Philippines. Overall the research has illustrated that the PLPrEP program was effective in increasing knowledge, and significantly improving perceptions and acceptability among young adults; the PLPrEP program definitely had a substantial impact on the attitudes and approvals around accessing ultimately more openness towards PrEP. The benefits of developing this research further and the relevance of its contribution to society were evident. The research provides robust evidence for the inclusion of pharmacists in HIV prevention methodologies, strengthens their contribution to increasing knowledge, enhancing positive beliefs, and developing greater acceptability of PrEP in young adults. Pharmacists are available and are drug experts with counselling skills and knowledge about medication access, and can help to increase patient understanding of PrEP, enhance adherence and risk reduction counselling, and facilitate PrEP integration ultimately leading to prevention and reaching underserved people that would contribute toward reducing HIV transmission. As the overall aim of this research is to educate young adults about PrEP as an effective prevention strategy, if they feel empowered by their knowledge and experiences, they could become advocates for their own health and engage in conversations on sexual health. It by no means serves as another avenue to increase prevention strategies driving positive public health implications by increasing PrEP acceptability on a wider scale, and potentially reducing rates of HIV transmission within the community.

REFERENCES

1. World Health Organization: WHO & World Health Organization: WHO. (2023). HIV and AIDS. www.who.int. https://www.who.int/news-room/fact-sheets/detail/hiv-aids?gclid=CjwKCAjw7c2pBhAZEiwA88pOF560dwYiuo6eWyF2C3_jQ7QXgFYot-1Lx5w2I550qOI3Pe3oiTjk5xoC2iYQAvD_BwE
2. *Global PREP Network*. (n.d.). https://www.who.int/groups/global-prep-network
3. DOH, PNAC draft strategies vs. HIV, AIDS epidemicThe strategies formulated by the DOH and the PNAC were harmonized with the previously developed 7th AIDS Medium Term Plan, which highlights the five strategic pillars of the master plan: Prevent, Treat, Protect, Strengthen, and Sustain. According to DOH HIV/AIDS and ART Registry of the Philippines, a total of 12,859 HIV cases and 878 deaths ...https://www.pna.gov.ph/articles/1193752
4. DOH Epidemiology Bureau. HIV/AIDS and ART Registry of the Philippines. https://doh.gov.ph/sites/default/files/statistics/HARP-Report_January-AIDSreg2023_withAdvisory.pdf
5. HIV/AIDS data hub for the Asia Pacific. (n.d.). HIV/AIDS Data Hub for the Asia Pacific. https://www.aidsdatahub.org/resource/hiv-aids-and-art-registry-philippines-august-2018
6. Jaymalin, M. (2023, March 12). Pinoy teens, young children getting HIV. Philstar.com. https://www.philstar.com/headlines/2023/03/13/2251241/pinoy-teens-young-children-getting-hiv
7. HIV testing and pre-exposure prophylaxis (PrEP) in the Philippines: Where and how? (n.d.). Healthy Pilipinas: Health Information for All Filipinos. https://www.healthypilipinas.ph/news-and-articles/hiv-testing-and-pre-exposure-prophylaxis-prep-in-the-philippines-where-and-how
8. Baeten, J.M., Grant, R. Use of Antiretrovirals for HIV Prevention: What Do We Know and What Don't We Know?. Curr HIV/AIDS Rep 10, 142–151 (2013). https://doi.org/10.1007/s11904-013-0157-9
9. Pyra, M., Haberer, J., Hasen, N., Reed, J., Mugo, N., & Baeten, J. M. (2019). Global implementation of PrEP for HIV prevention: setting expectations for impact. Journal of the International AIDS Society, 22(8). https://doi.org/10.1002/jia2.25370
10. LoveYourself Inc. (2020, November 11). HIV Prevention - LoveYourself Inc. https://loveyourself.ph/hiv-prevention/#:~:text=PrEP%20Pilipinas&text=PrEP%20is%20a%20biomedical%20intervention,virus%20from%20establishing%20an%20infection.
11. Havens, J. P., Scarsi, K. K., Sayles, H., Klepser, D. G., Swindells, S., & Bares, S. H. (2019). Acceptability and feasibility of a Pharmacist-Led Human Immunodeficiency Virus Pre-Exposure Prophylaxis Program in the Midwestern United States. Open Forum Infectious Diseases, 6(10). https://doi.org/10.1093/ofid/ofz365
12. Restar, A., Surace, A., Adia, A., Goedel, W. C., Ogunbajo, A., Jin, H., Edeza, A., Hernandez, L., Cu-Uvin, S., & Operario, D. (2022). Characterizing Awareness of Pre-Exposure prophylaxis for HIV prevention in Manila and Cebu, Philippines: Web-Based Survey of Filipino cisgender men who have sex with men. Journal of Medical Internet Research, 24(1), e24126. https://doi.org/10.2196/24126

