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Implications of Educational Counseling on PrEP Uptake in MSM at a Community Health Clinic

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Implications of Educational Counseling on PrEP Uptake in MSM at a Community Health Clinic

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Abstract

HIV pre-exposure prophylaxis (PrEP) medication is 99% effective at preventing HIV acquisition if used daily (CDC, 2020; FDA, 2019). Despite its effectiveness and wide availability, PrEP uptake and adherence remained low, especially among MSM of color (Bradley et al., 2019; Kuhns et al., 2017). Prior studies have shown that participants exposed to PrEP information, counseling, and education were more likely to show interest in PrEP and uptake of PrEP. Although various studies support the effectiveness of educational interventions in increasing PrEP uptake, it has not been widely implemented in the practice setting in communities that would benefit from it. The quality improvement project aims to determine if providing focused PrEP educational counseling will increase participants' knowledge and PrEP uptake. This study is a quasi-experiment that measures pre- and post-educational intervention PrEP knowledge scores. The two-tailed paired samples *t*-test shows a significant difference in the mean PrEP knowledge score pre-and post-intervention (alpha value of .05, $t(4) = -5.88$, $p = .004$), with all participants having a 100% rate of PrEP uptake at the one-month follow-up visit. These findings support earlier studies that showed participants exposed to PrEP information, counseling, and education were more likely to uptake PrEP. These findings have implications for incorporating PrEP education at community health clinics that offer PrEP services to increase PrEP uptake and adherence in MSM patients.

Keywords: PrEP (pre-exposure prophylaxis), PrEP uptake, PrEP education, HIV, HIV infection, men who have sex with men (MSM).

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Introduction

HIV infection affects men who have sex with men (MSM) disproportionately compared to heterosexual males. The Centers for Disease Control and Prevention (CDC) estimated that 1.2 million people in the U.S. were infected with HIV in 2018, and there were 38,000 new HIV cases in the same year (CDC, 2020). Among the new HIV diagnoses, 69% occurred among MSM, even though they made up only 7% of the male population (CDC, 2020). Furthermore, new HIV diagnoses affect racial and ethnic minorities MSM disproportionately compared to white MSM. Black and Hispanic MSM comprised 67% of all the new HIV infections in 2018 (CDC, 2020).

There are nationwide efforts to decrease the HIV infection rates among uninfected MSM by offering HIV pre-exposure prophylaxis (PrEP), known as Truvada. Truvada is an oral combination antiretroviral medication that contains emtricitabine and tenofovir disoproxil fumarate (FTC-TDF). The goal is to prevent HIV acquisition among high-risk individuals and use it as a supplement to the condom. The Food and Drug Administration (FDA) approved Truvada in 2012 for use as HIV PrEP, and studies have shown that it is 99% effective at preventing HIV acquisition if used daily (CDC, 2020; FDA, 2019). The FDA also approved Descovy (emtricitabine and tenofovir alafenamide) for use as oral HIV PrEP in 2019 and Apretude (cabotegravir) as an extended-release injectable suspension HIV PrEP in 2021. Our discussion will focus on Truvada, as many initial clinical studies were based on Truvada.

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HIV Pre-Exposure Prophylaxis (PrEP) Safety and Efficacy

The safety and efficacy of Truvada have been extensively studied. Grant et al. (2010) evaluated the safety and efficacy of once-daily oral Truvada (FTC–TDF) compared with placebo to prevent HIV acquisition among seronegative MSM and transgender women who have sex with men. They concluded that oral FTC–TDF provided protection against the acquisition of HIV infection among the subjects, with a 44% reduction in HIV incidence (95% CI, 15 to 63; $p=0.005$). It was noted that detectable blood levels of the FTC-TDF were strongly correlated with the prophylactic effects. In this study, 22 of 43 seronegative subjects had a detectable level of the drug and that three of the HIV-infected subjects had a detectable level of drugs but not at a level comparable to the 22 subjects that remained HIV-negative. Nausea was reported more frequently in the first four weeks in the controlled group compared to the placebo group ($p < 0.001$), and adverse side effects were similar in both groups ($p = 0.57$). The results of this early study indicated that FTC-TDC was effective at preventing HIV acquisition. However, its effectiveness depends on the blood levels of detectable drugs, and the side effects were minimal.

In a different study, Grant et al. (2014) further examined the HIV incidence of participants who used FTC-TDC as HIV PrEP compared to participants who did not use PrEP. They reported that participants who received PrEP had an HIV incidence of 1.8 infections per 100 person-years compared to 2.6 infections per 100 person-years for participants who did not choose PrEP (HR 0.51, 95% CI 0.26-1.01, adjusted for sexual behaviors). Furthermore, they concluded that among participants who took PrEP, HIV incidence was 4.7 infections per 100 person-years if drug levels were not detected in dried blood spots, 2.3 infections per 100 person-years if participants used fewer than two tablets per week, 0.6 infections per 100 person-years if

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they used two to three tablets per week, and 0.0 infection per 100 person-years if they used four or more tablets per week ($p < 0.001$). These findings suggested that the effectiveness of PrEP is dosage-dependent, and participants needed to take PrEP at least four times a week to be effective at preventing HIV acquisition.

