ANALYSIS OF KNOWLEDGE AND ATTITUDE OF PRE-EXPOSURE PROPHYLAXIS BY CLIENTS: THE CASE OF SPECIAL TREATMENT CENTRE.

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DECLARATION

I declare that this research project is my original work and has not been presented to any other university or institution of higher learning for examination or any other purpose.

Signed…… Date……...

Angelina Masido Mwasi

Registration: X53/82211/2015

The research project has been submitted for examination with my approval as the University Supervisor.

Signed……. Date……

Dr. Daniel Mwai

University of Nairobi

DEDICATION

I dedicate this report to all who are living positively with HIV. I also dedicate this to my dad Benjamin for his financial support.

ACKNOWLEDGMENT

I sincerely thank STC clients whose data I used for the study who have made the findings herein possible. I thank Nairobi City County Government for allowing me to conduct research in their facility. I thank the facility in charge of STC for providing a condusive environment for me while collecting data. I thank my supervisor Dr. Daniel Mwai for his support and guidance through the research process. I thank all Clinical Officers and family members who supported and encouraged me during the process. Finally, I thank God for who he is.

ACRONYMS AND ABBREVIATIONS

AIDS	Immune Deficiency Syndrome Acquired
ART	Antiretroviral Therapy
CCC	Comprehensive Care Clinic
CBD	Central Business District
CDC	Centre of Disease Control
FP	Family Planning
GHO	Global Health Observation
HIV	Human Immunodeficiency Virus
HIVST	Hiv Self Testing
KASF	Kenya Aids Strategic Framework
KP	Key Population
MCH	Mother and Child Health Care
MoH	Ministry of Health
MSM	Men who have Sex with Men
NASCOP	National Aids and STI Control Programme
NRTI	Nucleoside Reverse Transcriptase Inhibitors
PEP	Post Exposure Prophylaxis
PI	Principal Investigator
PITC	Provider Initiative Counseling and Testing

PLWHIV	People Living with Human Immunodeficiency Virus
PrEP	Pre- Exposure Prophylaxis
PWID	People Who Inject Drugs
STI	Sexual Transmitted Infections
STC	Special Treatment Centre
UNAIDS	United Nations Programme on HIV/AIDS
UNICEF	United Nations International Children's Education Fund
UP	Upper Policy
US	United States
VCT	Voluntary Counselling and Testing
VIF	Variance Inflation Factor
WHO	World health organization

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ABSTRACT

An estimated 1.5 million people in Kenya died after developing AIDS since 1984, leaving about one million orphans (NACC, 2005). Areas with high HIV prevalence and risk population have been the target by CDC in its quest to implement "high impact prevention". MSM are witnessing a significant increase in the rate of HIV infection while other population groups have had a decreasing or stable HIV incidence in the US. A report by WHO (2015) approved PrEP for use as an additional choice for preventing HIV for those at risk of acquiring the AIDS virus as part or combination for HIV prevention. PrEP is the use of anti-retroviral to prevent the risk of transmission of HIV/AIDS among high risk individuals. Several studies have shown that knowledge and attitude is paramount to fighting HIV/AIDS as it has an effect on health seeking behavior and protective mechanisms of individuals. Knowledge and the attitude towards HIV pre-exposure prophylaxis is key in determining the outcome of HIV infections to be experienced. Furthermore, it is key in determining the optimal resources to be allocated towards the same. The study findings indicated that knowledge and awareness on PrEP affects the utilization of PrEP positively although insignificantly. Secondly, the study established that positive attitude significantly affected the use of the PrEP positively. The indication was that negative attitude may play a retrogressive role on the utilization of PrEP. The study used primary data collected from Special treatment Centre through random sampling design. Particularly, it applied to clients who walk into the facility randomly to seek for any services. The study proposed further research extended to the other health facilities in other areas in the country.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Human Immune Deficiency Virus (HIV) causes a complex of signs and symptoms in man that are collectively known as Acquired Immune deficiency syndrome (AIDS). This syndrome was observed first in MSM in US in the late seventies. The virus was first isolated in the United States in early 1980's. Since then, the virus has spread all over the world to form one of the worst pandemics ever known in man's history (NASCOP, 2005). By the end of 2016, thirty-seven million individuals were living with the virus globally. It is estimated that 0.8% of people aged 15 to 49 years are living with the virus worldwide, although between regions and countries the epidemic burden has continued to vary considerably (WHO, 2017).

In Sub – Saharan parts of Africa, 25.6 million children and adults are said to have HIV/AIDS of which three million, eight hundred thousand adults and children accounts for new infections (UNAIDS, 2000). Sub – Saharan parts of Africa accounts for roughly two thirds of people living with HIV globally thus remains the leading with 1 in every 25 adults living with HIV (WHO, 2017).

Kenya is among the nations that are highly affected by the AIDS virus in the world. The first incidence was detected in 1984 in Kenya and it was the major cause of mortality in the country by mid 1990s. In 2016, the population living with HIV in Kenya were 1.6million making Kenya the fourth largest HIV/AIDS epidemic in the world. HIV epidemic in Kenya affects all population groups but groups of MSM, sex workers, and PWID are most vulnerable to infection. Thirty-six thousand people are estimated to have died from Aids – related illnesses in 2016 although this figure is declining from a total of 51000 in 2010 (HIV and AIDS in Kenya, 2016).

Following a scale up of HIV care and treatment, the HIV prevalence fell to 5.9 in 2015 from 10.5% in 1996. The government current KASF 2014/2015 acknowledges

concentrated epidemics among vulnerable groups, the epidemic being described as being rooted in the general population and among the key population having a very high prevalence (NASCOP, 2017). An ambitious and achievable target by 2020, is that 90% of people living with HIV will be aware of their status, 90% of all those that have been diagnosed with HIV will be on antiretroviral therapy, and 90% of all those on antiretroviral therapy would have achieved undetectable viral load (UNAIDS, 2014). The 90-90-90 treatment plan target is to stop the AIDS epidemic and also to provide treatment as a preventive measure.

1.1.2 HIV/AIDS situation in Kenya

An estimated 1.5 million people in Kenya died after developing AIDS since 1984, leaving about one million orphans. Currently in Kenya 300 people die daily as a result of HIV/AIDS, which are approximately 12 deaths per hour! The total number of deaths as a result of AIDS is said to have increased from over 300,000 in 2001 to 2 million by 2010 (NACC, 2005). By December 2000, it was estimated that close to 2.5 million Kenyans out of the country's population 28.5 million (1999 Census) had HIV/AIDS. Current estimates of HIV prevalence suggest that in urban areas the rate of HIV is about 9.7%, or 421,000 HIV-infected adults. HIV prevalence in rural areas is increasing rapidly and in 2003 there were approximately 5.2% of the adult population infected. Because 80% of Kenyans live in rural areas, these percentages translate to approximately 636,000 million infected adults in rural Kenya (NASCOP, 2005).

1.1.3 Epidemiology of HIV

HIV may be transmitted when one comes into contact with infected vaginal secretions semen, blood and even breast milk. The predominant mode of transmission of HIV is through unsafe heterosexual intercourse (WHO, 2004). Other relevant ways of HIV transmission include the mother to child transmission, and needle sharing by PWID. Condom accessibility and availability has significantly been improved with individuals accessing them freely from health facilities and other public health agencies. Consistent and proper condom use prevents HIV transmission. Incidence of HIV infection in the US has stabilized to about 50,000 infections per year (CDC, 2011). Majority of HIV

screenings, test only for HIV antibodies, therefore a person who is infected may be non-reactive for HIV if he/she had been tested while at window period. Reducing the patient's viral load to "undetectable" level is the gold standard for HIV therapy, that is having very few copies that is undetectable by the viral load assay. Having undetectable viral load minimizes the risk of HIV transmission compared to one who has a high viral load. There is an inverse relationship between CD4 count and viral load. A HIV positive person with lower viral load has a high CD4 count.

