PREVALENCE AND DETERMINANTS OF HIV PRE EXPOSURE AND POST EXPOSURE PROPHYLAXIS USE AMONG YOUNG ADULTS IN KHWISERO SUBCOUNTY, KENYA

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A Thesis Submitted to the School of Public Health, Biomedical Sciences and Technology in Partial Fulfillment for the Requirements of the Award of Masters of Science Degree in Public Health of Masinde Muliro University of Science and Technology

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DECLARATION

This thesis is my original work and has not been presented for award of degree in any other university or institution.

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CERTIFICATION

The undersigned certify that they have read and hereby recommend for acceptance of Masinde Muliro University of Science and Technology a thesis entitled: **"Prevalence and determinants of HIV Pre Exposure and Post Exposure Prophylaxis use among young adults in Khwisero Sub County, Kenya"**

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DEDICATION

To my mother, Hawo Mustapha, and my sister, Zeituna Abdallah, who have stood by my side through thick and thin, offering their unwavering support from the beginning to the completion of my studies.

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ABSTRACT

HIV/AIDS remains a major global public health threat despite the emergence of biomedical prevention strategies such as HIV Pre Exposure Prophylaxis and Post Exposure Prophylaxis. Despite their efficacy, utilization rates are low among youths aged 15-24, who account for approximately 27% of new infections globally and 33% in Kenya. While the determinants of HIV Pre Exposure Prophylaxis and Post Exposure Prophylaxis usage have been documented among men who have sex with men, female sex workers, adolescent girls, and women, there are limited studies focusing on young adults, a high-risk population for HIV infection. This study aimed to address this gap by focusing specifically on young adults aged 18-24 in Khwisero sub-county, Kenya. The study investigated the prevalence and determinants of HIV Pre Exposure Prophylaxis and Post Exposure Prophylaxis use among young adults, with specific objectives including the determination of uptake prevalence and the exploration of demographic, health system, and socio-cultural determinants. Guided by the Health Belief Model, a cross-sectional design was adopted. The target population comprised young adults aged 18-24, with a sample size of 426 respondents determined using the Yamane formula. Two wards in Khwisero Sub-County were selected using simple random sampling, and systematic sampling was employed to select young adults from community units within these wards. Quantitative data were collected via a semi-structured questionnaire, while qualitative data were obtained through Key Informant Interviews. The Statistical Package for Social Sciences version 26 was used to analyze quantitative data through descriptive and inferential statistics, including chi-square and logistic regression at a significance level of 0.05. Thematic analysis was employed for qualitative data, and findings were presented in tables, figures, narratives, and direct quotes. The study revealed low prevalence of Pre Exposure Prophylaxis (23.4%) and Post Exposure Prophylaxis (22.6%) utilization. Significant determinants of Pre Exposure Prophylaxis use included education level (χ^2=8.1, OR=0.21, P=0.04), religion (χ^2=5.0, OR=0.40, P=0.03), affordability (χ^2=9.74, AOR=1.89, P=0.002), provider-initiated counseling (χ^2=17.09, AOR=2.69, P<0.001), and stigma (AOR=0.37, P=0.002). Factors affecting Post Exposure Prophylaxis utilization encompassed education level (χ^2=17.76, OR=0.43, P<0.001), marital status (χ^2=6.47, OR=0.33, P=0.04), living arrangement (χ^2=9.91, OR=1.95, P<0.001), and provider-initiated counseling (χ^2=5.71, AOR=1.49, P=0.02). Qualitative data highlighted additional factors such as adherence support and cultural beliefs. These results highlight the urgent need for targeted interventions to enhance Pre Exposure Prophylaxis and Post Exposure Prophylaxis utilization among young adults. By addressing the identified barriers and leveraging facilitators, policymakers can formulate strategies and interventions to strengthen uptake, ultimately reducing new HIV infections among young adults.

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LIST OF ACRONYMS AND ABBREVIATIONS

AGYW: Adolescent Girls and Young Women

AIDS: Acquired immunodeficiency syndrome

AVAC: AIDS Vaccine Advocacy Coalition

CCC: Comprehensive Care Clinic

CDC: Centers for Disease Control and Prevention

CHA: Community Health Assistant

CWOC: Cisgender Women of Color

FSW: Female Sex Workers

HBM: Health Belief Model

HIV: Human Immunodeficiency Virus

HTSO: HIV Testing Services Officer

IAS: International AIDS Society

KEMSA: Kenya Medical Supplies Authority

KII: Key Informant Interview

LGBTQ: Lesbian, Gay, Bisexual, Transgender and Queer

MEDS: Mission for Essential Drugs and Supplies

MSM: Men who have Sex with Men

PEP: Post-Exposure Prophylaxis

PLHIV: People Living with HIV

PMTCT: Prevention of Mother to Child Transmission

PrEP: Pre-Exposure Prophylaxis

PWID: People Who Inject Drugs

SCASCO: Sub County AIDS and STI program Coordinator

SDG: Sustainable Development Goal

T&T: Test and Treat

U.S.A: United States of America

UN: United Nations

UNAIDS: Joint United Nations Programme for HIV/AIDS

WHO: World Health Organization

YMSMOC: Young Men of Color who have Sex with Men

OPERATIONAL DEFINITION OF TERMS

Accessibility: The ability to obtain healthcare services such as prevention, diagnosis, treatment, and management of diseases, illnesses, disorders and other health-impacting conditions.

AIDS: A spectrum of conditions caused by infection with the Human Immunodeficiency Virus (HIV).

County: Geographical units created by the 2010 constitution of Kenya as the new units of devolved government.

Demographic: A combination of attributes that define people in a specific group or population.

Determinants: Range of personal, social, economic and physical factors that influence health of individuals.

Disco matanga: A funeral ceremony organized by the family members of the deceased, which involves dancing and partying, mostly at night, with music played by a DJ or a band.

HIV: A lentvirus (a subgroup of retrovirus) that causes HIV infection and overtime Acquired Immunodeficiency Syndrome (AIDS).

Incidence: The number of cases of a disease that are present in a particular population at a given time.

Policy: A set of overarching principles and goals that dictate how care is delivered and accessed.

Post-exposure Prophylaxis (PEP): The use of antiretroviral drugs after a single high-risk event to stop HIV seroconversion.

Pre-exposure Prophylaxis (PrEP): The use of antiretroviral medication by HIV-negative people to reduce the risk of HIV acquisition.

Prevalence: The proportion of a population who have a specific characteristic in a given time period.

Serodiscordant couple: Relationships in which one partner is HIV-positive and one is HIV-negative.

Young adults: Persons between the ages of 18 and 24 years.

CHAPTER ONE

INTRODUCTION

This chapter presents an overview of the study's background, the problem description, study objectives, research questions, and the rationale and importance of the investigation. The chapter also examines the theoretical and conceptual underpinning of the research.

1.1 Background Information

HIV/AIDS remains a significant health burden in the world, with 39 million people living with HIV at the end of 2022. The Joint United Nations Programme on HIV/AIDS estimates that there are 25.6 million people with HIV (66%) in Africa, 6.5 million (17%) in Asia and the Pacific, and 2.3 million (6%) in Western and Central Europe and North America. The bigger proportion of new infections were recorded in Africa especially the Sub-Saharan region which reports a record of >600,000 new HIV infections (UNAIDS, 2023). In Kenya, the national adult HIV prevalence rate was estimated at 3.7% with prevalence higher among women (5.3%) than men (2.6%). People living with HIV (PLHIV) in Kenya were estimated at approximately 1.3 million in 2023 (NASCOP, 2024).

Desai et al. (2017) noted that the introduction of PrEP and PEP as preventive measures has raised hopes of completely eradicating new HIV transmission. Oral post-exposure prophylaxis (PEP) for 28 days has been recommended in many nations for cases of sexual assault and occupational HIV exposure since the late 90s (WHO, 2007). A more recent antiretroviral (ARV) formulation of emtricitabine and tenofovir disoproxil fumarate, known as pre-exposure prophylaxis (PrEP), has shown promise in reducing the incidence of HIV in adults at high risk of contracting the virus through sexual contact, including women (Marrazzo et al., 2015), men who have sex with men (MSM)

(Jourdain et al., 2022), and serodiscordant couples (Baeten et al., 2012).

Nearly 845,000 individuals in 54 different countries were administered PrEP in 2020, according to national statistics. The United States, Eastern and Southern Africa, and a few of other nations continue to account for the vast majority of PrEP scale-ups. At least 158,630 individuals in the region received PrEP in Kenya and South Africa alone (UNAIDS, 2022). Masyuko et al. (2018) reports that around 14,000 people in Kenya were using PrEP a year after its 2016 launch. PEP was authorized in Kenya in 2001 for individuals who have been sexually assaulted, encountered condom breaks, or occupationally exposed to blood; however, it has not been authorized for use in any other contexts (Siika et al., 2009).

Previous studies have identified a number of determinants to HIV PrEP and PEP use. Studies conducted among MSM in the urban areas of China, Australia, USA and Netherlands revealed that being separated/divorced/widowed, being migrant worker, young age, having multiple sex partners, perceiving PrEP as an important prevention tool and higher scores in quality of life domains were positively associated with PrEP and PEP uptake (Zhou et al., 2022; Chan et al., 2021; Hulstein et al., 2022 and Liu et al., 2022). However, being from Asian or Black race, use of condom, recreational drugs and lubricant were negatively associated with PrEP and PEP use among MSM in U.S.A, Brazil and China (Blair et al., 2022; Gordián-Arroyo et al., 2020 and Wang et al., 2022). Studies conducted among sex workers in Uganda and Ghana revealed that higher perceived social support from family and being Christian were facilitators of PrEP use (Guure et al., 2022; Witte et al., 2022).

According to research done among MSM in the US, there are a number of structural factors that impact the usage of PrEP. These factors include healthcare accessibility, pharmaceutical logistics, cost, availability of financial aid, counselling support, and

stigma (Arnold et al., 2017; Jaiswal et al., 2018). Among the institutional factors that impacted the uptake of PrEP among young people in South Africa, Zimbabwe, and Uganda, the most common complaints were long clinic wait times and the attitudes of health professionals (Muhumuza et al., 2021). Among MSM in South Africa, Rwanda, Ghana, and Nigeria, the likelihood of using PEP was higher if they had vocational training, were familiar with the term, knew where to obtain PEP, and had experienced housing discrimination (Isano et al., 2020).

According to a study conducted by Karletsos et al. (2020), female university students in Lesotho who reported high levels of perceived HIV risk, good antibiotic adherence, a dislike for condoms, and an experience of intimate relationship abuse were more likely to use PrEP. The Ggaba fishing community in Uganda was found to be more likely to use PrEP if they felt a high risk of HIV, had tested for HIV within the preceding six months, and had completed tertiary education (Ssuna et al., 2022). Having an HIV-positive main partner, frequent transactional sex in the previous twelve months, being a female sex worker, and recent STIs were the factors linked to PrEP use among Kenyan women (Bien-Gund et al., 2022).

Despite their importance in HIV prevention, utilization rates of HIV PrEP and PEP among young adults have been reported to be low at 17% (Koss et al., 2020). Furthermore, there is a paucity of research assessing the utilization of HIV PrEP and PEP within the Kenyan population. Limited data on the magnitude of HIV PrEP and PEP use means that issues related to its use such as determinants and prevalence, which could be used to inform intervention strategies, are not adequately established. This study utilized the Health Belief Model to explore the prevalence and determinants of HIV PrEP and PEP use among young adults aged 18-24 in Khwisero Sub County. By doing so, it aimed to inform policy decisions and contribute to the existing knowledge

base on HIV prevention strategies. The study findings will contribute to advocacy efforts for enhanced use of PEP and PrEP among young people in Khwisero and other similar contexts.

1.2 Problem statement

Despite the proven effectiveness of HIV PrEP and PEP in preventing HIV infection, the uptake among young adults remains alarmingly low. This poses a significant challenge to reducing HIV incidence within this vulnerable population (Hosek et al., 2017). Studies have reported low uptake rates in the USA (11.4%), China (13.8%), Nigeria (1.5%), and rural areas of Kenya and Uganda (17%) (Harris, 2019; Liu et al., 2024; Ajayi et al., 2018; Koss et al., 2020). In Kenya, efforts to increase uptake have not met expectations, as highlighted at the 10th International AIDS Society conference (AIDSMAP, 2019). Awareness and usage levels of HIV PrEP and PEP among young individuals remain insufficient (Ajayi et al., 2020; Shamu et al., 2021). Despite these findings, few interventions have been put in place to increase awareness and uptake among young adults.

The low uptake of HIV PrEP and PEP among young adults is a concern due to the high incidence of HIV infections in this age group. Globally, youth aged 15-24 account for approximately 27% of new HIV infections, with Sub-Saharan Africa bearing more than half of these cases (UNAIDS, 2023). In Kenya, individuals aged 15-24 contributed 33% of the 22,052 new HIV infections in 2023, and constituted 10.5% of people living with HIV (NASCOP, 2024). There is an urgent need to explore the prevalence and determinants of PrEP and PEP uptake among young people to improve HIV prevention strategies.

Previous research on PrEP and PEP use has primarily focused on populations such as MSM, female sex workers, adolescents, and young women. However, gaps exist in

understanding the factors affecting their use among young adults. Studies among MSM in the Netherlands and the UK identified predictors like engaging in sex with HIV-positive partners, previous STI diagnosis, recent methamphetamine use, and relationship status (Wang et al., 2022; Goedel et al., 2017). Similarly, among female sex workers in Dar-es-Salaam, Tanzania, factors such as marital status, number of sex partners, and consistent condom use during transactional sex were associated with PrEP use (Faini et al., 2023).

Among adolescent girls and young women (AGYW) in Kenya and Uganda, predictors included stigma, drug side effects, frequent relocation, limited resources, and the availability of support tools and incentives (Jackson-Gibson et al., 2021; Kayesu et al., 2022). Effective policy frameworks are essential in addressing the low uptake of PrEP and PEP among young adults. However, a review of HIV PrEP and PEP policies in South Africa, Uganda and Kenya revealed that none directly addressed the accessibility of these services for young adults (Lane et al., 2021). This policy gap can significantly limit access and usage among this population, who are prone to increased sexual activity, substance abuse, experimentation, and engagement in risky behaviors.

1.3 Research objectives

1.3.1 General Objective

To investigate the prevalence and determinants of HIV PrEP and PEP use among young adults in Khwisero sub county, Kenya.

1.3.2 Specific Objectives

i. To establish the prevalence of HIV PrEP and PEP use among young adults in Khwisero sub county.
ii. To determine the influence of demographic determinants on HIV PrEP and PEP use among young adults in Khwisero sub county.

iii. To examine the influence of health system determinants on HIV PrEP and PEP use among young adults in Khwisero sub county.

iv. To assess the influence of socio-cultural determinants on HIV PrEP and PEP use among young adults in Khwisero sub county.

1.4 Research questions

i. What is the prevalence of HIV PrEP and PEP use among young adults in Khwisero sub county?

ii. How do demographic determinants that influence HIV PrEP and PEP use among young adults in Khwisero sub county?

iii. What role do health system determinants play in influencing HIV PrEP and PEP use among young adults in Khwisero sub county?

iv. How do socio-cultural determinants influence the use of HIV PrEP and PEP among young adults in Khwisero sub county?

1.5 Justification of the study

This study aimed to bridge the gap in low uptake of HIV PrEP and PEP among young adults by identifying the determinants influencing their use and providing actionable recommendations. Focusing on young adults aged 18-24 in Khwisero sub-county, the study sought to elucidate the factors affecting PrEP and PEP uptake within this demographic. Understanding these determinants is crucial for developing tailored educational programs and campaigns to enhance awareness, acceptability, and utilization of PrEP and PEP among young adults.

Young adults were chosen for this study due to the high incidence of HIV within this age group, driven by behavioral and social factors. This demographic often engages in high-risk behaviors such as having multiple sexual partners and inconsistent condom use, increasing their vulnerability to HIV. By examining the prevalence and

determinants of HIV PrEP and PEP uptake, the study aimed to inform strategies for improving their usage in Khwisero sub-county. The findings will guide the integration of PrEP and PEP services into existing healthcare facilities, enhancing accessibility for young adults and the broader population.

This study contributes to the existing body of knowledge by providing current data on the uptake rates and determinants of HIV PrEP and PEP use among young adults in Khwisero sub-county. The findings seek to fill gaps in the literature and offer a snapshot of the usage patterns in this demographic. By uncovering the determinants of PrEP and PEP use, the study provides valuable insights into the facilitators and barriers influencing tier use. This knowledge aims to inform policy and practice and guide future research efforts to improve the uptake of these preventive measures among young adults.

1.6 Significance of the study

This study aims to inform HIV prevention policy formulation at both national and county levels in Kenya. The findings provide compelling evidence to support policy changes and advocacy efforts focused on increasing the uptake of HIV PrEP and PEP among young adults. The insights from this study can drive policy reforms, funding allocations, and the implementation of comprehensive HIV prevention strategies tailored to the specific needs of young adults, ensuring accessibility, affordability, and recognition of PrEP and PEP as effective prevention methods. This, in turn, will contribute to reducing new HIV infections.

By uncovering factors influencing the use of PrEP and PEP, the study seeks to foster more informed and supportive healthcare interactions, ultimately leading to increased PrEP and PEP prescriptions, adherence, and improved uptake among young adults. Additionally, the study aimed to inform the development of tailored interventions, such

as targeted educational programs, peer support initiatives, and community engagement efforts, to promote PrEP and PEP uptake among individuals aged 18-24.

Furthermore, this study contributes to the achievement of Sustainable Development Goal 3, which advocates for good health and well-being for all. Specifically, it aligns with Target 3.3 of SDG 3, which focuses on ending the AIDS epidemic by 2030. By understanding the prevalence and determinants of PrEP and PEP uptake, the study seeks to inform strategies to reduce HIV transmission rates, enhance access to preventive measures, and promote the overall well-being of young adults. Moreover, the study supports Kenya Vision 2030's social pillar, prioritizing universal health care through preventive rather than curative care approaches. It also aligns with the WHO global target to end HIV as a public health threat by 2030, aiming for a 90% reduction in HIV incidence.

1.7 Scope of the study

This study confined itself to investigating the prevalence of HIV PrEP and PEP use among young adults aged 18-24 years in Khwisero sub-county, Kakamega County. It aimed to identify the factors affecting the usage of HIV PrEP and PEP among this age group, given the high incidence of HIV within this population. Data collection took place from January 2024 to February 2024.

1.7.1 Limitations of the study

This study employed a cross-sectional study design, which precluded the ability to establish causality based on the findings. The main reason for this was because it evaluated various factors that influence exposure, such as demographic, health system, and socio-cultural determinants, together with the outcome variable, the usage of PrEP and PEP, all at the same time. However, this work may serve as a springboard for longitudinal research in the future. The study provided valuable information on the

frequency and factors influencing the use of HIV PrEP and PEP among individuals aged 18-24. This knowledge can serve as a basis for future research planning.

The study utilized self-reported data, which was susceptible to biases such as social desirability and self-reported bias. The participants may have provided inaccurate information regarding their usage of PrEP and PEP, resulting in potential measurement inaccuracies. To address this issue, we utilized questionnaires which had been standardized in form and validated in content. The confidentiality of the study participants was guaranteed by substituting their names with serial numbers throughout the study regardless of the stage of data collection. The young adults may have also regarded the use of PrEP and PEP as socially desirable, perhaps resulting in an overestimation of usage rates. This issue was resolved by providing participants with a guarantee of secrecy and stressing the significance of providing truthful responses in order to collect more precise data.

The sample selection may have resulted in volunteer bias as only individuals who were willing to participate were included in the study. To mitigate volunteer bias, the study implemented measures to guarantee the anonymity and confidentiality of responders, hence enhancing participation. The utilization of a semi-structured questionnaire in data collecting for this study may have resulted in response bias. In order to mitigate this issue, the researcher employed straightforward and readily comprehensible language to guarantee that participants could precisely interpret and provide responses to the inquiries. In addition, the researcher conducted a pretest of the questionnaire to identify and rectify any instances of ambiguity. Furthermore, the questions were reiterated to the respondents in order to guarantee clarity.

1.7.2 Delimitation of the study

Due to constraints in time and resources, the study was confined to two wards in Khwisero Sub-County, Kakamega County. Specifically, the research focused on young adults aged 18-24 years within the selected wards, given the high reported HIV prevalence in this demographic. It is important to note that the study's scope was limited to Khwisero Sub-County, and therefore, the findings are specific to this geographic area. Extrapolation of results to other regions should be done cautiously.

1.8 Theoretical model

This research was founded on the Health Belief Model, a psychological framework that is employed to comprehend and anticipate the health-related behaviours of individuals (Becker, 1974). This model implies that an individual's health behaviour, specifically the use of PrEP and PEP, is contingent upon their perception of four key areas: their susceptibility to the illness (perceived risk of acquiring HIV), the severity of a potential illness (perceived severity of the consequences of acquiring and living with HIV), the advantages of taking preventative action (benefits of PrEP and PEP use), and perceived obstacles to taking preventative action (such as a lack of insurance). Furthermore, the HBM posits that behaviour is influenced by signals to action that motivate individuals to modify their behaviour, such as reminder postcards.

The study was influenced by HBM due to its exhaustive framework for comprehending the individual factors and decision-making processes that influenced the use of PrEP and PEP. HBM's emphasis on the beliefs, perceptions, and concerns of individuals facilitated the identification of cognitive factors that influenced decision-making regarding the use of PrEP and PEP. HBM has been identified as a valuable framework for comprehending the role of PrEP and HIV-related beliefs, concerns, and perceptions of risk in relation to prior PrEP and PrEP use intentions in other studies (Halkitis, et al.,

2018; Holloway et al., 2017).

An individual's perception of their likelihood of developing a condition that has a detrimental impact on their health is referred to as perceived susceptibility. The HBM places an emphasis on how vulnerable a person feels to a health problem (in this case, HIV infection) and how serious the possible outcomes could be. This study investigated the beliefs of young adults regarding their susceptibility to HIV infection, the severity of the disease, and the potential effects it may have on their lives by utilizing the HBM. This information facilitated the identification of the factors that influenced their decision to implement preventive measures such as HIV PrEP and PEP.

The HBM underscores the importance of evaluating the perceived benefits and obstacles to health actions. Perceived benefits are the advantages that an individual perceives as being obtained or experienced as a result of engaging in a particular health-related behaviour, whereas perceived barriers are the expenses associated with implementing the behaviour. The study examined the perceptions of young adults regarding the advantages of using PrEP and PEP, such as a reduced risk of infection, and the obstacles to their use, such as concerns about access to healthcare services and a lack of insurance coverage, in the context of HIV prevention. This information was used to inform interventions that aimed to promote and improve the adoption of PrEP and PEP among this population.

Cues to action are external stimuli or impulses that induce individuals to take action, including personal experiences, advice from healthcare professionals, or information. The HBM acknowledges that individuals are more inclined to take action when they are provided with cues or triggers to do so. Cues to action for PrEP and PEP in young adults aged 18-24 years may have incorporated educational campaigns, peer influence, healthcare provider recommendations, or reminder postcards. Using the HBM, the

researcher was able to identify and analyse the impact of these cues to action on the intentions and behaviours of young adults with respect to PrEP and PEP.

The HBM acknowledges that health beliefs and behaviours are influenced by demographic factors. HBM was employed in this investigation to ascertain the extent to which young adults' perceptions and behaviours regarding PrEP and PEP were influenced by factors such as age, gender, knowledge levels, religion, marital status, and access to healthcare services. Ultimately, this knowledge promoted the effective utilization of PrEP and PEP for HIV prevention in this population by informing targeted interventions and policy recommendations that addressed the specific requirements of young people.

1.9 Conceptual Framework

This study was guided by a conceptual framework that was divided into three components: the dependent, independent, and moderating variables. The independent variables were the demographic, health system, and socio-cultural determinants of HIV PrEP and PEP use, while the dependent variable was the use of HIV PrEP and PEP. The moderating variables included individual perception and cues to action.