13. Freeborn, K., & Portillo, C. J. (2018). Does pre-exposure prophylaxis for HIV prevention in men who have sex with men change risk behaviour? A systematic review. Journal of Clinical Nursing, 27(17–18), 3254–3265. https://doi.org/10.1111/jocn.13990

14. Kelley, C. F., Kahle, E., Siegler, A. J., Sanchez, T., Del RíO, C., Sullivan, P. S., & Rosenberg, E. S. (2015b). Applying a PREP continuum of care for men who have sex with men in Atlanta, Georgia. Clinical Infectious Diseases, 61(10), 1590–1597. https://doi.org/10.1093/cid/civ664

15. Kudu, I., Pillay, V., & Moodley, B. (2022). Antiretrovirals (ARVs) in the environment. In *Elsevier eBooks* (pp. 227–239). https://doi.org/10.1016/b978-0-12-822850-0.00006-5

16. Catallozzi, M. (2008). Human immunodeficiency virus. In *Elsevier eBooks* (pp. 220–228). https://doi.org/10.1016/b978-032304073-0.10029-9

17. Allsworth, J. E., & Goldman, M. B. (2017). Populations at special health risk: women. In *Elsevier eBooks* (pp. 609–616). https://doi.org/10.1016/b978-0-12-803678-5.00350-7

18. Letshwenyo-Maruatona, S., Madisa, M., Boitshwarelo, T., George-Kefilwe, B., Kingori, C., Ice, G. H., Bianco, J. A., Marape, M., & Haile, Z. T. (2019). Association between HIV/AIDS knowledge and stigma towards people living with HIV/AIDS in Botswana. *African Journal of AIDS Research*, *18*(1), 58–64. https://doi.org/10.2989/16085906.2018.1552879

19. Yang, D., Allen, J. E., Mahumane, A., Riddell, J., & Yu, H. (2023). Knowledge, stigma, and HIV testing: An analysis of a widespread HIV/AIDS program. *Journal of Development Economics*, *160*, 102958. https://doi.org/10.1016/j.jdeveco.2022.102958

20. Staff, R. (2017, August 1). Philippines has highest HIV infection growth rate in Asia-Pacific: U.N. *U.S.* https://www.reuters.com/article/us-health-aids-philippines-idUSKBN1AH3CW

21. Gangcuangco, L. M. A., & Eustaquio, P. C. (2023). The state of the HIV epidemic in the Philippines: progress and challenges in 2023. Tropical Medicine and Infectious Disease, 8(5), 258. https://doi.org/10.3390/tropicalmed8050258

22. *Addressing the HIV crisis in the Philippines during the COVID-19 pandemic*. (2023, July). The Lancet - HIV; The Lancet - HIV. https://doi.org/10.1016/S2352-3018(23)00133-9

23. Alibudbud, R. (2021). The Philippine HIV crisis and the COVID-19 pandemic: a worsening crisis. *PMC COVID-19 Collection*. https://doi.org/10.1016/j.puhe.2021.09.008

24. Della Sala, S. (2020). Quality of life and its determinants among filipino patients living with HIV/AIDS enrolled in treatment hub of a tertiary government hospital. *International Journal of Infectious Diseases*, *101*, 286. https://doi.org/10.1016/j.ijid.2020.09.746

25. *Mindanao AIDS Advocates.* (n.d.). https://sites.google.com/view/mindanao-aidsadvocates/home

26. Alderite, T. O. (2013). *Factors Determining the Knowledge and Awareness of Human Immunodeficiency Virus among Fourth Year High School Students in Davao City*. https://ejournals.ph/article.php?id=13179

27. McFarlane, M. (2000). The internet as a newly emerging risk environment for sexually transmitted diseases. JAMA, 284(4), 443. https://doi.org/10.1001/jama.284.4.443

28. McFarlane, M., Bull, S., & Rietmeijer, C. A. (2002). Young adults on the Internet: risk behaviors for sexually transmitted diseases and HIV1 The full text of this article is available via JAH Online at http://www.elsevier.com/locate/jahonline. Journal of Adolescent Health, 31(1), 11–16. https://doi.org/10.1016/s1054-139x(02)00373-7

29. Rangel, M. C., Gavin, L., Reed, C., Fowler, M. G., & Lee, L. M. (2006). Epidemiology of HIV and AIDS among Adolescents and Young Adults in the United States. *Journal of Adolescent Health*, *39*(2), 156–163. https://doi.org/10.1016/j.jadohealth.2006.02.011