Barriers to PrEP Uptake and Adherence

There has been a steady increase in PrEP uptake over the years since the introduction of Truvada (Hood et al., 2016; Kelly et al., 2020). However, despite its effectiveness and wide availability, PrEP uptake and adherence remained low, especially among MSM of color. A study by Kuhns et al. (2017) showed that only 12.2% of young MSM participants reported having ever taken PrEP. Moreover, young Black MSM was at 84% reduced odds of having ever used PrEP than their white counterparts (Kuhns et al., 2017). In a separate study, Brantley et al. (2019) indicated that Black MSM was less likely to accept PrEP than their white and Hispanic counterparts. Even when Black MSM was eligible for PrEP, the percent of Black MSM referred to a PrEP provider and then prescribed for PrEP was lower than white MSM (Brantley et al., 2019).

Many studies have examined the barriers to PrEP uptake in the MSM population. Barriers to PrEP uptake and nonadherence include lack of PrEP awareness, cost of PrEP medication, fear of potential side effects of PrEP, perceived low sexual risk, and HIV-related stigma (Ezennia et al., 2019; Garcia, M. & Saw, G., 2019; Owens et al., 2020). In other instances, mistrust of the healthcare system and providers, lack of access, and low quality of PrEP care also served as barriers (Quinn et al., 2019; Owens et al., 2020). Thus, some local PrEP care programs experience low utilization due to these barriers.

Evidence-Based Intervention Analysis

Prior studies have shown that participants exposed to PrEP information, counseling, and education were more likely to show interest in PrEP and uptake of PrEP. Sineath et al. (2013) conducted a study on Thai MSM to determine if participants had knowledge or interest in PrEP as part of a national HIV prevention program to decrease the HIV rates in Thailand. The results indicated that less than 7% of participants had heard of PrEP, but once the participants were shown information describing PrEP, 36% reported interest in using it. HIV knowledge and risk behaviors were predictors of PrEP interest in this particular population.

McMahan et al. (2019) also observed that despite 96% of participants who had heard of PrEP, only 3% of MSM and transgender had ever used PrEP. After an educational card was distributed with a PrEP message, significantly more participants reported ever receiving PrEP at follow-up (21%; $p < 0.001$). There was a positive correlation between seeing the cards and PrEP use ($p = 0.053$). Lastly, Desrosiers et al. (2019) performed a randomized controlled trial in young Black MSM to determine if culturally tailored counseling would impact their access and PrEP uptake. They concluded that at the end of a three-month study, 85% of the intervention group participants had discussed PrEP with their medical provider compared with only 42% in the controlled group. Six participants in the intervention group had initiated PrEP compared to none in the controlled group ($p = 0.02$). These studies indicated that PrEP education and counseling could increase participants' interest in PrEP and uptake of PrEP.

Despite various studies supporting the effectiveness of educational interventions on increasing PrEP uptake, it has not been widely implemented in the practice settings in communities that would benefit from it. The quality improvement project aims to determine if

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providing focused educational counseling on PrEP will increase PrEP knowledge and uptake among MSM prospective users at Asian Health Services.

Theoretical Framework and Application

The Dual Motivation Model of PrEP Use Intention was used as a guiding theory for this quality improvement project. Examining the theoretical constructs of the intention of PrEP use helps explain how certain behavioral and motivational factors interact and influence each other to affect the decision to use PrEP (Ranjit et al., 2019). The model was tested using structural equation modeling to determine the relationship between various behaviors and the motivational factors for PrEP use intention. Simulating and testing the theory resulted in two motivational pathways that can influence the intention for PrEP use in MSM: the Protection Motivational Pathway and the Expectancy Motivation Pathway. There were five proposed variables for the theory: the number of sexual partners, perceived risk, safe sex fatigue, negative attitude toward condom use, and expectation of a better sexual experience (Ranjit et al., 2019). Both motivational pathways are influenced by these variables and the number of sexual partners (Ranjit et al., 2019).

In the Protection Motivational Pathway, individuals are motivated to use PrEP to protect themselves from HIV infection (Ranjit et al., 2019). In the Expectancy Motivation Pathway, individuals are motivated to take PrEP to have enhanced sexual experience through condomless anal sex (Ranjit et al., 2019). The number of sexual partners heavily influences these two pathways. Having an increased number of sexual partners increases the perception of risk for HIV infection. In addition, having an increased number of sexual partners is also associated with a higher perception of safe sex fatigue. Safe sex fatigue is the state in which maintaining and

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practicing safe sex behaviors becomes burdensome over time (Ranjit et al., 2019). Both variables of increased perception of HIV risk and safe sex fatigue motivated individuals to use PrEP as a preventative method from acquiring HIV infection. Likewise, having an increased number of sexual partners and safe sex fatigue can contribute to having negative attitudes toward condom use. When individuals have a negative attitude towards condom use, they are more likely to use PrEP as a safer alternative to the condom to have a better sexual experience.