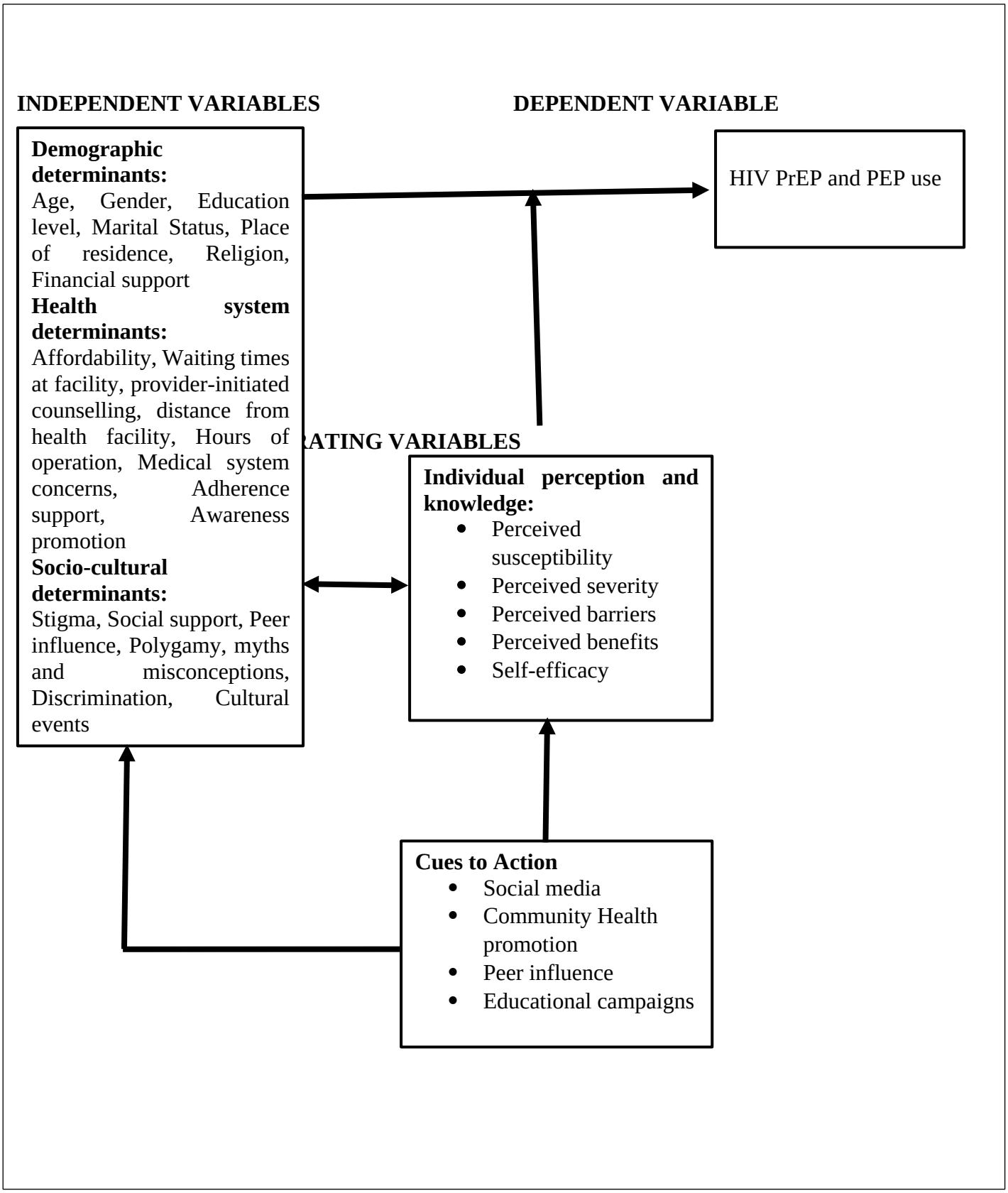

Figure I.1: Conceptual Framework

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter presents a comprehensive analysis of the current body of evidence on the frequency and factors influencing the utilization of HIV Pre-Exposure Prophylaxis (PrEP) and Post-Exposure Prophylaxis (PEP) among young adults. The researcher conducted this review with the intention of recognizing the contributions made by other researchers to the subject of study, as well as identifying and addressing any gaps in knowledge.

2.1. Prevalence of HIV Pre-exposure Prophylaxis (PrEP) and Post-exposure Prophylaxis (PEP) use

The HIV/AIDS epidemic is a worldwide public health crisis, with roughly 85.6 million individuals having contracted HIV since the onset of the epidemic (UNAIDS, 2023). In 2016, the United Nations General Assembly recognized the need for an expedited approach to eradicate AIDS by 2030 and decrease the number of new HIV infections to less than 500,000 per year globally by 2020 (UNAIDS, 2016). This approach aims to reach a 90% diagnosis rate among those infected with HIV by the year 2020. Out of those diagnosed, 90% will get anti-retroviral medication (ART), and 90% of those on ART will achieve sustained viral suppression. The primary reaction is achieved by making ongoing advancements towards the 90–90–90 target, and by placing a strong emphasis on implementing the five preventative pillars in a manner that prioritizes the needs and well-being of individuals. The five preventative pillars encompass a comprehensive set of strategies that include sexual education and economic empowerment for women, human rights programs targeting important communities, condom distribution programs, voluntary surgical male circumcision, and the

utilization of Pre-exposure prophylaxis (UNAIDS, 2019).

PrEP is a scientifically supported method of preventing HIV transmission that involves taking daily or event-based doses of antiretroviral drugs, specifically tenofovir disoproxil fumarate (TDF) and emtricitabine (FTC), to lower the chances of contracting HIV after exposure (Davies et al., 2016). PrEP has minimal toxicity and has demonstrated efficacy, especially when high adherence is maintained, among high-risk populations such as Men who have Sex with Men (Traeger et al., 2018), serodiscordant couples (Baeten et al., 2016), and individuals who engage in drug injection (Choopanya et al., 2013). The high efficacy of PrEP has resulted in recommendations for increased availability of this preventive measure for individuals who are at risk of contracting HIV (WHO, 2016).

Post-exposure prophylaxis (PEP) is a biological method used to prevent HIV infection in individuals who are HIV-negative. It involves taking a 28-day course of antiretroviral medication within 48-72 hours following potential contact to the virus (EACS, 2022). The 2014 PEP recommendation from the World Health Organization suggests that PEP should be provided based on the risk of HIV rather than the specific type of exposure. The World Health Organization (WHO) recommends tenofovir disoproxil fumarate (TDF) in combination with either lamivudine (3TC) or emtricitabine (FTC) as the preferred treatment for adults and adolescents. This recommendation is based on considerations of safety and affordability (WHO, 2014).

In 2020, PrEP was given to almost 845,000 individuals in at least 54 countries, marking a 43% rise from the previous year and a 182% increase compared to 2018. The data indicates that the expansion of PrEP usage is mostly focused in a limited number of countries, specifically the United States of America, and in eastern and southern Africa. In 2020, Kenya and South Africa accounted for 158,630 individuals (19%) who

received PrEP at least once. According to UNAIDS (2022), the goal of reaching 3 million people in low- and middle-income countries in 2020 was only achieved by 28%. Additionally, only 8% of the revised worldwide target for 2025 was achieved.

HIV PrEP offers a chance to connect vulnerable populations, like men who have sex with men (MSM), to healthcare services, which include testing for sexually transmitted infections and counseling to reduce risk. PrEP, at the community level, can decrease the transmission of HIV in high-risk sexual networks by reducing the number of new infections (CDC, 2022). An investigation carried out among men who have sex with men (MSM) between the ages of 18 and 29 in the United States revealed that 67.5% of those who did not take pre-exposure prophylaxis (PrEP) were knowledgeable about its existence, whereas a mere 8.7% of all participants reported actually using PrEP. The study revealed that older respondents and individuals with better education, full-time job, and residence in New York City and Chicago had a greater level of awareness regarding PrEP, in comparison to those in Atlanta. The study indicated that it is imperative to enhance the understanding and use of PrEP among young men who have sex with men (Strauss et al., 2017).

In a similar vein, a survey conducted among men who have sex with men (MSM) in Beijing, China, revealed that 27.9% of participants had knowledge of Pre-Exposure Prophylaxis (PrEP), 3.3% had actually used PrEP, and 57.9% showed a desire to receive PrEP if necessary. PrEP awareness was more likely among those with higher levels of education, greater understanding about HIV, a history of HIV testing, and previous sexually transmitted illnesses. In contrast, there was a negative correlation between higher stigma scores and lower levels of PrEP awareness (Sun et al., 2023). The data indicate that there is a lack of awareness and underutilization of PrEP in Beijing, particularly among MSM who face stigma. Additionally, there are disparities in PrEP

access and usage within this group.

These research emphasize the urgent necessity to tackle inequalities in PrEP awareness and utilization. The correlation between greater education and awareness of PrEP suggests a possible advantage in focusing educational activities. Moreover, the significance of stigma reduction efforts is underscored by the reported influence of stigma on PrEP awareness in Beijing. Therefore, it is crucial to implement targeted tactics, such as training peer educators and implementing comprehensive stigma reduction programs, in order to enhance the global uptake of PrEP among MSM.

A survey was done among female sex workers in Anambra State, located in south-eastern Nigeria. The findings revealed that 31.2% of the participants were aware of PrEP, 3.9% had previously utilized PrEP, and a significant majority of 91.0% expressed their readiness to use PrEP. The study revealed that female sex workers (FSWs) in Onitsha exhibited a much greater inclination to adopt Pre-Exposure Prophylaxis (PrEP), but FSWs from Awka displayed a significantly diminished inclination. Female sex workers (FSWs) earning less than 18,000 Naira per month had reduced likelihood of being willing to employ Pre-Exposure Prophylaxis (PrEP). On the other hand, individuals who wanted to acquire more information about HIV/AIDS were more likely to be willing to use PrEP. Additionally, female sex workers who were worried about facing discrimination were less likely to be willing to use PrEP compared to those who were not concerned about discrimination (Nwagbo et al., 2023).

These findings indicate the possibility of boosting the adoption of PrEP among female sex workers (FSWs) in Nigeria, despite the existing low levels of awareness and usage. The notable inclination to utilize PrEP underscores the need of tackling obstacles such as financial constraints, limited awareness, and apprehension towards prejudice. Hence, comprehending these factors is essential for formulating efficient PrEP strategies and

treatments customized to the requirements of female sex workers (FSWs).

Koblin et al. (2018) examined the level of knowledge and utilization of pre-exposure prophylaxis (PEP) among young men of color who have sex with men (YMSMOC), transgender women (TW), and cisgender women of color (CWOC) in New York City. The survey revealed that 59% of the participants had knowledge of PEP. Specifically, 80% of Young Men who have Sex with Men of Color (YMSMOC) were aware of PEP, whereas 63% of Transgender Women (TW) and 34% of Cisgender Women of Color (CWOC) had knowledge of PEP. In addition, 13% of the participants had previously utilized PEP. PEP awareness was more prevalent among YMSMOC who had recently undergone an HIV test and less prevalent among those with four or more partners. Within the population of transgender women (TW), individuals who anticipated stigma and faced difficulties to taking pre-exposure prophylaxis (PEP) had lower awareness of PEP. Conversely, those who engaged in transactional sex for resources had higher awareness of PEP.

These findings suggest that there are differences in the level of awareness and use of PEP among various subgroups. The increased consciousness among young men who have sex with men of colour regarding recent HIV testing highlights the significance of incorporating PEP teaching into regular HIV testing services. The expected social disapproval and identified difficulties underscore substantial challenges that must be resolved for TW. It is clear that customized educational and outreach initiatives should be designed for each specific community, with a specific emphasis on decreasing stigma and other obstacles that hinder access to PEP.

HIV PrEP and PEP have the potential to substantially decrease the likelihood of contracting HIV. Nevertheless, the most susceptible populations, such as young people in sub-Saharan Africa, frequently fail to make full use of these preventative strategies.

An investigation carried out at a South African university, involving 772 students aged 16-24 years, revealed that there was a low level of awareness (24.1%) of PEP (Post-Exposure Prophylaxis). This lack of understanding was particularly evident among individuals who had experienced sexual violence in the previous year (19.8%), compared to those who had not (24.8%). The study conducted by Ajayi et al. (2020) revealed that a mere 2.6% of the participants had utilized PEP, whereas 7.5% had been exposed to it, and 14.6% were aware of its availability. The study determined that there was a notably low level of awareness on PEP among individuals who are in the greatest need of it.

A study conducted among university students in Nigeria found that the levels of awareness for PrEP and PEP were 18.9% and 25.4%, respectively. A minor fraction of students, namely 5.6%, have seen or utilized these preventive measures, as stated by Ajayi et al. (2018). The data suggest that university students in both South Africa and Nigeria have a limited understanding and usage of PrEP and PEP. Due to the fact that the samples were specifically taken from university students, who share similar characteristics in terms of age, education level, and socio-economic background, the applicability of these studies is restricted to young adults inside the university environment.

In Kenya, although oral PrEP was implemented nationwide in May 2017, its usage is still not optimal. According to PrEP Watch in 2024, around 438,003 Kenyans had collectively started taking oral PrEP by April of that year. However, the challenge lies in determining the precise number of young individuals aged 18-24 years who are among these initiators, mostly due to the utilization of aggregated data sources. A study conducted among individuals who engage in drug injection (PWID) in Kenya revealed a limited degree of knowledge of oral Pre-Exposure Prophylaxis (PrEP), with only

8.7% of participants being aware of PrEP, 6.5% having previously utilized it, and 66.7% no longer using it. Although individuals are well-informed about the dangers of risky drug injection, a significant number of participants demonstrated a readiness to engage in oral PrEP (Cosmas et al., 2023). These data indicate a notable lack of information regarding oral PrEP among PWID, highlighting the potential for focused awareness initiatives.

2.2 Demographic determinants of HIV PrEP and PEP use

Demographic variables such as gender, age, marital status, population type, and education have a substantial impact on the adoption of HIV PrEP and PEP. Research has shown that different communities have different degrees of awareness and usage, which has revealed significant inequalities in access and utilization. A study conducted at a community clinic in Los Angeles, California found that among MSM and transgender individuals, the use of sex drugs, participation in condomless anal intercourse, recent contraction of a sexually transmitted infection, older age, and higher education level were all related to an increased likelihood of PrEP usage. On the other hand, individuals of Latino or Asian race/ethnicity and those with a bisexual orientation had a decreased likelihood of using PrEP, according to Shover et al. (2018). This highlights the necessity for customized interventions to enhance the adoption of PrEP among high-risk populations, such as men who have sex with men (MSM) and transgender individuals.

A study conducted in China among MSM revealed that individuals who were separated, divorced, or widowed, as well as those working as migrant laborers, farmers, or government officials, had a higher propensity for utilizing PrEP (Zhou et al., 2022). Nevertheless, the influence of age on PrEP acceptability varied across different studies. For instance, among gay and bisexual males in Australia (Chan et al., 2021) and female

sex workers in Ghana (Guure et al., 2022), being young was associated with higher acceptance of PrEP. However, in Brazil, 18-24-year-old men who had sex with men were less inclined to use PrEP (Blair et al., 2022). The variations seen can be ascribed to the particular subgroups examined and emphasize the significant disparities in awareness and acceptance between nations.

Additional discrepancies were seen in the United States, where Asian individuals exhibited a lower propensity to utilize PrEP (Gordián-Arroyo et al., 2020), while Black participants had a reduced likelihood of employing PrEP (Blair et al., 2022). PEP utilization was hindered for married or cohabiting MSM in Shenzhen who had an HIV-positive sexual partner, but having a sexual partner with a 'HIV status unclear' and engaging in several sexual partnerships encouraged PEP usage (Wang et al., 2022).

The acceptability of both PrEP and nPEP was facilitated by earlier HIV testing (Zhou et al., 2022). According to a study conducted in Ghana, female sex workers (FSW) who were tested for sexually transmitted infections (STIs) and participated in anal intercourse were shown to have a higher likelihood of using pre-exposure prophylaxis (PrEP) (Guure et al., 2022). According to Wang et al. (2022), in Shenzhen, China, engaging in sexual intercourse with women, seeking sexual partners in venues for men who have sex with men (MSM), using Viagra, and accessing services linked to HIV were all positively correlated with the use of non-occupational post-exposure prophylaxis (nPEP). On the other hand, the use of condoms and rush poppers showed a negative association.

Attitudes regarding the use of Pre-Exposure Prophylaxis (PrEP) and Post-Exposure Prophylaxis (PEP) also have a substantial impact. The use of PrEP was facilitated among both young and older MSM in the Netherlands who perceived it as a vital tool for prevention and believed that PrEP users took responsible measures for their own well-

being and the well-being of others (Hulstein et al., 2022). In contrast, a higher level of stigma against PrEP was found to have a negative correlation with the readiness to use PrEP, as reported by Mueses-Marín et al. (2021). The availability of physical access also impacts the adoption of PrEP. MSM living in nonurban regions of the United States, where PrEP clinics are far away, are less inclined to utilize PrEP (Sharpe et al., 2022).

The implementation of community-based PrEP service delivery and motivational interviewing treatments resulted in a notable increase in the utilization of PrEP among men who have sex with men (MSM) who visited an urban sexually transmitted infection (STI) clinic in the United States, as reported by Chan et al. (2021). The COVID-19 pandemic had a negative effect on PrEP usage in the U.K., according to Gillespie et al. (2022). However, in Chicago, black MSM and transgender women who experienced physical symptoms of COVID-19 and had close contact with COVID-19 patients were more inclined to use PrEP, as reported by Chen et al. (2021).

In Sub-Saharan Africa, there is a significant prevalence of new HIV infections, especially among the younger population, which suggests a poor level of adoption of Pre-Exposure Prophylaxis (PrEP) and Post-Exposure Prophylaxis (PEP) (UNAIDS, 2024). The studies undertaken in this region have predominantly concentrated on men who have sex with men (MSM), female sex workers, teenagers, and young women. The primary barriers to PrEP utilization among MSM and FSWs in South Africa were the lack of availability and concerns about potential adverse effects. Conversely, perceived risk and difficulties such as partners refusing to use condoms were factors that encouraged the commencement of PrEP (Pillay et al., 2020). The acceptance of PrEP and PEP in Ghana showed considerable variation based on location and religion (Guure et al., 2022). Additionally, among female sex workers in Uganda, a shorter duration of

engagement in sex work was positively correlated with acceptability (Witte et al., 2022).

The current ARV guidelines in Kenya suggest providing PrEP to persons who perceive themselves as being at a high risk, therefore increasing access to the general community. According to a study conducted in rural Western Kenya, adults aged 45 years and older, particularly male participants and male household heads, had a greater rate of PrEP uptake compared to female participants (Olilo et al., 2019). According to a study conducted in Kenya, 83% of males who have sex with men (MSM) expressed a desire to take daily oral HIV PrEP. The study also found that bisexual men and younger men were more likely to be eager to take this preventive medication (Karuga et al., 2016).

The results from these studies emphasize the necessity of focused education and communication on PrEP in order to improve adherence, ensure proper usage, and decrease stigma, especially among populations at high risk. The discrepancies in awareness and utilization among various demographic groups underscore substantial differences that must be addressed to enhance the adoption of PrEP and PEP and eventually decrease new HIV infections.

2.3 Health System determinants influencing the use of HIV PrEP and PEP

While HIV PrEP and PEP are viable options in the fight against HIV/AIDS, emphasis and education efforts in health system have been placed on advocacy for condoms and other safer sexual practices. A study conducted among MSM in Shanghai, China, highlights mistrust of research institutions and medical trials as a major deterrent to PrEP adoption, fueled by concerns about being treated as mere subjects rather than individuals seeking care (Liu et al., 2017). Similarly, among male sex workers (MSWs) in Rhode Island, USA, negative encounters with healthcare providers significantly

impede engagement with PrEP services, characterized by rudeness, indifference, and dismissiveness, among other factors (Underhill et al., 2015). These findings underscore the critical need to address medical mistrust, promote disclosure, and enhance cultural competency within healthcare systems to facilitate broader access to biomedical HIV prevention among high-priority populations.

The gap in access to HIV Pre-Exposure Prophylaxis (PrEP) and Post-Exposure Prophylaxis (PEP) programs is strikingly evident in studies among young men who have sex with men (YMSM) and men who have sex with men (MSM). Research conducted in U.S.A highlights the pivotal role of cost and accessibility in influencing PrEP utilization (Arnold et al., 2017; Jaiswal et al., 2018). Cost emerged as a significant barrier, with a substantial number of individuals citing financial constraints as a major deterrent to accessing and using PrEP as prescribed (King et al., 2014).

Notably, individuals without private medical insurance face heightened challenges, as they perceive PrEP as unaffordable or lack coverage, further impeding engagement with preventive measures (Macapagal et al., 2020; Asiago-Reddy et al., 2022). The consequences of limited access to PrEP are dire, with uninsured individuals at high risk for HIV exhibiting lower engagement in PrEP care (Serota et al., 2019). These findings underscore the urgent need to address financial barriers and improve accessibility to PrEP and PEP programs to effectively combat the HIV/AIDS pandemic.

The policies governing access to HIV prevention products represent critical determinants in the uptake of biomedical prevention options like PrEP and PEP. These policies specify who is eligible to access these products, the locations where they can be accessed, and the providers from whom they can be obtained. Despite the endorsement of PrEP by the WHO, the majority of United Nations member nations have yet to provide regulatory approval for PrEP (WHO, 2016). While some countries with high

HIV prevalence, accounting for 58% of people living with HIV by the end of 2016, have approved PrEP, many regions have not. This lack of approval means that access to PrEP is largely limited to those with financial means and international connections to obtain antiviral medication (WHO, 2018).

Addressing these cost barriers requires concerted efforts at both the national and local levels. Encouragingly, countries like Brazil, France, and Norway have implemented policies to offer PrEP services and medication at little to no cost to end-users (Coleman, 2017). Despite these strides, there remains a historical "prevention paradox" where infectious disease providers and primary care providers have not fully embraced PrEP provision as part of their responsibilities (Krakower et al., 2014). To address this, Calabrese et al. (2018), advocates for a broader adoption of PrEP provision within accessible service settings such as primary care, reproductive health, and mental health settings, to prevent exacerbations in health inequities.

Studies in Sub-Saharan Africa reveal significant gaps in communication and healthcare system support for PrEP among vulnerable populations, such as sex workers and adolescent girls. In Durban, South Africa, a study highlighted a troubling disconnect between private research organizations and public healthcare providers, resulting in conflicting messages about PrEP. Some healthcare providers dismissed PrEP as just another antiretroviral (ARV), causing uncertainty and discontinuation among sex workers. Clear communication distinguishing PrEP from ARVs is essential to reduce confusion and interpersonal conflict (Makhakhe et al., 2022).

Similarly, studies conducted among AGYW in Kampala, Uganda, and Kisumu, Kenya, underscore the importance of healthcare system factors in facilitating PrEP uptake and adherence. In Kampala, factors such as adherence counseling, support tools, and incentives provided during health center visits were found to positively impact PrEP

uptake and adherence. In Kisumu, facilitators included the use of safe spaces, linkage with the existing healthcare system, peer mentorship, parental and male sexual partner education, stakeholder involvement, and continuous quality evaluation of PrEP implementation. These findings highlight the pressing need to address community misconceptions and barriers to maximize PrEP uptake among AGYW (Kayesu et al., 2022; Jackson-Gibson et al., 2021).

Significant gaps exist in PrEP access attributable to regulatory policies and frameworks, particularly evident in Sub-Saharan Africa. Lane et al. (2021), conducted a review of PrEP and PEP policies in Kenya, South Africa, and Uganda, highlighting substantial accessibility gaps among young adults. In South Africa, although policies initially prioritized sex workers for PrEP access, subsequent expansions failed to provide clear guidance on ensuring young people's access. Similarly, Uganda's consolidated guidelines lack specific directives on PrEP accessibility for young individuals.

Among adolescent girls and young women (AGYW) in Kisumu County, Kenya, Heck et al. (2022), reported high PrEP eligibility rates due to inconsistent condom use, violence survivorship or recent STI. However, PrEP consultations were infrequent and varied by age and vulnerability, suggesting a critical gap in service provision. Furthermore, the study identified potential inaccuracies in self-reported sexual activity due to social stigmatization and introduced response bias due to participant compensation. These findings illuminate the persistently low knowledge of PrEP and PEP among high-risk populations and the limited availability of medical care for preventive measures, necessitating urgent action to address accessibility challenges. Clearer policy directives, enhanced service provision, and improved accuracy in risk assessment are imperative to bridge these gaps and ensure equitable access to PrEP and PEP for vulnerable populations.

2.4 Socio-cultural determinants influencing the use of HIV PrEP and PEP

The usage of HIV PrEP and PEP is highly influenced by socio-cultural variables. Comprehending these factors is essential for creating successful solutions; nonetheless, significant deficiencies remain in this field. Previous research has found that certain socio-cultural characteristics, such as awareness of HIV prevention methods among one's social circle and the expectation of facing stigma connected to HIV within one's society, can predict the use of PrEP and PEP (Goldbach & Kipke, 2020; Pullen et al., 2022). A study conducted among African American young adults found that community and social network impacts, medical mistrust, and stigma have a significant impact on PrEP use (Ayangeakaa et al., 2023).