30. Kyselyova, G., Martsynovska, V., Volokha, A., Nizova, N., Malyuta, R., Judd, A., Thorne, C., & Bailey, H. (2019). Young people in HIV care in Ukraine: a national survey on characteristics and service provision. *F1000Research*, *8*, 323. https://doi.org/10.12688/f1000research.18573.2

31. At Great Risk of HIV/AIDS: Young People in Eastern Europe and Central Asia. (2005). UNAIDS. https://www.unodc.org/pdf/event_2005-03-31_young_people.pdf

32. HIV in the Philippines now a 'Youth epidemic.' (2018, November 7). Sustained Health Initiatives of the Philippines. Retrieved December 7, 2023, from https://www.ship.ph/hiv-in-philippines-now-a-youth-epidemic/

33. HIV/AIDS & ART REGISTRY OF THE PHILIPPINES DECEMBER 2018 Average number of people newl. (2018, December). AIDS DATA HUB. Retrieved December 7, 2023, from https://www.aidsdatahub.org/sites/default/files/resource/eb-hiv-december-aidsreg2018.pdf

34. Goldstein, M., Archary, M., Adong, J., Haberer, J. E., Kuhns, L. M., Kurth, A., Ronen, K., Lightfoot, M., Inwani, I., John-Stewart, G., Garofalo, R., & Zanoni, B. C. (2022). Systematic Review of mHealth Interventions for Adolescent and Young Adult HIV Prevention and the Adolescent HIV Continuum of Care in Low to Middle Income Countries. *AIDS and Behavior*. https://doi.org/10.1007/s10461-022-03840-0

35. Louw, K.-A., Ipser, J., Phillips, N., & Hoare, J. (2016). Correlates of emotional and behavioural problems in children with perinatally acquired HIV in Cape Town, South Africa. *AIDS Care*, *28*(7), 842–850. https://doi.org/10.1080/09540121.2016.1140892

36. Hillis, A., Germain, J., Hope, V., McVeigh, J., & Van Hout, M. C. (2020). Pre-exposure Prophylaxis (PrEP) for HIV Prevention Among Men Who Have Sex with Men (MSM): A Scoping Review on PrEP Service Delivery and Programming. AIDS and Behavior, 24(11), 3056–3070. https://doi.org/10.1007/s10461-020-02855-9

37. Sundareshan, V. (2022, September 20). Preexposure prophylaxis for HIV prevention. StatPearls - NCBI Bookshelf. https://www.ncbi.nlm.nih.gov/books/NBK507789/

38. Ms, E. M. W. R. (2018, September 6). FAQ: Pre-Exposure prophylaxis (PREP) for HIV. WebMD. https://www.webmd.com/hiv-aids/prep-faq-preexposure-prophylaxis

39. Tetteh, R. A., Yankey, B. A., Nartey, E. T., Lartey, M., Leufkens, H. G. M., & Dodoo, A. (2017). Pre-Exposure prophylaxis for HIV prevention: safety concerns. Drug Safety, 40(4), 273–283. https://doi.org/10.1007/s40264-017-0505-6

40. PrEP in pregnancy: safe, but many unanswered questions. (2020, February 7). aidsmap.com.https://www.aidsmap.com/news/feb-2020/prep-pregnancy-safe-many-unanswered-questions

41. Camlin, C.S., Koss, C.A., Getahun, M. et al. Understanding Demand for PrEP and Early Experiences of PrEP Use Among Young Adults in Rural Kenya and Uganda: A Qualitative Study. AIDS Behaviour 24, 2149–2162 (2020). https://doi.org/10.1007/s10461-020-02780-x

42. McCormack, S., Dunn, D. T., Desai, M., et al. (2016). Pre-exposure prophylaxis to prevent the acquisition of HIV-1 infection (PROUD): effectiveness results from the pilot phase of a pragmatic open-label randomised trial. The Lancet, 387(10013), 53-60.

43. Grant, R. M., Lama, J. R., Anderson, P. L., et al. (2010). Preexposure chemoprophylaxis for HIV prevention in men who have sex with men. New England Journal of Medicine, 363(27), 2587-2599.

44. Centers for Disease Control and Prevention. (2018). Preexposure Prophylaxis for the Prevention of HIV Infection in the United States – 2017 Update: A Clinical Practice Guideline.

45. Goodreau, S. M., Hamilton, D. T., Jenness, S. M., et al. (2017). Targeting Human Immunodeficiency Virus Pre-Exposure Prophylaxis to Adolescent Sexual Minority Males in Higher Prevalence Areas of the United States: A Modeling Study. JAMA Pediatrics, 171(10), 965-972.

46. Hosek, S. G., Siberry, G., Bell, M., et al. (2017). The acceptability and feasibility of an HIV preexposure prophylaxis (PrEP) trial with young men who have sex with men. Journal of Acquired Immune Deficiency Syndromes, 74(2), 132-139.