Understanding the motivational factors that drive PrEP use can help design new and modify existing campaigns to promote PrEP use in MSM. The Dual Motivational Model for PrEP Use Intention can also influence PrEP uptake in MSM as it can help shift the conversation between the PrEP providers and the patients. Knowing factors such as the number of sexual partners, safe sex fatigue, and unwillingness to use condoms when engaging in anal sex allows PrEP providers to discuss PrEP use as these patients are more likely to be motivated to use PrEP to protect themselves from HIV infection. The variables in this theory, such as the number of sexual partners, condom use, and perceived risk for HIV infection, were incorporated into the survey questionnaires to provide further information on the participants' sexual health and behaviors. It will also lead to opportunities to educate patients about PrEP and the steps they can take to mitigate their risk for HIV infection.

Methods

Design. The quality improvement project used a quasi-experimental design with an educational intervention and the PrEP knowledge score measurement. The purpose of the quality improvement project was to implement a focused PrEP educational counseling

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intervention to evaluate whether the participants' PrEP knowledge pre-education and one-month post-education intervention will affect PrEP uptake.

Participants. The participants in this quality improvement project were recruited from a convenience sampling from three medical offices at Asian Health Services and through the HIV/HIV Prevention department outreach services. Participants were included in the quality improvement project if they were MSM, 18 years old or older, had a self-reported HIV-negative status, engaged in high-risk sexual activities, had a history of recent sexually transmitted infections, and were interested or planned to resume HIV PrEP. Exclusion criteria were patients who had a self-reported diagnosis of HIV infection or currently taking PrEP. Patients were also excluded if they had limited English proficiency due to the feasibility of translating documents into 14 different languages, the current number of language services Asian Health Services provides to their patients. This project was conducted as a quality improvement project, and therefore was not supervised by the institutional review board.

Setting. The quality improvement project was taken place at Asian Health Services, located in Oakland, California (www.asianhealthservices.org). It is a federally qualified health center with three medical offices that provide primary care and various specialty services, including HIV/HIV Prevention services. The HIV/HIV Prevention department has three HIV medical providers and 15 PrEP medical providers. Six case managers support the program and assist patients with different needs along the HIV/HIV Prevention care continuum. The program serves about 92 HIV-positive MSM patients and approximately 70 to 80 HIV-negative MSM patients for PrEP. Each month, about 25 patients are seen for routine PrEP care.

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The HIV/HIV Prevention program comprises MSM patients from the Bay Area counties with different ethnic backgrounds, including Asian, Pacific Islander, Hispanics, and African American. Most patients are on government-supported insurance such as MediCal, Covered California, HealthPac, FamPACT, and sliding scale fees. Most PrEP patients spoke English and were classified as having income below the federal poverty guidelines.

Data Collection. The investigator used a computer-based program, Qualtrics, to administer the survey questionnaires. The survey questionnaires were administered before educational intervention at the initial visit and again at the one-month follow-up visit post-educational intervention. The survey questionnaires included a PrEP knowledge test with 15 multiple-choice questions to test participants' general knowledge of PrEP (Appendix 4). These questions were chosen from the prepared PrEP pamphlet, adapted from "A Frontline Provider Manual on PrEP Research, Care and Navigation ." PrEP knowledge scores were reported as the number of correct answers out of the total number of questions asked. The higher the score, the more knowledgeable the participant had about PrEP. The PrEP pamphlet was distributed to all participants during their initial visit for PrEP content reinforcement (Appendix 2 and 3).

Other survey questionnaires included demographic, social history, substance use history, sexual history, PrEP use history, and barriers to PrEP uptake. Questionnaires were a combination of filling in the requested data, multiple-choice, and selecting all that apply options. Social history, substance use history, sexual history, and PrEP use history were asked at the initial visit and again at the one-month follow-up visit for comparison purposes. The investigator developed the PrEP knowledge test and the survey questionnaires, and these tools have not established validity and reliability.

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Procedures. Prior to the quality improvement project, the investigator announced via email to all medical providers and the HIV/HIV Prevention department staff at Asian Health Services to bring about awareness of the project and enhance the recruitment of subjects. The investigator distributed recruitment flyers in keyed strategic locations, including AHS medical offices and the HIV/HIV Prevention office (Appendix 1). The investigator conducted an in-person meeting with the HIV/HIV Prevention team to discuss the project's purpose and to train case managers on how to administer survey questionnaires. The investigator also discussed and emphasized critical points on the PrEP pamphlet for case managers to review with participants. No training was provided to medical providers due to their limited appointment time allotment for conducting in-depth PrEP education with the participants. However, they were asked to refer all interested patients to the project team.