Although the significance of social networks in creating norms and influencing behaviour is widely acknowledged, there is a lack of research on the impact of peer support and social networks on the usage of PrEP and PEP (Schneider et al., 2013). PrEP utilization decisions have been demonstrated to be influenced by social network characteristics, such as the size of one's peer network. The presence of a greater number of young homosexual and bisexual men in one's social network increases the likelihood of using PrEP, indicating that social networks can play a significant role in promoting awareness and acceptance of PrEP (Kuhns et al., 2017; Holt et al., 2019).

Nevertheless, even with these discoveries, there is still a lack of comprehension of the mechanisms by which social networks impact the utilization of PrEP and PEP. Additional investigation is required to clarify these pathways and determine successful approaches for utilizing social networks to enhance the adoption of PrEP and PEP among populations vulnerable to HIV infection. It is crucial to overcome this gap in order to create specific interventions that effectively tackle socio-cultural obstacles and encourage open communication about HIV prevention among communities.

Studies have shown that there are gaps in the use of supportive social networks to promote awareness and adoption of PrEP among high-risk populations, including young males who engage in sexual activity with other men. A study conducted with young Black homosexual, bisexual, and other men who have sex with men in the United States emphasizes that these individuals primarily depend on their peers and social networks for information about PrEP, while they receive little guidance from medical professionals. A significant number of participants indicated that their main healthcare providers had not engaged in discussions on Pre-Exposure Prophylaxis (PrEP), and some physicians were completely uninformed of the existence of PrEP. This lack of awareness and communication has resulted in a sense of distrust towards both physicians and the utilization of PrEP (Quinn et al., 2020). This highlights the urgent requirement for additional study to determine the processes by which PrEP is effective and to identify specific locations when intervention can be implemented to enhance PrEP usage among these populations.

Prior research has demonstrated the efficacy of treatments employing peer outreach workers to effectively engage communities that are susceptible to harm. As an illustration, initiatives in the northern region of Vietnam and the southern region of China provided training to peer outreach workers who were responsible for educating individuals and distributing needles/syringes. This led to a decrease in HIV risk behaviors among persons who engage in drug injection, as reported by Hammett et al. in 2012. Nevertheless, there remains a deficiency in the efficient utilization of supportive social networks to enhance the adoption of PrEP among groups at high risk. Additional research is required to create novel approaches for utilizing peer networks and surmounting obstacles to PrEP awareness and utilization. It is essential to address this gap in order to improve access to HIV prevention and decrease transmission in

communities that are at a higher risk.

PrEP has been proven to reduce the likelihood of contracting HIV in populations at high risk, such as individuals who engage in drug injection (Choopanya et al., 2013). Nevertheless, individuals who inject drugs (PWID), although meeting the criteria for PrEP, exhibit the lowest utilization of PrEP in comparison to other significant populations such as men who have sex with men (MSM) and transgender women (Kamitani et al., 2020). This disparity underscores a notable deficiency in the efficient distribution and administration of PrEP among people who inject drugs (PWID).

A study conducted in New York, U.S.A. found that just 31% of women who inject drugs were aware of HIV PrEP. According to Walters et al. (2017), there was a correlation between heightened consciousness and engaging in transactional sex, as well as discussing HIV prevention at a syringe exchange program. The results indicate that social networks, especially those associated with sex work and syringe exchange programs (SEPs), are effective channels for spreading information about preventive resources like PrEP. Hence, by utilizing the social networks of women who engage in drug injection and incorporating Syringe Exchange Programs (SEPs) into various healthcare settings, there is a potential for a substantial rise in awareness and utilization of Pre-Exposure Prophylaxis (PrEP) and Post-Exposure Prophylaxis (PEP).

An observational study, conducted in a network of 26 community-based voluntary HIV/STI counseling and testing clinics in Portugal, revealed that awareness of PrEP and PEP was limited among all major population groups. During a four-year period, a mere 15.7% of participants indicated awareness of PEP, whereas only 10.9% expressed knowledge of PrEP. The utilization rates were also minimal, with 1.8% of individuals utilizing PEP and 0.4% using PrEP. According to Simões et al. (2021), MSM constituted 88.9% of PrEP users and 52.8% of PEP users. These findings emphasize the

necessity of enhancing both awareness and utilization of HIV PEP and PrEP among individuals who are vulnerable to HIV infection.

These findings emphasize a significant deficiency in the availability and usage of PrEP and PEP among PWID and other important demographics. Although these preventative strategies have been demonstrated to be successful, there is still a lack of awareness and low levels of uptake. To address this gap, it is necessary to implement specific interventions that utilize social networks and include harm reduction programs into wider healthcare settings. This will help improve the spread and adoption of HIV prevention techniques.

According to Idoko et al. (2015), stigma is a significant concern and acts as a possible obstacle to the uptake and utilization of PrEP among serodiscordant couples in Nigeria. In order to combat this negative perception, it is crucial to implement couple therapy, identify couples where one partner is HIV-positive and the other is HIV-negative, carry out regular monitoring of HIV infection, and launch public awareness campaigns to tackle the stigma. Furthermore, a research conducted among young individuals in Uganda, Zimbabwe, and South Africa revealed that the impact of peers and the social stigma are major obstacles to the adoption of PrEP. The presence of sufficient PrEP information, awareness campaigns, and documented evidence of PrEP effectiveness and safety were identified as factors that promote the acceptance and adoption of PrEP (Muhumuza et al., 2021). These studies emphasize the need of addressing the stigma that affects the adoption of HIV PrEP among young individuals.

Moreover, a research conducted in Kisumu, Kenya, revealed that the implementation of peer mentors, raising awareness among parents and male sexual partners, beneficiaries openly sharing their use of PrEP, active participation of stakeholders, and community engagement were identified as factors that facilitated the acceptance and adoption of

PrEP. Nevertheless, the study identified several obstacles to the implementation, initiation, and adherence of PrEP. These barriers encompassed the stigma surrounding the use of antiretroviral drugs, the adverse effects of the medication, frequent relocation of individuals benefiting from PrEP, insufficient resources for regular screening and medication monitoring, and a scarcity of qualified healthcare professionals for the distribution and administration of PrEP (Jackson-Gibson et al., 2021).

These findings emphasize a notable deficiency in addressing the social disapproval linked to the use of PrEP. Although PrEP has the capacity to prevent HIV transmission, the presence of stigma continues to be a major obstacle that impedes its adoption and use. In order to effectively promote the usage of HIV PrEP and PEP, it is essential to overcome these obstacles through the implementation of focused interventions that diminish stigma, offer sufficient information, and guarantee ongoing support and resources for PrEP users.

2.5 Summary and research gap

The empirical studies reviewed highlight the increasing adoption of HIV PrEP and PEP and their significant impact on reducing new HIV infections. Key findings reveal low awareness and utilization of HIV PrEP and PEP, particularly among high-risk populations such as MSM, transgender individuals, sex workers, and serodiscordant couples. Facilitators of PrEP and PEP uptake identified in the review include adherence counseling, support tools, incentives, use of safe spaces, linkage with existing health systems, peer mentors, education of sexual partners on benefits, healthcare provider recommendations, social support, and active stakeholder involvement. Conversely, barriers include medical mistrust, cost, insurance coverage, miscommunication, stigma, drug side effects, frequent relocation of beneficiaries, limited resources for routine screening and monitoring, and a shortage of qualified health workers.

Although there have been significant study efforts to comprehend and tackle these factors that aid or hinder progress, the impact of peer support and social networks in PrEP and PEP research has not been thoroughly examined. The reviewed literature emphasizes the need for comprehensive and targeted PrEP and PEP promotion strategies among at-risk populations, particularly the young adults, due to their high incidence of HIV and low uptake and awareness. Efforts should focus on increasing awareness and knowledge about PrEP and PEP, conducting couple counseling, expanding access through healthcare systems and community-based services, strengthening peer educator training, and considering factors such as accessibility, cost, HIV knowledge, and fear of discrimination when formulating PrEP and PEP policies. Additionally, integrating PrEP and PEP provision into accessible service settings such as primary care, reproductive health, and mental health settings is crucial.

In view of the identified gaps, further research is warranted to explore the prevalence and determinants of HIV PrEP and PEP use among young adults aged 18-24 years. Limited studies have focused on this age group, with previous research predominantly targeting specific populations like university students. University students represent a distinct demographic group with unique characteristics, including age, education, and healthcare access, which may not be generalizable to the broader population of young adults. This introduces a sampling bias and limits the external validity of the studies. By conducting this study among young adults aged 18-24 years, the researcher aimed to provide valuable insights for policymakers and healthcare providers in HIV prevention.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter provides a comprehensive analysis of the materials and methods employed in the research. The researcher has provided a comprehensive description of the study population, study variables, study design, and sampling strategies employed. This document also includes descriptions of the methodologies for data collecting, data analysis, and the ethical considerations involved.

3.1 Study area

The study was conducted in Kakamega County due to its significant incidence of HIV among youth aged 15-24 years. Although not traditionally categorized as a high HIV burden county, Kakamega ranks among the top ten counties for new HIV infections among young adults and it is within the top five for the number of youth living with HIV as of 2023 (NASCOP, 2024). Kakamega County lies at latitude of 0° 16' 60" N and longitude 34° 45' 0"E, with a population of 1,867,579 people with 48% males and 52% females and an area of 3,033.8 Km^2 (KNBS, 2019).

The targeted study area was Khwisero Sub County, because it has the highest HIV prevalence in the county. In 2023, the prevalence of HIV in Kakamega County was 3.3% with Khwisero Sub County recording the highest prevalence at 5.5%, followed by Mumias West at 4.7% and Shinyalu at 4.3%. The sub counties with the lowest prevalence were Malava, Mumias East and Likuyani at 2.2%, 2.3% and 2.4% respectively (NSDCC, 2024). Khwisero Sub County has a population of 113,476 people with 47% males and 53% females and an area of 145.6 Km^2. The sub county lies at latitude of 0° 10' 16" N and longitude 34° 35' 40"E. It has four wards namely Kisa East, Kisa West, Kisa North and Kisa Central (KNBS, 2019).

3.2 Study design

This study employed a descriptive and analytical cross-sectional design using both quantitative and qualitative data collection methods. The descriptive study design is appropriate for assessing the frequency of occurrence of an event (Orodho, 2005) thus used to determine the prevalence of HIV PrEP and PEP use among young adults. The analytical component of the study aimed to identify determinants associated with the use of HIV PrEP and PEP.

The cross-sectional aspect of the study involved by collecting data from study participants at a single point in time. This facilitated a snapshot view of the prevalence and determinants related to HIV PrEP and PEP use among the target population. A mixed-methods approach was utilized to leverage the strengths of both quantitative and qualitative methods. Quantitative data was collected first and then qualitative data was collected to triangulate the results from the former. This combination of methods helps to mitigate the weaknesses inherent in using either approach independently, thereby providing a more comprehensive perspective on the research questions.

3.3 Study population

The study population comprised of young adults 18-24 years in Khwisero Sub County. The young adults were selected from Khwisero Sub County since it has the highest prevalence of HIV in Kakamega County.

3.3.1 Inclusion criteria

Inclusion criteria are the key features of the target population that investigators use to address their research question (Browner, 2022). In this study, the inclusion criteria were based on being a young individual aged 18-24 years and being a resident of the selected community units in Khwisero sub-county. Study participants were also required to be willing to participate by signing a consent form.

3.3.2 Exclusion criteria

Exclusion criteria refer to the attributes of possible study participants who match the inclusion requirements but have extra traits that can hinder the study's progress or raise the possibility of a negative result (Browner, 2022). People who did not dwell in the chosen community units in Khwisero sub-county, as well as those who were either under the age of 18 or over the age of 24, were not included in this study.

3.4 Study variables

3.4.1 Dependent variables

The use of HIV PrEP and PEP among young adults aged 18-24 years in Khwisero sub-county served as the dependent variable for this study. This included determining whether the study participants had ever used HIV PrEP or PEP.

3.4.2 Independent variables

Demographic determinants (age, gender, marital status, education level, marital status, place of residence, religion and financial support), health system determinants (affordability, provider-initiated counseling, distance from facility, hours of operation, adherence support, waiting times at facility, medical system concerns, adherence support and awareness promotion) and socio-cultural determinants of HIV PrEP and PEP (peer influence, polygamy, myths and misconceptions, discrimination, cultural events, social support and stigma) were the independent variables for this study.

3.5 Sample size determination

The number of study participants was calculated using Yamane (1967) formula. This formula was chosen because it permits the researcher to generalize inferences and conclusions drawn from the study to the complete population from which the sample was drawn (Sutanapong & Louangrath, 2015). The formula states:

$$n = \frac{N}{1 + N(e)^2}$$

Where: N= total number of young adults 18-24 in Khwisero sub county, e= margin error 5% and n is the sample size computed. Therefore:

$$n = \frac{12{,}299}{1 + 12{,}299\ (0.05)^2}$$

= 387 + (10% attrition)

= 426 young adults 18-24 years

Furthermore, a priori power analysis conducted using G*Power 3.1 for Windows (Faul, et al., 2009) indicated that a sample size of 426 would be adequate for detecting significant effect sizes.

3.6 Sampling design

3.6 Sample strategy

The study sites and participants were selected using a multi-stage sampling process. The study locations were selected purposively because of the high incidence and prevalence of HIV among young adults in Kakamega County and Khwisero Sub-county. Two wards were selected at random from among four in Khwisero Sub-county using the lottery technique. The selected wards were Kisa East and Kisa North. In Kisa East ward, three community units (Mundaha, Eshibinga, and Emalindi) were further selected using the simple random sampling by lottery method. Similarly, in Kisa North ward, three community units (Eshirandu, Mwikalikha, and Mundobelwa) were chosen through simple random sampling by lottery method. This method gave all the wards and community units an equal chance of being selected.

Probability proportional to size sampling was used to determine the number of young adults aged 18-24 years to be selected from each community unit. The number of

households in each community unit was as follows: Mundaha (612), Eshibinga (1,107), Emalindi (1,051), Eshirandu (1,409), Mwikalikha (1,450), and Mundobelwa (2,919) (KNBS, 2019). To determine the number of households from which to sample the young adults, the researcher calculated the ratio of young adults to households in each community unit. Subsequently, systematic sampling was employed to select the young adults. The total number of young adults in the household register was divided by the sample size to determine the sampling interval. A random number generator was used to select a random starting point, followed by the selection of every nth young adult according to the sampling interval.

$$K = \frac{N}{n}$$

Where: N = Total number of young adults 18-24 years in the community unit

n = sample size obtained for the community unit

The number of young adults 18-24 years sampled per each community unit is shown in the table 3.1.

Table 3.1: Sampling frame

Sampled wards	**Sampled CU**	**Population (18-24 years)**	**Sample size**	**Sampling interval (k)**
1.Kisa East	Mundaha	1,825	(1,825÷14,778)×426= 53	(1,825÷53)= 34
	Eshibinga	2,582	(2,582÷14,778)×426= 74	(2,582÷74)= 39
	Emalindi	2,199	(2,199÷14,778)×426= 63	(2,199÷63)= 35
2.Kisa North	Eshirandu	3,077	(3,077÷14,778)×426= 89	(3,077÷89)= 35
	Mwikalikha	2,591	(2,591÷14,778)×426= 75	(2,591÷75)= 35
	Mundobelwa	2,504	(2,504÷14,778)×426= 72	(2,504÷72)= 35
Total		14,778	426	

Table 3. 2 Sampling procedure for households in the community units

Study site	Targeted sample size	Sampling interval
1. Mundaha	(53÷(1825÷612) = 18	612÷18 = 34
2. Eshibinga	(74÷(2,582÷1,107) = 32	1,107÷32 = 35
3. Emalindi	(63÷(2,199÷1,051) = 30	1,051÷30 = 35
4. Eshirandu	(89÷(3,077÷1,409) = 41	1,409÷41 = 34
5. Mwikalikha	(75÷(2,591÷1,450) = 42	1,450÷42 = 35
6. Mundobelwa	(72÷(2,504÷2,919) = 84	2,519÷84 = 35

3.7 Data and information collection

3.7.1 Data collection procedure

Data was collected between January and February 2024 with the assistance of research assistants who were recruited and trained based on the criteria that they had a minimum of a diploma in community health or any other related field. They were also required to have experience in data collection from previous studies and be able to speak and write in both Swahili and English. The selected research assistants underwent a two-day training session, focusing on research ethics, data handling techniques, data collection tools, communication skills, questionnaire administration, and interview skills. The objective of the training was to ensure consistency in the understanding of the study design and the content of the tools prior to their utilization in data collecting.

The research assistants collected data using a semi-structured questionnaire and conducted Key Informant Interviews. The research assistants initiated the process by greeting the respondents in order to establish rapport. Subsequently, the participants were provided with information regarding the study's goals, as well as the potential hazards and advantages associated with it. They were guaranteed the confidentiality and anonymity of their responses. Afterwards, the participants were queried about their

willingness to participate in the study. A written informed consent was presented to respondents who agreed to participate in the study. It took approximately 15-20 minutes to complete administering the questionnaire and approximately 30 minutes for the Key Informant Interview for each respondent.

3.7.2 Data collection instruments

3.7.2.1 Semi-structured Questionnaire

A semi-structured questionnaire (Appendix II) was used to collect data from the young adults aged 18-24 years from the selected community units. A semi-structured questionnaire includes both open-ended and close-ended questions, allowing respondents to answer freely and on their terms without restrictions (Ranganathan & Caduff, 2023). In this study, the open-ended part of the questions enabled respondents to give additional answers not among the listed alternatives to describe their situation. The close-ended questions were used because they were easier to administer and analyze since they were in an immediate usable form (Mugenda & Mugenda, 2008).

Semi-structured questionnaires were divided into four sections. A variety of demographic information was gathered from the respondents in Part A, including their age, gender, sex, education level, marital status, and religion. Part B sought data on how often PrEP and PEP were used by the study participants, and Part C sought data on the factors within the health care system that affected the use of PrEP and PEP by the study participants. Information about the impact of socio-cultural factors on the utilization of HIV PrEP and PEP was sought out using Part D.

3.7.2.2 Key Informant Interview

An interview is a way of collecting qualitative data, which essentially involves an in-depth discussion with one or more persons on a particular topic or set of issues (McGrath et al., 2019). The researcher conducted Key Informant Interviews (Appendix

III-XI) with fourteen healthcare professionals in the sub county. These interviews aimed to explore themes related to health system and socio-cultural determinants, as well as strategies for enhancing the use of PrEP and PEP among young adults. The sample size of 14 falls within the recommended range of 12-15 interviews (Muellmann et al., 2021) and was selected to ensure comprehensive coverage of diverse perspectives. This number allowed for data saturation, enabling a thorough exploration of key themes without redundancy.

3.7.3 Reliability

The reliability of the research instruments was assessed during the pre-test phase. The test-retest method was employed to determine the consistency of the questionnaire. Respondents were interviewed twice, with a one-week interval between sessions. The reliability of the instrument was evaluated using the Intraclass Correlation Coefficient (ICC), a measure of internal consistency. The ICC was computed using SPSS version 26 and yielded a coefficient of 0.635. According to Koo and Li (2016), an ICC of 0.5 or higher indicates acceptable reliability, confirming the instrument's suitability for the study. Furthermore, reliability was ensured by training research assistants, involving them in the pre-test, and supervising them during data collection to ensure their understanding of the research procedure.

3.7.4 Validity

Validity is the ability of the research instruments to measure what it purports to measure (Walingo & Ngaira, 2008). This was accomplished through a pre-test, during which the research instruments underwent testing to identify and rectify any ambiguities before full administration. Content validity was ensured by aligning the research instruments with the conceptual framework and research objectives. Feedback from supervisors was utilized to refine and enhance the accuracy of the instruments. Additionally, criterion

validity was established by comparing the research instruments with established measures known for their validity, such as the WHO implementation tool for PrEP of HIV infection. Adjustments to the tools were made based on this comparison, ensuring alignment with accepted standard guidelines for assessing the variables.

3.7.5 Quality assurance

Potential errors and biases were minimized by training research assistants to ensure their understanding of the research procedure, including the study design, data collection, recording, and handling. Pre-testing of the questionnaire was conducted, and any ambiguity was corrected before the actual data collection. Random selection of study participants was ensured to increase the chances of inclusion for everyone and to avoid selection bias. Filled questionnaires were reviewed on a daily basis for completeness and accuracy, and any unforeseen challenges were addressed through constant communication with the research assistants during the data collection period.

3.8 Pre-test

Pretesting of the data collection tools was conducted in Ikolomani Sub County, where 42 young adults aged 18-24 years (10% of 426) were selected to assess the validity and reliability of research instruments. The purpose of the pre-test was to educate the research assistants and determine the validity and reliability of the data collection instruments. The areas appraised included the appropriateness of language, the time taken to complete and return the data collection instrument, and the completion rate. Unclear terms were reviewed, reconstructed, and adjustments were made to the final questionnaire based on the feedback received during the pre-testing phase.

3.9 Data Analysis

As this study employed a mixed methods approach, data was obtained utilizing both qualitative and quantitative research instruments. The quantitative data was subjected to

data cleansing through the process of data editing, followed by coding and entry into the SPSS version 26 software. Prior to analysis, a cleaning process was conducted to detect any inconsistencies, outliers, and missing numbers. In order to streamline the analysis procedure, the quantitative data collected from the questionnaire were coded using SPSS version 26.0. Descriptive statistics were used to calculate frequencies and percentages, which helped determine the prevalence of HIV PrEP and PEP uptake among young individuals.

The chi-square test for independence was used to conduct inferential analysis in order to establish the association between the utilization of PrEP and PEP and other demographic and health system factors. Logistic regression was utilized to calculate the odds ratio, which was employed to assess the magnitude of the relationship between the utilization of PrEP and PEP and demographic factors. Logistic regression analysis was performed to calculate the adjusted odds ratio, which quantified the extent of the association between the utilization of PrEP and PEP, health system factors, and socio-cultural variables. The confidence interval was established with a significance level of 95% ($P < 0.05$). P values less than 0.05 were deemed to be statistically significant, and the findings were displayed in tables, figures, and graphs.

The qualitative data collected from the key informant interviews were captured on tape, transcribed, and analysed thematically, in accordance with the study objectives. The data were classified and frameworks were identified based on the primary topics mentioned throughout the interviews. A coding strategy was created to investigate interactions, with each section of the transcript being assigned a specific code. The analysis technique commenced by acquainting oneself with the material through perusing the verbatim and recording noteworthy themes. Emerging patterns were recognized, and coding categories were established according to the viewpoints of the

participants. The data analysis resulted in the creation of tables that displayed matrices of frequencies and patterns of responses pertaining to the factors influencing the utilization of PrEP and PEP among young adults. Table 3.3 presents a concise overview of the statistical methods employed in the examination of data.

Table 3.3: Summary of Statistical Techniques

Objectives	Variables	Data analysis methods
1. To determine the prevalence of HIV PrEP and PEP use among young adults years in Khwisero sub county.	HIV PrEP or PEP use	Descriptive statistics Frequency Percentage
2. To determine the influence of demographic determinants on HIV PrEP and PEP use among young adults in Khwisero sub county.	Age, gender, marital status, Education level, place of residence, religion, financial support	Chi square Logistic Regression
3. To determine the influence of health system determinants on HIV PrEP and PEP use among young adults in Khwisero sub county.	Affordability, waiting times, hours of operation, provider-initiated counseling, distance from health facility, adherence support, medical system concerns, awareness promotion	Chi square Adjusted Logistic Regression Thematic analysis
4. To assess the influence of socio-cultural determinants on HIV PrEP and PEP use among young adults in Khwisero sub county.	Stigma, social support, peer influence, polygamy, myths and misconceptions, discrimination, cultural events	Adjusted Logistic Regression Thematic analysis

3.10 Logistical and ethical considerations

Research approval was obtained from the MMUST Directorate of Postgraduate Studies (Appendix XV), and ethical clearance was granted by the MMUST Institutional Scientific and Ethics Research Committee (MMUST-ISERC) with reference number

MMUST/IERC/193/2023 (Appendix XVI). A research permit was also secured from the National Commission for Science, Technology, and Innovation under license number NACOSTI/P/23/31097 (Appendix XVIII). Additionally, written permission was obtained from the County Government of Kakamega (Appendix XVIII) before commencing data collection. The researcher adhered to the principles of research ethics as outlined in Table 3.4.

Table 3.4 Summary of Ethical Considerations.