47. Shamu, S. (2021, February 2). Pre-exposure prophylaxis (PrEP) awareness, attitudes and uptake willingness among young people: Gender differences and associated factors in two south african districts. *GLOBAL HEALTH ACTION*. https://www.tandfonline.com/doi/pdf/10.1080/16549716.2021.1886455

48. Lauren A. Stutts , Patrick A. Robinson , Brian Witt & Debra F. Terrell (2022) Lost in translation: College students' knowledge of HIV and PrEP in relation to their sexual health behaviors, Journal of American College Health, 70:2, 561-567, DOI: 10.1080/07448481.2020.1757679

49. Farmer, E. K., Koren, D. E., Cha, A., Grossman, K., & Cates, D. W. (2019). The Pharmacist's Expanding Role in HIV Pre-Exposure Prophylaxis. AIDS Patient Care and STDs, 33(5), 207–213. https://doi.org/10.1089/apc.2018.0294

50. Restar, A., Kuhns, L. M., Reisner, S. L., Ogunbajo, A., Garofalo, R., & Mimiaga, M. J. (2018). Acceptability of Antiretroviral Pre-exposure Prophylaxis from a Cohort of Sexually Experienced Young Transgender Women in Two U.S. Cities. *AIDS and Behavior*, *22*(11), 3649–3657. https://doi.org/10.1007/s10461-018-2127-0

51. Ssuna, B., Katahoire, A., Armstrong-Hough, M., Kalibbala, D., Kalyango, J. N., & Kiweewa, F. M. (2022). Factors associated with willingness to use oral pre-exposure prophylaxis (PrEP) in a fisher-folk community in peri-urban Kampala, Uganda. *BMC Public Health*, *22*(1). https://doi.org/10.1186/s12889-022-12859-w

52. Faryar, K. A., Braun, R., Ancona, R. M., Freiermuth, C. E., & Lyons, M. S. (2022). Acceptance of HIV pre-exposure prophylaxis (PrEP) referral among a sample of PrEP-eligible emergency department patients. *American Journal of Emergency Medicine*, *60*, 152–155. https://doi.org/10.1016/j.ajem.2022.07.055

53. Munthali, R., Stangl, A., Baron, D., Barré, I., Harvey, S., Ramskin, L., Colombini, M., Naicker, N., Kapiga, S., & Delany-Moretlwe, S. (2022). Prevalence and risk factors of PREP use stigma among adolescent girls and young women in Johannesburg, South Africa and Mwanza, Tanzania participating in the EMPOWER trial. *AIDS and Behavior*, *26*(12), 3950–3962. https://doi.org/10.1007/s10461-022-03721-6

54. Conrad, E., Misenar, S., & Feldman, J. (2017). Chapter 1 - Domain 1: Security risk management. In *Eleventh Hour CISSP* (11th ed.). https://doi.org/10.1016/b978-0-12-811248-9.00001-2

55. Ajayi, A. I., Mudefi, E., Yusuf, M., Adeniyi, O. V., Rala, N., & Ter Goon, D. (2019). Low awareness and use of pre-exposure prophylaxis among adolescents and young adults in high HIV and sexual violence prevalence settings. *Medicine*, *98*(43), e17716. https://doi.org/10.1097/md.0000000000017716

56. Ahouada, C., Diabaté, S., Mondor, M., Hessou, S., Guédou, F., Béhanzin, L., Batona, G., Gning, N. N., Zannou, D. M., & Alary, M. (2020). Acceptability of pre-exposure prophylaxis for HIV prevention: facilitators, barriers and impact on sexual risk behaviors among men who have sex with men in Benin. *BMC Public Health*, *20*(1). https://doi.org/10.1186/s12889-020-09363-4

57. Bunting, S. R., Garber, S. S., Goldstein, R. H., Ritchie, T. D., Batteson, T. J., & Keyes, T. (2020). Student education about pre-exposure prophylaxis (PREP) varies between regions of the United States. *Journal of General Internal Medicine*, *35*(10), 2873–2881. https://doi.org/10.1007/s11606-020-05736-y

58. Lindsay.Capozzi. (2023, June 1). *Integrating PREP into primary care for adolescents*. PolicyLab. https://policylab.chop.edu/project/integrating-prep-primary-care-adolescents

59. Nakamanya, S., Kawuma, R., Kibuuka, D., Kusemererwa, S., McCormack, S., Ruzagira, E., & Seeley, J. (2022). Assessing acceptability of pre-exposure prophylaxis (PrEP) among participants in an HIV vaccine preparedness study in southwestern Uganda. *PLOS ONE*, *17*(7), e0271104. https://doi.org/10.1371/journal.pone.0271104