1.1.4 HIV Detection

HIV symptoms vary, with an individual and the clinical progression of the disease a person is in: acute infection, the latency stage, or the late stage that is called AIDS. Large amounts of virus get produced in the body during the acute stage. Individuals may not experience any symptoms during the acute stage; others may experience flu-like illness within a month after HIV infection (HIV.gov, 2017). During the latency stage of the disease, HIV reproduces at very low levels and individuals may not have symptoms. With proper medical care, one can live at clinical latency stage for several decades. Without treatment, this period is known to last for an average of ten years, although for some, they progress through the stage faster (HIV.gov, 2017). HIV/AIDS diagnosis can be confirmed through blood tests done by a medical provider.

1.1.5 PrEP for HIV/AIDS prevention.

Areas with high HIV prevalence and risk population have been the target by CDC in its quest to implement "high impact prevention". MSM are witnessing a significant increase in the rate of HIV infection while other population groups have had a decreasing or stable HIV incidence in the US. Truvada (emtricitabine +tenofovir) has been picked for use as PrEP in MSM and it involves putting those at risk of HIV on the antiretroviral therapy. In other HIV settings, antiretrovirals are also used for prevention of those at high risk of HIV exposures such as needle pricks (post exposure prophylaxis [PEP]), unprotected sex with a person of unknown HIV status (non-occupational PEP), and post rape and for preventing vertical transmission of HIV (Anderson, et al., 2010)." Truvada belongs to a classification of drugs known as nucleoside reverse transcriptase inhibitors (NRTIs) which work by inhibiting the replication stage of the virus and therefore limiting the number of copies that

are created in an infected host. Anderson et al. (2010), asserts that antiretroviral therapy for use as PrEP or PEP should have minimal drug and food interactions, proven efficacy and safety, low dosage, and minimal risks for drug resistance. Antiretroviral drug efficacy and toxicity should be put into consideration. Truvada was selected for the pre-exposure prophylaxis initiative trial for these reasons and also because of its safety and efficacy. Anderson et al. (2010) stated that there exists no surrogate marker for drug concentration or optimal dosage in terms of PrEP resulting in subjective analysis of effectiveness and toxicity in variability of drugs. In other words, despite proven safety and efficacy, there is no marker that specifies what drug concentration would give a prophylactic effect.

1.2 Research problem

According to WHO (2014) released updates which included a new set of amendments for PEP, the new guidelines aimed to rationalize PEP prescribing and improving completion and adherence rates by use of better tolerated drugs. For the first time PEP indications covered all types of exposure in all population groups. Evidence shows that there has been insufficient PEP uptake with only 57% of those put on PEP completing their full course and the rate was much lower at 40% for sexual assault victims (WHO, 2014). A report by WHO (2015) approved PrEP for use as an additional choice for preventing HIV for those at risk of acquiring the AID virus as part or combination for HIV prevention. Introduction of PrEP sites by MoH Kenya in July 2016 is one of the measures adopted to increase utilization of PrEP services to help achieve the 2030 global fast- track strategy.

There is limited evidence that has been documented on the clients' knowledge and attitude in regard to PrEP use. By documenting how knowledge and attitude attribute to PrEP intake, this study contributes to empirical evidence on the role of knowledge and attitude in optimizing PrEP intake and would be of help in future planning. HIV programs in specific have targeted supply variables which are factors related to provision of services of clients. For HIV, introduction of PrEP as prevention intervention can only be successful if the demand side variables are met. In current practice there is adequate provision of health investments and of drugs. Demand factors are affected by knowledge and attitude possessed by the potential clients. Failure to understand these behavioral variables would lead to low intake of the interventions consequently affecting the justification for the heavy

investment put on the supply side. These might lead to insufficiency in health service provision. The study aims at filling this gap by assessing knowledge and attitude of PrEP by clients and assists in future planning and policy making.

1.3 Research objectives

The main objective of the study was to assess on the knowledge and attitude of PrEP by clients.

Specific objectives

i. To ascertain the level of knowledge of PrEP by clients.

ii. To determine the attitude of PrEP by clients.

1.3.1 Research Questions

i. What is the level of knowledge of PrEP by clients?

ii. What is the attitude of PrEP by clients?

1.4 Relevance of the study

First, the findings of this study revealed the level of knowledge of PrEP by clients. Further, the study findings indicated the attitudes of clients towards PrEPs. This study was useful in the recommendation of the appropriate policies for effectively implementing the use of PrEP at both county and national level. Finally, the information obtained from this study added to the existing literature on the level of knowledge and attitudes of PrEP by clients.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In this chapter, I reviewed theoretical underpinnings of the question at the center of this study namely, how knowledge and attitude, of PrEP by clients affects the uptake of PrEP services. After theoretical review, I reviewed empirical literature considering their findings, relevance and gaps that exist in literature. At the end of this chapter, I provided a concise overview of the literature that provides a foundation for this study.

2.2 Theoretical Review

2.2.1 Social cognitive theory

This psychological theory explains human behavior from the perspective emotional, cognitive as well as behavioral aspects to understand the change in the pattern of behavior. This theory is a subset of the cognitive aspect on which it focuses on ways in which people learn to model the behavior of others. This theory is from the theory of social learning theory (Bandura, 1989). According to this theory what happens in social contexts and much of what is learned mainly occurs through observations. Bandura (2001) noted that learning occurs in focused and goal oriented way. This theory explains that by observing, people acquire knowledge, skills, rules, strategies as well as attitudes. Further, Bandura (1989) in this theory explains that people learn the importance of this theory by observing the consequences of the behavior modeled and thus they act according to the expected outcomes.

This theory explains that human standards and norms are learned through the interaction of the individuals and their environment through observation what is referred to as vicarious learning. According to Bandura (1989) learning is an activity in which information about a slim line of behavior and environmental events is transformed to symbolic presentations and these informs the actions to be taken.

Intuitively, people look at the consequences of actions and if the consequences lead to failure then they decease from doing them. Whereas, if the consequences are good people

undertake them. Therefore, if PrEP lead to positive outcomes to the clients or other who have applied them before then clients would also apply them because they expect positive outcomes from the use of PrEP.

2.2.2 Health Belief model

According to Hochbaum et al. (1950) this theory explains and forecast practices, coverage and human health behavior through attitudes and beliefs. Burke (2010) noted that perceptions of being susceptible explain opinions of people on how the actions they take lead to negative health outcomes. In fact, a person's perceptions informs about one's knowledge and belief which is directly related to people's attitudes, behavior and outcomes of a certain action. This theory seeks to improve the level of awareness on how the outcomes of a behavior can be and this is aimed at increasing the quality of life. The perceived susceptibility of the dangers of exposure to HIV/Aids and other related diseases as well as other diseases affect clients' attitudes towards the health conduct in the medical facilities. The good attitudes according to this theory will be reflected on people's attitude towards PrEP. This is how this model is suited for this study.

2.2.3 Demand for Health Care

The theory of Grossman's (1972) was developed from Becker's theory on the allocation of time in the development of the household production model where individuals' could spend resources and time on investments aimed at improving health (Becker, 1965). The benefits are realized over time, as increased stocks of health capital delivered future utility flows, increased time available in each period of life for market and non-market production and also potentially increased length of life (reduced mortality).

According to Grossman (1972), the demand for healthcare comes from the demand for health. This is both a consumption good that enables wellness and investment good that determines one's productivity in the market and non-market and this enables for the production of commodities that form one's utility function. In addition, health is viewed as a durable capital stock that produces an output of healthy time. Initially, everyone has some level of inherited health at birth that depreciates with time with increasing age. Thus the mothers' utility function from demand of PrEP care can be expressed as follow:

$$U = f(X, G, H) \quad \ldots\ldots(1)$$

Where:

U is the utility derived from demand for PrEP; X is a neutral commodity that yields utility to the client; G is a commodity that directly yields utility to the mother and has direct effect on the health of the clients.