S/N	Principle	Ethical concern (s)	How it was addressed
1.	Informed consent	Participant informed consent	The participants were provided with a detailed explanation of the informed consent. Individuals who consented to take part were asked to provide their consent. Individuals who gave their verbal agreement were requested to affix their signature on the permission document.
2.	Voluntary participation	Justice	The study recruited young adults through a process called simple random sampling, ensuring that each individual had an equal opportunity to participate.
		Coercion to participate	Participation hinged on the voluntary inclination of the young adult, and no participant was compelled in any way to take part in the study.
3.	Privacy,and confidentiality	Identity of the youth on questionnaire	The questionnaire lacked any indication of the participant's identity. The researcher employed distinct questionnaire codes during data collection and maintained the confidentiality of respondents' identities.
		Data collection	The study entailed gathering data on the adoption and factors influencing the utilization of PrEP and PEP. This was done in strict confidence.
		Security of the data	The raw data collected in the questionnaire was treated with utmost confidentiality, and to ensure anonymity, the files were appropriately tagged with serial numbers. The researcher stored the files in a secure cabinet after retrieving them, and only the researcher had permission to open the cabinet.
4.	Beneficence	Respondents	The young adults' anticipation of the

		expectations	advantages of the study was discussed. The trial did not provide any immediate advantages to the study participants. The study findings provided valuable information to policymakers at both the county and national levels, aiding in the management of HIV rates among young adults. The study participants were properly informed of this information during the process of obtaining their consent.
5.	Risks	Harm to the study participant	The researcher employed non-intrusive methodologies for data collection. Consequently, the study participants faced a negligible likelihood of experiencing physical damage. .

CHAPTER FOUR

RESULTS

4.1 Introduction

This chapter summarizes the study's findings. The researcher assessed the prevalence of HIV PrEP and PEP use among young adults in Khwisero Sub County. Additionally, the study investigated the influence of demographic, health system, and socio-cultural factors on the utilization of HIV PrEP and PEP among young adults. The key findings are presented chronologically according to the study's objectives.

4.2 Demographic Characteristics

The majority, constituting 225 (56%) of the young adults, were within the age bracket of 21 to 24 years, with a higher proportion of females at 229 (57%) compared to males. Average age of participants was 21 years (SD=2.2). Secondary education emerged as the modal level of academic attainment, accounting for 61.7% of respondents, while an additional 78 individuals (19.4%) had obtained a post-secondary level. Nearly three quarters of the respondents, 291 (72.4%), reported being single. Overwhelmingly, 372 (92.5%) identified as Christians, while the majority, 255 individuals (63.5%), resided with their parents or guardians, and 250 (62.2%) relied on financial assistance. Further details can be found in table 4.1.

Table 4.1: Demographic characteristics

Variable	Grouping	Frequency Mean (SD)	Percentage
Age		21(2.2)	
	18 to 20	177	44.0
	21 to 24	225	56.0
Gender			
	Male	173	43.0
	Female	229	57.0
Education level			
	No education	1	0.2
	Primary	75	18.7
	Secondary	248	61.7
	Tertiary	78	19.4
Marital status			
	Married	96	23.9
	Single	291	72.4
	Widowed/ Separated	15	3.7
Living arrangement			
	Independent	147	36.6
	With guardian	255	63.4
Religion			
	Christian	372	92.5
	Islam	30	7.5
Financial support			
	Yes	250	62.2
	No	152	37.8

Data presented in proportions (%); n, 402

4.3 Prevalence of HIV PrEP and PEP

As illustrated in Figure 4.1, awareness levels for both PEP and PrEP were moderately high, with proportions of 58% and 56.7%, respectively. However, the actual usage prevalences were lower, with PrEP at 23.4% and PEP at 22.6%.

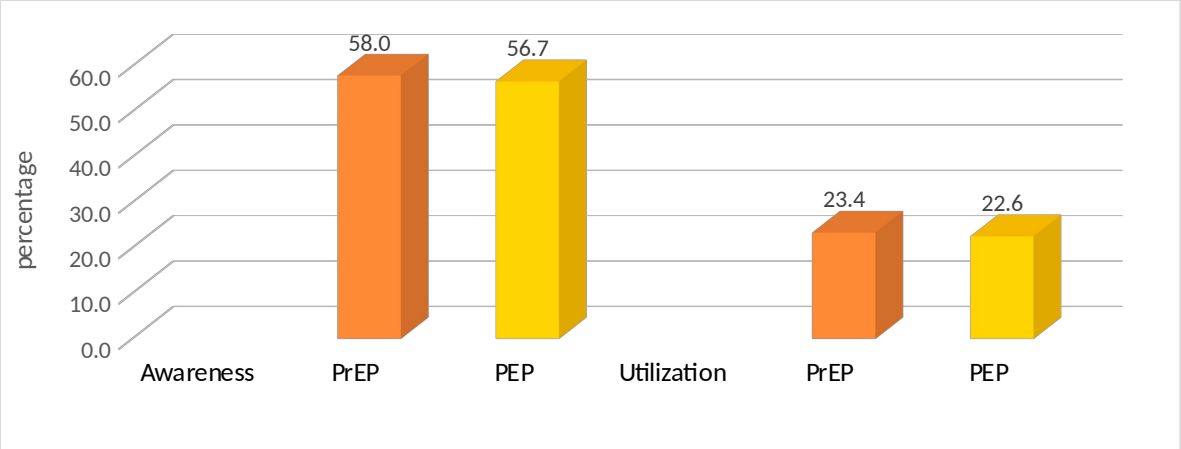

Figure 4.1: PREP and PEP awareness and prevalence

Notably, social media emerged as the primary source of information for both PrEP (36.3%) and PEP (25.2%). In contrast, school health awareness programs represented the least common sources of information for HIV PrEP and PEP, representing 0.8% and 0.9%, respectively, as depicted in Figure 4.2.

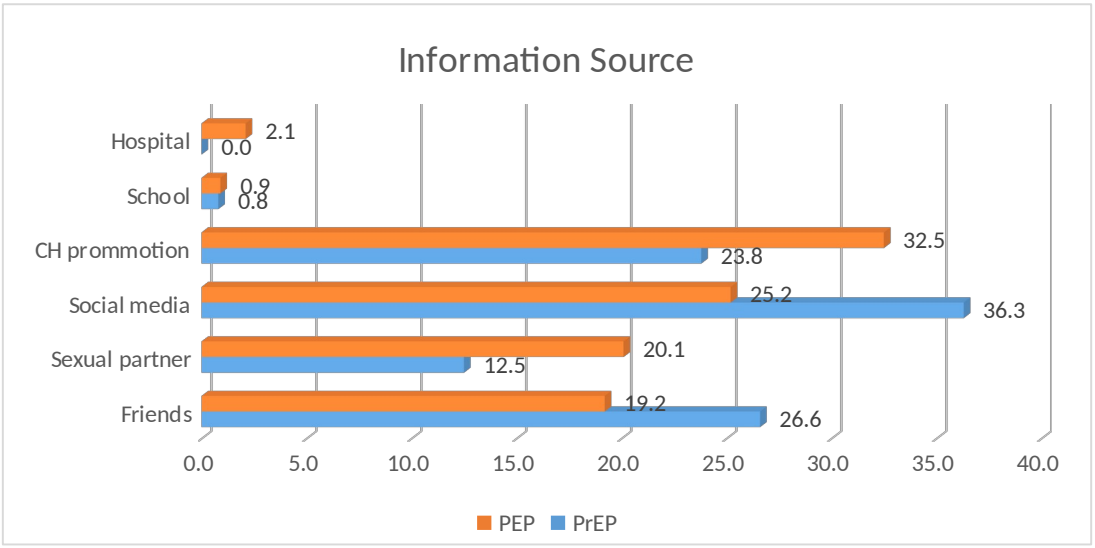

Figure 4.2: Sources of P(r)EP information

4.4: Influence of demographic determinants on HIV PrEP and PEP use among young adults in Khwisero sub county

4.4.1: Influence of demographic determinants on HIV PrEP use

As detailed in table 4.2, the level of education was found to have a significant association with the use of PrEP ($\chi^2 = 8.10$, P = 0.04). This shows that higher levels of education are associated with a higher likelihood of PrEP use. The study also found a significant association between religion and the use of PrEP ($\chi^2 = 5.0$, P = 0.03).

Table 4.2: Chi square test of Association between demographic factors and PrEP use

Variable	Grouping	PrEP use		χ^2	P value
		Yes	No		
Age					
	18 to 20	44(24.9)	133(75.1)	0.38	0.54
	21 to 24	50(22.2)	175(77.8)		
Gender					
	Male	39(22.5)	134(77.5)	0.12	0.73
	Female	55(24.0)	174(76.0)		
Education					
	No education	0(0.0)	1(100)		
	Primary	26(34.7)	49(65.3)	8.10	0.04
	Secondary	48(19.4)	200(80.6)		
	Tertiary	20(25.6)	58(74.4)		
Marital					
	Married	27(28.1)	69(71.9)		
	Single	62(21.3)	229(78.7)	2.74	0.26
	Widowed/ Separated	5(33.3)	10(66.7)		
Living					
	Independent	41(27.9)	106(72.1)	2.63	0.11
	With guardian	53(20.8)	202(79.2)		
Religion					
	Christian	82(22.0)	290(78.0)	5.00	0.03
	Islam	12(40.0)	18(60.0)		

Data is in frequencies (n) and row proportions (%). Statistical significance was determined by χ^2 at P<0.05.

Further tests by logistic regression revealed that individuals with no education were 79% less likely to use PrEP compared to those with tertiary education (OR = 0.21, 95% CI = 0.85-1.03). Additionally, based on religion, Christian respondents were found to be 60% less likely than their Muslim counterparts to use PrEP (OR = 0.40, 95% CI = 0.18-0.92). These results are presented in Table 4.3.

Table 4.3: Demographic determinants of PrEP use.

Independent	Grouping	OR	95% CI	P value
Age				
	18 to 20	1.34	0.81-2.20	0.259
	21 to 24	Ref		
Gender				
	Male	0.97	0.60-1.57	0.898
	Female	Ref		
Education level				
	No education	0.21	0.85-1.03	<0.001
	Primary	1.62	0.77-3.40	0.200
	Secondary	0.79	0.43-1.46	0.453
	Tertiary	Ref		
Marital status				
	Married	0.6	0.17-2.11	0.422
	Single	0.54	0.17-1.76	0.308
	Separated	Ref		
Religion				
	Christian	0.4	0.18-0.92	0.030
	Islam	Ref		

OR, Odds Ratio; CI, Confidence Interval. Statistical significance was determined by the OR at P<0.05.

4.4.2: Influence of demographic determinants on HIV PEP use

There was found a higher proportion of PEP use among respondents between 21 and 24 years of age n=172 (23.6%), more females, 24.5%, than males used PEP, while those with tertiary level of education used it most when aggregated by education level. The level of education was found to have a significant association with the use of PEP (χ^2 = 17.76, P <0.001), suggesting significant differences in the use of PEP between the levels

of education. In addition to this, a significant difference was observed in the use of PEP between marital statuses, ($\chi^2 = 6.47$, P = 0.04). Living arrangement was found to have an association with the use of PEP ($\chi^2 = 9.91$, P <0.001). The study also found a significant association between religion and the use of PEP ($\chi^2 = 10.69$, P <0.001) as shown in table 4.4.

Table 4.4: Chi square test of Association between demographic factors and PEP use

Variable	Grouping	PEP use		χ^2	P value
		Yes n (%)	No n (%)		
Age					
	18 to 20	38(21.5)	139(78.5)	0.25	0.62
	21 to 24	53(23.6)	172(76.4)		
Gender					
	Male	35(20.2)	138(79.8)	1.00	0.32
	Female	56(24.5)	173(75.5)		
Education level					
	No education	1(100.0)	0(0.0)		
	Primary	21(28.0)	54(72.0)	17.76	<0.001
	Secondary	41(16.5)	207(83.5)		
	Tertiary	28(35.9)	50(64.1)		
Marital status					
	Married	28(29.2)	68(70.8)		
	Single	57(19.6)	234(80.4)	6.47	0.04
	Widowed/ separated/ Divorced	6(40.0)	9(60.0)		
Living arrangement					
	Independent	46(31.3)	101(68.7)	9.91	<0.001
	With guardian	45(17.6)	210(82.4)		
Religion					
	Christian	77(20.7)	295(79.3)	10.69	<0.001
	Islam	14(46.7)	16(53.3)		

Data is in frequencies (n) and row proportions (%). Statistical significance was determined by χ^2 at P<0.05.

The study found that young adults with secondary level of education were 57% less likely to use PEP than those with a tertiary level of education (OR= 0.43, 95% CI= 0.24-0.77). Single respondents were found to be 0.67 times less likely to use PEP as compared to those who were separated (OR= 0.33, 95% CI= 0.11-0.96). It was also found that those living independently were 1.95 times more likely to use PEP compared to those who lived with their parents/guardians, while in comparison to Muslims, Christians were 0.72 times less likely to use PEP, as presented in table 4.5

Table 4.5 Demographic determinants of HIV PEP use

Variable	Grouping	OR	95% CI	P value
Age				
	18 to 20	1.14	0.68-1.9	0.61
	21 to 40	Ref		
Gender				
	Male	0.78	0.47-1.3	0.35
	Female	Ref		
Education				
	Primary	0.77	0.36-1.63	0.49
	Secondary	0.43	0.24-0.77	<0.001
	Tertiary	Ref		
Marital status				
	Married	0.36	0.11-1.19	0.09
	Single	0.33	0.11-0.96	0.04
	Widowed/separated	Ref		
Living arrangement				
	Independently	1.95	1.09-3.52	0.03
	With guardian	Ref		
Religion				
	Christian	0.28	0.12-0.65	<0.001
	Muslim	Ref		
Financial support				
	Yes	1.68	0.97-2.91	0.06
	No	Ref		

OR, Odds Ratio; CI, Confidence Interval. Statistical significance was determined by the OR at P<0.05.

4.5: The influence of health system determinants on HIV PrEP and PEP use among young adults in Khwisero Sub County

4.5.1 Influence of health system determinants on HIV PrEP use

As detailed in table 4.6, there exists a statistically significant association between the affordability of PrEP and its usage, as evidenced by a significant association ($\chi^2 = 9.74$, $P = 0.002$). This indicates a substantial difference in PrEP utilization based on affordability. Furthermore, provider-initiated counseling was found to significantly influence PrEP utilization ($\chi^2 = 17.09$, $P < 0.001$), alongside the convenience of facility operating hours ($\chi^2 = 8.09$, $P = 0.004$).

Table 4.6: Chi square test of Association between health system factors and PrEP use

Variable	Grouping	PrEP use		χ^2	P value
		Yes	No		
PrEP affordable					
	Yes	68(28.9)	167(71.1)	9.74	0.002
	No	26(15.6)	141(84.4)		
PrEP waiting time					
	Less than 15mins	19(31.7)	41(68.3)	4.83	0.19
	15-30	45(21.0)	169(79.0)		
	30-60	15(19.5)	62(80.5)		
	Over 60 mins	15(30.0)	35(70.0)		
Medical system concerns					
	Yes	13(26.5)	36(73.5)	0.31	0.58
	No	81(22.9)	272(77.1)		
Provider-initiated PrEP counseling					
	Yes	68(31.5)	148(68.5)	17.09	<0.001
	No	26(14.0)	160(86.0)		
Convenient operating hours					
	Yes	63(28.9)	155(71.1)	8.09	0.004
	No	31(16.8)	153(83.2)		
Distance from facility					
	Less than 1km	23(23.5)	75(76.5)	0.70	0.87
	1-5km	35(21.5)	128(78.5)		
	5-10km	26(25.5)	76(74.5)		
	More than 10km	10(25.6)	29(74.4)		

Data is in frequencies (n) and row proportions (%). Statistical significance was determined by χ^2 at P<0.05.

During the key informant interviews the respondents indicated that provider-initiated counseling facilitates informed decision-making and promotes adherence to HIV preventive measures such as PrEP and PEP among young adults. Respondents

emphasized the multifaceted nature of counseling sessions, encompassing various aspects of HIV prevention and management. This included HIV literacy, testing, and counseling on ways to reduce transmission through condom use, PrEP and PEP. By offering comprehensive information and support, healthcare providers empowered the young adults to make informed decisions regarding their sexual health and risk reduction strategies.

> *"…I provide them with information about these preventive measures… I also talk to them about the importance of HIV testing and provide counseling to them so as to help them in decision-making process and direct them on where to get tested at the HTS office or the comprehensive care center"* (KI_6)

Where healthcare providers initiated PrEP counselling, respondents were 2.69 times more likely to use PrEP compared to those who did not receive provider-initiated counseling (AOR = 2.69, 95% CI = 1.58-4.59). Respondents who perceived PrEP as affordable were 1.89 times more likely to use PrEP compared to those who found it unaffordable (AOR = 1.89, 95% CI = 1.58-4.59). Similarly, individuals who found the operating hours of their nearest health facility convenient were 1.94 times more likely to use PrEP than those who found the hours inconvenient (AOR = 1.94, 95% CI = 1.18-3.19). After adjusting for the interaction between health system factors, waiting times of 30 to 60 minutes for PrEP services decreased the likelihood of PrEP usage by 54% compared to waiting times of less than 15 minutes (AOR = 0.46, 95% CI = 0.22-0.96). These results are presented in table 4.7.

Table 4.7 Health system determinants of HIV PrEP use

Variable	Grouping	AOR	95% CI	P value
Provider-initiated PrEP counseling				
	Yes	2.69	1.58-4.59	<0.001
	No	Ref		
PrEP affordable				
	Yes	1.89	1.12-3.21	0.002
	No	Ref		
Distance from nearest facility				
	More than 10km	1.03	0.41-2.58	0.95
	5-10km	0.89	0.37-2.11	0.79
	1-km	1.20	0.49-2.94	0.70
	Less than 1km	Ref		
Convenient working hours				
	Yes	1.94	1.18-3.19	0.004
	No	Ref		
Waiting time				
	Over 60 minutes	0.74	0.30-1.78	0.49
	30-60 minutes	0.46	0.22-0.96	0.04
	15-30 minutes	0.43	0.18-1.04	0.06
	Less than 15 minutes	Ref		

AOR, Adjusted Odds Ratio; CI, Confidence Interval. Statistical significance was determined by the AOR at P<0.05.

Respondents of the key informant interview highlighted the significance of service provision beyond regular working hours to accommodate the needs of young adults. This was evidenced by the implementation of flexible working hours at the Comprehensive Care Centre (CCC) to cater to the needs of the youth as mentioned by one participant:

> *"…we have working hours plus flexy time in our day to day service provision at the CCC. …the youth mostly come either very early in the morning or very late in the evening but our normal working hours is between 8 in the morning and 5 in the*

evening. With the flexy time it depends on the need of the clients and we are ready to serve when called upon at any given time." (KI_1)

Adherence support strategies, including education sessions, mobile phone reminders, and support groups facilitated by healthcare workers and external organizations, were reported by respondents of KII to influence the utilization of HIV PrEP among young adults. Adherence support counselors and pharmacists were mentioned to play a crucial role in educating clients about adherence and ensuring timely refills. Support groups, particularly those for discordant couples, were noted to provide a platform for education, discussion of challenges, and mutual support, contributing to a supportive environment conducive to adherence. Additionally, psycho-social support groups and continuous medical education sessions served as significant avenues for promoting adherence, with healthcare workers providing guidance and support during these meetings.

"We also have continuous medical education (CMEs) and Psychosocial support groups (PSSGs) whereby we provide key messages to HIV positive girls and young women who are enrolled at our clinic and those taking HIV PrEP on healthy living. This PSSG meetings are done on a monthly basis…" (KI_3)

Respondents also noted that stock outs of rapid test kits and PrEP significantly hindered utilization impacting the continuity of care. They expressed concern about stock outs of rapid test kits, crucial for HIV testing prior to PrEP or PEP initiation, leading to delays and ethical dilemmas for healthcare providers. Shortages of medications like cotrimoxazole and emtricitabine was reported to force clients to seek alternatives, often purchasing drugs from chemists, imposing financial burdens and undermining service reliability. Supply chain delays, attributed to suppliers like KEMSA and MEDS, was

said to exacerbate stock outs, disrupt service delivery and compromise prevention efforts. Prolonged stock outs of PrEP resulted in missed services and regimen changes, disrupting care continuity and compromising prevention effectiveness, especially among young adults. Referrals to distant facilities due to stock outs further aggravated access challenges, particularly in rural areas.

> *"…in the last quarter we have had stock outs especially PrEP that lasted for almost the entire quarter whereby patients either they missed the service or we are forced to change the regiments that they are used to…"* (KI_11)

4.5.2 Influence of health system determinants on HIV PEP use

Provider-initiated PEP counselling was found to have a significant association with the utilization of PEP ($\chi^2 = 5.71$, P = 0.02). A significant association in PEP use was also observed between individuals who found health facilities' working hours convenient and those who did not ($\chi^2 = 6.49$, P = 0.01). The use of PEP also differed significantly between respondents in whose community there were awareness promotion and those who lacked such programs ($\chi^2 = 4.80$, P = 0.03). Table 4.8 details the findings.

Table 4.8 Chi square test of Association between health system factors and PEP use

Variable	Grouping	PEP use		χ^2	P value
		Yes	No		
Provider-initiated PEP counseling					
	Yes	60(27.1)	161(72.9)	5.71	0.02
	No	31(17.1)	150(82.9)		
PEP affordable					
	Yes	59(25.2)	175(74.8)	2.12	0.15
	No	32(19.0)	136(81.0)		
Distance from nearest facility					
	Less than 1km	25(25.5)	73(74.5)	2.60	0.46
	1-5km	37(22.7)	126(77.3)		
	5-10km	18(17.6)	84(82.4)		
	>10km	11(28.2)	28(71.8)		
Facilities convenient working hours					
	Yes	60(27.5)	158(72.5)	6.49	0.01
	No	31(16.8)	153(83.2)		
Medical system concerns					
	Yes	11(22.4)	38(77.6)	0.01	0.97
	No	80(22.7)	273(77.3)		
Waiting time					
	Less than [illegible]	17(28.3)	43(71.7)	3.44	0.33
	15-30	47(22.0)	167(78.0)		
	30-60	13(16.9)	64(83.1)		
	Over 60 mins	14(28.0)	36(72.0)		
PEP awareness promotion					
	Yes	39(29.1)	95(70.9)	4.80	0.03
	No	52(19.4)	216(80.6)		

Data is in frequencies (n) and row proportions (%). Statistical significance was determined by χ^2 at $P<0.05$.

During the key informant interview, it was mentioned that health workers play a crucial role in helping individuals opt for preventive services such as PEP. This underscores the significance of pre-counseling sessions in preparing individuals for HIV testing and subsequent preventive interventions such as PrEP and PEP. In support of this notion one respondent noted:

> *"…before testing we do pre-counselling where we talk to them about the benefits of HIV testing, the meaning of an HIV positive and negative diagnosis, the services available in the case of an HIV-positive diagnosis, a description of prevention options available such as PrEP and PEP and we also encourage sexual partner testing and notification…"* (KI_9)

To examine the influence of the health system factors on PEP utilization, an adjusted logistic regression analysis detailed in table 4.9 was conducted. The results revealed that respondents exposed to PEP awareness promotion were 1.61 times more likely to use PEP than those who were not (AOR = 1.61, 95% CI = 0.96-2.69). Additionally, individuals who found the working hours of their nearest health facilities convenient were 60% more likely to use PEP (AOR = 1.60, 95% CI = 0.94 - 2.73) compared to those who found them inconvenient. It was also found that healthcare providers initiating PEP counseling increased the likelihood of PEP use by 1.49 times compared to situations where PEP counseling was not initiated (AOR = 1.49, 95% CI = 0.88-2.53).

Table 4.9 Health system determinants of PEP use

Variable	Grouping	AOR	95% CI	P value
Provider-initiated PEP counseling				
	Yes	1.49	0.88-2.53	0.02
	No	Ref		
PEP affordable				
	Yes	1.25	0.74-2.09	0.40
	No	Ref		
Distance from nearest facility				
	More than 10km	0.89	0.34-1.97	0.66
	5-10km	0.700	0.30-1.61	0.40
	1-5km	0.58	0.24-1.45	0.25
	Less than 1 km	Ref		
Facilities convenient working hours				
	Yes	1.60	0.94-2.73	0.01
	No	Ref		
Medical system concerns				
	Yes	1.00	0.45-2.14	0.97
	No	Ref		
Waiting time				
	Over 60 mins	0.79	0.32-1.95	0.61
	30-60	0.63	0.30-1.32	0.22
	15-30	0.46	0.19-1.14	0.09
	Less than 15mins	Ref		
PEP awareness promotion				
	Yes	1.61	0.96-2.69	0.07
	No	Ref		

AOR, Adjusted Odds Ratio; CI, Confidence Interval. Statistical significance was determined by the AOR at P<0.05.

Respondents of the KII noted that the integration of HIV PEP services into various service delivery points, such as the Outpatient Department (OPD), pharmacy, Maternal and Child Health (MCH) unit, and CCC, facilitated access throughout the day and night. This integration was said to ensure that individuals can access these services during regular working hours and beyond thus significantly influencing utilization.