60. Ekwunife, O. I., Ejie, I. L., Okelu, V., Mita, C., Durosinmi-Eti, O., Powell, A., & Franke, M. F. (2022). Interventions to increase the uptake and continuation of pre-exposure prophylaxis (PrEP) by adolescent girls and young women at high risk of HIV in low-income and middle-income countries: a scoping review. *BMJ Global Health*, *7*(12), e009474. https://doi.org/10.1136/bmjgh-2022-009474

61. Centers for Disease Control and Prevention. (2022, July 5). *Pre-exposure prophylaxis (prep)*. Centers for Disease Control and Prevention. https://www.cdc.gov/hiv/risk/prep/index.html

62. *HIV prevention*. LoveYourself Inc. (2020, November 11). https://loveyourself.ph/hiv-prevention/

63. *HTAC GUIDANCE: Oral PrEP for inclusion in the PNF*. Department of the Philippines Health Technology Assessment Department of Health. (2022). https://hta.doh.gov.ph/2022/02/10/rekomendasyon-ng-htac-sa-oral-prep/

64. Centers for Disease Control and Prevention. (2021). *Paying for Pre-Exposure Prophylaxis (PrEP): Ready, Set, PrEP*. Centers for Disease Control and Prevention. https://www.cdc.gov/hiv/basics/prep/paying-for-prep/index.html

65. World Health Organization. (2019). *'We are the community': Scaling up PrEP through community-based organizations in the Philippines*. World Health Organization. https://www.who.int/philippines/news/feature-stories/detail/we-are-the-community-scaling-up-prep-through-community-based-organizations-in-the-philippines

66. Malebranche, D., Watriss, A., & Dangerfield, D. T. (2022). *Implementing a National PrEP Program: How Can We Make It*. The Journal of law, medicine & ethics : a journal of the American Society of Law, Medicine & Ethics. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9341202/

67. Casal, C. C. (2019, December 1). *Is PrEP the key to ending our HIV epidemic?* CNN. http://www.cnnphilippines.com/life/culture/2019/12/1/HIV-PrEP.html

68. Meyerson, B. E., Dinh, P. C., Agley, J., Hill, B. H., Motley, D., Carter, G. A., Wasantha Jayawardene, & Ryder, P. T. (2019). Predicting Pharmacist Dispensing Practices and Comfort Related to Pre-exposure Prophylaxis for HIV Prevention (PrEP). Aids and Behavior, 23(7), 1925–1938. https://doi.org/10.1007/s10461-018-02383-7

69. Bruno, C., & Saberi, P. (2012). Pharmacists as providers of HIV pre-exposure prophylaxis. *International journal of clinical pharmacy*, *34*, 803-806.

70. Smith, B. D., Hester, A. M., Cantos, V. D., James, T. D., & Lora, M. (2019). 1280. A Pharmacist-led PrEP Program at the Epicenter of the HIV Epidemic in Atlanta; Our Experience. 6 (Supplement_2), S461–S461. https://doi.org/10.1093/ofid/ofz360.1143

71. Quinn, K., Dickson-Gomez, J., Zarwell, M., Pearson, B., & Lewis, M. (2019). "A gay man and a doctor are just like, a recipe for destruction": How racism and homonegativity in healthcare settings influence PrEP uptake among young Black MSM. *AIDS and Behavior*, *23*, 1951-1963.

72. Tung, E. L., Thomas, A., Eichner, A., & Shalit, P. (2018). Implementation of a community pharmacy-based pre-exposure prophylaxis service: a novel model for pre-exposure prophylaxis care. *Sexual health*, *15*(6), 556-561.

73. Nunn, A. S., Brinkley-Rubinstein, L., Oldenburg, C. E., Mayer, K. H., Mimiaga, M., Patel, R., & Chan, P. A. (2017). Defining the HIV pre-exposure prophylaxis care continuum. *AIDS (London, England)*, *31*(5), 731.

74. Rimer, B. K., & Viswanath, K. "Vish." (n.d.). *Health Behavior and Health Education*. Health Behavior and Health Education | Part Two, Chapter Three : Main Constructs. https://www.med.upenn.edu/hbhe4/part2-ch3-main-constructs.shtml

75. Castro, M., & Kraft, M. (2008, April 21). *Clinical Asthma (E-book)*. Google Books. https://books.google.com/books/about/Clinical_Asthma_E_Book.html?id=y9WYwLVn7pgC

76. Mckellar, K., & Sillence, E. (2020). *Teenagers, Sexual Health Information and the Digital Age*. Teenagers, Sexual Health Information and the Digital Age - 1st Edition. https://shop.elsevier.com/books/teenagers-sexual-health-information-and-the-digital-age/mckellar/978-0-12-816969-8