Subjects were selected from medical providers' referrals and interested list who met the eligibility criteria to be included in the project. For participants who agreed to participate in the quality improvement project, the project team met with the participants before or after their scheduled initial clinic visit to review the project's purpose and administer the computer-based initial survey questionnaires, including the multiple-choice PrEP knowledge test. The project team then conducted a 15 to 30 minutes one-on-one educational counseling with the participant to discuss PrEP and review critical information on the PrEP pamphlet. The project team also addressed any concerns and identify participants' needs, including insurance and drug coverage. Participants completed a similar survey questionnaire and the same multiple-choice PrEP knowledge test at the one-month follow-up visit.

Analysis. Intellectus Statistics (2021) software was used to perform statistical data analysis. The evaluation consisted of descriptive analysis, which included age, race/ethnicity,

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educational level, employment status, household income, housing status, health insurance status, and modes of transportation to the clinic. In addition, a pre-and post-intervention sexual history, substances use history, and PrEP use history was conducted to measure the differences in these behaviors. Frequency and percentages were reported for categorical variables, and mean and standard deviation was reported for ratio variables. The effects of the pre-intervention and post-intervention on PrEP knowledge scores were compared using a paired t-test. The participants' pre-and post- PrEP knowledge scores were tracked using the last four digits of their telephone number.

Results

There was a total of five participants in the quality improvement project. There were two white, two Black/African Americans, and one Asian participant. The observations for age had an average of 31.60 years ($SD = 9.76$, $SE_M = 4.37$, $Min = 26.00$, $Max = 49.00$, $Skewness = 1.47$, $Kurtosis = 0.21$, $Mdn = 28.00$) (Appendix 5, Table 1). Most of the participants had some college education, most with full-time employment, had an annual income between \$20,000 to \$79,000, and all had stable housing. Most participants had public or private insurance coverage, and the majority did not encounter any transportation barrier to the clinic. Frequencies and percentages of the above summary are presented in Appendix 5, Table 3.

The majority of the participants identified their sexual orientation as being gay or bisexual, engaging in sexual activity as a versatile or a top, with an average of two sexual partners within the last 30 days, pre-intervention ($SD = 0.82$, $SE_M = 0.41$, $Min = 1.00$, $Max = 3.00$, $Skewness = 0.00$, $Kurtosis = -1.00$, $Mdn = 2.00$) and 1.80 partners post-intervention ($SD = 0.45$, $SE_M = 0.20$, $Min = 1.00$, $Max = 2.00$, $Skewness = -1.50$, $Kurtosis = 0.25$, $Mdn = 2.00$). (Appendix, Table 2). Most used condoms at the frequency of sometimes to most of the time

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during the last 30 days pre-and post-intervention. The most cited reasons for not using condoms were that they do not like to use condoms, they like to have condomless sex, the condom does not provide much skin-to-skin pleasure, and the condom disrupts "in the moment" sexual feelings. None of the participants reported the use of recreational drugs or alcohol consumption during sexual activity. None of the participants tested positive for a sexually transmitted infection within 30 days of the pre-and post-intervention. Frequencies and percentages of the above summary are presented in Appendix 6, Table 4.

At the initial visit, participants reported having little PrEP knowledge to having a great deal of knowledge on PrEP. However, they reported having little to a lot of knowledge of PrEP at the post-intervention. Most participants reported receiving their PrEP information from various sources, including social media, news media, healthcare professionals, and friends at the initial visit. At the follow-up visit, all participants reported receiving their PrEP information from a healthcare professional. Most participants reported having low risk to medium risk for HIV infection during the initial visit. The HIV risk perception was not measured at the post-intervention. During the pre-intervention phase, none of the participants had used PrEP, but at the post-intervention follow-up, all of the participants reported using PrEP. Participants reported using either Truvada or Descovy and reported daily use, except for two participants who reported missing one day of PrEP because one forgot to take the medication and the other participant did not provide a reason. Frequencies and percentages of the above summary are presented in Appendix 6, Table 4.

A two-tailed paired samples *t*-test was conducted to examine whether the mean difference of pre-intervention and post-intervention PrEP knowledge scores were significantly different from zero. The two-tailed paired samples *t*-test was significant based on an alpha value of .05,

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$t(4) = -5.88, p = .004$, indicating the null hypothesis can be rejected. This finding suggests a difference in the mean of the pre-intervention PrEP knowledge score, and the mean of the post-intervention PrEP knowledge score was significantly different from zero. The mean of the pre-intervention PrEP knowledge score was significantly lower than the mean of the post-intervention PrEP knowledge score. The results are presented in Appendix 7, Table 5. A bar plot of the means is presented in Appendix 7, Figure 1.

Discussion

PrEP serves as an essential biomedical tool to decrease HIV infection among MSM, especially in MSM of color. The quality improvement project aims to determine if providing focused PrEP education to participants will affect their PrEP knowledge and PrEP uptake. The paired t-test statistical analysis indicates that after a one-on-one PrEP educational counseling with the participants, there was a statistical difference in pre-intervention and post-intervention PrEP knowledge scores. The study participants had a 100% rate of PrEP uptake at the one-month follow-up. These findings support earlier studies that showed participants exposed to PrEP information, counseling, and education were more likely to uptake PrEP.