> *"…HIV PEP is provided 24/7 in all the health facilities within the sub county and in all service points such as maternity, out-patient and the CCC…."* (KI_2)

4.6 The influence of socio-cultural factors on HIV PrEP and PEP use

4.6.1 The influence of socio-cultural factors on HIV PrEP Utilization

The tests of association between socio-cultural factors and HIV PrEP use, as shown in table 4.10, revealed significant associations. Individuals who reported having peers and friends who have used PrEP were 4.5 times more likely to use PrEP themselves (AOR = 4.50, 95% CI = 2.49-8.15), indicating a strong positive association. Conversely, experiencing stigma was associated with a 63% lower likelihood of PrEP use (AOR = 0.37, 95% CI = 0.20-0.68) compared to those who have not experienced stigmatization.

Table 4.10: Socio-cultural determinants of PrEP use

Variables	Grouping	N (%)	AOR	95% CI	P value
Peers, friends, use PrEP					
	Yes	74(18.4)	4.50	2.49-8.15	<0.001
	No	328(81.6)	Ref		
PrEP use stigma					
	Yes	114(28.4)	0.37	0.20-0.68	0.002
	No	288(71.6)	Ref		
Community support PrEP					
	Yes	232(57.9)	0.94	0.55-1.61	0.833
	No	169(42.1)	Ref		
Social support					
	Yes	263(65.6)	1.04	0.59-1.81	0.900
	No	138(34.4)			

AOR, Adjusted Odds Ratio; CI, Confidence Interval. Statistical significance was determined by the AOR at P<0.05.

The respondents of the KII also emphasized the significant impact of HIV/AIDS-related stigma on the utilization of HIV PrEP within the community. Some individuals were said to hide their use of PrEP due to fear of negative perceptions from friends, family, and partners. However, there has been noted improvement in understanding HIV prevention, with some individuals accepting PrEP as a preventive tool rather than indicator of HIV positivity. Stigma toward people living with HIV/AIDS was observed to extend beyond PrEP users, affecting healthcare-seeking behaviors and service utilization.

Some individuals were reported to travel to distant hospitals to avoid recognition and negative judgment in the local community. Negative perceptions about HIV PrEP was described to induce stigma within the community, with some associating these medications with promiscuity and distrust, falsely linking its use to living with HIV. Such notions were alluded to perpetuate stigma and discourage individuals from

seeking HIV PrEP and PEP services. Fear of disclosure and concerns about stigma was also conveyed to prevent individuals from seeking HIV testing and disclosing their status to family members or partners, as reported by respondents.

> *"…there is widespread stigma associated with HIV PrEP because if people see you taking drugs they start talking about how you are emaciated and wasted even though you are HIV negative… this person may keep to himself or herself and even sometimes end up relocating elsewhere like Eldoret thus defaulting on their regimen"* (KI_8)

The respondents also highlighted polygamy as a key determinant affecting the utilization of HIV PrEP in the community. Polygamous marriages prevalent in this sub county was observed to pose a challenge when accessing and utilizing HIV PrEP. The reluctance of other wives within polygamous families to accept and use PrEP and PEP was identified as a primary barrier, driven by factors such as lack of awareness, cultural beliefs, and resistance to modern healthcare practices. This situation was reported to complicate HIV status disclosure and knowledge, hindering effective prevention efforts due to undisclosed HIV-positive individuals within households. Familial dynamics and lack of cooperation among the co-wives was mentioned to further impede adoption of prevention interventions, with some co-wives unwilling to use the regimen, thereby hindering its effectiveness. Additionally, patriarchal norms within polygamous marriages was pointed out to lead husbands to control their wives' healthcare decisions, forbidding them from accessing or using HIV prevention strategies based on misinformation.

> *"…you find that they practice polygamous marriages whereby the husbands are the head of the family and they forbid their wives against taking the HIV PrEP. This*

is mostly brought about due to misinformation about these HIV preventive strategies" (KI_5)

The respondents of the KII also emphasized the pervasive influence of myths and misconceptions as socio-cultural determinants affecting the utilization of HIV PrEP within the community. They shared insights into how these myths and misconceptions arise from a lack of accurate information about HIV transmission, prevention, and treatment, leading to hesitancy and distrust surrounding preventive measures such as HIV PrEP. One prevalent myth pointed out by the respondents was the belief that HIV can be transmitted through casual contact, like shaking hands or sharing water with an infected person. This misinformation was observed to create hesitancy among young adults in seeking PrEP. A persistent belief identified in the community was the notion that HIV is caused by witchcraft, considered a generational curse, or inflicted through black magic. This belief was highlighted as a deterrent for young adults accessing PrEP, as they may perceive HIV infection as inevitable and untreatable.

Respondents also reported that some individuals erroneously believe that taking PrEP signifies HIV positivity or impending death. Others were observed to associate these medications with negative side effects such as impotency or infertility, further deterring young adults from seeking PrEP. Additionally, cultural beliefs and attitudes towards illness and healthcare were described to contribute to misconceptions about HIV prevention and treatment. Some community members were reported to view HIV as a form of punishment, leading to distrust of medical interventions and reliance on traditional healing practices. This reluctance to seek medical care was conveyed to further hinder young adults from accessing PrEP. Others expressed a belief that HIV PrEP was exclusively for sex workers and seen as a form of neo-colonialism, as articulated by one of the study participants.

"…people believe that PrEP and PEP are only for individuals who have multiple sexual partners or engage in risky behaviors like sex workers while others say that PrEP and PEP are a form of colonization by the whites as a means of controlling the world population" (KI_6)

The respondents also mentioned that discrimination promoted misconceptions about PrEP among community members, leading to further barriers in utilization. Negative beliefs about these preventive measures, viewing them as ineffective or harmful, were shared as a result of discrimination and misinformation. This discrimination and misinformation were suggested to contribute to poor adherence and discontinuation of PrEP regimens. Additionally, discrimination within healthcare settings was pointed out to further impede access to PrEP for marginalized populations.

Respondents identified discrimination as a prominent barrier to the utilization of PrEP among key populations, such as the LGBTQ community and commercial female sex workers. These populations were observed to experience isolation, which hinders them from seeking HIV prevention services like PrEP and PEP. Furthermore, the legal context was described to further promote discrimination, as laws criminalizing homosexuality and sex work restrict access to healthcare services for these populations. In support of this notion one research participant had this to say:

"…there is some sort of discrimination especially for the key population which leads to isolation and they feel like HIV PrEP and PEP are not allowed for them for example the LGBTQ community and commercial female sex workers… they are not open to seek these services because the law does not recognize and support publicity of LGBTQ and female sex workers…" (KI_2)

4.6.2 The influence of socio-cultural factors on HIV PEP Utilization

Respondents who had peers and friends who had used PEP were found to be 2.72 times more likely to use PEP than those who did not (AOR = 2.72, 95% CI =1.51- 4.88) as shown in table 4.11

Table 4.11: Socio-cultural determinants of PEP use

Variables	Groupin	N (%)	AOR	95% CI	P value
Peers, friends, use PEP					
	Yes	67(16.7)	2.72	1.51-4.88	<0.001
	No	335(83.3)	Ref		
PEP use stigma					
	Yes	99(24.6)	1.08	0.64-1.83	0.78
	No	303(75.4)	Ref		
Community support PEP					
	Yes	232(57.9)	0.93	0.53-1.61	0.78
	No	169(42.1)	Ref		
Social support					
	Yes	263(65.6)	0.63	0.34-1.14	0.12
	No	138(34.4)			

AOR, Adjusted Odds Ratio; CI, Confidence Interval. Statistical significance was determined by the AOR at P<0.05.

The respondents of the KII noted the fear of judgment, particularly among young girls and women, who expressed concerns about potential criticism from friends, family members, and community members, including uncles and grandfathers who have committed incestuous acts. This fear was said to deter them from seeking and openly using PEP. They shared that young girls and women feel discouraged from accessing HIV PEP due to concerns about being perceived as HIV-positive or engaging in risky behavior. This fear of judgment creates a barrier to seeking care and leads young adults to conceal their use of PEP from their partners and family members.

The perception that individuals taking PEP are HIV-positive was observed to contribute to secrecy surrounding its use, undermining adherence to medication regimens and

hindering effective HIV prevention efforts. Respondents mentioned that community members harbor misconceptions that individuals taking PEP are actually using antiretroviral medications (ARVs), contributing to further stigma and discrimination. This fear of being misjudged was stated to reinforce secrecy and reluctance to openly access and utilize HIV PEP.

> *"We have had cases of fear of judgment from friends, family members and community members which were reported by young girls and women who come to seek services at our MCH clinic. This....has discouraged these young people from seeking HIV prevention services such as HIV PrEP and PEP"* (KI_3)

The respondents also highlighted the significant impact of cultural practices, such as "disco matanga", on the utilization of HIV PEP within the community. These events were described as settings where risky behaviors, including unprotected sex and substance abuse, are common, heightening vulnerability to HIV transmission. "Disco matanga", in particular, were described as environments where alcohol consumption and substance abuse prevail, creating conditions conducive to risky sexual practices. The combination of alcohol, drug use, and unprotected sex amplifies the risk of HIV transmission, necessitating preventive measures like PEP. Notably, unprotected sex during "disco matanga" was observed predominantly among young individuals, who perceive PEP as a quick fix, similar to painkillers, reflecting a misunderstanding of the importance of adherence and dosage requirements for these preventive measure. This is reflected in the comment below:

> *"…I have encountered scenarios where the young people engage in unprotected sex during the "disco matanga" and come in the morning for the PEP as if it is a*

pain killer not knowing that you have to follow some dosages and have adherence for it to be effective in HIV prevention" (KI_11)

4.6.3 HBM constructs in HIV PrEP and PEP use

HBM constructs and PrEP use

The researcher examined the relationship between PrEP usage and several factors including respondents' perceived susceptibility to HIV, perceived severity of HIV infection, perceived efficacy of PrEP in preventing HIV infection, and cues to action. Among these factors, a significant association was observed with perceived susceptibility. Individuals with low perceived susceptibility to infection were 0.51 times less likely to use PrEP compared to those with high perceived susceptibility (OR = 0.49, 95% CI = 0.3-0.80). Additionally, media campaigns promoting PrEP use were associated with a 2.92 times higher likelihood of PrEP usage compared to instances of high sexual encounters, as outlined in table 4.12.

Table 4.12: Association between HBM paradigms and PrEP use

Variable	Grouping	OR	95% CI	P value
Perceived severity of HIV/AIDS				
	Low	0.96	0.54-1.78	0.9
	High	Ref		
Perceived susceptibility				
	Low	0.49	0.3-0.80	0.01
	High	Ref		
Perceived efficacy PrEP				
	No	1.05	0.56-1.96	0.88
	Yes	Ref		
Cue to action				
	Healthcare providers recommendation	0.74	0.39-1.40	0.36
	Media campaigns	2.92	1.31-6.50	0.01
	Friends/family's experiences	0.82	0.33-2.08	0.68
	High-risk sexual encounter	Ref		

OR, Odds Ratio; CI, Confidence Interval. Statistical significance was determined by the OR at P<0.05.

HBM constructs and PEP use

The study also investigated the relationship between the utilization of PEP and respondents' perceptions of susceptibility to HIV, perceived severity of HIV infection, perceived efficacy of PEP in preventing HIV infection, and cues to action. Individuals with a low perception of susceptibility to HIV infection were found to be 49% less likely to use PEP compared to those with a perception of high susceptibility. Similarly, as with PrEP use, media campaigns were associated with a 2.89 times higher likelihood of PEP usage (OR = 2.89, 95% CI = 1.25-5.70). These findings are presented in table 4.13.

Table 4.13: Association between HBM paradigms and PEP use

Variable	Grouping	OR	95% CI	P value
Perceived severity of HIV/AIDS				
	Low	0.91	0.50-1.67	0.77
	High	Ref		
Perceived susceptibility				
	Low	0.51	0.31-0.84	0.01
	Yes	Ref		
Perceived efficacy PEP				
	No	0.55	0.25-1.18	0.12
	Yes	Ref		
Cue to action				
	Healthcare providers recommendation	1.09	0.57-2.11	0.79
	Media	2.89	1.25-5.70	0.01
	Friends/family's experiences	1.94	0.85-4.38	0.11
	High-risk sexual encounter	Ref		

OR, Odds Ratio; CI, Confidence Interval. Statistical significance was determined by the OR at P<0.05.

Respondents of the KII highlighted the pivotal role of HIV PrEP and PEP medication availability within the healthcare system as a determinant influencing their utilization among young adults in the Khwisero sub-county. They discussed how the presence of these drugs at health facilities significantly impacts service uptake, underlining the necessity of maintaining adequate stocks to meet demand. Despite the availability of drugs, respondents shared instances where demand for HIV PrEP and PEP services remained low, even when medications were accessible. Challenges such as insufficient drug supply at certain linked health facilities were identified as persistent issues. Moreover, respondents pointed out discrepancies between service demand and drug availability. They also reported that drug availability is monitored through regular

reporting and refill processes, highlighting a systematic approach to ensuring continuous access to HIV PrEP and PEP medications within the healthcare system.

> *"…we have the drugs at the sub county hospital store, pharmacy and also in our health facilities. We normally have monthly reporting of commodity by the linked health facilities on 5th of every month whereby they usually submit a report of how their commodity consumption so that we do a refill…"* (KI_4)

Respondents also emphasized the significant influence of religion on attitudes towards HIV prevention methods, particularly PrEP and PEP, and its impact on access and acceptance of these services. They pointed out that certain religious institutions, such as the Catholic Church, hold stances on condom use and family planning that indirectly affect the acceptance and utilization of other HIV prevention measures. Religious teachings discouraging condom use and family planning were reported to shape community attitudes towards PrEP and PEP.

Additionally, sponsorship and influence from religious institutions were observed to influence the provision of healthcare services, with community-linked health centers adhering to specific doctrines potentially limiting the availability of services like family planning, consequently affecting HIV prevention services. Respondents also described how individual adherence to religious beliefs such as impacts healthcare-seeking behaviors, with some community members favoring reliance on prayer over conventional healthcare services, thus deterring them from accessing PrEP and PEP. This highlights the role of religion in creating disparities in the utilization of HIV prevention services as stated by one respondent:

"…some community members come from religious dominations such as Dini ya Musambwa whose members are told not to seek health care services and that they should pray and fast so as to be healed by the God in heaven." (KI_7)

The respondents also mentioned that the practice of wife inheritance in the community significantly influences the spread of HIV indirectly affecting utilization of HIV PrEP and PEP. They pointed out that wife inheritance, a traditional custom in Khwisero, poses considerable risks for HIV transmission, as widows are inherited by their brother-in-law regardless of their HIV status. This practice disregards the widow's HIV status, leading to potential exposure to the virus through unprotected sexual relations with the inherited widow.

Moreover, respondents observed that the concealment of HIV/AIDS-related deaths and subsequent inheritance further exacerbates the risk of HIV transmission. Family members are reported to conceal the true cause of death to avoid stigma, attributing it to other diseases such as malaria or tuberculosis. This concealment was reported to promote the spread of HIV within the community, as the inherited widow may unknowingly transmit the virus to her new partner. One respondent had this to say:

"…when reading the eulogy the family members tend to hide the cause of death of the deceased mostly when they have died of HIV/AIDS and they say other diseases like malaria, Tuberculosis or Asthma. After the deceased is buried there is also a tendency of his brothers (Mulamwah) inheriting the wife leading to spread of HIV in the community" (KI_8)

CHAPTER FIVE

DISCUSSION

5.0 Introduction

This chapter provides a comprehensive analysis of the research findings according to each objective of the study. The discussion presents a juxtaposition of the results obtained in the present investigation with those obtained in other studies of a similar nature. The researcher has offered a critical evaluation of the findings from previous studies and has also assessed the quality and value of those findings.

5.1 Prevalence of HIV PrEP and PEP use among young adults in Khwisero sub county

5.1.1 Prevalence of HIV PrEP use among young adults in Khwisero sub county

The results of the study revealed low prevalence of HIV PrEP use among the young adults. While awareness levels are moderately high at 58%, actual usage remains comparatively low at 23.4%. This observation is consistent with previous studies. For instance, a study conducted among HIV potential transmission networks in U.S.A. highlighted similar trends reporting moderate awareness at 53.2% but relatively low utilization as 6.0% of the participants reported ever using PrEP (Schueler et al., 2019). Studies conducted among female sex workers in Nigeria, Ethiopia and Tanzania also noted low prevalence of PrEP use at 8%, 15.9% and 3.9% respectively (Nwagbo et al., 2023; Shibesh 2023; Faini et al., 2023). Similarly, a study by Sila et al. (2020), highlighted disparities between PrEP awareness (89%) and use (4%) among adolescents and young women in Kenya. From

these studies it is evident that despite being aware of PrEP, a substantial portion of individuals are not utilizing these preventive measures emphasizing the need for targeted interventions to address barriers to PrEP utilization.

The Health Belief Model provides a framework for understanding these findings. According to the HBM, individuals' health-related behaviors are influenced by their perceptions of susceptibility to a health threat, the severity of the consequences, the benefits of taking action, and the barriers to action. In this context, the discrepancy between awareness and utilization of PrEP suggests a gap between perceived susceptibility to HIV and the perceived benefits of PrEP as a preventive measure, indicating a potential area of intervention. The findings highlight the importance of addressing individuals' perceptions of HIV risk and the effectiveness of PrEP through targeted health education campaigns and interventions.

The study findings contrasted with those recorded from studies conducted in South Africa, Brazil and Uganda where the prevalence of HIV PrEP use was much higher. According to Pillay et al., (2020), the prevalence of PrEP use was 36.6% among clients at sex worker and MSM facilities in South Africa while PrEP uptake was reported as 60.9% among MSM and transgender women in Brazil (Hoagland et al., 2017). A study that evaluated PrEP uptake and retention among individuals with high risk of HIV in Uganda reported high PrEP uptake rate at 92.2% (Kagaayi et al., 2020) consistent with other implementation studies (Baeten et al., 2016). This disparity can be

attributed to the different study populations as high risk populations such as sex workers, transgender and MSM are given priority in HIV prevention programs. Addressing these disparities in prevalence requires targeted interventions tailored to the specific needs of young adults so as to improve access to these services.

Social media emerged as the primary source of information for PrEP in this study, with 36.3% of respondents indicating it as an informational source for PrEP. This trend aligns with contemporary patterns of information dissemination, particularly among younger demographics. These findings are supported by previous studies that explored the utilization of mobile applications to improve awareness, uptake, and adherence to PrEP. Sharpe and Kamara (2018), conducted an assessment of existing Android and iOS apps, identifying various features that facilitated understanding and access to PrEP. These included the provision of comprehensive information, access to location-based resources, and tools to support adherence. Additionally, Sullivan et al., (2017), examined a comprehensive HIV prevention app designed specifically for Black and Latinx men who have sex with men (MSM). Their findings revealed that 9% of PrEP-eligible individuals initiated PrEP after using the app, with six users attributing their decision to the app's influence.

In an assessment of the #PrEP4Love (P4L) campaign, based in Chicago, researchers examined the campaign's online reach through Facebook and Instagram. Utilizing targeted ads, the campaign directed users to the P4L website, which featured a PrEPLine, offering

information about PrEP and connecting callers to PrEP services. Impressively, the web-based ads garnered over 40 million unique views, with one of the most clicked-on ads titled "HIV Prevention Medication." Through data collected from PrEPLine, researchers tracked referrals to PrEP care initiated by the P4L campaign. Impressively, 53% of these individuals became aware of PrEP through the P4L campaign, with 34% specifically identifying it as their source of information among PrEPLine callers (Dehlin et al., 2019). This underscores the importance of leveraging digital platforms for targeted health promotion efforts aimed at increasing PrEP awareness and uptake among younger adults because they are more likely to engage with social media platforms.

The HBM emphasizes the role of cues to action, such as social media and healthcare campaigns, in prompting individuals to engage in preventive behaviors. In this study, social media emerged as a significant source of information on PrEP, indicating its potential as a platform for health promotion efforts targeting young adults. The emergence of social media as the primary source of PrEP information among study participants highlights the influence of contemporary patterns of information dissemination, particularly among younger demographics. Leveraging digital platforms for targeted health promotion efforts, as demonstrated by initiatives like the #PrEP4Love (P4L) campaign, can effectively increase PrEP awareness and uptake among younger adults. In this context, the HBM emphasizes the role

of cues to action, such as social media campaigns, in prompting individuals to engage in preventive behaviors.

However, the minimal contribution of school health awareness programs as a source of information for PrEP represents a notable discrepancy with some existing studies. While the current study found that school health programs accounted for only 0.8% of PrEP information, other research suggests that school-based health education can play a significant role in promoting PrEP awareness among young adults. For instance, studies conducted among students in United States noted that 56.5% of students indicated PrEP was taught in their academic program (Bunting et al., 2020) while the most common source of information on PrEP was campus health services (24%) (Okeke et al., 2021). The difference between these findings indicate variations in the implementation and effectiveness of school health programs across different settings. This highlights the need for comprehensive and inclusive sexual health education initiatives among young adults in Khwisero Sub County.

The minimal contribution of school health awareness programs as a source of PrEP information highlights the need to strengthen educational initiatives addressing HIV prevention and sexual health among young adults. This highlights the need for comprehensive and inclusive sexual health education initiatives among young adults, grounded in the HBM principles, to promote PrEP awareness and utilization. By integrating PrEP education into school curricula and providing access to comprehensive sexual health services, barriers to PrEP utilization can be addressed, and awareness can be enhanced

among this demographic. The implications of the study findings underscore the importance of targeted interventions tailored to the specific needs of young adults, addressing perceived barriers and enhancing perceived benefits to promote PrEP uptake. Integrating the principles of the Health Belief Model into these interventions can enhance their effectiveness in promoting PrEP utilization and ultimately reducing HIV transmission rates among at-risk populations.

5.1.2 Prevalence of HIV PEP among young adults

As with PrEP, the study recorded a low prevalence of PEP use (22.6%). However, the awareness level was moderately high at 56.7%. These findings align with existing studies within the field of HIV prevention. For instance, Goedel et al., (2017), reported similar trends indicating a high level of awareness (88.3%) but lower rates of actual PEP usage (27.4%) among MSM in London. In a study conducted among young men of color who have sex with men, transgender women, and cisgender women of color in New York City, it was found that 59% of participants were aware of PEP but only 13% of participants reported ever using PEP (Koblin et al., 2018). This consistency across studies suggests that the observed gap between PEP awareness and utilization is a widespread phenomenon that warrants attention in public health interventions.

In the context of the Health Belief Model, behavior change is influenced by cues to action, which play a pivotal role in motivating individuals to adopt preventive measures such as seeking medical interventions like PEP. However, the observed disparity between

awareness and utilization of PEP suggests that mere awareness of a preventive measure may not necessarily lead to behavior change. Despite being aware of PEP, individuals may not perceive themselves as susceptible to HIV infection, underestimate the severity of HIV transmission consequences, or deem the benefits of PEP insufficient compared to perceived barriers. This finding highlights the need for a nuanced understanding of factors influencing behavior within the HBM framework. Effective public health interventions targeting PEP utilization should address perceived barriers, enhance perceived benefits, and consider contextual factors influencing individuals' decision-making processes.

Contrary to our findings, studies conducted across various countries have reported lower awareness and use of PEP. Studies conducted in Portugal, Canada, the USA, and Spain consistently report lower levels of PEP awareness and usage among key populations, including men who have sex with men (MSM) and sexual minority individuals. For instance, Simões et al. (2021), found that only 15.7% of respondents in Portugal were aware of PEP, with a mere 1.8% having ever used it. Similarly, Lin et al. (2016) reported a PEP awareness rate of 51.9% among MSM in Canada, with a usage rate of only 3%. Fernández-Balbuena et al. (2013), observed that 22% of individuals receiving rapid HIV testing in Spain were aware of non-occupational PEP (nPEP), while a mere 2% had utilized it. Moreover, John et al. (2022), found that only 11.28% of cisgender and transgender sexual minority men had ever used PEP. These findings highlight the persistent challenge of low awareness and utilization of PEP within key populations, emphasizing the need for targeted interventions to enhance PEP education and access globally.

The emergence of social media as the primary source of information for PEP (25.2%) resonates with the findings of Fagan et al., (2020), who noted the influential role of social media campaigns in raising awareness and demand for PEP among MSM and TW populations in U.S.A. Within the framework of the Health Belief Model, social media serves as a potent cue to action, stimulating individuals to actively seek information and engage in preventive behaviors.