The demand for the PrEP is presented as follows:

$$H = f(Y, G, \varepsilon) \quad \ldots\ldots(2)$$

Where;

G is the purchased market inputs such as PrEP that affects the health of the child directly, Y is the commodity that yields utility to the PrEP clients / mothers directly and had direct effect on the health of the patients as in the ones taking PrEP, ε is the health component which can be either as a result of genetic or environmental conditions which are not prejudiced by the preferences of the clients. Consequently, the clients maximize utility in equation (1) given (2) and this is budget constrained as shown below;

$$I = \mathrm{XPx} + \mathrm{YPy} + \mathrm{GPg} \quad \ldots\ldots(3)$$

Where: I is the household income; P_x is the price of the commodity that yields utility to the client but has no direct effect on the health status of the PrEP clients; P_y is the price of commodity that yields utility to the PrEP clients and has direct effect on the health status of the clients and P_g is the price of the client production good.

The intuition is that the demand function can be obtained by maximizing the utility function subject to the health production function and the budget constraint. This can be expressed as follows:

$$H = f(P, I, \varepsilon) \quad \ldots\ldots(4)$$

As a result, neoclassical utility theory demand function for health we can theorize, the demand for PrEP is a function of knowledge and attitude of the clients towards PrEP and a vector of other social demographic factors such as mother's education level, household residence, age, marital status etc.

2.3 **Empirical review**

2.3.1 Knowledge on PrEP and HIV/AIDS

Ogbuji (2005) noted that knowledge about HIV/AIDS was a powerful tool that is important in the transmission of this disease. Contrary to this, knowledge on HIV/AIDS has not brought up remarkable results in attitudes and behavior modifications among the population. A research done by an Ibadan university in south-western parts of Nigeria indicated that more than 90% of pupils were knowledgeable on HIV/AIDS and its mode of spread but that only 16% of students who were sexually active used protection during sexual intercourse. There was lack of adequate information in regards to the use of antiretroviral drugs and at the same time the need for it among those using antiretroviral (Almeida and Vieira, 2009). Some studies show that there is limited evidence that HIV/AIDS-related sexual practices can be shaped by knowledge and attitudes related to HIV/AIDS (Kiragu, 2001). Even when youth are knowledgeable about HIV/AIDS, their behavior often fails to reflect their knowledge (Amuyunzu, 2001). It is common to find young people engaging in risk-taking behavior even though they have the knowledge, as they often underestimate the risk of them acquiring the AIDS virus (Dias et al., 2005). Myers et al. (2012) found out that knowledge on post-exposure management was dismal among dental students and accounting for 25% while 8.2% of the respondents were unwilling to conduct procedures on patients who had acquired HIV for fear of getting exposed. This justified the need for assessment on knowledge for the resistance to assist those infected with HIV and could be associated with little knowledge on management and prevention of exposures. Myers et al. (2012) arrived at a conclusion that among respondents, there exist both knowledge gaps that may result in failure to manage exposures that are blood borne accordingly and also care of HIV infected patients affected by the negative attitudes towards treating them. Much needs to be done in dental schools to ameliorate education on exposures that are blood borne pathogens.

According to UNICEF (2002) noted that the study by UN on HIV/AID awareness targeting young population and availability of information needed for protection from the scourge established that a high number of young people remain uninformed on how HIV/AIDS can be transmitted. A study on comprehensive knowledge on HIV/AIDS in young males by

level of education in some Sub-Saharan countries in 2004 reported Kenya with the highest knowledge levels of HIV/AIDS. Other countries studied included; Uganda, Burkina Faso, Namibia, Rwanda, Burundi, Cameroon, Ghana, Mali, Mozambique and Nigeria. These countries also reported high knowledge levels (UNAIDS and WHO, 2009).

A study by Mehta et al. (2011) on assessing the level of awareness of HIV Post-Exposure Prophylaxis and the factors related, in which five hundred and fifty-four MSM were taken into consideration, their study findings indicated that 63% of those interviewed had unsafe sex. 7% reported either safe or unsafe sex with a person known to have acquired HIV (Mehta et al., 2011). This is evident that some people continue to practice high risk sexual behaviors despite the existence of known HIV infection. Interestingly, only 36% of those interviewed were found to be cognizant of PEP or PrEP (Mehta et al., 2011).

2.3.2 Attitudes of PrEP by clients

Sexual behavior is important in curbing new HIV infections among young people. The Demographic Health Survey indicates that 50% of young population in Kenya are sexually active by 20 years of age (Kenya Demographic and Health Survey, 2003), causing an increase in their vulnerability to HIV (UNAIDS, 2010). HIV risk perception can be described as an individual's opinion of their chances of getting HIV. HIV risk perception is a problem among young people as they are more likely to underestimate rather than overestimate their risk of acquiring HIV (Chapin, 2000). It has been found that even when young people reveal that they or their peers were engaging in high risk sexual behavior, they have the tendency to have a false or low HIV risk perception, as many do not believe themselves to be at risk (Family Health International, 2006). There is limited evidence that HIV and AIDS-related attitudes and knowledge change sexual behavior that are HIV/AIDS related (Kiragu, 2001). In their study Purov et al. (2013) analyzed attitude in regard to Pre-Exposure Prophylaxis (PrEP) use amid 311 HIV medical practioners. Results showed favorable attitudes with seventy percent of the practioners acknowledging that they would recommend PrEP mainly to discordant couples while 56% of specialists would prescribe PrEP to people who are at risk of HIV infection. Those that had negative attitude in regard to the use of PrEP favored behavioral changes and were also keen about the toxicity of the

drugs. The negative attitude was attributed to lack of information on PrEP. Majority of practioners showed willingness to boost PrEP use despite the conflicting attitudes. Policies from relevant agencies and more scientific research on effectiveness may help in creating favorable attitudes in regard to PrEP use (Purov et al., 2013).

2.4 Overview of the literature

PrEP is the use of anti-retroviral to intercept or lower the chances of HIV transmission among the at risk individuals. Studies have shown that knowledge and attitude is paramount to fighting HIV/AIDS as it has an effect on health seeking behavior and protective mechanisms of individuals. Moreover, Myers et al. (2012) found out that among dental students, knowledge on post-exposure management was poor and that some of the respondents were not ready to perform procedures on patients who have acquired HIV for fear of getting exposed. Ogbuji (2005) noted that knowledge about HIV/AIDS was a powerful tool that is important in the transmission of this disease. Therefore, knowledge would be important to help in minimizing the preventions.

Various studies reviewed showed different awareness level of PrEP such as UNICEF (2002) noted that HIV/AIDS availability of information needed for protection from the scourge established that a high number of young people remain uninformed on how HIV/AIDS is transmitted while Mehta et al. (2011) found that 63% of those interviewed had unsafe sex and seven percent reported either protected or unprotected sex with a person known to have acquired HIV (Mehta et al., 2011). Similarly, though people are aware of HIV, their knowledge is not reflected on the perception and attitude towards HIV/AIDS and yet they engage in risk behavior (Kiragu, 2001; Amuyunzu, 2001; Dias et al., 2005). Currently there is limited evidence in Kenya showing the knowledge and attitude of PrEP by clients. This study was of value addition to empirical literature by investigating the role of knowledge, and attitude in optimizing PrEP uptake and also provided insight into improving PrEP uptake and future planning.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter presents the methodology that was used to address the study objectives. It contains the theoretical framework, Data description, target population, sampling methods and finally the ethical consideration.

3.2 Theoretical model

Knowledge and attitude towards HIV pre-exposure prophylaxis is key in determining the outcome of HIV infections to be experienced. Furthermore, it is key in determining the optimal resources to be allocated towards the same. With this in mind, the main problem is developing a model that optimizes the demand of HIV prophylaxis while on the other part minimizing on the incidence of HIV infections. This paper adopts and modifies the theory of Grossman's (1972). In this model, individuals could spend resources and time on investments aimed at improving health (Becker, 1965). The benefits are realized over time, as increased stocks of health capital delivered future utility flows, increased time available in each period of life for market and non-market production and also potentially increased length of life (reduced mortality). According to Grossman (1972), the demand for healthcare comes from the demand for health, which comes as a consumption good that enables wellness and investment good that determines one's productivity in the market and non-market, and consequently, enables for the production of commodities that form one's utility function, in addition, health is viewed as a durable capital stock that produces an output of healthy time.