Because all participants reported using PrEP at the one-month follow-up, this study could not assess the barrier factors to PrEP uptake. Contrary to other study findings, none of the participants reported using recreational drugs such as methamphetamine, cocaine, or alcohol during sex. Perhaps, this was due to the small sample size. It was also noted that the frequencies of condom usage and the number of sexual partners pre-and post-intervention did not change. It was expected that participants who took PrEP would have a decrease in condom usage and an increase in the number of sexual partners due to the protective effects of PrEP.

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This quality improvement project has several limitations. The study sample was a convenience sampling and consist of five participants, which is considered a very small sample size. The COVID-19 pandemic and the surge in positive cases during the study limited recruitment opportunities from various venues due to their closure for safety precautions. It is difficult to generalize these results to the general MSM population with this small sample size. Other limitations include a limited follow-up visit. This study only offered a one-month follow-up visit after the intervention. It would be difficult to determine the effect of educational counseling on PrEP uptake and the rate of PrEP adherence after that. Perhaps extending the study to three-, six-, or nine months follow-up would provide better understanding PrEP uptake and adherence.

Conclusion

This quality improvement project demonstrated that providing PrEP education counseling to MSM at a community health clinic improved their PrEP knowledge and PrEP uptake. Community health clinics that offer PrEP services should incorporate PrEP educational counseling as part of the PrEP care continuum. Offering PrEP education is crucial, especially when primary care providers have limited time to discuss PrEP information in detail with their patients. PrEP knowledge will empower patients to make informed decisions about PrEP usage and foster PrEP uptake. MSM engaging in this HIV preventative strategy and services will minimize their risk for HIV infection. Thus, we are optimistic that the rate of HIV infection will decrease among MSM, especially in MSM of color.

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Appendix 1 – Recruitment Flyer

Want to Learn More About PrEP & HIV Prevention?

Investigators want to know if providing focused education counseling on PrEP will increase PrEP uptake among men who have sex with men (MSM) at Asian Health Services.

WHAT WILL PARTICIPANTS BE ASKED TO DO?

Participants will be asked to complete a survey questionnaire and take a short quiz when they are qualified to start PrEP. The same survey questionnaire and quiz will be administered again 1 month after starting PrEP.

WHO CAN JOIN?

We are looking for volunteers who are planning to start PrEP and able to participate in a 15-30 minutes educational counseling on PrEP.

WANT TO LEARN MORE?

Please contact our team at:

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Appendix 2 – PrEP Pamphlet, Front and Back Covers

**Understanding
PrEP & HIV
Prevention**

Frequently Asked Questions

 
ASIAN HEALTH SERVICES

This project is a collaboration between San Jose State University, Asian Health Services and HCHS10 to provide focused education counseling on PrEP to determine if increased knowledge on PrEP affects PrEP Uptake among MSM users at Asian Health Services. The information presented was adopted from PleasePrepMe.org.

For more information, please contact at tdinh@ahsdc.org

 
ASIAN HEALTH SERVICES

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ASIANHEALTHSERVICES.ORG

Running Head: IMPLICATIONS OF PREP EDUCATION AND PREP UPTAKE

Appendix 3 – PrEP Pamphlet, Inside Content

WHAT IS PREP?
 PREP stands for Pre-Exposure Prophylaxis. PREP means doing something ahead of time to prevent harm to yourself. For HIV PREP, a person who does not have HIV can take daily medication to prevent being infected with the HIV virus. PREP is an effective method for preventing HIV infection.

WHO ARE ELIGIBLE TO TAKE PREP?
 Anyone who is HIV-negative, interested in taking PREP, or considered yourself at high risk for HIV infection can take PREP. Also, if you are having anal sex without using a condom, have multiple sex partners, have HIV-positive partners, have sex with anybody with unknown HIV status, recently diagnosed with bacterial sexually transmitted infections (STIs), inject drugs, or use stimulants such as methamphetamine during sex are eligible for PREP.

HOW DOES PREP WORK?
 PREP contains two different HIV medicines in one single pill. If you take PREP daily, the medications will be available inside the immune cells, waiting to fight the HIV virus when you are exposed to it. When there is exposure to the HIV virus, the medicines prevent the HIV virus from making copies of itself, therefore, it cannot cause HIV infection.

WHICH PREP MEDICATIONS ARE NOW AVAILABLE?
 Two prescription medications are now available for PREP: Truvada and Descovy. Both are approved for the prevention of HIV infection. Both medications work in the same way, and both drugs are generally safe for most people. One is not necessarily better than the other.

HOW SHOULD I TAKE PREP MEDICATION TO ENSURE THAT I AM PROTECTED FROM THE HIV INFECTION?
 It is important to take the medication daily. Generally, if you take PREP every day or nearly every day, you will remain protected from HIV infection. If you take PREP daily, it is 99% effective at preventing HIV infection. Those who took PREP less often or not regularly are at higher risk of becoming infected with HIV.