77. Washburn, L. (n.d.). *Understanding the Health Belief Model*. The University of Tennessee System. https://extension.tennessee.edu/publications/Documents/W931-C.pdf

78. Etheridge, J. (n.d.). *Translational Surgery*. ScienceDirect. https://www.sciencedirect.com/book/9780323903004/translational-surgery

79. Prochaska, J., & Velicer, W. (1997). *The transtheoretical model of Health Behavior Change*. American journal of health promotion : AJHP. https://pubmed.ncbi.nlm.nih.gov/10170434/

80. *Fact Sheet Talking about Fall Prevention with Your Patients*. Centers for Disease Control and Prevention. (2017). https://www.cdc.gov/steadi/pdf/STEADI-FactSheet-TalkingWPatients-508.pdf

81. Rimer, B. K., & Viswanath, K. "Vish." (n.d.). *Health Behavior and Health Education | Part Three, Chapter Eight: Key Constructs (Social Cognitive Theory)*. Health Behavior and Health Education Theory Research and Practice. (n.d.). https://www.med.upenn.edu/hbhe4/part3-ch8-key-constructs.shtml

82. Coulston, A., Rock, C., & Monsen, E. (2001). *Nutrition in the Prevention and Treatment of Disease*. ScienceDirect. https://www.sciencedirect.com/book/9780121931551/nutrition-in-the-prevention-and-treatment-of-disease

83. Modi , A., & Driscoll, K. (2020). *Adherence and Self-Management in Pediatric Populations*. ScienceDirect. https://www.sciencedirect.com/book/9780128160008/adherence-and-self-management-in-pediatric-populations

84. Yuvaraj, A., Mahendra, V., Chakrapani, V., Yunihastuti, E., Santella, A., Ranauta, A., & Doughty, J. (2020). *HIV and stigma in the healthcare setting*. Oral diseases. https://pubmed.ncbi.nlm.nih.gov/32862542/

85. Li , X., Stanton, B., Zhao, Q., Mao, R., & Zhang, L. (2011). *Effect of social cognitive theory-based HIV Education Prevention Program among high school students in Nanjing, China*. Health education research. https://pubmed.ncbi.nlm.nih.gov/21330355/

86. Riddell, J., Amico, K. R., & Mayer, K. H. (2018). HIV Preexposure Prophylaxis. JAMA, 319(12), 1261. https://doi.org/10.1001/jama.2018.1917

87. World Health Organization. (2021). HIV/AIDS. Www.who.int. https://www.who.int/health-topics/hiv-aids#tab=tab_1

88. McCree, D. H., Byrd, K. K., Johnston, M., Gaines, M., & Weidle, P. J. (2020). Roles for Pharmacists in the "Ending the HIV Epidemic: A Plan for America" Initiative. Public Health Reports, 135(5), 547–554. https://doi.org/10.1177/0033354920941184

89. Higley, E. (2019). Defining Young Adulthood. https://repository.usfca.edu/cgi/viewcontent.cgi?article=1017&context=dnp_qualifying

90. Lin, X. (2019). Review of knowledge and knowledge Management research. American Journal of Industrial and Business Management, 09(09), 1753–1760. https://doi.org/10.4236/ajibm.2019.99114

91. Lazzara, J. (2020, April 22). Sensation and perception. Pressbooks. https://open.maricopa.edu/intropsych/chapter/sensation-and-perception/#:~:text=While%20our%20sensory%20receptors%20are,%2C%20interpreted%2C%20and%20consciously%20experienced.

92. Adell, E., Várhelyi, A., & Nilsson, L. (2018). The definition of acceptance and acceptability. In CRC Press eBooks (pp. 11–22). https://doi.org/10.1201/9781315578132-2

93. Antwi, S. K., & Hamza, K. (2015). Qualitative and quantitative research paradigms in business research: A philosophical reflection. European journal of business and management, 7(3), 217-225.

94. White, H., & Sabarwal, S. (2014). Quasi-experimental design and methods. Methodological briefs: impact evaluation, 8(2014), 1-16.

95. Cook, T. D. (2015). Quasi-experimental design. Wiley encyclopedia of management, 1-2.

96. Quasi-experimental study: comparative studies. (2021, September 8). GOV.UK. https://www.gov.uk/guidance/quasi-experimental-study-comparative-studies

97. Harris, A. D., McGregor, J. C., Perencevich, E. N., Furuno, J. P., Zhu, J., Peterson, D. E., & Finkelstein, J. (2006). The use and interpretation of quasi-experimental studies in medical informatics. Journal of the American Medical Informatics Association, 13(1), 16-23.

98. Taliaferro, T., Layson-Wolf, C., Seung, H., Banjo, O., & Tran, D. (2021). Impact of pharmacist-led program on knowledge of college students about pre-exposure prophylaxis. *Journal of the American Pharmacists Association*, *61*(2), 206-212.