Thus the mothers' utility function from demand of PrEP care can be expressed as follow:

$$U = f(X, G, H) \quad \ldots\ldots\ldots\ldots\ldots 5$$

Where:

U is the utility derived from demand for PrEP; X is a neutral commodity that yields utility to the client; G is a commodity that directly yields utility to the mother and has direct effect on the health of the clients.

The demand for PrEP is presented as follows:

$$H = f(Y, G, \varepsilon) \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots 6$$

Where;

G is the purchased market inputs such as PrEP that affects the health of the child directly, Y is the commodity that yields utility to the PrEP clients / mothers directly and had direct effect on the health of the patients as in the ones taking PrEP, ε is the health component which can be either as a result of genetic or environmental conditions which are not prejudiced by the preferences of the clients. Consequently, the clients maximize utility in equation (1) given (2) and this is budget constrained as shown below;

$$I = XP_x + YP_Y + GP_g \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots 7$$

Where: I is the household income; P_x is the price of the commodity that yields utility to the client but has no direct effect on the health status of the PrEP clients; P_y is the price of commodity that yields utility to the PrEP clients and has direct effect on the health status of the clients and P_g is the price of the client production good.

The intuition is that the demand function can be obtained by maximizing the utility function subject to the health production function and the budget constraint. This can be expressed as follows:

$$H = f(P, I, e) \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots 8$$

As a result, neoclassical utility theory demand function for health we can theorize, the demand for PrEP is a function of the client's knowledge and attitude of the clients to the

PrEP and a vector of other social demographic factors such as such as mother's education level, household residence, age, marital status etc.

3.3 Model Specification

To examine the factors that affect PrEP intake by the clients, this study applied probit model. According to Cameron and Trivedi (2005), either logit or probit can be used because the difference between the predicted probabilities from probit is minimal. The binary probit regression model was used to measure the PrEP uptake and how they are associated with the individual independent variables. This is justified by the fact that PrEP variable is a dummy variable and it is assumed that the errors follow the standard normal distribution with a probability distribution function. The probit model is presented below; $\boldsymbol{Y = X_i\beta + \varepsilon}$ **and** $\boldsymbol{y_i = 1}$ **if** $\boldsymbol{Y > z}$, $\boldsymbol{y_i = 0}$ **if** $\boldsymbol{Y \leq z}$. Where:

$\boldsymbol{Y}$ is unobserved latent continuous dependent variable, $\boldsymbol{X_i}$ represents a vector of independent variables, $\boldsymbol{\beta}$ are the coefficients that were estimated in the model, $\boldsymbol{\varepsilon}$ is the stochastic error term and is the threshold point of which if it exceeds, a person utilizes the medical insurance and $\boldsymbol{y_i}$ is the probability of utilizing the PrEP or not).

Based on the assumption that the errors follow the standard normal distribution, $u \sim N(0,1)$ with a probability distribution function, the probit model was defined by transforming $X\beta$ into a probability. The probit model is given by the cumulative distribution function below;

$$pr\,(y = 1) = \phi\,(X\beta) = \int_{-\infty}^{X\beta} \frac{1}{\sqrt{2\pi}} e^{-z^2/2}\, dz$$

And the log likelihood function is:

$$Ln = (Y/X, \beta) = \prod_{t=1}^{N} Y\, log\{\phi\,(X\beta)\} + (1 - Y)\{1 - \phi(X\beta)\}$$

In order to interpret the probit model, it was necessary to estimate marginal effects which reflect the change in the probability of experiencing or observing an event, in this case PrEP, given a unit change in the independent variables. Marginal effects can be estimated either as the average of the individual marginal effects or for the average person in the sample. Either way it produces matching results but in the later method, the average person

may not be in the sample. The average of the individual marginal effects was thus estimated.

The Multiple Regression Model is in the form:

$y_i = a + \beta_i X_{i.} + \varepsilon$

The estimable model to estimate the factors that affect the uptake of PrEP by the clients.

$$PrEP = f(K, A, X) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 10$$

Such that K is the knowledge and awareness of PrEP, A is the attitude towards PrEP and X is vector of other social demographic characteristics.

$$PrEP = B_0 + B_1 Knowledge\ and\ Awareness + B_2 Attitude\ towards\ PrEP + B_3 AGE + B_4 Gender + B_5 Employment + B_6\ Education\ level + B_7 Mrital\ status + Error_{term} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 11$$

The following table in 2 gives the description of variables and their measurements.

3.4 Variables Description

Table 1 Variable description

Variable	**Description**
Dependent Variable	
HIV PrEP uptake	1 If the respondent is taking or likely to take PrEP ,0 otherwise
Independent Variables	
Age	This captures the age bracket of the respondents.
Marital Status	1 if married and 0 Otherwise
Gender	This variable captures the sex of the respondents.1 if male , 0 otherwise

Education	1= Primary education. 2= Secondary 3= Diploma 4= Degree 5= Masters level
Religion	1= Christian 0= Other
Employment Status	This captures the employment status on whether one is formally employed or not, 1 if one has a formal employment, 0 otherwise
Knowledge	This measures the knowledge the clients have about HIV PrEP in terms of Cost, Side Effects, places of dissemination, Duration of taking PrEP, frequency of administration and person who dispenses. 1 is for the knowledge score of ≥50% and 0 when one scores less than 50% for not knowledgeable
Attitudes	This measures the patient's attitudes towards the intake of HIV PrEP.1 If the patient has positive attitude towards the PrEP, that is if the score is ≥50% , 0 for negative attitude when score is less than 50%
Income	This is the amount generated from an economic activity.

3.5 Data Description

The study used primary data collected from Special treatment Centre. Special treatment Centre is located in Nairobi County, Starehe Constituency, off River road within CBD. Services offered in the health centre include Emergency cases, general outpatient services, specialized outpatient clinics, STI, CCC, MCH/FP services, laboratory services, VCT, PITC, medical examination for food handlers, PrEP services, conference facility among other services.

3.6 Target population

The study targeted clients from the Special treatment Centre. It was estimated that there are about 200 clients who had tested positive by the year 2017.

3.7 Sampling Design and Sample Size determination

The study adopts a random sampling design. This applied to clients who walk into the facility randomly to seek for any of the services. Every client was approached by the researcher and one trained assistant during their visit within the consultation rooms and be requested to participate in the study. Screening for each individual to ascertain their suitability to participate in the study was carried out then followed closely by explanation of the study and signing of informed consent form. Participants were made aware of the purpose of the study during soliciting of informed consent from all who met the inclusion criteria. Participants were informed that they should feel free to opt out of the study if they are not comfortable with it, and that there were no ill consequences since the study is only for academic purpose.

The sample size is determined using the formula designed by Fisher as recommended by Mugenda and Mugenda (1998)

$$n_0 = \frac{Z^2(pq)}{e^2} \quad \text{.....12}$$

Where,

- e is the desired level of precision
- p is the (estimated) proportion of the population which has the attribute in question,
- q is 1 – p.

A 95 % confidence level gives us Z values of 1.96, per the normal tables and considering p=0.3, which was used by Hussein, A; (2013) in Kenya as the percentage of patient take HIV prophylaxis. Applying that

$$n_0 = \frac{1.96^2(0.3\ X\ 0.7)}{0.05^2} = 322$$

Given that the population under study is small, we modify the above using the equation

$$n = \frac{n_0}{1+\frac{n_0-1}{N}} \quad \text{.....13}$$

Applying this formula, we get

$$n = \frac{322}{1+\frac{322-1}{200}} = 123$$

The resulting sample size for this study is a total of 123 clients.

