DETERMINANTS OF HUMAN IMMUNODEFICIENCY VIRUS PRE-EXPOSURE PROPHYLAXIS UPTAKE AMONG SEX WORKERS IN NAKURU TOWN KENYA

MARTHA NYAMBURA KAHURA

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF PUBLIC HEALTH DEGREE OF MOUNT-KENYA UNIVERSITY

JANUARY 2025

DECLARATION AND APPROVAL

Declaration

This thesis is my original work and has never been presented for a degree in any other instistution.

MARTHA NYAMBURA KAHURA

REG. NO. MPH/2021/80808

Signature  Date 9/9/2024

Approval by supervisors:

This thesis is being submitted for examination with our approval as university supervisors

Dr. Alfred Owino Odongo (PhD)
School of Public Health
Mount Kenya University

Signature  Date 9/9/2024

Dr. Joseph Muchiri (PhD)
School of Public Health
Mount Kenya University

Signature  Date 9/9/2024

DEDICATION

I dedicate this project to my parents for the encouragement, my spouse for support and finally, my children for their understanding when I was absent.

ACKNOWLEDGEMENT

I thank God, the Almighty, for protecting my health and sanity during the duration of my endeavor. Without the assistance of my two supervisors, I would not have been able to go this far in the project, so please accept my deepest appreciation. Thanks to everyone who helped me, gave me advice, or otherwise contributed to this effort.

ABSTRACT

The Initiative for Strong, Empowered, HIV-Free, Mentored, and Safe Women includes PrEP as one of its primary initiatives. However, adoption of Pre exposure Prophylaxis has been delayed in Sub-Saharan Africa despite effectiveness evidenced in studies. Nakuru County has a high HIV burden, with a prevalence of 4.1%, according to a study by the county administration. Only 4% of Female sex workers and 2% of Male sex workers were taking PrEP in 2018. The study assessed determinants of HIV PrEP uptake and retention among sex workers in Nakuru town Kenya. Theory of planned behavior and the AIDS risk reduction model served as the study's theoretical framework. The study design was a cross-sectional, analytical investigation. It targeted all the sex workers in Nakuru town who were 18 years old and above. Stratified sampling technique was used to get the sex workers hotspots, snow balling sampling technique was adopted to recruit the study participants. The data was obtained from the respondents using questionnaires. Descriptive and inferential statistics were adopted to analyze quantitative data. Findings were presented in table and graphical formats, 55% had used PrEP while 45% indicated that they had not. Further, this study found that even among the respondents who had used PrEP, only 20% indicated to still be on PrEP. In this regard, the study concluded that PrEP uptake is low considering that the actual target should be 100%. Further the study concluded that PrEP retention was low as only 20% reported still be on PrEP, chi square test was used to establish whether socio demographic characteristics were associated with the adoption of PrEP by the respondents. All the tests returned a statistically significant difference test, with chi result for age being, X^2 (3, N = 375) =18.4, p = 0.000 gender, X^2 (1, N = 375) =17.24, p = 0.000 education X^2 (2, N = 375) =53.4, p = 0.000, and marital status being X^2 (2, N = 375) =16.3, p = 0.000. Duration in the trade was also positively correlated with use or non-use of PrEP, X^2 (2, N = 375) =13.4, p = 0.002. Questions on Likert scale indicated a high level of awareness, concluding that respondents had acceptable level awareness. On factors associated with HIV PrEP uptake and retention among sex workers in Nakuru town. Analysis using multiple logistic regression indicated that there was a collective significant effect between the awareness, health system factors, socio economic individual factors and use of PrEP among sex workers. A further analysis showed that, put together, the four predictor variables explained 20.3% of variation on PrEP retention factors that influences the respondents taking PrEP. The study concluded that while use and none use PrEP can be explained by the four factors evaluated in this study, there is an array of factors that influence utilization of PrEP. The study also recommends that while the rate of awareness is high among the respondents, the Nakuru health department needs to continue promoting this as this is necessary to increase utilization.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS AND ACRONYMS

ARRM:	AIDS Risk Reduction Model
ART:	Antiretroviral Therapy
FSW:	Female Sex Worker
MoH:	Ministry of Health
MSM:	Men who have sex with men
MSW:	Male Sex Worker
PEP:	Post-Exposure Prophylaxis
PrEP:	Pre-exposure prophylaxis
STI:	Sexually Trans-Mitted Infection
TPB:	Theory of Planned Behavior
WHO:	World Health Organization

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

To reduce the spread of HIV among high-risk groups, several countries in sub-Saharan Africa have begun pre-exposure prophylaxis (PrEP) programs. Unfortunately, there is lack of information on PrEP adoption and continuation in high-risk African areas (Anyona, 2019). Individuals with a higher risk of HIV infection may benefit from pre-exposure prophylaxis (PrEP). Research on SSA's high-risk demographics, including steelworkers, fishermen, and couples with different HIV statuses, found a readiness to utilize PrEP ranging from 60-90% (Muwonge et al., 2020). Monitoring PrEP enrollment, use, and adherence is critical as Sub-Saharan African countries try to include it into public health programs.