The widespread reach and accessibility of social media platforms offer an invaluable opportunity for targeted health promotion endeavors. This allows for the customization of messaging and engagement strategies tailored to diverse populations, aligning with the HBM's emphasis on cues to action. By leveraging social media channels, barriers to PEP utilization can be effectively addressed through the dissemination of accessible and compelling educational content. This highlights the significance of employing social media platforms in focused health promotion initiatives aimed at bolstering PEP awareness and uptake across diverse populations.

The limited contribution of school health awareness programs as a source of information for PEP (0.9%) underscores a gap in traditional education channels. Within the framework of the Health Belief Model, educational interventions provided through school health programs serve as important cues to action, shaping individuals' perceptions of susceptibility, severity, benefits, and barriers related to preventive behaviors. While the current study's findings reveal a minimal utilization of school health programs for PEP information, existing

research suggests that school-based sexual health education can significantly influence healthy sexual development and reduce risky behaviors among adolescents (Jennings et al., 2014).

The effectiveness of school-based sexual health education programs in improving sexual risk behavior knowledge, attitudes, and behaviors highlights the potential of educational interventions to address barriers and enhance perceived benefits associated with PEP utilization. Therefore, the low utilization of school health programs for PEP information highlights the importance of integrating modern HIV prevention strategies into current curricula. By incorporating comprehensive education about PEP within school-based sexual health programs, individuals can be empowered to make informed decisions regarding HIV prevention, thereby addressing gaps in traditional education channels and promoting healthier behaviors among young adults.

5.2 Influence of demographic determinants on HIV PrEP and PEP use among young adults.

5.2.1 Influence of demographic determinants on HIV PrEP use

The level of education emerged as a significant factor influencing PrEP utilization among the respondents. The study also revealed a noteworthy association between higher education levels and increased likelihood of PrEP uptake. These results concur with different previous studies. For instance, PrEP use was reported more frequently by those with secondary and university-level education among the key population in Portugal (Simões et al., 2021).

The study findings also agreed with a Ugandan study among fisher-folk community which reported that inclination toward PrEP use increased progressively with higher levels of education (Ssuna et al., 2022). This aligns with other studies which established that university and college education level was significantly and positively associated with a willingness to use PrEP among MSM in China, Germany and Portugal (Fu et al., 2021; Werner et al., 2018; Fernandes et al., 2019). These findings imply that educational attainment shapes individuals' awareness and uptake of PrEP, suggesting the importance of targeted educational interventions to enhance PrEP uptake among young people.

The association between higher education levels and PrEP use lies within the framework of the Health Belief Model. Individuals with higher education levels may perceive themselves as more susceptible to HIV infection due to their increased awareness of the risks associated with sexual behaviors. Additionally, they may perceive the benefits of PrEP, such as reducing the risk of HIV transmission, as more significant compared to perceived barriers, such as concerns about side effects or stigma.

This heightened perception of susceptibility and benefits may motivate individuals with higher education levels to actively seek out and utilize PrEP as a preventive measure. Furthermore, individuals with higher education levels may have better access to information about PrEP through formal education channels, healthcare providers, or social networks, leading to greater awareness and understanding of its benefits. As a result, targeted educational interventions aimed

at enhancing PrEP uptake among young people should consider the role of educational attainment in shaping individuals' perceptions of susceptibility and benefits, thereby empowering them to make informed decisions about HIV prevention strategies.

Contrary to our findings, some studies observed that a higher education level was associated with lower willingness to use PrEP. According to a study conducted among MSM in China, it was noted that respondents who had university or college education were less willing to use PrEP (Yu et al., 2021). Similarly, lower education level and was associated with willingness to use PrEP among MSM and transgender women in Spain (Iniesta et al., 2018). These findings imply that individuals with higher levels of education may harbor more concerns about the effectiveness and side effects of PrEP, leading them to exercise caution in considering its use.

The contradicting findings in willingness to use PrEP among individuals with higher education levels suggests that perceived barriers play a crucial role in shaping preventive behaviors. Those with more education may have heightened concerns about the effectiveness and side effects of PrEP, viewing these barriers as significant obstacles despite their awareness of HIV risks and PrEP benefits. Additionally, their access to more information through formal education or healthcare providers may reinforce these perceived barriers. Therefore, targeted educational interventions aimed at enhancing PrEP uptake among individuals with higher education levels should address these perceived barriers by providing accurate information about the effectiveness and safety of PrEP. By addressing concerns and misconceptions, such interventions can empower individuals to make informed decisions about HIV prevention

strategies, ultimately increasing PrEP uptake and reducing HIV transmission rates.

Furthermore, this study identified a significant association between religion and PrEP use, with Muslims having a higher likelihood of PrEP use compared to Christians. This results is similar to those of Guure et al., (2022), who reported that among female sex workers in Ghana, Muslim respondents were more likely to use PrEP compared to Christians. Additionally, a study conducted among black Americans established that individuals who attend religious services a few times a year or monthly showed higher likelihood of willingness to use PrEP compared to those who do not attend religious services (Ransome et al., 2018). These findings suggests that religious communities could potentially serve as avenues for promoting PrEP awareness and uptake. Therefore, there is need to engage religious leaders and institutions in promoting HIV prevention efforts such as PrEP.

Within the Health Belief Model framework, religious beliefs and practices influence perceptions of susceptibility to HIV infection, the severity of the disease, and the perceived benefits and barriers of PrEP use. Muslims' higher likelihood of PrEP use compared to Christians may stem from differing religious teachings and community norms regarding HIV prevention. Similarly, the findings among female sex workers in Ghana and black Americans suggest that religious engagement can influence individuals' willingness to use PrEP, potentially due to the guidance and support provided within religious communities. These findings resonate with the HBM's emphasis on social influences and cues to action, where religious communities play influential roles in shaping health-related decisions. Given the significant association between religion and PrEP use, there is an opportunity to engage religious leaders and institutions in promoting PrEP awareness and uptake. By doing so, public health efforts

can address religious factors that may hinder PrEP uptake, ultimately enhancing HIV prevention strategies.

The study revealed no significant association between PrEP use and other demographic factors including age, gender, marital status, and living arrangement. This contradicts with findings from studies conducted among MSM and transgender people in U.S.A and China which reported that older age, being separated, divorced, or widowed increased the likelihood of PrEP use (Shover et al., 2018; Zhou et al., 2022). However, other research, such as studies conducted among gay and bisexual men in Australia and female sex workers in Ghana, found that young age was associated with increased PrEP acceptability (Chan et al. 2021; Guure et al., 2022). Additionally, a study conducted in Kenya found that male respondents had higher PrEP uptake compared to females (Olilo et al., 2019). These findings highlight the variability in perceptions of susceptibility, severity, benefits, and barriers among different demographic groups. Tailoring PrEP promotion efforts to address the specific needs and concerns of each population is crucial, aligning with the individual-centered approach of the Health Belief Model.

5.2.2 Influence of demographic determinants on HIV PEP use

The study revealed a significant association between education level and PEP use, indicating that individuals with secondary education level were less likely to use PrEP compared to those with a tertiary education level. This finding aligns with a study conducted by Simões et al. (2021), which found a higher frequency of PEP utilization among the key population in Portugal with university-level education compared to those with lower levels of education. Likewise, a study among MSM in Sub-Saharan Africa reported that individuals with vocational education

had higher odds of PEP use compared to those with no education (Isano et al., 2020). These findings highlight the importance of addressing educational disparities in healthcare access to enhance utilization of PEP among populations with lower educational levels.

In the context of the Health Belief Model, these findings suggest that individuals with higher education levels may perceive themselves as more susceptible to HIV due to their deeper understanding of associated risks and greater awareness of PEP's preventive benefits. This heightened health literacy likely fosters a stronger belief in PEP's efficacy and a greater willingness to overcome obstacles to its utilization. Conversely, individuals with lower education levels may face barriers such as limited access to accurate health information, leading to potential underestimation of HIV susceptibility and the severity of its consequences. The study's alignment with previous research underscores the urgency of addressing educational disparities in healthcare access. Interventions targeting populations with lower education levels should prioritize not only raising awareness of PEP but also mitigating structural barriers. This includes initiatives to enhance healthcare access and provide financial assistance for PEP-related expenses. By addressing these disparities, healthcare systems can better ensure equitable access to PEP, thereby contributing to the reduction of HIV transmission rates.

The study further revealed significant associations between both marital status and living arrangement with PEP utilization. It established that single individuals were more inclined to use PEP compared to those who were separated, aligning with previous research by Eshun et al., (2023), suggesting lower PEP awareness among married and separated/divorced individuals. These findings

highlight the importance of considering marital status as a determinant of PEP utilization and advocate for targeted interventions to enhance awareness and access among different marital status groups. Additionally, the study noted a significant influence of living arrangement on PEP use, with individuals living independently demonstrating higher utilization rates compared to those living with parents or guardians. This finding contrasts with research by Shibesh et al., (2023), among Ethiopian female sex workers, indicating that individuals with only one living parent were less likely to use PrEP than those with both parents alive. The disparity in PEP utilization according to living arrangement may be attributed to perceived autonomy in decision-making when living independently. These insights emphasize the need for tailored interventions to address diverse living circumstances and optimize PEP uptake across different populations.

The finding that single individuals exhibit higher PEP utilization rates aligns with the Health Belief Model's notion that they may perceive themselves as more susceptible to HIV due to their potentially active sexual lifestyles, fostering a greater willingness to access preventive measures like PEP. In contrast, the lower PEP utilization among married and separated/divorced individuals may reflect lower awareness or perceived susceptibility to HIV transmission within these groups, consistent with previous research suggesting lower PEP awareness among married individuals.

Additionally, the significant influence of living arrangement on PEP use, with higher utilization rates among those living independently, suggests that perceived autonomy in decision-making plays a crucial role. Individuals living independently may feel more empowered to seek and adhere to PEP due to greater control over their healthcare decisions. These insights underscore the importance of considering demographic factors such as marital status and living arrangement when designing interventions to enhance PEP awareness and access. Tailored interventions should address knowledge gaps and barriers to PEP utilization, including limited autonomy in decision-making among certain living arrangements.

The study also highlights the influence of religion on PEP utilization, indicating that Christians are less likely to use it compared to Muslims. This finding agrees with prior studies which have assessed the influence of religion on uptake of HIV prevention services. For instance, Njau et al., (2013), observed that Catholic youth were less likely to use condoms compared to Muslims. Similarly, Eriksson et al., (2014), reported that religious affiliation was associated with varying levels of education on sexuality and HIV among youth groups in South Africa, with members of the Lutheran and Catholic churches receiving better information. These findings suggest the need for religion sensitive interventions within communities to address barriers to PEP use.

The finding that Christians are less likely to use PEP compared to Muslims suggests that religious beliefs and affiliations may shape individuals' perceptions of HIV risk and preventive measures.

Christians may perceive themselves as less susceptible to HIV or may underestimate the severity of its consequences due to religious surrounding sexuality and health. Conversely, Muslims may have different beliefs or attitudes that prioritize preventive measures such as PEP. By understanding and respecting individuals' religious beliefs and norms, healthcare providers can develop tailored interventions that resonate with the values and perspectives of these communities. Such interventions can include educational initiatives that incorporate religious teachings and outreach programs conducted in collaboration with religious leaders.

While our study did not find a significant association between age, gender, and PEP use, contrasting findings from other studies emphasize the influence of these factors on PEP uptake. For instance, research conducted in Portugal by Simões et al., (2021), revealed a higher prevalence of PEP usage among men compared to women. Similarly, a study by Koblin et al., (2018), in the United States found that young MSM exhibited greater PEP awareness and use compared to transgender and cisgender women. Moreover, findings from Izulla et al., (2016), among female sex workers in Nairobi indicated that repeat PEP users tended to be younger, had higher casual partner volumes, and were more inclined to use condoms. Additionally, Thomas et al., (2015), found that first-time PEP consultations, older age, and male gender were associated with higher treatment adherence in North America. These divergent findings highlight the importance of considering the multifaceted nature of PEP utilization

across different genders and age groups. The discrepancies can be attributed to variances in individual's perceived susceptibility to HIV and attitudes towards preventive measures.

5.3 Influence of health system determinants on HIV PrEP and PEP use among young adults

5.3.1 Influence of health system determinants on HIV PrEP use

In this study, the researcher reported a significant association between the affordability of PrEP and its use among young adults in Khwisero Sub-county. Specifically, individuals who perceived PrEP as affordable demonstrated a higher likelihood of usage. Macapagal et al., (2020) and Asiago-Reddy et al., (2022), reported similar findings in their study where a belief that PrEP is unaffordable or not insurance-covered deterred MSM from exploring PrEP options.

Moreover, in a study conducted among young MSM in the U.S.A, Arnold et al. (2017) identified that both perceived and actual costs of PrEP medications and clinical visits undermined retention in PrEP care. However, contrasting findings were reported by Chan et al., (2016), where medication cost was not identified as a factor affecting PrEP use among MSM. These findings reveal the critical influence of affordability perceptions on PrEP utilization among young adults. Thus, interventions targeting cost barriers are imperative to enhance PrEP access and uptake, particularly among vulnerable populations.

Perceived affordability, as highlighted in this study, aligns closely with the barrier component of the Health Belief Model. The findings demonstrate that individuals who perceive PrEP as affordable are more likely to use it, while those who believe it to be unaffordable are

deterred from exploring PrEP options. This perception of affordability acts as a barrier to PrEP utilization, directly influencing individuals' decisions regarding preventive action against HIV. Consequently, interventions aimed at addressing cost barriers are pivotal for enhancing PrEP access and uptake, particularly among young adults. By addressing individuals' perceptions of affordability and removing financial obstacles to preventive healthcare access, these interventions can effectively bolster PrEP utilization rates.

Provider-initiated counseling also emerged as a pivotal facilitator of PrEP utilization, with individuals who received counseling demonstrating a higher likelihood of PrEP use. This counseling empowered individuals to make informed decisions about their sexual health and promoted adherence to PrEP. Consistent with these findings, Jaiswal et al. (2018) identified counseling support for PrEP use and one's sexual life as statistically significant predictors of PrEP utilization among young men in the U.S.A. Similarly, in a study conducted among MSM in Thailand, counseling was reported as the leading facilitator of PrEP adherence (Yu et al., 2024).

Additionally, the utilization of the safe space model, decentralization of PrEP support and delivery, peer mentors, and effective linkage to local healthcare facilities were identified as facilitators to PrEP uptake among adolescent girls and young women in Kenya (Jackson-Gibson et al., 2021). These findings collectively emphasize the importance of comprehensive counseling strategies and supportive environments in enhancing PrEP access and adherence among at risk populations.

Counseling plays a significant role in shaping perceptions of severity and benefits within the Health Belief Model, as supported by the findings of this study. Provider-initiated counseling emerged as a crucial facilitator of PrEP utilization, with individuals who received counseling demonstrating a higher likelihood of PrEP use. This counseling empowered individuals to make informed decisions about their sexual health by providing them with crucial information about the severity of HIV risk and the benefits of PrEP in reducing that risk. By addressing these aspects, counseling enhances individuals' perceptions of both the severity of the threat posed by HIV and the benefits of taking action to mitigate it.

The convenience of facility operating hours also emerged as a critical factor influencing PrEP utilization, with individuals finding operating hours convenient being nearly twice as likely to use PrEP compared to those who find them inconvenient. This finding is consistent with qualitative research conducted among individuals who discontinued PrEP usage in Eswatini and Kenya, citing transportation expenses and clinic hours coinciding with work commitments as reasons for discontinuation (Bärnighausen et al., 2021; Ongolly et al., 2021). The study's qualitative insights stress the importance of providing healthcare services beyond regular working hours to accommodate the needs of young adults, highlighting the necessity of implementing flexible operating hours at healthcare facilities to enhance PrEP accessibility and uptake.

The convenience of facility operating hours directly relates to both perceived benefits and barriers within the Health Belief Model. Individuals who find operating hours convenient perceive benefits in

accessing PrEP services, while those who find them inconvenient encounter barriers that hinder their access. This finding emphasizes the interplay between convenience and individuals' perceptions of the benefits and barriers associated with PrEP utilization.

The study revealed that individuals who find operating hours convenient were more likely to use PrEP compared to those who find them inconvenient. This suggests that convenient operating hours are perceived as a benefit, facilitating easier access to PrEP services. Conversely, inconvenient operating hours act as a barrier, creating challenges for individuals in accessing PrEP and diminishing the perceived benefits of its use. Therefore, it is essential to offer healthcare services outside standard working hours to enhance PrEP accessibility and uptake.

Nevertheless, challenges such as stock outs of PrEP and other essential medications significantly impeded PrEP utilization in our study, echoing findings from research conducted among young populations in Uganda, Zimbabwe, and South Africa, which identified medicine stock outs as a potential barrier to PrEP use (Muhumuza et al., 2021). The issue of drug stock outs emphasizes the critical need for logistical planning and forecasting to ensure continuous availability of PrEP.

Recent research highlights the importance of consistent PrEP access, with daily usage demonstrating greater efficacy compared to time-driven or event-driven dosing methods (Bekker et al., 2018). Ensuring consistent availability of PrEP and related medications is paramount

to overcoming barriers to access and optimizing PrEP utilization among young adults, particularly in rural areas where access challenges are compounded by referrals to distant facilities due to stock outs.

The stock outs of PrEP medications aligns with barriers within the Health Belief Model, as a lack of medication availability represents a significant obstacle to taking preventive action, such as using PrEP. The consistency of these findings with prior research, which also identified medicine stock outs as a potential barrier to PrEP use, emphasizes how the absence of medication availability acts as a common barrier across different contexts and populations, reinforcing its significance within the HBM framework. The issue of drug stock outs spotlights the critical need for logistical planning and forecasting to ensure continuous availability of PrEP. Addressing inconsistent availability of PrEP aligns with strategies to reduce barriers and enhance perceived benefits within the HBM, thus promoting PrEP utilization among young adults.

Although our study did not reveal a significant association between medical system concerns, distance from facilities, and PrEP utilization, previous research have illustrated similar barriers to PrEP uptake in diverse settings. For instance, mistrust of research institutions and medical trials was identified as a significant obstacle to PrEP uptake among MSM in China (Liu et al., 2017). Similarly, health providers' behaviors characterized by rudeness, indifference, or dismissiveness were shown to negatively influence the uptake of HIV PrEP among male sex workers in the USA (Underhill et al., 2015).

Furthermore, increased distance to clinics was significantly linked to decreased odds of both PrEP uptake and retention (Mayer et al., 2019). These findings are consistent with a study among MARPs in Uganda, which highlighted the proximity to PrEP-dispensing facilities as the primary facilitator for PrEP usage (Muwonge et al., 2020). These findings highlights the significance of addressing medical mistrust, enhancing cultural competency among health workers and ensuring the accessibility of PrEP services to bolster uptake among high-priority populations.

5.3.2 Influence of health system determinants on HIV PEP use

In this study, provider-initiated PEP counseling emerged as a significant facilitator of PEP utilization, with healthcare providers initiating counseling associated with an increased likelihood of PEP use compared to situations where PEP counseling was not initiated. This finding is consistent with previous literature; for instance, a study by Bentz et al., (2010), found that the proportion of 100% adherent patients to PEP was significantly higher in the intervention group compared to the control group in a randomized controlled trial.

Similarly, an analysis of survey data collected over three months revealed that a notably higher percentage of participants who underwent motivation information counseling began using PrEP compared to those in the control group (da Silva et al., 2021). These findings emphasize the importance of pre-counseling sessions in preparing individuals for HIV testing and subsequent preventive interventions such as PEP.

Provider-initiated PEP counseling aligns with the Health Belief Model by enhancing individuals' perceptions of the severity of HIV risk and

the benefits of taking preventive action, such as using PEP. The finding that provider-initiated counseling increased the likelihood of PEP use, aligned with prior studies which established that counseling enhances the uptake of PEP.

These findings illuminate the importance of pre-counseling sessions in preparing individuals for HIV testing and subsequent preventive interventions such as PEP. By providing crucial information and support, provider-initiated counseling enhances individuals' understanding of the severity of HIV risk and the benefits of taking preventive action. This aligns with the HBM by increasing perceived susceptibility to HIV and perceived benefits of using PEP, thereby motivating individuals to engage in preventive behavior.

The convenience of health facility working hours was also reported to be significantly associated with increased PEP use, corroborating findings from other studies indicating that convenient access to healthcare services enhances utilization HIV prevention tools (Khan et al., 2022). The integration of PEP services into various healthcare delivery points, as highlighted during key informant interviews, further supports the notion that accessibility influences PEP utilization.

In the context of the HBM, the finding that convenient health facility working hours are associated with increased PEP utilization accents their perceived benefit, simplifying access to PEP services. Extended or flexible hours make it easier for individuals to seek out PEP when needed, enhancing the perceived benefits of accessing such services.

Conversely, inconvenient hours act as a barrier, imposing hurdles and discouraging individuals from seeking PEP due to accessibility challenges. Therefore, by addressing barriers related to accessibility, healthcare systems can enhance the perceived benefits of PEP utilization and ultimately increase its uptake among young adults.

The findings from adjusted logistic regression analysis reaffirmed the substantial impact of provider-initiated counseling and convenient health facility hours on PEP utilization. This reaffirmation emphasizes the pivotal role of these factors in facilitating access to and utilization of PEP services, further highlighting their importance. By addressing barriers and enhancing perceived benefits, provider-initiated counseling and convenient health facility hours not only promote access to PEP services among young adults but also contribute to increasing their utilization. Moreover, these findings accentuate the complex interplay between health system factors and PEP utilization, emphasizing the need for targeted interventions to enhance access and uptake among at risk populations.

Contrasting findings emerged regarding the impact of PEP awareness promotion on utilization. While our study identified a significant association between awareness promotion and increased PEP use, other studies have reported mixed results, underscoring the necessity for additional investigation into the effectiveness of these programs (Queiroz et al., 2021; Li et al., 2021). In the context of the Health Belief Model, awareness programs serve as pivotal tools in

shaping individuals' perceptions of the severity of HIV risk and the benefits of using PEP.

By augmenting awareness about the risks associated with HIV and the effectiveness of PEP in reducing transmission, these programs enhance individuals' perceptions of HIV risk severity and the benefits of PEP utilization. However, the divergent findings suggest that the effectiveness of awareness programs may vary depending on factors such as the target audience, program content, and delivery method. Therefore, further exploration into the efficacy of awareness programs is necessary to better grasp their impact on individuals' perceptions and behaviors concerning HIV prevention and PEP utilization.

5.4 Influence of socio-cultural factors on HIV PrEP and PEP use

5.4.1 Influence of socio-cultural factors on HIV PrEP use

The researcher established a significant influence of peer networks on the utilization of PrEP, with individuals who reported having peers and friends using PrEP being more likely to use it themselves. This aligns with existing research highlighting the role of social networks in health behavior adoption. For instance, a study among African American young adults found that community acceptance and endorsements, along with recommendations from trusted individuals within social networks, influenced PrEP engagement (Ayangeakaa et al., 2023).

Similarly, studies conducted among young MSM indicates that peer influence plays a crucial role in promoting PrEP engagement within this community (Young et al., 2018). Furthermore, the size of one's peer network has been linked to PrEP uptake, with individuals having a larger number of other young MSM in their social circles being

more inclined to use PrEP (Kuhns et al., 2017). These findings highlight the importance of peer networks in shaping attitudes and behaviors towards PrEP utilization. Recognizing and harnessing peer influence, especially among young adults, can bolster PrEP use and advance HIV prevention efforts.

In the context of the Health Belief Model, the significant influence of peer networks on PrEP utilization can be understood through constructs of perceived susceptibility and severity of HIV infection, perceived benefits of PrEP, cues to action provided by peer endorsements, and enhanced self-efficacy resulting from social validation. Observing peers and friends using PrEP not only reinforces perceptions of susceptibility to HIV but also amplifies the perceived severity of the infection, motivating individuals to adopt PrEP as a preventive measure.

Peer endorsements and recommendations within social networks serve as powerful cues to action, prompting individuals to seek information about PrEP and take steps towards its utilization. Additionally, witnessing peers successfully navigate PrEP use enhances individuals' self-efficacy, increasing their confidence in their ability to engage in PrEP uptake. Recognizing and harnessing peer influence within HIV prevention efforts, particularly among young adults, can effectively promote PrEP uptake and contribute to advancing HIV prevention efforts within communities.

The study also revealed a significant association between experiencing stigma and a lower likelihood of PrEP use, consistent with existing literature highlighting the detrimental effects of stigma on HIV prevention efforts. Stigma not only deters individuals from seeking PrEP but also undermines adherence and leads to discontinuation of PrEP regimens (Calabrese et al., 2018; Golub et al., 2019). The qualitative results further emphasized the pervasive

impact of HIV/AIDS-related stigma on PrEP utilization within the community.