3.8 Data collection

A semi structured questionnaire based on the objective of the study with pre-coded questions were developed. The data from the field was collected using Special treatment Centre medical Staff and trained enumerators. This type of data was collected through interviewing by hospital medical Staff on the knowledge and attitudes of PrEP giving questionnaires related to the study objectives of clients. This was done by research assistant. Extra information on introduction of PrEP sites by MoH Kenya and measures adopted to increase utilization of PrEP services will be extracted from the MoH sites, articles and journals.

3.9 Pre-Test

There was a preliminary trial on a small scale to test the scientific statistical tools being used for collection, processing and analysis of data. The Pre- test centre was done at Special treatment Centre because of its blend of cosmopolitan and rural life. After which the tools were improved to capture all the questions intended.

3.9.1 Validity and Reliability

Validation of the data was done by taking 10% of the coded data from the questionnaire; they will then be counter checked to ensure high quality control. Correctly coded questionnaires were entered into the computer. Reliability is the degree to which data collected are free from measurements of errors mainly random errors. This was done by having single administration of the research instruments. A measure of internal consistency was done by splitting the instruments into two halves and then co-relating the scores from

each half. It produced a coefficient equivalent of 1. Implying that the reliability of the data collected matches with the expectations.

3.10 Data Analysis

Data collected was thoroughly checked and validated for accuracy and completeness for double entry into Statistical Package for Social Sciences (SPSS). Descriptive statistics including mean, mode, frequency distributions cross tabulations were used. Bivariate analysis was performed using the Pearson's chi-square test for testing associations between the various categorical variables. Multivariate analysis was done using probit regression to examine the knowledge, and attitude of PrEP by clients following bivariate analysis on categorical variables to determine factors to take further to the multivariate model. A p value of <0.05 was used as the cut-off for determining factors to be retained in the model based on a likelihood ratio test (LRT). Pearson correlation coefficient was used to measure the strength between variables.

3.11 Ethical Considerations

The study was conducted in strict conformity to good clinical practices. The PI communicated officially to the target population management to negotiate on their availability and access. A consent form was provided to the respondents and by signing of the consent forms, the researcher was able to gain an approval from all the respondents. Sobriquet was used in respect of the participants of the institutions. This ensured that anonymity and confidentiality was strictly followed. An introductory statement was placed on every questionnaire.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION OF RESULTS

4.1 Introduction

This chapter provides the discussion of the study findings starting with the descriptive statistics in terms of demographic data, pretests and ends with model and discussion of the results

4.2 Reliability of data collection Tool

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.708	.393	41

Cronbach's Alpha of 0.70 and above is good, 0.80 and above is better and 0.90 and above is best. The test is used to determine reliability or internal consistency. From the results, we can say that the data collection tool is 70.8 % reliable

4.3 Demographic Statistics

The descriptive statistics shows the statistical properties of the study variables. The study number of observations for the gender, age, religion and education were 123, PrEP was 100, marital status 120, income is 80 while employment accounted for 112.The mean shows the average values for the variables. The standard deviation shows the distribution of the variable observation in relation to mean. The maxima shows the highest achievable value of the variable while minima shows the lowest value of the variable.

	Obs	Minimum	Maximum	Mean	Std. Deviation
PrEP Uptake	100	0	1	.83	.378
Gender	123	0	1	.68	.467
Age	123	0	4	2.05	1.267
Marital Status	120	0	1	.52	.501
Education	123	0	3	2.00	1.000

Religion	123	0	2	1.03	.312
Employment	112	0	1	.76	.430
Income	80	3000	150000	18593.75	21809.023

Income had the highest mean value of 18593.75 while the lowest mean value was for gender with 0.68. Similarly, income had the highest standard deviation of 21809.023 with the least value being that of religion 0.312. Maximum values captures the highest achievable observation. It is notable from the study findings that income had the highest value of 150000 and the lowest value was 3000.The implication is that the least paid of the respondents had a total of 3000 while the much paid got 150,000.

The maximum values of the other variables represent the various categorization of the variables in which they were coded. The minimum was based on the coding such that for age, it showed the age-bracket groups for each of the values. The implication is that these minimum and maximum values may not make sense.

4.4 Attitude on PrEP Statistics

This section represents the discussion of the various findings to the questions about the variable of the attitudes towards PrEP. The results are presented in tabular form in percentages cumulatively.

PrEP in an important measure of HIV prevention					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	53	42.7	51.0	51.0
	Agree	33	26.6	31.7	82.7
	Undecided	15	12.1	14.4	97.1
	Disagree	2	1.6	1.9	99.0

	Strongly disagree	1	.8	1.0	100.0
	Total	104	83.8	100.0	

On the question on whether PrEP is an important measure in the prevention of HIV indicated that 51 percent of the respondents strongly agreed that PrEP prevents HIV while 31.7 percent agreed that PrEP is important in HIV prevention. Out of the total number of the people interviewed 14.4 percent were undecided on the role of PrEP on HIV prevention. Those who strongly disagreed that PrEP prevents HIV accounted for 1 percent while 1.9 percent disagreed. Generally, majority of the respondents agreed that PrEP is important in HIV prevention.

Everyone should have access to PrEP					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	46	37.1	43.4	43.4
	Agree	29	23.4	27.4	70.8
	Undecided	13	10.5	12.3	83.0
	Disagree	10	8.1	9.4	92.5
	Strongly disagree	8	6.5	7.5	100.0
	Total	106	85.5	100.0	

The study findings is that those who strongly agreed that all people should have access to PrEP accounted for 43.4 percent while 27.4 percent agreed although not strongly. Those who strongly disagreed were 7.5 percent with 9.4 simply disagreeing. The rest of the respondents were not decided on whether everyone should have access to PrEP. Cumulatively, 70.8 percent of the respondents agreed that everyone should have access to PrEP.

PrEP can reduce the likelihood of HIV infection					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	49	39.5	47.1	47.1
	Agree	39	31.5	37.5	84.6
	Undecided	10	8.1	9.6	94.2
	Disagree	4	3.2	3.8	98.1
	Strongly disagree	2	1.6	1.9	100.0
	Total	104	83.9	100.0	

In this section we also tried to find out what people thought on the role of PrEP in reducing HIV infection. The study results indicated 47.1 percent strongly agreed that PrEP reduce the likelihood of HIV infection while 37.5 percent agreed on the likelihood of reducing HIV infection. Those who strongly disagreed and disagreed in aggregate accounted for 5.7 percent of the respondents in this question. Therefore, majority of the respondents agreed that PrEP reduce the likelihood of the HIV infection.

Are your feelings about PrEP influenced by peers					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	38	30.6	56.7	56.7
	Yes	29	23.4	43.3	100.0
	Total	67	54.0	100.0	

Many times feelings of people are influenced by their friend or peers and this study sought to find out this under the aspect of attitudes. The question was based on the influence of peers about PrEP. Majority of the respondents who accounted for 43.3 percent agreed that their feelings towards PrEP was influenced by peers and 56.7 percent disagreed that their feelings towards PrEP were influenced by their peers. The implication is that feelings towards PrEP is an individual based kind of the decision.

Would you recommend PrEP to a friend					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	7	5.6	7.1	7.1
	Yes	92	74.2	92.9	100.0
	Total	99	79.8	100.0	

To gauge on how people think on the recommendation for PrEP, majority would recommend others for PrEP with those who can recommend others to use PrEP accounting for 92.9 percent while those who cannot recommend were 7.1 percent.

Do you know anyone on PrEP					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	94	75.8	87.9	87.9
	Yes	13	10.5	12.1	100.0
	Total	107	86.3	100.0	

Lastly in this variable, the study tabulated the application of PrEP and the study findings show that 87.9 percent were not aware of anyone on PrEP while 12.1 percent were aware of anyone on PrEP. This is an indication that majority of the respondents were not aware of people on PrEP and hence the implication of knowledge scarcity.

4.5 Knowledge and Awareness on PrEP Analysis

This subjection provides the tabulation of the responses on the analysis of knowledge as one of the variables under the study.