HOW LONG DOES IT TAKE FOR ME TO BE PROTECTED FROM HIV INFECTION ONCE I START TAKING PREP?
 The time it takes to be fully protected depends on the sites of exposure. It takes about 7 days when you start taking PREP for the medication to reach rectal tissue and about 21 days to reach vaginal or cervical tissues. If you are injecting drugs, it takes 21 days to be protected as well.

WHAT ARE THE COMMON SIDE EFFECTS OF THE PREP MEDICATIONS AND HOW LONG DOES IT LAST?
 PREP is very well-tolerated in most people. The most common side effects of PREP medication include nausea, abdominal discomfort, or headache. These side effects usually resolve in a few weeks. Serious side effects were nearly non-existent.

CAN PREP AFFECT MY KIDNEY FUNCTION AND CAUSE MY BONE LOSS?
 Some people are worried that PREP can cause kidney or bone problems, but less than 1% of people who took PREP have a slight decline in kidney and bone health. Descovy has a smaller reduction in kidney and bone health when compared to Truvada. However, your medical provider will check your kidney functions with a blood test every 3-6 months to make sure your kidneys are functioning well.

WHAT SHOULD I DO IF I FORGET TO TAKE MY PREP MEDICATION? DO I NEED TO TAKE PREP WITH OR WITHOUT FOOD? CAN I STILL TAKE PREP IF I DRINK ALCOHOL?
 It is not dangerous to miss a dose by an hour or two, but you should take your medication around the same time each day. If you forget to take your medicine, take it as soon as you remember it. If it is almost time for the next dose, you can skip the missed dose and continue on the regular schedule. Both Truvada and Descovy have no food restrictions and have few drug interactions. You can drink alcohol while taking PREP, although we don't recommend it.

WHAT IS PREP 2-1-1, AND HOW DO I TAKE IT? WHO QUALIFIES FOR PREP 2-1-1?
 PREP 2-1-1 is also known as "PrEP on Demand" and is highly effective only for anal sex among men who have sex with men (MSM). Rather than taking Truvada once daily, PREP 2-1-1 involves taking PREP around the time of anal sex.

You take 2 pills 2 to 24 hours before sex, one pill 24 hours after the initial dose, and one last pill 24 hours later. PREP 2-1-1 is not for everybody, especially if you have chronic hepatitis B, have vaginal sex, or use injectable street drugs. Discuss this option with your provider first before you start. PREP 2-1-1 dosing is only recommended for Truvada and not with Descovy due to lack of studies.

WHICH PATIENTS SHOULD NOT TAKE PREP 2-1-1?
 If you have chronic hepatitis B infection, you should not take PREP 2-1-1. This is because the same medication in PREP is used to treat hepatitis B infection. Because of the way PREP 2-1-1 is dosed, it can cause a hepatitis B infection to flare and cause serious liver problems. Your provider will check if you have chronic hepatitis B disease with your baseline labs. If you are taking daily PREP and have a chronic hepatitis B infection, let your medical provider know if you plan to stop taking PREP so that they can monitor your liver function.

WHY DO I HEAR THAT SOME PEOPLE CAN GET HIV INFECTION WHILE ON PREP?
 Testing positive for HIV while taking PREP every day is very rare. Some patients may be infected with HIV before they start PREP but were not diagnosed early enough. Also, people who do not take PREP daily or skip taking PREP can put themselves at risk for HIV infection.

WHAT ARE THE SYMPTOMS OF ACUTE HIV INFECTION?
 If a rare HIV transmission occurs while you take PREP, it is important for you to recognize the signs and symptoms of acute HIV infection. About two-third or 66% of people will have a flu-like illness. These symptoms can include fever, tiredness, swollen gland, muscle ache, joint pain, skin rash, headache, sore throat, chill, and night sweats. If these symptoms occur, it usually appears 2 to 4 weeks after the initial HIV exposure. You can ask your provider to get early HIV testing before your next appointment if you are concerned about these symptoms.

WHEN SHOULD I STOP TAKING PREP AND WHAT SHOULD I DO IF I HAVE SYMPTOMS OF ACUTE HIV INFECTION?
 You should stop taking PREP if you tested positive for HIV. If you continue to use PREP, you could develop drug resistance. It can make treating chronic HIV infection more difficult. This is because Truvada and Descovy contain only two drugs and are not the proper medication to treat active HIV infection. Therefore, it is important that if you are diagnosed with HIV while on PREP, you must tell your provider right away to be switched to a different medication to fully suppress the HIV virus and avoid developing drug resistance.

HOW OFTEN DO I NEED TO SEE MY PROVIDER AND DO MY BLOOD AND OTHER SEXUALLY TRANSMITTED INFECTIONS (STIs) TESTING WHILE ON PREP?
 All patients need a negative HIV antibody test before starting PREP. After that, you will need to get routine testing every 3 months to check for HIV and other sexually transmitted infections such as chlamydia, gonorrhea, or syphilis. Keep in mind that PREP only prevents HIV infection, but not other sexually transmitted diseases or pregnancy. You will also need to follow up with your provider every 3 months to ensure that you receive the right care. Anytime you are worried about a recent HIV exposure, you can always ask your provider to order these tests for you sooner.