99. Thongsutt, T., Lao Paiboon Kun, S., Thanon, N., Thongthummachart, V., Yaena, A., & Muthanna, F. M. S. (2022). Awareness of existence, knowledge, and acceptability of HIV pre-exposure prophylaxis (PrEP) among university students in Thailand. Journal of Applied Pharmaceutical Science. https://doi.org/10.7324/japs.2022.121206

100. Bunting, S. R., Feinstein, B. A., Hazra, A., Sheth, N. K., & Garber, S. S. (2021). Knowledge of HIV and HIV pre-exposure prophylaxis among medical and pharmacy students: A national, multi-site, cross-sectional study. Preventive Medicine Reports, 24, 101590. https://doi.org/10.1016/j.pmedr.2021.101590

101. Gerald, B. (2018). A brief review of independent, dependent and one sample t-test. International Journal of Applied Mathematics and Theoretical Physics, 4(2), 50–54. https://doi.org/10.11648/j.ijamtp.20180402.13

102. Mishra, P., Singh, U., Pandey, C., Mishra, P., & Pandey, G. (2019). Application of student's t-test, Analysis of variance, and Covariance. Annals of Cardiac Anaesthesia, 22(4), 407–411. https://doi.org/10.4103/aca.aca_94_19

103. Wadhwa, R. R. (2023, January 16). T test. StatPearls - NCBI Bookshelf. https://www.ncbi.nlm.nih.gov/books/NBK553048/

104. Statistics Solutions. (2021, August 2). Effect size - Statistics solutions. https://www.statisticssolutions.com/free-resources/directory-of-statistical-analyses/effect-size/

105. Matyanga, C. M. J. (2014). The role of the pharmacist in Pre-Exposure prophylaxis. Pharmacology & Pharmacy, 05(03), 225–228. https://doi.org/10.4236/pp.2014.53029

106. Dong, B. J., Lopez, M. I., & Grant, R. M. (2019). Response to: Acceptability and feasibility of a Pharmacist-Led HIV pre-exposure prophylaxis program in the Midwestern United States. *Open Forum Infectious Diseases*, *6*(12). https://doi.org/10.1093/ofid/ofz497

107. Ahouada, C., Diabaté, S., Mondor, M., Hessou, S., Guédou, F., Béhanzin, L., Batona, G., Gning, N. N., Zannou, D. M., & Alary, M. (2020). Acceptability of pre-exposure prophylaxis for HIV prevention: facilitators, barriers and impact on sexual risk behaviors among men who have sex with men in Benin. *BMC Public Health*, *20*(1). https://doi.org/10.1186/s12889-020-09363-4

108. Earl, G., Cillessen, L. M., Lyons-Burney, H., Gubbins, P. O., Mina, A. W., Silverman, D. M., Silvestri, C. M., & Leibfried, M. (2021). Pharmacists' role in infectious pandemics: illustration with COVID-19. Remington, 849–876. https://doi.org/10.1016/B978-0-12-820007-0.00064-7

109. Unni EJ, Lian N, Kuykendall W. Understanding community pharmacist perceptions and knowledge about HIV preexposure prophylaxis (PrEP) therapy in a Mountain West state. J Am Pharm Assoc (2003). 2016 Sep-Oct;56(5):527-532.e1. doi: 10.1016/j.japh.2016.05.004. PMID: 27594106.

110. World Health Organization: WHO. (2019, December 1). *'We are the community': Scaling up PrEP through community-based organizations in the Philippines*. https://www.who.int/philippines/news/feature-stories/detail/we-are-the-community-scaling-up-prep-through-community-based-organizations-in-the-philippines

111. O'Connell, H. R., & Criniti, S. M. (2021). The Impact of HIV Pre-Exposure Prophylaxis (PrEP) Counseling on PrEP Knowledge and Attitudes Among Women Seeking Family Planning Care. *Journal of women's health (2002)*, *30*(1), 121–130. https://doi.org/10.1089/jwh.2019.8217

112. Eshiet, U. I., Igwe, C. N., & Ogbeche, A. O. (2024). Comparative assessment of medication knowledge among ambulatory patients: A cross-sectional study in Nigeria. *Exploratory Research in Clinical and Social Pharmacy*, *13*, 100388. https://doi.org/10.1016/j.rcsop.2023.100388

113. Ayangeakaa, S. D., Kerr, J., Combs, R. M., Harris, L. M., Sears, J. S., Parker, K., & Sterrett-Hong, E. (2023). Sociocultural and structural influences on HIV Pre-Exposure Prophylaxis (PrEP) Engagement and Uptake among African American Young adults. BMC Public Health, 23(1), 1427. https://doi.org/10.1186/s12889-023-16273-8