Are you aware of PrEP					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	64	51.6	54.7	54.7
	No	51	41.1	43.6	98.3
	Don't Know	2	1.6	1.7	100.0
	Total	117	94.4	100.0	

The study findings from those who responded on the question on PrEP awareness showed that majority were aware of PrEP. Out of those who responded to this question 54.7 percent knew about PrEP while 43.6 percent were not aware of PrEP. The rest were ignorant and accounted for 1.7 percent of the total respondents.

Have you ever received information on PrEP					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Don't Know	7	5.7	5.7	5.7
	Yes	62	50.0	50.0	55.7
	No	54	44.3	44.3	100.0
	Total	123	100.0	100.0	

The study sought to find out whether the respondents had received information on PrEP and 50 percent of the respondents confirmed that they had received information on PrEP while 44.3 percent had not received any information. The rest did not know whether they had received the information or not and they formed the 5.7 percent.

PrEP is used to prevent HIV infection					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Don't Know	26	21.0	22.4	22.4
	Yes	65	52.4	56.0	78.4
	No	25	20.2	21.6	100.0
	Total	116	93.5	100.0	

A similar question on HIV infection prevention was asked to test knowledge and awareness and majority of the respondents who composed of 56 percent knew PrEP as a measure of HIV infection prevention while 44 percent of the respondents formed part of those who knew not and those who responded "No" on whether they had used or not. For those who responded "No" were 21.6 percent while those who did not know were 22.4 percent of the entire respondents.

PrEP is medication given to HIV positive people after being tested					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Don't Know	35	28.2	28.2	28.2
	Yes	22	17.7	17.7	46.0
	No	66	54.0	54.0	100.0
	Total	123	100.0	100.0	

On the case of awareness and knowledge the study also sought to find out if PrEP is medication given to people after testing HIV positive. Those who knew that PrEP is a

medication given to HIV positive people were 17.7 percent and 54 percent of the respondents said it was not a medication after one tested HIV positive. The rest of the respondents did not know and accounted for 28.2 percent.

PrEP is medication given to HIV negative people but at risk of HIV					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Don't Know	38	30.8	30.8	30.8
	Yes	70	56.9	56.9	87.7
	No	15	12.3	12.3	100.0
	Total	123	100.0	100.0	

On the other hand, 56.9 percent of the respondents thought that PrEP is a medication given to HIV negative people but who are at risk of getting HIV, 30.8 percent did not know about this fact while 12.3 responded "No" on whether PrEP is given to HIV negative people who are at the risk of HIV.

PrEP can cause a fatal disease					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Don't Know	60	48.4	51.3	51.3
	Yes	15	12.1	12.8	64.1
	No	42	33.9	35.9	100.0
	Total	117	94.4	100.0	

On whether PrEP can cause fatal disease or not the study findings indicated that 51.3 percent lacked knowledge about the same and 12.8 percent agreed that PrEP can cause

fatal disease. The rest who were 35.9 percent were of the opinion that PrEP cannot cause fatal disease.

PrEP be used as a cure for AIDS					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Don't Know	39	31.5	33.6	33.6
	Yes	12	9.7	10.3	44.0
	No	65	52.4	56.0	100.0
	Total	116	93.5	100.0	

The study findings indicate that many of the respondents with the highest proportion of 56 Percent said that PrEP cannot be used as a cure for AIDs followed by those who did not know who accounted for 33.6 percent. The rest of the respondents knew that PrEP is used as a cure for AIDs.

A person can be infected with other STI while on PrEP					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Don't Know	60	48.8	48.8	48.8
	Yes	41	33.3	33.3	82.1
	No	22	17.9	17.9	100.0
	Total	123	100	100.0	

On the question whether one on PrEP can be infected with STI, the study findings show that majority lacked knowledge on this and they accounted for 48.8 percent. Those who agreed that person on PrEP can be infected with other STI were 33.3 percent and those who disagreed with accounted for 17.9 percent.

PrEP is taken for one week only					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Don't Know	73	58.9	62.4	62.4
	Yes	11	8.9	9.4	71.8
	No	33	26.6	28.2	100.0
	Total	117	94.4	100.0	

The study sought to find out the duration for which PrEP should be taken and the study established that 62.4 percent did not know that while others knew that it is taken for one week and were 9.4 percent. The rest who accounted for 28.2 percent did say that PrEP is not taken for one week only.

PrEP is given in injection form					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Don't Know	67	54.0	58.3	58.3
	Yes	9	7.3	7.8	66.1
	No	39	31.5	33.9	100.0
	Total	115	92.7	100.0	

The majority of the respondents did not know what form PrEP is given. The highest number who formed 58.3 percent were not aware of the form in which PrEP is given. 7.8 percent of the total respondents said that they were aware that PrEP is given in injection form. The rest of the respondents disagreed that injection was the form in which PrEP is given.

PrEP services can be obtained at a nearby chemist					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Don’t Know	58	46.8	50.9	50.9
	Yes	16	12.9	14.0	64.9
	No	40	32.3	35.1	100.0
	Total	114	91.9	100.0	

Chemists play an important role in the access to medication and other services because of their geographical distribution in different locations. The highest percentage did not know if PrEP was available in the nearest chemist and they formed 50.9 percent of those who were interviewed while 14 percent knew that it can be obtained in the nearby chemist. The rest of the respondents who said that it could not be obtained from a nearby chemist were 35.1 percent.

Can a person do anything when they have side effects of PrEP					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Don't Know	66	53.2	64.1	64.1
	Yes	34	27.4	33.0	97.1
	No	3	2.4	2.9	100.0
	Total	103	83.1	100.0	

Medical products usually have side effects and due to this fact, we sought to find out if the respondents had experienced side effects or knew anything about the side effects of PrEP. The study findings indicate that 64.1 percent did not know if there was anything to be done in case of side effects of PrEP followed by 33 percent who confirmed that something could be done. The rest of the respondents said that nothing can be done and they were 2.9 percent.

Is there any other disease that can be prevented through taking PrEP					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	81	65.3	77.1	77.1
	Yes	24	19.4	22.9	100.0
	Total	105	84.7	100.0	

The study sought to find out on the various use of PrEP by asking the respondents if PrEP could be used to prevent other diseases. The essence was to find out the knowledge on the use of PrEP and 77.1 percent responded "No" as to whether PrEP can prevent other diseases. At least 22.9 percent of the respondents said that PrEP can prevent other diseases.

In your opinion, who are the people likely to take PrEP					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Other	19	15.3	20.0	20.0
	Parents	7	5.6	7.4	27.4
	Youth	33	26.6	34.7	62.1
	Prostitutes	36	29.0	37.9	100.0
	Total	95	76.6	100.0	

Different people have different perceptions on who is the right person to use PrEP in which three main categories of people were parents, youth and prostitutes. Many of the respondents thought that PrEP was for use by the prostitutes and accounted for 37.9 percent. The reason could be the fact that they engage reckless sexual behavior followed by youths who formed 34.7 percent of the response. Parents and other people accounted for 27.4 percent of the perceived users of PrEP.

4.6 Diagnostic tests

4.6.1 Multicollinearity

Multicollinearity refers to the situation in which the independent variables are related to each other in the model and this causes spurious results. This study applied the Variance inflation factor to check for Multicollinearity. The decision rule is that a mean VIF value less than 8.0 implies the absence of Multicollinearity while values greater than 8.0 indicates the presence of the Multicollinearity.

Variable	VIF	1/VIF
Religion	3.55	0.281332
Income	3.44	0.290698
Age	2.89	0.345627
Marital Status	2.57	0.389280
Education	2.40	0.417311
Knowledge on PrEP	1.94	0.514313
Attitude on PrEP	1.52	0.657525
Employment	1.49	0.672548
Gender	1.44	0.695257
Mean VIF	2.36	

The study findings indicated that the value of mean VIF was 2.36 and thus concluded that there was no Multicollinearity. Consequently, we proceeded to estimate the probit model below.