WHAT SHOULD I DO IF I DON'T HAVE INSURANCE OR CAN'T AFFORD TO PAY FOR PREP MEDICATION?
 We recognize that not having health insurance and unable to pay for PREP medication can be a barrier for some people. But don't worry, we are here to help you navigate this problem. The PREP navigator or case manager can help you obtain health insurance and help you find programs that will cover your PREP medication. Contact our clinic or our PREP hotline for further assistance.

WHO AND WHERE SHOULD I SEEK HELP IF I HAVE ANY QUESTIONS OR CONCERN ABOUT PREP?
 We are here to help you with whatever you need at any time. If you have any questions, you can ask our PREP navigator or case manager or ask your LGBT-friendly providers. You can call or text us anytime at (510) 972-HIVE or email us at PrEP@hscichc.org. We are located at 310 8th Street, Suite 103, Oakland, CA 94607. Appointments and walk-in's welcome.

Running Head: IMPLICATIONS OF PREP EDUCATION AND PREP UPTAKE

Appendix 4 – PrEP Knowledge Test

1. PrEP (pre-exposure prophylaxis) is a medication to...
 - a) Prevent sexually transmitted infection.
 - b) Prevent from allergic reaction to using a condom.
 - c) Prevent infection due to a needle stick only.
 - d) Prevent HIV infection from exposure before, during, and after having sex or sharing a needle.

2. If I take PrEP every or nearly every day, I will remain protected from HIV infection.
 - a) True
 - b) False

3. Once started on PrEP, what is the time needed to achieve protection from HIV infection in *rectal* tissue?
 - a) Immediately
 - b) 24 hours
 - c) 7 days
 - d) 14 days
 - e) 21 days

4. How does PrEP medication work?
 - a) It works by enhancing your body to fight infection.
 - b) It works by making the medication available in the immune cells, and when it sees the HIV virus, it prevents the virus from making copies itself.
 - c) It works by suppressing the CD4 cells.
 - d) It works by allowing the HIV virus to duplicate itself faster.

5. The risk of HIV resistance can occur if acute HIV is not identified quickly while on PrEP.
 - a) True
 - b) False

6. Potential side effects occurred in people who started on PrEP and usually resolved in a few weeks. Side effect(s) can include:
 - a) Nausea
 - b) Abdominal discomfort
 - c) Headache
 - d) All of the above
 - e) None of the above

7. What is the percentage of people who took PrEP experience a decline in kidney function and bone loss?
 - a) 0%
 - b) 1%

Running Head: IMPLICATIONS OF PREP EDUCATION AND PREP UPTAKE

- c) 15%
 - d) 50%
 - e) 60%
8. Truvada and Descovy are active against the Hepatitis B virus. When you plan to discontinue these medications, what step do you need to take?
- a) I do not need to tell my medical provider because there is no effect on my liver enzymes.
 - b) I need to tell my medical provider only if I stop taking the medication for three months.
 - c) I need to tell my medical provider when I plan to stop the medication because they need to monitor my liver enzymes.
 - d) My medical provider does not need to know if I stop the medication.
9. Taking PrEP will protect me from getting any sexually transmitted infection, including gonorrhea, Chlamydia, syphilis, or genital herpes.
- a) True
 - b) False
10. What should you do if you forget to take your PrEP medication on time?
- a) Skip the PrEP medication today and start again tomorrow.
 - b) Take it as soon as you remember it. If it is almost time for the next dose, you can skip it and continue on the regular schedule.
 - c) Take two pills immediately.
 - d) Take two pills now and take another pill in 12 hours.
11. Which types of tests are needed every three months when you take PrEP?
- a) Blood test to check for my kidney functions.
 - b) Blood test to check if I have HIV.
 - c) Gonorrhea and Chlamydia test in the urine, throat, and rectal.
 - d) Blood test to check for syphilis.
 - e) All of the above.
12. 2-1-1 or "On-Demand PrEP" means taking take two pills 2 to 24 hours before anal sex, then one pill 24 hours after the first dose, and then one pill 24 hours after the second dose.
- a) True
 - a) False
13. What are the symptoms of acute HIV infection?
- a) It hurts when I urinate.
 - b) I have a white or green discharge on my penis.
 - c) I have symptoms that are similar to having a cold or the flu.
 - d) I will have a fever only.
14. If I test positive for HIV, I should not continue with PrEP and should tell my medical provider right away.

Running Head: IMPLICATIONS OF PREP EDUCATION AND PREP UPTAKE

- a) True
- b) False

15. What is the main reason why people become infected with HIV while they are taking PrEP?

- a) They have multiple sexual partners.
- b) They do not take PrEP daily or skip taking PrEP regularly.
- c) They have sex with a person who is HIV-positive.
- d) They have sex with people who have syphilis or Chlamydia.