Stigma extends beyond PrEP users to affect people living with HIV/AIDS, hindering healthcare-seeking behaviors and service utilization. These findings resonate with previous studies that have identified stigma as a barrier to ART adherence and status disclosure (Mugo et al., 2023; McMahon et al., 2019). Therefore, addressing stigma is paramount for improving PrEP uptake and enhancing HIV prevention efforts, as it significantly influences individuals' behaviors and attitudes towards HIV prevention strategies.

The Health Belief Model posits that perceived barriers, such as stigma, can hinder the adoption of health behaviors. This study demonstrates stigma's significant role as a barrier to the uptake of preventive measures like PrEP for HIV prevention. The findings highlight a notable association between experiencing stigma and a reduced likelihood of PrEP use, aligning with existing literature that underscores the detrimental impact of stigma on HIV prevention efforts.

Stigma not only discourages individuals from seeking out PrEP but also undermines adherence to PrEP regimens, potentially leading to discontinuation. Consequently, addressing stigma is crucial for improving PrEP uptake and enhancing HIV prevention efforts, as it significantly shapes individuals' behaviors and attitudes towards HIV prevention strategies. By addressing stigma, interventions can effectively reduce barriers to PrEP uptake and promote the adoption

of preventive measures, ultimately contributing to more comprehensive HIV prevention strategies.

The qualitative findings revealed the profound influence of myths and misconceptions on PrEP usage, originating from misinformation about HIV transmission, treatment, and prevention. These misconceptions not only fostered hesitancy and skepticism towards preventive measures like PrEP but also hindered its uptake, as demonstrated by Escudero et al., (2020), in their study on adolescent girls and young women in Western Kenya. Stakeholders in the study highlighted widespread confusion regarding PrEP eligibility and duration, alongside concerns about its efficacy and potential effects on pregnancy, exacerbated by insufficient awareness among youth.

Similarly, misconceptions about HIV in the community and misunderstandings about PrEP pharmacology were reported to substantially influence its uptake, further complicating efforts to promote PrEP adoption (Kambutse et al., 2018; Nabunya et al., 2023). Addressing these misconceptions is crucial for enhancing PrEP access and effectiveness in HIV prevention initiatives.

According to the Health Belief Model, individuals' beliefs about the effectiveness of a health behavior are influenced by their perceptions of the benefits and efficacy of that behavior. In the context of PrEP usage, myths and misconceptions about PrEP can contribute to hesitancy or skepticism towards its adoption. The study findings revealed the notable influence of these myths and misconceptions on PrEP usage, contributing to hesitancy towards preventive measures like PrEP and hindering its uptake.

Addressing these misconceptions is crucial for enhancing PrEP access and effectiveness in HIV prevention initiatives, as it aligns with the HBM's emphasis on individuals' perceptions of the benefits and efficacy of health behaviors in shaping their adoption. Through targeted education and awareness campaigns, interventions can

correct inaccurate beliefs and enhance perceptions of PrEP efficacy, ultimately facilitating its uptake.

The study also revealed that polygamous marriages present a distinct obstacle to PrEP utilization, attributed to familial dynamics and the lack of cooperation among co-wives. This observation illuminates the complex interplay between cultural norms, gender dynamics, and healthcare decision-making within polygamous households. This contrasts with previous research conducted in Uganda and Kenya, which found that PrEP use was associated with being in a polygamous marriage (Bongomin et al., 2023; Olilo et al., 2019).

While this specific context may not be extensively studied, literature on male partner support and PrEP use indicates that receiving practical and emotional support from male partners, such as reminders, encouragement, reassurance, and side effect management, serves as a significant driver of consistent PrEP adherence (Kayesu et al., 2022; Joseph Davey et al., 2021). In light of these findings, it is important to address these challenges and capitalize on support structures within households to improve PrEP access and efficacy in HIV prevention efforts, especially within polygamous communities.

The finding that polygamous marriages present a barrier to PrEP utilization aligns with the Health Belief Model construct of perceived barriers hindering health behavior adoption. Familial dynamics and the lack of cooperation among co-wives in polygamous households may indeed act as perceived barriers to PrEP adoption. These barriers

are further compounded by cultural norms and gender dynamics, which significantly influence healthcare decision-making within such households.

While previous research suggested a positive association between PrEP use and polygamous marriages, this finding emphasizes the importance of contextualizing the impact of cultural and gender factors on PrEP utilization. To address these challenges, interventions should recognize and target interpersonal factors within the family unit, such as communication patterns, power dynamics, and social norms surrounding healthcare decision-making.

Discrimination, particularly within healthcare settings and legal frameworks, emerged as a significant barrier to PrEP utilization among marginalized populations. This finding reflects the broader structural inequalities and human rights violations faced by key populations, including the LGBTQ community and sex workers. This aligns with a study by Isano et al. (2020), which reported that a majority of MSM experienced discrimination, police detainment, and refusal to access health services, posing challenges to PrEP use.

Similarly, the criminalization of same-sex relations in Sub-Saharan Africa has facilitated discrimination against the LGBTQ community, adversely affecting access to HIV prevention and care services like PrEP (Yelverton et al., 2021; Hagopian et al., 2017). These findings suggest that the existing discrimination within healthcare and legal systems significantly hinders PrEP uptake among marginalized groups. Addressing these structural inequalities and human rights

violations is paramount to ensure equitable access to HIV prevention services, including PrEP, for individuals of all sexual orientations and occupations.

The Health Belief Model acknowledges the influence of socio-cultural factors in shaping health beliefs and behaviors. Discrimination within healthcare settings and legal frameworks, as highlighted by the study findings, can create significant barriers to accessing HIV prevention and care services, including PrEP, particularly among marginalized populations.

Within the HBM framework, perceived barriers, including discrimination, can deter individuals from seeking out and utilizing health services, as they may perceive healthcare settings and legal frameworks as hostile or unwelcoming environments. By addressing discrimination and promoting inclusive healthcare and legal systems, interventions can effectively mitigate perceived barriers, facilitate access to PrEP, and protect the rights of marginalized populations.

5.4.2 Influence of socio-cultural factors on PEP use

The findings of this study highlight the significant influence of peer networks on the utilization of PEP. Individuals with peers and friends who have used PEP were nearly three times more likely to utilize PEP themselves, indicating the substantial impact of social influence on preventive behavior. This aligns with previous research emphasizing the role of peer networks in shaping health behaviors. For instance, Calhoun et al., (2022), found that young men and women who perceive their peers as contraceptive users were more likely to use condoms. Similarly, a study among Ugandan FSWs showed that peer support encourages uptake of HIV self-testing and

linkage to care (McGowan et al., 2022). These findings emphasize the crucial role of social connections in shaping uptake of preventive behaviors.

In the context of the Health Belief Model, the influence of peer networks on PEP utilization emphasizes the role of social influence in shaping health behaviors. The findings of this study reveal that individuals with peers and friends who have used PEP are significantly more likely to adopt it themselves. This aligns with the HBM's emphasis on perceived norms within one's social environment influencing health-related decisions.

When individuals perceive that others in their social network are engaging in preventive behaviors like PEP utilization, they are more inclined to do the same. This social influence plays a crucial role in shaping health behaviors, particularly regarding PEP utilization. Recognizing the impact of peer networks on health behavior adoption, interventions can effectively leverage social connections to promote PEP uptake among young adults and enhance HIV prevention efforts.

Nevertheless, despite this association, the qualitative interviews revealed a concerning trend of fear and stigma surrounding PEP uptake, particularly among young girls and women. This fear stemmed from the perceived judgment of peers, family members, and community members, which deterred individuals from openly seeking and using PEP. The fear of being labeled as HIV-positive or engaging in risky behavior further exacerbated the reluctance to access PEP services openly. This finding aligns with studies by Babel et al. (2021), and Khan et al. (2022), which similarly identified stigma as a barrier to accessing HIV prevention services among vulnerable populations.

These findings highlight the urgent need for targeted interventions aimed at destigmatizing PEP and fostering supportive environments that encourage individuals, especially young adults, to access HIV prevention services without fear of judgment or

discrimination. Such efforts are essential for enhancing PEP uptake and mitigating the spread of HIV within communities.

Within the Health Belief Model, perceived barriers play a significant role in hindering health behavior adoption. The study findings regarding fear and stigma surrounding PEP utilization underline how fear acts as a deterrent to openly seeking and using PEP. These observations highlight the concept of perceived barriers within the HBM, which encompasses internal and external factors that impede individuals' willingness to adopt preventive behaviors.

This notion resonates with existing research, which has also identified stigma as a barrier to accessing HIV prevention services among vulnerable populations. To address these barriers, targeted interventions should focus on creating supportive environments. By fostering environments free from judgment or discrimination, individuals, particularly young adults, can feel more empowered to access HIV prevention services like PEP, ultimately enhancing uptake.

The perception that individuals using PEP are already HIV-positive fueled secrecy around its use, hindering medication adherence and perpetuating stigma. Risky behaviors like unprotected sex and substance abuse at events like “disco matanga” heightened vulnerability to HIV transmission. Alarmingly, unprotected sex during these events was normalized among young individuals, who saw PEP as a quick remedy rather than a vital preventive measure against HIV. This finding, specific to this study's context, resonates with research in Cambodia, which identified a surge in HIV transmission among couples due to cultural norms mandating wives to fulfill their husbands' sexual needs and tolerate infidelity (Yang et al., 2016).

Moreover, cultural expectations of women to obey, submit, and serve their husbands, along with men's entitlement to control women's bodies, perpetuate a dynamic where

women lack empowerment to negotiate safe sex practices, increasing their vulnerability to HIV infection, especially in the face of husbands' unfaithfulness (Fauk et al., 2021). These findings underscore the urgent need for comprehensive interventions addressing the cultural and societal factors fueling HIV transmission.

According to the HBM, perceived susceptibility and severity of a health threat influence individuals' likelihood of adopting preventive behaviors. In this context, the perception that PEP users are already HIV-positive heightens the perceived severity of the health threat, leading individuals to view PEP use as an admission of their HIV-positive status. Consequently, individuals may be reluctant to openly discuss or seek PEP due to fear of being perceived as HIV-positive, which can lead to secrecy surrounding its use. This secrecy can hinder medication adherence, as individuals may be less likely to adhere to treatment regimens when they feel compelled to conceal their PEP use.

Additionally, the normalization of risky behaviors like unprotected sex and substance abuse, as observed in events like “disco matanga”, exacerbates vulnerability to HIV transmission and reinforces the perception of PEP as a remedy rather than a preventive measure. These findings highlight the need for comprehensive interventions that address not only individual-level factors but also cultural and societal norms perpetuating HIV transmission. Through tackling stigma and fostering transparent conversations regarding PEP as a preventive measure, interventions have the potential to alleviate the secrecy enveloping its utilization and enhance medication adherence, thus fostering more impactful HIV prevention endeavors.

CHAPTER SIX

CONCLUSION AND RECOMMENDATION

6.1 Introduction

The chapter consists of the conclusions derived from the study findings and the subsequent discussion. In this part, the researcher has provided recommendations for action, policy, and additional research.

6.2 Conclusions

Study conclusions are based on objectives and research questions of the study.

6.2.1 Prevalence of HIV PrEP and PEP use among young adults in Khwisero sub county

The study revealed low prevalence rates of HIV PrEP and PEP use among young adults, with only 23.4% using PrEP and 22.6% using PEP, despite moderate awareness levels of 58% and 56.7%, respectively. Social media emerged as the primary source of information for both PrEP and PEP, while school health awareness programs had limited involvement.

6.2.2 Influence of demographic determinants on HIV PrEP and PEP use among young adults in Khwisero sub county

The study reveals that higher educational attainment significantly influences HIV PrEP and PEP utilization among young adults in Khwisero sub-county. Religion is also associated with PrEP use, while marital status and living arrangement influence PEP use. No

significant associations were found between PrEP and PEP use and other demographic factors such as age and gender.

6.2.3 Influence of health system determinants on HIV PrEP and PEP use among young adults in Khwisero sub county

The study highlighted that affordability perceptions, provider-initiated counseling, and convenient facility operating hours significantly influence PrEP utilization among young adults in Khwisero sub-county. For PEP utilization, provider-initiated counseling and convenient health facility hours were significant determinants. Qualitative data revealed that medication stock outs and medical mistrust were challenges to the accessibility and utilization of both PrEP and PEP.

6.2.4 Influence of socio-cultural determinants on HIV PrEP and PEP use

The study highlights the significant influence of peer networks, stigma, myths and misconceptions, polygamous marriages, and discrimination on PrEP utilization among young adults. Additionally, peer networks, fear, stigma, and cultural norms significantly impact PEP utilization.

6.3 Recommendations

6.3.1 Recommendation for Action

The findings from the first objective highlight a low prevalence of HIV PrEP and PEP use among young adults in Khwisero sub-county. The researcher recommends implementing tailored comprehensive sexual health education initiatives, utilizing digital platforms for targeted promotion efforts. Additionally, integrating modern HIV prevention strategies into school curricula is recommended to address disparities in school health program involvement.

From the second objective, higher education levels are linked to higher PrEP uptake, highlighting the need for targeted educational efforts to enhance awareness and utilization. Leveraging religious events for PrEP promotion is recommended due to the association between religion and PrEP use. Addressing educational disparities in healthcare access is crucial, along with targeted interventions focusing on marital status and living arrangements to improve access across diverse groups.

The third objective highlights the significant influence of affordability perceptions, provider-initiated counseling, and convenient facility operating hours on both PrEP and PEP utilization. To enhance access and uptake, interventions targeting cost barriers, comprehensive counseling strategies, and flexible healthcare service hours are recommended. Additionally, efforts to ensure consistent availability of medications and mitigate medical mistrust are essential, particularly in rural areas. Integrating PEP services into various healthcare delivery points can further enhance accessibility and utilization.

The fourth objective highlights the significant influence of peer networks, stigma, myths, polygamy, and discrimination on the utilization of PrEP and PEP among young adults in Khwisero sub-county. Interventions should prioritize leveraging peer influence, combating stigma, and dispelling myths. Addressing discrimination within healthcare and legal systems is essential to ensure equitable access to PrEP and PEP, especially for marginalized groups.

6.3.2 Recommendations for Policy

1. Given the low utilization of HIV PrEP and PEP among young adults, the County Government of Kakamega should prioritize implementing comprehensive sexual health education initiatives. These initiatives should target young adults aged 18-24, focusing on high-risk groups such as sexually active individuals,

serodiscordant couples, those in polygamous marriages, and marginalized communities like LGBTQ and female sex workers. The education programs should utilize social media platforms, peer networks and community-based organizations for effective outreach and engagement.

2. The Ministry of Health Services, through the office of the County AIDS and STI Program Coordinator, should invest in training community health promoters on emerging HIV prevention commodities such as PrEP and PEP. This training will be crucial in addressing stigma, dispelling myths, and combating discrimination during community visits and community dialogue days, thereby advocating for safe sex practices at the community level. This aims to fill the knowledge gap among community health promoters, ensuring they are well-equipped to educate the community effectively on PrEP and PEP, thereby improving acceptance and utilization of these HIV prevention methods.

6.3.3 Recommendations for Further Research

1. Further research should focus on qualitative investigations into barriers and facilitators influencing PrEP and PEP utilization. Existing studies have largely focused on quantitative data, highlighting the need for qualitative research to explore personal experiences and perspectives. Additionally, longitudinal studies are necessary to understand long-term usage patterns and outcomes of PrEP and PEP.
2. Further research should extend to diverse settings such as universities, technical institutes, and polytechnics to facilitate comparisons with the findings of the current study. This will offer insights into potential variations in HIV PrEP and PEP

utilization among young adults across different contexts. While existing studies have primarily focused on young men who have sex with men (YMSM), female sex workers, adolescents, and young women, there is a significant gap in understanding how young adults in different educational settings engage with these HIV prevention measures.

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APPENDICES.

APPENDIX I: INFORMED CONSENT FORM.

Title: **Prevalence and determinants of HIV Pre-Exposure and Post-Exposure prophylaxis use among young adults in Khwisero sub county, Kenya.**

Dear Respondent,

I am Abubakar Gurre Abdallah, a postgraduate student at Masinde Muliro University of Science and Technology pursuing a Master's degree in Public Health. As part of the requirements for the award of MSc. in Public Health degree, I am conducting a study to investigate the prevalence and determinants of HIV PREP and PEP use among young adults 18-24 years in Khwisero sub county. This study aims to determine the prevalence of HIV PrEP and PEP use and the influence of demographic, health system and socio-cultural determinants on PrEP and PEP use among young adults 18-24 years in Khwisero sub county.

I kindly request for your permission to participate in this study. The information you give is purely for academic purpose and the answers you give will be kept confidential. The study will not pose any risk to you and no names will be used in the write up. There will be no costs to you for taking part in this study. Your participation is strictly voluntary and you can withdraw from the study at any time without incurring any penalty.

You are encouraged to ask any questions to clarify any issues at any time. If you later think you need more information you may call the researcher on 0794276224 or via email abdallahabubakar716@gmail.com

Respondent's statement.

I have been explained to what the study is about and I am willing to participate in the study.

Signature: …… Date: ……

APPENDIX II: SEMI-STRUCTURED QUESTIONNAIRE.

PREVALENCE AND DETERMINANTS OF HIV PRE-EXPOSURE AND POST-EXPOSURE PROPHYLAXIS USE AMONG YOUNG ADULTS IN KHWISERO SUB COUNTY, KENYA.

SERIAL NO: _____

INSTRUCTIONS

- *Tick the appropriate answers inside the boxes*
- *For option "Other", specify the answer by writing it in full.*

PART A: DEMOGRAPHIC DETERMINANTS.

1. What is your age (Years)? _____
2. What is your gender? Male ☐ Female ☐
3. What is your highest level of education?

Primary ☐ Secondary ☐ Tertiary ☐ Other _____

4. What is your current marital status?

Single ☐ Married ☐ Widowed/Separated ☐

5. Where do you reside?

Living independently (alone, with a spouse or sibling) ☐

Living with a guardian (parent or relative) ☐

6. What is your religion? Christian ☐ Islam ☐

Others (Specify) _____

7. Is there anyone supporting you financially? Yes ☐ No ☐
8. If yes, who is supporting you financially?

Spouse ☐ Partner ☐ Parent ☐ Siblings ☐

Friends ☐ Others (specify) _____

PART B: PREVALENCE OF PREP AND PEP USE.

9. Have you ***ever*** heard of PrEP? Yes ☐ No ☐

If yes, where did you hear about PrEP?

Friend ☐ Sex partner ☐ Social Media ☐

Health promotion event in community ☐ Others (specify) _____

10. Have you ***ever*** used PrEP? Yes ☐ No ☐

If yes, what is the main reason for using PrEP?

I don't trust my partner ☐ I have multiple sex partners ☐

Sexual partner has HIV ☐ Unprotected sex ☐ Sharing needles ☐

Others (specify) _____

11. Have you ever heard of PEP? Yes ☐ No ☐

If yes, where did you hear about PEP? Friend ☐ Sex partner ☐ Social Media ☐

Health promotion event in the community ☐

12. Have you **ever** used PEP? Yes ☐ No ☐

If yes, what is the main reason using PEP?

I don't trust my partner ☐ I have multiple sex partners ☐

Sexual partner has HIV ☐ Unprotected sex ☐ Sharing needles ☐

Others (specify) _____

13. How likely do you think it is that you could contract HIV in the future?

Not likely at all ☐ Slightly likely ☐ Moderately likely ☐

Very likely ☐ Extremely likely ☐

14. How serious do you believe the consequences of contracting HIV would be for your health?

Not serious at all ☐ Slightly serious ☐ Moderately serious ☐

Very serious ☐ Extremely serious ☐

15. Please indicate your level of agreement with the following statements about HIV PrEP and PEP:

a. PrEP can effectively prevent HIV transmission.

Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐

b. The benefits of using PrEP are much greater than the risks.

Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐

c. PEP is effective if taken promptly after a potential HIV exposure.

Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐

d. PEP is readily available when needed.

Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly agree ☐

16. a. What do you perceive are the main barriers that would prevent you from using PrEP?

Cost ☐ Side effects ☐ Fear of judgment ☐ Lack of awareness ☐

Stigma ☐

Other (please specify): _____

b. What do you perceive are the main barriers that would prevent you from using PEP?

Cost ☐ Fear of judgment ☐ Lack of awareness ☐ Side effects ☐ Stigma ☐

Other (please specify): _____

17. a) What would prompt you to consider using PrEP?

A healthcare provider's recommendation ☐ Media campaigns ☐ Friends or family sharing their experiences ☐ High-risk sexual encounter ☐

Other (please specify): _____

b) What would prompt you to consider using PEP?

A healthcare provider's recommendation ☐ Media campaigns ☐ Friends or family sharing their experiences ☐ High-risk sexual encounter ☐

Other (please specify): _____

PART C: HEALTH SYSTEM DETERMINANTS.

18. Have you ever been tested for HIV? Yes ☐ No ☐

i. If yes, did your healthcare provider discuss HIV PrEP during your last HIV test?

Yes ☐ No ☐ Not Applicable (I have not been tested for HIV) ☐

ii. If yes, did your healthcare provider discuss HIV PEP during your last HIV test?

Yes ☐ No ☐ Not Applicable (I have not been tested for HIV) ☐

19. a). Would you consider HIV PrEP affordable? Yes ☐ No ☐

If yes, how affordable do you find the cost of HIV PrEP?

Very affordable ☐ Somewhat affordable ☐ Not affordable ☐ Not sure ☐

b). Would you consider HIV PEP affordable? Yes ☐ No ☐

If yes, how affordable do you find the cost of HIV PEP?

Very affordable ☐ Somewhat affordable ☐ Not affordable ☐ Not sure ☐

20. Do you have a regular medical provider whom you visit for routine healthcare needs?

Yes ☐ No ☐

21. How frequently do you visit a medical provider for routine check-ups or healthcare services?

Once a year ☐ Twice a year ☐ Quarterly ☐

Monthly ☐ Rarely ☐ Never ☐

22. Have you ever faced difficulties in accessing healthcare services due to transportation issues?

Yes ☐ No ☐

If yes, please specify the nature of the transport difficulties you have faced.

Lack of transportation ☐ Transportation cost ☐Limited public transportation options ☐ Distance to the healthcare facility ☐

Other (please specify) _____

23. How far is the nearest healthcare facility that provides PrEP and PEP services?

Less than 1 Km ☐ 1-5 Km ☐ 5-10 Km ☐ More than 10 Km ☐

24. Do you have health insurance coverage? Yes ☐ No ☐

a. If yes, does your insurance cover PrEP? Yes ☐ No ☐

b. If yes, does your insurance cover PEP? Yes ☐ No ☐

25. Are the health facilities providing PrEP and PEP services open during hours that are convenient for you? Yes ☐ No ☐

a. If no, please describe the challenges you face _____

26. a. Do you receive support for adhering to your PrEP regimen?

Yes ☐ No ☐

If yes, please describe the type of support you receive _____

b. Do you receive support for adhering to your PEP regimen?

Yes ☐ No ☐

If yes, please describe the type of support you receive _____

27. How long do you typically have to wait at the health facility/clinic before receiving PrEP or PEP services?

Less than 15 minutes ☐ 15-30 minutes ☐ 30-60 minutes ☐
More than 60 minutes ☐

28. Are there outreach programs or community initiatives that promote awareness and use of PrEP and PEP in your community? Yes ☐ No ☐
If yes, what kind of information did you get?

_____

29. Do you have any concerns or mistrust regarding healthcare providers or the medical system that affect your decisions about PrEP and PEP? Yes ☐ No ☐
If yes, please describe your concerns or reasons for mistrust.

_____

PART D: SOCIO-CULTURAL DETERMINANTS.

30. How comfortable do you feel discussing HIV-related topics, including PrEP and PEP, within your community or social circles?
Very comfortable ☐ Comfortable ☐ Neutral ☐ Uncomfortable ☐ Very uncomfortable ☐

31. How supportive is your social network (friends, family) regarding your decisions about HIV prevention, including PrEP and PEP?
Very supportive ☐ Somewhat supportive ☐ Not supportive ☐ Not sure ☐

32. i). Do you have peers or friends who have used HIV PrEP? Yes ☐ No ☐
If yes, how has their experience influenced your perceptions and decisions regarding PrEP and PEP?

_____

ii). Do you have peers or friends who have used HIV PrEP? Yes ☐ No ☐
If yes, how has their experience influenced your perceptions and decisions regarding PrEP and PEP?

_____

33. i). To what extent do societal norms and cultural beliefs in your community influence your decision to use or consider using PrEP?
Not at all ☐ Slightly ☐ Moderately ☐ Very much ☐ Extremely ☐

ii). To what extent do societal norms and cultural beliefs in your community influence your decision to use or consider using PEP?
Not at all ☐ Slightly ☐ Moderately ☐ Very much ☐ Extremely ☐

34. a). Do you feel that there is stigma associated with using HIV PrEP?
Yes ☐ No ☐
If yes, how does this stigma affect your willingness to use PrEP?