114. Shamu, S., Khupakonke, S., Farirai, T., Slabbert, J., Chidarikire, T., Guloba, G., & Nkhwashu, N. (2020). Knowledge, attitudes and practices of young adults towards HIV prevention: an analysis of baseline data from a community-based HIV prevention intervention study in two high HIV burden districts, South Africa. BMC Public Health, 20(1). https://doi.org/10.1186/s12889-020-09356-3

115. Zhao, A., Dangerfield, D. T., Nunn, A., Patel, R., Farley, J. E., Ugoji, C. C., & Dean, L. T. (2021). Pharmacy-Based Interventions to Increase Use of HIV Pre-exposure Prophylaxis in the United States: A Scoping Review. AIDS and Behavior, 26(5), 1377–1392. https://doi.org/10.1007/s10461-021-03494-4

116. Macdonald, C., Murphy, A., Isenor, J. E., Ramsey, T. D., Furlotte, K., Smith, A., Bishop, A., Kelly, D., Woodill, L., Booker, C. G., & Kyle John Wilby. (2023). Target users' acceptance of a pharmacist-led prescribing service for pre-exposure prophylaxis (PrEP) for human immunodeficiency virus (HIV). Canadian Pharmacists Journal, 156(4), 194–203. https://doi.org/10.1177/17151635231177027

117. Santa Maria, D., Flash, C. A., Narendorf, S., Barman-Adhikari, A., Petering, R., Hsu, H.-T., Shelton, J., Bender, K., & Ferguson, K. (2019). Knowledge and Attitudes About Pre-Exposure Prophylaxis Among Young Adults Experiencing Homelessness in Seven U.S. Cities. Journal of Adolescent Health, 64(5), 574–580. https://doi.org/10.1016/j.jadohealth.2018.06.023

118. Voglino, G., Gualano, M. R., Rousset, S., Forghieri, P., Fraire, I., Bert, F., & Siliquini, R. (2021). Knowledge, Attitudes and Practices Regarding Pre-Exposure Prophylaxis (PrEP) in a Sample of Italian Men Who Have SEX with MEN (MSM). International Journal of Environmental Research and Public Health, 18(9), 4772. https://doi.org/10.3390/ijerph18094772

119. Silapaswan, A., Krakower, D., & Mayer, K. H. (2016). Pre-Exposure Prophylaxis: A Narrative Review of Provider Behavior and Interventions to Increase PrEP Implementation in Primary Care. Journal of General Internal Medicine, 32(2), 192–198. https://doi.org/10.1007/s11606-016-3899-4

120. Newman, R., Katchi, T., Karass, M., Gennarelli, M., Goutis, J., Kifayat, A., Solanki, S., Yandrapalli, S., Forman, L., & Nabors, C. (2019). Enhancing HIV Pre-exposure Prophylaxis Practices via an Educational Intervention. American Journal of Therapeutics, 26(4), e462–e468. https://doi.org/10.1097/mjt.0000000000000773

121. Pharmacist-initiated PrEP and PEP. (n.d.). https://nastad.org/sites/default/files/2021-11/PDF-Pharmacist-Initiated-PrEP-PEP.pdf

122. Rajiah, K., Sivarasa, S., & Maharajan, M. K. (2021). Impact of Pharmacists' Interventions and Patients' Decision on Health Outcomes in Terms of Medication Adherence and Quality Use of Medicines among Patients Attending Community Pharmacies: A Systematic Review. International Journal of Environmental Research and Public Health, 18(9), 4392. https://doi.org/10.3390/ijerph18094392

123. Newman, P. A., Akkakanjanasupar, P., Tepjan, S., Boborakhimov, S., van Wijngaarden, J. W. de L., & Chonwanarat, N. (2022). Peer education interventions for HIV prevention and sexual health with young people in Mekong Region countries: a scoping review and conceptual framework. Sexual and Reproductive Health Matters, 30(1). https://doi.org/10.1080/26410397.2022.2129374

124. Garett, R., & Young, S. D. (2021). The Impact of Misinformation and Health Literacy on HIV Prevention and Service Usage. Journal of the Association of Nurses in AIDS Care, Publish Ahead of Print. https://doi.org/10.1097/jnc.0000000000000298

125. Lutz, S., Heberling, M., & Goodlet, K. J. (2020). Patient perspectives of pharmacists prescribing HIV pre-exposure prophylaxis: A survey of patients receiving antiretroviral therapy. Journal of the American Pharmacists Association. https://doi.org/10.1016/j.japh.2020.09.020

126. HIV prevention medication users fear being stigmatized as 'promiscuous.' (n.d.). Northwestern Now. https://news.northwestern.edu/stories/2024/august/prep-user-perceived-stigma-hiv/