Appendix 5 - Table 1 & Table 2**Table 1***Summary Statistics Table for Interval and Ratio Variables*

Variable	<i>M</i>	<i>SD</i>	<i>n</i>	<i>SE_M</i>	Min	Max	Skewness	Kurtosis	<i>Mdn</i>
Age	31.60	9.76	5	4.37	26.00	49.00	1.47	0.21	28.00

Note. '-' indicates the statistic is undefined due to constant data or an insufficient sample size.

Table 2*Summary Statistics Table for Interval and Ratio Variables*

Variable	<i>M</i>	<i>SD</i>	<i>n</i>	<i>SE_M</i>	Min	Max	Skewness	Kurtosis	<i>Mdn</i>
Pre-Sexual Partners	2.00	0.82	4	0.41	1.00	3.00	0.00	-1.00	2.00
Post-Sexual Partners	1.80	0.45	5	0.20	1.00	2.00	-1.50	0.25	2.00

Note. '-' indicates the statistic is undefined due to constant data or an insufficient sample size.

Appendix 5 – Table 3**Table 3***Frequency Table for Nominal Variables*

Variable	<i>n</i>	%
Ethnicity		
White	2	40.00
Black or African American	2	40.00
Asian	1	20.00
Education		
2-year degree	1	20.00
Some college	3	60.00
Professional degree	1	20.00
Employment Status		
Unemployed	1	20.00
Full-time	3	60.00
Part-time	1	20.00
Income Level		
\$20,000-\$39,999	3	60.00
\$40,000-\$59,999	1	20.00
\$60,000-\$79,999	1	20.00
Housing Status		
Live with relative/family member	2	40.00
Live in own home/apartment	2	40.00
Share home/apartment	1	20.00
Insurance Status		
No insurance	2	40.00
Public health insurance (Medi-Cal, Covered CA, Health Pac, FamPACT)	1	20.00
Private health insurance (employer-sponsored health insurance, Kaiser)	2	40.00
Transportation to Clinic		
Walking	1	20.00
Drive own car	2	40.00
Public transportation (public bus, BART, CalTrain)	2	40.00

Note. Due to rounding errors, percentages may not equal 100%.

Appendix 6 -Table 4**Table 4:** *Frequency Table for Nominal Variables*

Variables	Pre-Intervention		Post Intervention	
	<i>n</i>	%	<i>n</i>	%
Sexual Orientation				
Bisexual	3	60.00	3	60.00
Gay or homosexual	2	40.00	2	40.00
Sexual Position				
Insertive (top)	3	60.00	4	80.00
Versatile (top and bottom)	2	40.00	1	20.00
Condom Usage Within Last 30 Days				
Sometimes	2	40.00	2	40.00
About half of the time	2	40.00	1	20.00
Most of the time	1	20.00	2	40.00
Reasons for Not Using Condoms				
I don't carry condom around with me	1	20.00	1	20.00
It does not give me much skin-to-skin pleasure	1	20.00	1	20.00
I don't like to use condom, does not give much skin to-skin pleasure, disrupt "in the moment" feeling.	1	20.00	1	20.00
I don't like to use the condom, I like to bareback	1	20.00	1	20.00
It does not give me much skin-to-skin pleasure.				
It disrupts "in the moment" sexual feeling	1	20.00	1	20.00
Drugs Usage Within Last 30 Days				
I don't use any drug	4	80.00	3	60.00
Popper or amyl nitrate	1	20.00	2	40.00
Diagnosed of STI Within Last 30 days				
Yes	0	0.00	0	0
No	5	100.00	5	100
PrEP Information Sources				
News media, healthcare team, friends	1	20.00	0	0
Friends	1	20.00	0	0
Social media, healthcare team, news media	1	20.00	0	0
Social media, healthcare team	1	20.00	0	0
Healthcare team	1	20.00	5	100
PrEP Knowledge Perception				
A little	2	40.00	1	20.00
A moderate amount	1	20.00	2	40.00
A lot	1	20.00	2	40.00
A great deal	1	20.00	0	0
HIV Risk Perception				
Low risk	2	40.00	NA	
Medium risk	3	60.00	NA	
Use PrEP within last 30 days				
Yes	0	0	5	100
No	5	100	0	0

Note. Due to rounding errors, percentages may not equal 100%.

Appendix 7 -Table 5 & Figure 6

Table 5

Two-Tailed Paired Samples *t*-Test for the Difference Between Pre-Intervention PrEP Knowledge Score and Post-Intervention PrEP Knowledge Score.

Pre-intervention PrEP Knowledge score		Post-intervention PrEP Knowledge score		<i>t</i>	<i>p</i>	<i>d</i>
<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
10.00	1.22	12.20	1.10	-5.88	.004	2.63

Note. N = 5. Degrees of Freedom for the *t*-statistic = 4. *d* represents Cohen's *d*.

Figure 1

The means of Pre-Intervention PrEP Knowledge Score and Post-Intervention PrEP Knowledge Score with 95.00% CI Error Bars