_____

b). Do you feel that there is stigma associated with using HIV PrEP?

Yes ☐ No ☐

If yes, how does this stigma affect your willingness to use PrEP?

_____

Thank you so much for taking your time to answer the questions

APPENDIX III: KEY INFORMANT INTERVIEW FOR KI_1

I am Abubakar Abdallah, a postgraduate student from MMUST pursuing MSc. in Public Health. As part of the requirements for my degree programme, I am conducting a study to investigate the prevalence and determinants of HIV PrEP and PEP use among young adults 18-24 years in Khwisero sub county, Kenya.

You have been selected as one of the respondents for my study because you have some knowledge about HIV PrEP and PEP uptake, as it falls within your docket. Your cooperation in giving accurate responses to my interview questions will be highly appreciated.

INTERVIEW QUESTIONS.

1. Briefly describe the nature of your job as the CCC In-charge in relation to providing HIV prevention such PrEP and PEP to young adults?
2. Can you please provide an overview of the demographic profile of the population you serve in the context of your sub county?
3. At which specific hours of operation does your program provide HIV PrEP and PEP services?
4. What are some of the healthcare policies and regulations in shaping the delivery and accessibility of HIV PrEP and PEP among young adults in your community?
5. How does the availability of HIV PrEP and PEP in your program compare to the demand for these services?
6. When a young adult inquires about HIV PrEP and PEP what information or counseling are provided to them?
7. What are some of the adherence support programs in place for individuals using PrEP or PEP in your program?
8. From your perspective, what are the strengths and weaknesses of the current health system in supporting HIV programs such as PrEP and PEP?
9. In your experience, what are some of the socio-cultural factors that influence the utilization of HIV prevention services such as PrEP and PEP in the sub county?
10. What strategies would you recommend to strengthen the uptake of HIV PrEP and PEP among young adults in your sub county?

Thank you so much for taking your time to participate in this interview.

APPENDIX IV: KEY INFORMANT INTERVIEW FOR KI_ 5, 7, 8, 12, 13, 14

I am Abubakar Abdallah, a postgraduate student from MMUST pursuing MSc. in Public Health. As part of the requirements for my degree programme, I am conducting a study to investigate the prevalence and determinants of HIV PrEP and PEP use among young adults 18-24 years in Khwisero sub county, Kenya.

You have been selected as one of the respondents for my study because you have some knowledge about HIV PrEP and PEP uptake, as it falls within your docket. Your cooperation in giving accurate responses to my interview questions will be highly appreciated.

INTERVIEW QUESTIONS.

1. Briefly describe the nature of your job as the community health assistant in relation to HIV PrEP and PEP services?
2. Can you please provide an overview of the demographic profile of the population you serve in the context of your community?
3. How does the availability of HIV PrEP and PEP in your community compare to the demand for these services among young adults?
4. What are the barriers that young adults in your community face when trying to access PrEP and PEP services?
5. What are some of the healthcare policies and regulations in shaping the delivery and accessibility of HIV PrEP and PEP among young adults in your community?
6. From your experience what are some of the socio-cultural factors which influence the utilization of HIV PrEP and PEP in your community?
7. How does the community perceive HIV prevention services such as HIV PrEP and PEP?
8. What are the adherence support programs in place for young adults using PrEP or PEP in your community?
9. From your experience, what are the challenges you face in the provision of HIV prevention services like HIV PrEP and PEP in the community?
10. In your opinion, what are some of the strategies you recommend to the county and national government so as to enhance access and utilization of HIV PrEP and PEP among young adults?

Thank you so much for taking your time to participate in this interview.

APPENDIX V: KEY INFORMANT INTERVIEW FOR KI_9

I am Abubakar Abdallah, a postgraduate student from MMUST pursuing MSc. in Public Health. As part of the requirements for my degree programme, I am conducting a study to investigate the prevalence and determinants of HIV PrEP and PEP use among young adults 18-24 years in Khwisero sub county, Kenya.

You have been selected as one of the respondents for my study because you definitely have some knowledge about HIV PrEP and PEP uptake, as it falls within your docket. Your cooperation in giving accurate responses to my interview questions will be highly appreciated.

INTERVIEW QUESTIONS.

1. Briefly describe the nature of your job as the HIV testing services officer in relation to HIV PrEP and PEP services?
2. Can you please provide an overview of the demographic profile of the population you serve in the context of your facility?
3. When a young adult inquires about HIV PrEP and PEP what information or counseling are provided to them?
4. How does the availability of PrEP and PEP in your sub county compare to the demand for these services among young adults?
5. What are the adherence support programs you have in place for young adults using HIV PrEP and PEP service?
6. What are some of the healthcare policies and regulations in shaping the delivery and accessibility of HIV PrEP and PEP among young adults in your community?
7. What are some of the health system factors shaping the delivery and accessibility of HIV PrEP and PEP among young adults in the sub county?
8. From your experience what are some of the socio-cultural factors which influence the utilization of HIV PrEP and PEP in the sub county?
9. From your experience, what are the challenges you face in the provision of HIV prevention services like HIV PrEP and PEP in the community?
10. What strategies would you recommend to strengthen the uptake of HIV PrEP and PEP among young adults in your sub county?

Thank you so much for taking your time to participate in this interview.

APPENDIX VI: KEY INFORMANT INTERVIEW FOR KI_6

I am Abubakar Abdallah, a postgraduate student from MMUST pursuing MSc. in Public Health. As part of the requirements for my degree programme, I am conducting a study to investigate the prevalence and determinants of HIV PrEP and PEP use among young adults 18-24 years in Khwisero sub county, Kenya.

You have been selected as one of the respondents for my study because you have some knowledge about HIV PrEP and PEP uptake, as it falls within your docket. Your cooperation in giving accurate responses to my interview questions will be highly appreciated.

INTERVIEW QUESTIONS.

1. Briefly describe the nature of your job as a peer counselor in relation to HIV PrEP and PEP services?
2. In your experience, how familiar are young adults in our community with PrEP and PEP?
3. How does the availability of HIV PrEP and PEP in your community compare to the demand for these services among young adults?
4. When a young adult inquiries about HIV PrEP and PEP what information or counseling are provided to them?
5. What is the process by which the young adults are given the HIV PrEP or PEP when they come to the health facility?
6. What are the barriers that young adults in your community face when trying to access PrEP and PEP services?
7. From your experience what are some of the socio-cultural factors which influence the utilization of HIV PrEP and PEP in your community?
8. What are the adherence support programs in place for young adults using PrEP or PEP in your community?
9. From your experience, what are the challenges you face in the provision of HIV prevention services like HIV PrEP and PEP in the community?
10. In your opinion, what are some of the strategies you recommend to the county and national government so as to enhance access and utilization of HIV PrEP and PEP among young adults?

Thank you so much for taking your time to participate in this interview.

APPENDIX VII: KEY INFORMANT INTERVIEW FOR KHWISERO KI_11

I am Abubakar Abdallah, a postgraduate student from MMUST pursuing MSc. in Public Health. As part of the requirements for my degree programme, I am conducting a study to investigate the prevalence and determinants of HIV PrEP and PEP use among young adults 18-24 years in Khwisero sub county, Kenya.

You have been selected as one of the respondents for my study because you have some knowledge about HIV PrEP and PEP uptake, as it falls within your docket. Your cooperation in giving accurate responses to my interview questions will be highly appreciated.

INTERVIEW QUESTIONS.

1. Briefly describe the nature of your job as the facility pharmacist in relation to providing HIV prevention such PrEP and PEP to young adults?
2. Can you please describe the process of dispensing PrEP and PEP medications to young adults in your facility?
3. What challenges do you encounter in ensuring the availability and accessibility of PrEP and PEP medications for young adults?
4. In your opinion how do health system factors, impact young adults' access to PrEP and PEP? Probe: medication stock-outs, insurance coverage limitations?
5. In your experience, what are some of the sociocultural factors that influence young adults' decisions to use or not use PrEP and PEP?
6. How do you address cultural or societal attitudes towards HIV/AIDS when providing PrEP and PEP services to young adults?
7. What counseling services do you provide to young adults who are considering or using PrEP and PEP?
8. What are the adherence support programs in place for young adults using PrEP or PEP in your sub county?
9. From your perspective as a pharmacist, what are the strengths and weaknesses of the current health system in supporting the dispensing and management of HIV PrEP and PEP?
10. In your opinion, what improvements or changes could be made at the healthcare system level to enhance access to and utilization of PrEP and PEP services among young adults?

Thank you so much for taking your time to participate in this interview.

APPENDIX VIII: KEY INFORMANT INTERVIEW FOR KI_3

I am Abubakar Abdallah, a postgraduate student from MMUST pursuing MSc. in Public Health. As part of the requirements for my degree programme, I am conducting a study to investigate the prevalence and determinants of HIV PrEP and PEP use among young adults 18-24 years in Khwisero sub county, Kenya.

You have been selected as one of the respondents for my study because you have some knowledge about HIV PrEP and PEP uptake, as it falls within your docket. Your cooperation in giving accurate responses to my interview questions will be highly appreciated.

INTERVIEW QUESTIONS.

1. Briefly describe your roles as a nurse in providing HIV prevention services, including PrEP and PEP, to young adults?
2. What is the procedure of providing PrEP and PEP services to young adults in the facility?
3. What educational resources or materials do you use to inform young adults about PrEP and PEP?
4. In your experience, what socio-cultural factors do you think influence young adults' use of PrEP and PEP?
5. At which specific hours of operation does your clinic provide HIV PrEP and PEP services?
6. How does the availability of PrEP and PEP in your facility compare to the demand for these services?
7. What are some of the healthcare policies and regulations in shaping the delivery and accessibility of HIV PrEP and PEP among young adults?
8. What are some of the barriers young adults face in accessing PrEP and PEP services?
9. What are the challenges you encounter in delivering PrEP and PEP services to young adults?
10. What strategies would you recommend to strengthen the uptake of HIV PrEP and PEP among young adults in your sub county?

Thank you so much for taking your time to participate in this interview.

APPENDIX IX: KEY INFORMANT INTERVIEW FOR KI_2

I am Abubakar Abdallah, a postgraduate student from MMUST pursuing MSc. in Public Health. As part of the requirements for my degree programme, I am conducting a study to investigate the prevalence and determinants of HIV PrEP and PEP use among young adults 18-24 years in Khwisero sub county, Kenya.

You have been selected as one of the respondents for my study because you have some knowledge about HIV PrEP and PEP uptake, as it falls within your docket. Your cooperation in giving accurate responses to my interview questions will be highly appreciated.

INTERVIEW QUESTIONS.

1. Briefly describe your roles as the sub county HIV Program Coordinator in relation to HIV PrEP and PEP services?
2. Can you provide an overview of the demographic profile of the population you serve in the context of your HIV program?
3. At which specific hours of operation does your program provide HIV PrEP and PEP services?
4. When a young adult inquires about HIV PrEP and PEP what information or counseling are provided to them?
5. How does the community perceive HIV prevention services such as HIV PrEP and PEP?
6. What are some of the healthcare policies and regulations in shaping the delivery and accessibility of HIV PrEP and PEP among young adults in your sub county?
7. What are some of the adherence support programs in place for individuals using PrEP or PEP in your program?
8. From your perspective what are some of the socio-cultural factors which influence the utilization of HIV PrEP and PEP among young adults in your sub county?
9. From your perspective, what are the strengths and weaknesses of the current health system in supporting HIV programs?
10. What strategies would you recommend to strengthen the uptake of HIV PrEP and PEP among young adults in your sub county?

Thank you so much for taking your time to participate in this interview.

APPENDIX X: KEY INFORMANT INTERVIEW FOR KI_4

I am Abubakar Abdallah, a postgraduate student from MMUST pursuing MSc. in Public Health. As part of the requirements for my degree programme, I am conducting a study to investigate the prevalence and determinants of HIV PrEP and PEP use among young adults 18-24 years in Khwisero sub county, Kenya.

You have been selected as one of the respondents for my study because you have some knowledge about HIV PrEP and PEP uptake, as it falls within your docket. Your cooperation in giving accurate responses to my interview questions will be highly appreciated.

INTERVIEW QUESTIONS.

1. Briefly describe the nature of your job as the sub county pharmacist in relation to providing HIV prevention such PrEP and PEP to young adults?
2. In which health facilities in the sub county are HIV PrEP and PEP services offered?
3. What are some of the health policies and regulations that impact the implementation of HIV programs in your region?
4. Can you discuss the availability and accessibility of HIV-related resources, such as testing facilities, treatment centers, and medications, in your sub county?
5. What are the adherence support programs in place for young adults using PrEP or PEP in your sub county?
6. What are the challenges you encounter in ensuring the availability and accessibility of HIV PrEP and PEP in the sub county?
7. What are some of the health system factors that influence the utilization of HIV PrEP and PEP among young adults in your sub county?
8. In your experience as the sub county pharmacist, what are some of the sociocultural factors that influence young adults' decisions to use or not use PrEP and PEP?
9. From your perspective as the sub county pharmacist, what are the strengths and weaknesses of the current health system in supporting the dispensing and management of HIV PrEP and PEP?
10. In your opinion, what strategies or changes would you recommend to the county and national government to enhance access to and utilization of PrEP and PEP services among young adults?

Thank you so much for taking your time to participate in this interview.

APPENDIX XI: KEY INFORMANT INTERVIEW FOR KI_10

I am Abubakar Abdallah, a postgraduate student from MMUST pursuing MSc. in Public Health. As part of the requirements for my degree programme, I am conducting a study to investigate the prevalence and determinants of HIV PrEP and PEP use among young adults 18-24 years in Khwisero sub county, Kenya.

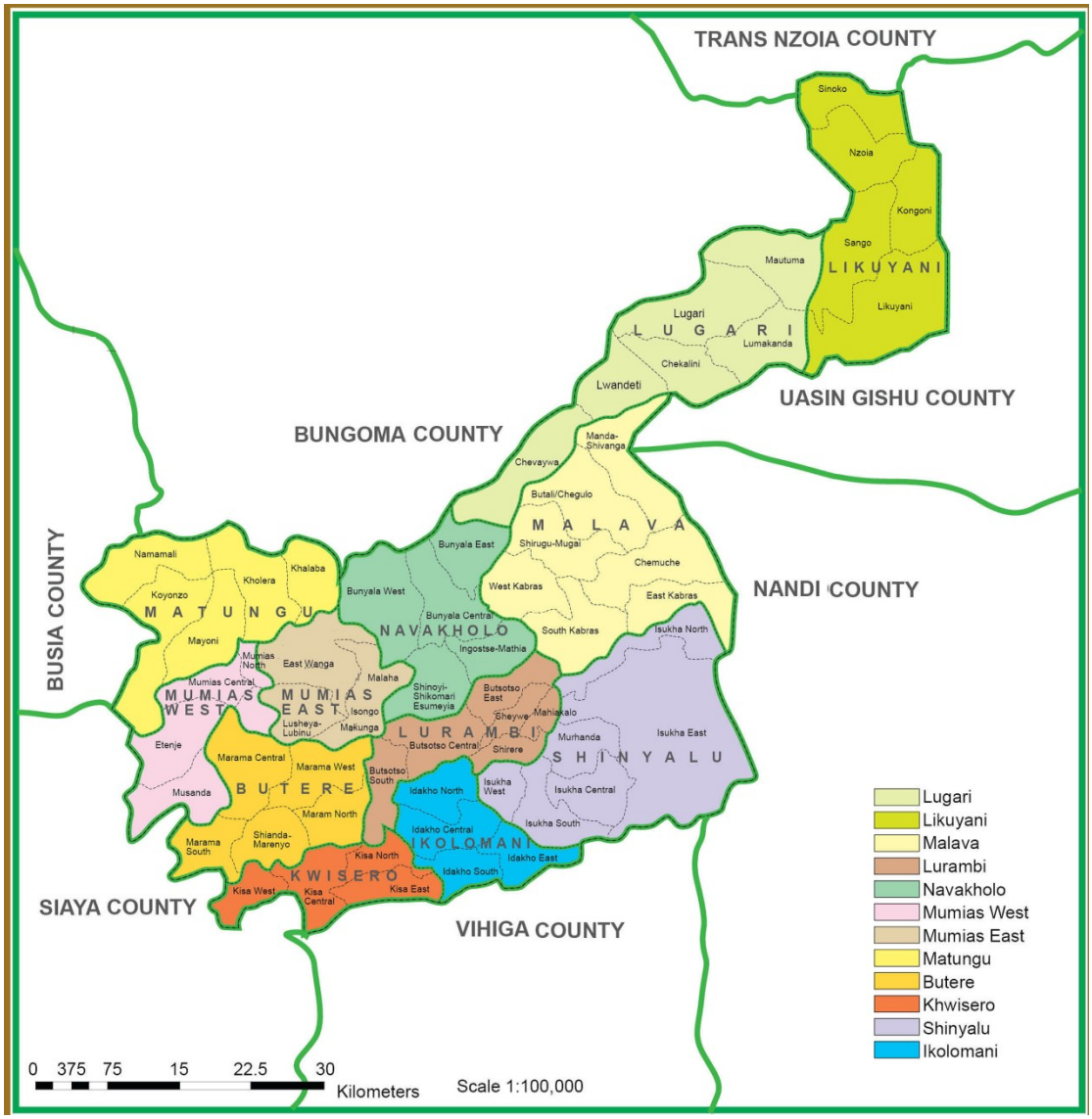
You have been selected as one of the respondents for my study because you have some knowledge about HIV PrEP and PEP uptake, as it falls within your docket. Your cooperation in giving accurate responses to my interview questions will be highly appreciated.

INTERVIEW QUESTIONS.

1. Briefly describe the nature of your job as the clinician in relation to providing HIV prevention such PrEP and PEP to young adults?
2. Can you please describe the process of dispensing PrEP and PEP medications to young adults in your facility?
3. In your opinion what are the health system factors that impact young adults' access to PrEP and PEP?
4. What are some of the healthcare policies and regulations in shaping the delivery and accessibility of HIV PrEP and PEP among young adults in your sub county?
5. In your experience, what are some of the sociocultural factors that influence young adults' decisions to use or not use PrEP and PEP?
6. What counseling services do you provide to young adults who are considering or using PrEP and PEP?
7. How does the community perceive HIV prevention services such as HIV PrEP and PEP?
8. What are the adherence support programs in place for young adults using PrEP or PEP in your facility?
9. What challenges do you encounter in ensuring the availability and accessibility of PrEP and PEP medications for young adults?
10. In your opinion, what improvements or changes could be made at the healthcare system level to enhance access to and utilization of PrEP and PEP services among young adults?

Thank you so much for taking your time to participate in this interview.

APPENDIX XII: STUDY AREA MAP.



Source: County Government of Kakamega (2023)

APPENDIX XIII: APPROVAL LETTER FROM THE UNIVERSITY

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

Tel: 056-30870
Fax: 056-30153
E-mail: directordps@mmust.ac.ke
Website: www.mmust.ac.ke

P.O Box 190
Kakamega – 50100
Kenya

Directorate of Postgraduate Studies

Ref: MMU/COR: 509099 **2nd October 2023**

Abubakar Gurre Abdallah
HPH/G/01-70416/2021,
P.O. Box 190-50100,
KAKAMEGA.

Dear Mr. Abdallah

RE: APPROVAL OF PROPOSAL

I am pleased to inform you that the Directorate of Postgraduate Studies has considered and approved your Masters Proposal entitled: "***Prevalence and Determinants of HIV Pre Exposure and Post Exposure Prophylaxis use Among Young Adult in Khwisero Sub-county, Kenya*** " and appointed the following as supervisors:

1. Dr. Rose Olayo - MMUST
2. Mr. Wilberforce Cholo - MMUST
3. Dr. Ruth Kapanga - MMUST

You are required to submit through your supervisor(s) progress reports every three months to the Director Postgraduate Studies. Such reports should be copied to the following: Chairman, School of Public Health, Biomedical Sciences and Technology Graduate Studies Committee and Chairman, Public Health Department. Kindly adhere to research ethics consideration in conducting research

It is the policy and regulations of the University that you observe a deadline of three years from the date of registration to complete your Master's thesis. Do not hesitate to consult this office in case of any problem encountered in the course of your work.

We wish you the best in your research and hope the study will make original contribution to knowledge.

Yours Sincerely,

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY
DIRECTORATE OF POSTGRADUATE STUDIES
P.O. BOX 190 – 50100, KAKAMEGA (K)
Date:..... Sign:.....

Prof. Stephen Odebero, PhD, FIEEP
DIRECTOR, DIRECTORATE OF POSTGRADUATE STUDIES

APPENDIX XIV: ETHICAL CLERANCE

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY

Tel: 056-31375
Fax: 056-30153
E-mail: ierc@mmust.ac.ke
Website: www.mmust.ac.ke

P. O. Box 190,
50100,
Kakamega,
KENYA

Institutional Scientific and Ethics Review Committee (ISERC)

REF: MMU/COR: 403012 Vol 6 (01)

Date: October 11th, 2023

To: Mr. Abubakar Gurre Abdallah,

Dear Mr.

RE: PREVALENCE AND DETERMINANTS OF HIV PRE EXPOSURE AND POST EXPOSURE PROPHYLAXIS USE AMONG YOUNG ADULTS IN KHWISERO SUBCOUNTY, KENYA.

This is to inform you that the ***Masinde Muliro University of Science and Technology Institutional Scientific and Ethics Review Committee (MMUST-ISERC)*** has reviewed and approved your above research proposal. Your application approval number is **MMUST/IERC/193/2023.** The approval covers for the period ***October*** 11th, ***2023 to October*** 11th, ***2024.***

This approval is subject to compliance with the following requirements;

i. Only approved documents including informed consents, study instruments, MTA will be used.
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by ***MMUST-ISERC.***
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to ***MMUST-ISERC*** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to ***MMUST-ISERC*** within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to ***MMUST-ISERC.***

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://research-portal.nacosti.go.ke and also obtain other clearances needed

Yours Sincerely,

Prof. Gordon Nguka (PhD)
Chairperson, Institutional Scientific and Ethics Review Committee

Copy to:
- The Secretary, National Bio-Ethics Committee
- Vice Chancellor
- DVC (PR&I)

APPENDIX XV: NACOSTI PERMIT

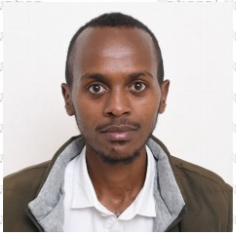
REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **189723**

Date of Issue: **03/November/2023**

RESEARCH LICENSE



This is to Certify that Mr.. ABUBAKAR GURRE ABDALLAH of Masinde Muliro University of Science and Technology, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Kakamega on the topic: PREVALENCE AND DETERMINANTS OF HIV PRE EXPOSURE AND POST EXPOSURE PROPHYLAXIS USE AMONG YOUNG ADULTS IN KHWISERO SUBCOUNTY, KENYA for the period ending : 03/November/2024.

License No: **NACOSTI/P/23/31097**

189723

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions

APPENDIX XVI: APPROVAL FROM KAKAMEGA COUNTY

REPUBLIC OF KENYA
COUNTY GOVERNMENT OF KAKAMEGA

OFFICE OF THE GOVERNOR
COUNTY SECRETARY AND HEAD OF PUBLIC SERVICE

Telephone: 056-31850/31852/31853
Website:www.kakamega.go.ke
E-mail:countysecretary@kakamega.go.ke

When replying please Quote

Ref No: CGK/OCS/GEN.CRR./04/VOL.4/39

County Government of Kakamega
P.O. Box 36-50100
KAKAMEGA

Date: 5th January, 2024

Abubakar Gurre Abdallah
Masinde Muliro University of Science & Technology
P. O. Box 190-50100
KAKAMEGA

RE: RESEARCH AUTHORIZATION

The above subject matter refers.

Following your authorization letter Ref. No.NACOSTI/P/23/31223 dated 3rd November, 2023 by NACOSTI to undertake research on "**Prevalence and Determinants of HIV Pre-Exposure and Post Exposure Prophylaxis use among Young Adults in Khwisero Sub-County, Kakamega County**" for the period ending 3rd November, 2024, I am pleased to inform you that you have been authorized to carry out the research on the same in Kakamega County.

It is therefore expected that you shall forward a copy of the thesis to this office.

Thank you.

COUNTY SECRETARY
KAKAMEGA COUNTY
P. O. Box 36 - 50100
KAKAMEGA

Dr. Lawrence Omuhaka, CBS
County Secretary and Head of Public Service

Copy to: H.E. the Governor