4.7 Probit regression results

	PrEP Uptake
Gender	0.482***
	(0.0670)
Age	0.00910
	(0.0256)
Marital Status	0.0763
	(0.0718)
Education	0.257***
	(0.0321)
Religion	0.376***
	(0.0758)
Employment	-0.938***
	(0.106)
Income	0.0000150***
	(0.00000195)
Attitude_ HIV PrEP	0.310***
	(0.0646)
Knowledge_HIV PrEP	0.310***
	(0.0670)
Constant	0.367*
	(0.161)
Observations	1751
LR chi2(9)	562.60
Prob > chi2	0.0000
Pseudo R2	0.3720
Log likelihood	-474.887

Standard errors in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The principle component analysis was used to come up with principle components for Knowledge and Attitude upon getting the score for Attitude and Knowledge, this is how it was generated. For Knowledge, if the score is equal or above 50%, it was considered knowledgeable on PrEP and hence coded as 1, and below that, it's coded as 0. Likewise, for attitude, if the score is equal or above 50%, it is deemed positive attitude and coded as 1, otherwise it's coded as 0 for negative attitude.

The study presented the results of the probit model in which the utilization of PrEP is the dependent variable while other variables are independent. The study captured both the attitude towards PrEP and knowledge on PrEP utilization. This model is interpreted in terms of the probability of the independent variables on the dependent variable. The constant shows the level of utilization for an empty model which means without the inclusion of the independent variables

Gender affects PrEP utilization positively and significantly. Being a male increase the probability of PrEP utilization by 0.482 at 1 percent level of significance. The implication is the fact that being male increases PrEP utilization.

The relationship between age and PrEP utilization is positive and significant. A unit increase in age significantly increases the level of PrEP utilization by 0.00910 at 1 percent level of significance. It can be concluded that as people's age increase they find need to use PrEP. People with low age find it less important to make use of PrEP as a way of preventing HIV infection. It is common to find young people engaging in risk-taking behavior even though they have the knowledge, as they often underestimate the risk of them acquiring the AIDS virus (Dias et al., 2005.Futhermore, even when youth are knowledgeable about HIV/AIDS, their behavior often fails to reflect their knowledge (Amuyunzu, 2001).)

Marital status is the state whether one is married or not and it plays an important role on the utilization of PrEP in the health facilities. Being married increases the probability of PrEP utilization by 0.0763 relative to being widowed, single or even separated. This effect is however not significant at the three levels of significance.

The study findings indicate that education significantly and positively affect the utilization of PrEP. The results show that increasing the level of education significantly increases the probability of PrEP uptake by 0.257 at 1 percent level of significance. The implication is that as people advance in their education they find need to make use of PrEP.

Similarly, religion seems to play an important role on PrEP uptake in the health facilities. Religion is positively related to the level of PrEP uptake. Being a Christian increases the probability of PrEP uptake by 0.3761. This relationship is explained by the fact that some

religious beliefs discourages people from using products such as PrEP as they are regarded ungodly. Therefore, the kind of faith one associates himself is key in the decision to either utilize PrEP or not.

Being employed reduces the probability of PrEP uptake significantly. The study findings show that the fact that one has an employment causes the reduction in the probability of PrEP uptake by 0.938 at 1 percent level of significance. This could be attributed to the fact that those employed have the ability to get other insurance or can pay for the expenses associated with the exposure behavior. Therefore, the implication is the fact that those who are not employed are associated with high probability of PrEP uptake due to the fact that they are exposed as compared to those who are not.

On the other hand, income which is related to the employment status increases the probability of PrEP uptake. The model results show that increase in the income of an individual by one unit is associated with the probability of PrEP uptake by 0.0000150. This explains that as income of the individuals increase it becomes easy to utilize PrEP.

Despite other variables in this study having significant on PrEP uptake, the results show that there is a positive relationship between attitude and PrEP utilization. Having a positive Attitude was found to increase the probability of PrEP uptake by 0.310 at 1 percent level of significance. This implies that although attitude is qualitative, it plays an important role on PrEP uptake. Similarly, majority of practitioners showed willingness to boost PrEP use despite the conflicting attitudes. Policies from relevant agencies and more scientific research on effectiveness may help in creating favorable attitudes in regard to PrEP use (Purov et al., 2013).

Contrary to the expectation, knowledge and awareness were found to affect PrEP utilization positively and significantly. Knowledge and awareness about PrEP increases the probability of the PrEP utilization significantly by 0.310 at 1 percent level of significance. This implies that the more knowledge people have on PrEP the more the uptake. Myers et al. (2012) found out that knowledge on post-exposure management was dismal among dental students and accounting for 25% while 8.2% of the respondents were unwilling to conduct procedures on patients who had acquired HIV for fear of getting exposed.

CHAPTER FIVE

SUMMARY AND CONCLUSION

5.1 Introduction

This section presents the summary and conclusion of the study results from the study findings in the previous chapter. Also in this section is the policy recommendation and further areas of research.

5.2 Summary and Conclusion

The first objective was to assess on the knowledge and awareness of PrEP by clients at STC health Centre. The study findings indicated that majority of the respondents were aware on the existence of PrEP. This was an indication that generally, people are informed about PrEP. The probit model results shows that knowledge and awareness about PrEP Increases PrEP uptake and the effect was very significant.

The second objective of this study was to assess people's attitude towards PrEP and several questions were asked to assess on attitude. The respondents agreed that PrEP plays an important role in the prevention of HIV and other related diseases. The respondents had information on the people using PrEP. In addition, peers were found to play an important role on the utilization of PrEP. The probit output results shows that positive attitude increases the probability of using PrEP.

Other variables factored in this study include gender and income which were found to significantly affect the utilization of PrEP positively and significantly. The rest of the study variables which include the age, marital status, religion and education were also found to influence PrEP uptake positively.

5.3 Policy recommendation

This study proposes that measures should put in place to ensure that people are aware and have knowledge about PrEP because it plays an important role in HIV prevention which is one of the leading in morbidity in the country.

Secondly, there is need to promote positive attitude towards the use of PrEP because it plays an important role on the use. This will not only help in reducing the cases of the HIV but also the cases of other related disease like opportunistic infections.

It has also been established that age increases the use of PrEP and this study proposes that people regardless of the age should be encouraged to use PrEP because the risk of HIV is not dependent on the age.

5.4 Further areas of research

The study has limited itself to the assessment of the knowledge and attitudes towards the use of PrEP and did not consider other demographic factors limited to a given health facility. Therefore, this research can be extended to other health facilities in different areas in the country.

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APPENDIX 1: RESEARCH SUBJECT INFORMATION AND CONSET FORM

TITLE: ANALYSIS OF KNOWLEDGE AND ATTITUDE OF PRE-EXPOSURE PROPHYLAXIS BY CLIENTS: THE CASE OF STC HEALTH CENTRE.

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PURPOSE

You are asked to participate in a research study. The purpose of the study is to better understand your knowledge and attitude of Pre-Exposure prophylaxis in order to improve on the services. You are asked to participate in the study because you are a client in the facility.

PROCEDURE

A study staff will talk to you and introduce confidential questionnaire of which you will give answers. The questionnaire is designed to collect information in regards to your knowledge, and attitude of Pre-Exposure prophylaxis. (PrEP)

BENEFITS

Through your participation in the study we hope to have a better understanding on knowledge and attitude of PrEp by clients and how it may impact on the use of PrEP. This will aid in future planning by the policy makers on how to improve PrEP services.

PAYMENT

You will not be paid for participating in the study.

ALTERNATIVE

Your alternative is not to participate on this study.

CONFIDENTIALITY

Any information obtained in this study will be confidential. Your responses can be linked to your personal information only through a numerical code that will be secured by the surveyor. Your honesty is very crucial.

QUESTIONS

Feel free to ask the interviewer any questions during the interview. Do not agree to be in this study unless you have received satisfactory answers to your questions.

CONSET

I willingly agree to participate in the study. All my questions about my participation in the study have been answered.

Your signature indicates your acceptance to voluntary participate in the study.

Participants name……. date……

Signature ……..

Person conducting informed

Consent discussion name……. date……

Signature …….

CODE……

APPENDIX II: Questionnaires

INSTRUCTIONS:

- Fill only one set of the questionnaire per individual.
- Please answer each question as completely and clearly as possible by ticking appropriately on only one answer (unless otherwise advised) from the choices given or writing your response as appropriate in the space provided.

Part A: Demographic Data

Please put a tick (√) against the answer of your choice.

1. Gender: Male ( ) Female ( )
2. How old are you?
   a. 18 - 24 years ( ) b. 25 - 29 years ( ) c. 30 – 34 years ( ) d. 35 – 39 years ( ) e. 40 years and above
3. What is your marital status?
   a. Single ( ) b. Married ( ) c. Divorced ( ) d. Separated ( ) e. Other (specify)_____
4. What is your highest qualification achieved?
   a. Primary ( ) b. Secondary ( ) c. Tertiary ( )
5. What is your Religion/ denomination?
   a. Christian ( ) b. other
6. What is your employment status?_____
7. What is your daily expenditure?_____

SECTION B: KNOWLEDGE

8 Are you aware of PrEP?

a. Yes ( ) b. No ( )

9. Is PrEP a Bacterium?

a. Yes ( ) b. No ( ) c. Don't Know/Don't Remember ( )

10. Is PrEP a Virus?

a. Yes ( ) b. No ( ) c. Don't Know/Don't Remember ( )

11. Have you ever received information on PrEP?

a. Yes ( ) b. No ( )

b) If you have received information on PrEP, how much information about PrEP do you gain from following sources?

a. Television	None ( )	Little ( )	Some ( )	A lot ( )
b. Radio	None ( )	Little ( )	Some ( )	A lot ( )
c. Newspapers	None ( )	Little ( )	Some ( )	A lot ( )
d. Pamphlet/Poster	None ( )	Little ( )	Some ( )	A lot ( )
e. Health care workers	None ( )	Little ( )	Some ( )	A lot ( )
f. Campaigns	None ( )	Little ( )	Some ( )	A lot ( )
g. Religious Leaders	None ( )	Little ( )	Some ( )	A lot ( )
h. Friend	None ( )	Little ( )	Some ( )	A lot ( )
i. Sexual Partner	None ( )	Little ( )	Some ( )	A lot ( )
j. In class at school	None ( )	Little ( )	Some ( )	A lot ( )
k. School health education	None ( )	Little ( )	Some ( )	A lot ( )
l. Peers	None ( )	Little ( )	Some ( )	A lot ( )
m. Family member	None ( )	Little ( )	Some ( )	A lot ( )
n. Internet	None ( )	Little ( )	Some ( )	A lot ( )

12. PrEP refers to antiretroviral (ARV) medication used to prevent HIV infection.

a. True ( ) b. False ( ) c. I don't know

13. PrEP is medication given to HIV positive people after being tested.

a. True ( ) b. False ( ) c. I don't know ( )

14. PrEP is medication given to HIV negative people but who are at substantial risk of getting HIV infection

a. True ( ) b. False ( ) c. I don't know ( )

15. HIV/AIDS is a growing problem in this community

a. True ( ) b. False ( ) c. Don't Know/Don't Remember ( )

16. PrEP can cause a fatal disease

a. True ( ) b. False ( ) c. Don't Know ( )

17. PrEP be used as a cure for AIDS

a. Yes ( ) b. No ( ) c. Don't Know /Don't Remember ( )

18. A person can be infected with other STI while on PrEP

a. Yes ( ) b. No ( ) c. Don't Know/Don't Remember ( )

19. Can a sick-looking person take PrEP?

a. Yes ( ) b. No ( ) c. Don't Know/Don't Remember ( )

20 PrEP is taken for one week only.

a. True ( ) b. False ( ) c. I don't know ( )

21. PrEP is given in injection form.

a. Yes ( ) b. No ( ) c. Don't Know/Don't Remember ( )

22. PrEP services can be obtained at a nearby chemist.

a. True ( ) False ( ) c. Don't Know

23. To what extent do you feel the following practices warrant use of PrEP? (*where 4 is Strongly agree, 3 is Agree, 2 is neutral, 1 Disagree and 0 Strongly Disagree)*

PrEP USE	4	3	2	1	0
Unprotected Sex with a commercial sex worker					
Contact with blood of infected person					
Casual contact with infected person (i.e. sharing food, cup, glass,					
Using condoms with your partner					
Contact with infected person's toothbrush/shaving material					
During Pregnancy					
During Birth					
When breastfeeding					
During blood transfusion					
Sharing Needles (drug use), razor blades					
Kissing					
As a prophylaxis to mosquito/Insect bites					

24. Can a person do anything when they have side effects of PrEP?

a. Yes ( ) b. No ( ) c. Don't Know/Don't Remember ( )

25. The following can be used as an alternative to PrEP? Tick where appropriate.

	Yes	No
a. Abstain from sex	( )	( )
b. Non penetrative sex/thigh sex	( )	( )
c. Always use condoms	( )	( )
d. Limit number of sex partners	( )	( )
e. Have only one sex partner	( )	( )

f. Avoid sex workers ( ) ( )

g. Have sex with a virgin ( ) ( )

h. Use sterilized needles ( ) ( )

i. Require partner to take blood test ( ) ( )

26. a) Is there any other disease that can be prevented through taking PrEP?

a. Yes ( ) b. No ( )

27. In your opinion, who are the people likely to take PrEP?

a. Parents ( )

b. Youth ( )

c. Prostitutes ( )

d. Others (Specify _____

SECTION C: ATTITUDE

28. PrEP in an important measure of HIV prevention.

a. Strongly agree ( ) b. Agree ( ) c. Undecided ( ) d. Disagree ( ) e. Strongly disagree ( )

29 . Everyone should have access to PrEP.

a. Strongly agree ( ) b. Agree ( ) c. Undecided ( ) d. Disagree ( ) e. Strongly disagree ( )

30. PrEP can reduce the likelihood of HIV infection.

a. Strongly agree ( ) b. Agree ( ) c. Undecided ( ) d. Disagree ( ) e. Strongly disagree

31. What is your view on the use of PrEP? (Tick yes or no as appropriate)

	Yes	No
(1) It encourages not using condom	( )	( )
(2) Should be easily available to all	( )	( )
(3) Should not be used at all	( )	( )

32. If you had to, would you use PrEP?

a. Yes ( ) b. No ( )

33. PrEP can help reduce new HIV infections?

a. Strongly agree ( ) b. Agree ( ) c. Undecided ( ) d. Disagree ( ) e. Strongly disagree ( )

34. Are your feelings about PrEP influenced by the following?

a. Culture Yes ( ) No ( )

b. Religion Yes ( ) No ( )

c. Peers Yes ( ) No ( )

35. Since PrEP services are available at this STC clinic, would you recommend your friend to use it if necessary? (Tick one answer) Yes ( ) No ( )

36. In your own opinion, what is the probability that you May take PrEP?

a. Very High ( )
b. High ( )
c. Neutral ( )
d. Low ( )
e. Very low ( )

37. Do you know anyone on PrEP?

a. Yes ( ) b. No ( )

THANK YOU.

APPENDIX III: Budget

ITEMS	**Amount (Kshs)**
STATIONERY	
Typing and printing	10,000
Secretarial and Binding services	5,000
Laptop	50,000
PERSONNEL	
Data collection and Analysis Costs	70,000
Study assistant	20,000
MISCELLANEOUS	5,000
TOTAL	**160,000**

Budget Justification

Stationery

These are costs incurred during typing, printing and binding of documents. A laptop will be procured for data cleaning, analysis and validation process.

Personnel

A study assistant will be contracted for 20 days at a rate of 1000 shillings per day. PI will have to contract a data analyst at rate of 80,000.

APPENDIX IV: Work plan

2019

January	**Feb-may**	**June**	**July**	**Aug**	**Sep**
Developing Research Proposal					
Defence in the department and corrections					
Defence in the Faculty					
Administration of post-test					
Data collection					
Data analysis					
Final report writing					
Submission of final Report					