PrEP has shown promising results in clinical studies, but it has been adopted slowly by the public in Sub-Saharan Africa (WHO, 2018). According to the World Health Organization's 2020 report, 940,000 persons were using PrEP throughout the world. By comparison, in 2019, there were only 630 000 PrEP users (WHO, 2021). Additionally, the data shows that Africans accounted for 52% of PrEP users. Begnel et al. (2020) observed that as at January 2019 44,000 people were using PrEP in Kenya. Sex workers are screened bimonthly for STIs such as gonorrhea, trichomoniasis, chlamydia, and other bacterial illnesses that could be transferred to clients. Some of the most HIV-endemic areas in Uganda's central south that saw the introduction of the PrEP program include Rakai, Kyotera, Masaka, and Lyantonde (Kagaayi et al., 2020). The assessment tool looked at a variety of behaviors to determine HIV risk, including engaging in unprotected genital intercourse with multiple HIV-negative partners in the previous six months, having unprotected genital intercourse during this time, engaging in unprotected anogenital intercourse, exchanging sexual acts in the genital area

for material benefits, and drug injection in the genital region. Those who reported at least two of the indicated dangerous sexual acts were classified as "high risk." The study included a variety of focus groups, including males who have sex with men, adolescent girls, young women, sex workers, truck drivers, individuals in Sero discordant relationships, and youth aged 15-24 who have been recognized as having a higher risk of developing HIV (Muwonge et al., 2020).

An estimated 1.3 million persons in Kenya are living with HIV-1, making it the country with the fifth-highest HIV-1 prevalence worldwide. Nearly 40% of the 36,000 new HIV-1 infections in 2018 were in people aged 15 to 24. The dramatic drop in new HIV-1 infection rates can be linked to increased access to antiretroviral medication (ART) and improved care for HIV patients (McKinnon & Ireri, 2019). HIV-1 continues to have a considerable impact on specific groups, including as MSM, FSW, and intravenous drug users. Follow-up initiatives revealed varying levels of PrEP engagement: in Kenya, a significant number of Sero discordant couples and gay men showed high PrEP uptake (about 97%), sustained participation (over 90% retention at three months), and consistent use (adherence exceeding 80%) (Kagaayi et al., 2020). To effectively lower HIV prevalence in high-risk groups, including sex workers, PrEP must be integrated into larger HIV prevention initiatives in a supportive and nondiscriminatory healthcare environment (Beyrer et al., 2015).

Despite the fact that sex work is prohibited in Kenya, the government, in collaboration with local and international allies, supports projects to provide sexual health care to sex workers, including HIV prevention measures. In Kenya, transactional sex is a qualifying factor for pre-exposure prophylaxis (PrEP). In late 2015, Kenya's Pharmacy and Poisons Board and Ministry of Health approved daily oral PrEP for high-risk populations. This approach aligns

with the goals of the Kenyan National HIV Prevention Revolution Roadmap, which aims to guide the country's HIV prevention initiatives until 2030 (Ministry of Health, 2014a). However, the integration of PrEP services and the availability of continuous funding for their expansion remain dubious (Kiragu, 2016).

While there is optimism about PrEP and post-exposure prophylaxis (PEP) as key HIV prevention measures for sex workers in Kenya, there are still unresolved issues regarding their awareness, level of interest and usage among sex workers, and the factors influencing these decisions (Restar et al., 2018). Previous research has not fully investigated ways for increasing sex workers' access to sexual healthcare, which is critical for improving public health outcomes. This study will look into the factors that influence HIV PrEP adoption and adherence among sex workers in Nakuru, Kenya.

1.2 Statement of the Problem

In Kenya, HIV disproportionately affects women, with a prevalence of 6.6% compared to 3.1% among men, contributing to a national adult prevalence of 4.9% (Ministry of Health [MoH], 2020). Key populations, such as female sex workers (FSWs), face elevated risks, with an estimated HIV prevalence of 29.3% (Ng'ethe, 2020). Nakuru County, prioritized for HIV prevention despite its moderate prevalence of 4.1% (MoH, 2020), serves as a transport hub where sex work drives transmission. However, PrEP uptake among FSWs (4%) and men who have sex with men (MSMs, 2%) remains alarmingly low (NASCOP & MoH, 2018), lagging behind national estimates (10% for FSWs, NASCOP, 2019) and urban counterparts like Kisumu (15% FSW uptake, NASCOP, 2018). This disparity persists despite Nakuru's high-risk context: ~5,000 FSWs (NASCOP, 2018) and ~2,500 annual new

infections (MoH, 2020). The county's low PrEP adoption contrasts sharply with prioritized urban centers like Nairobi (3.8% prevalence, higher uptake) and Mombasa (5.1% prevalence), suggesting structural barriers—stigma, mobility, or inadequate access—undermine prevention efforts.

While high-prevalence rural counties (e.g., Homa Bay, 19.6%; MoH, 2020) are well-researched, Nakuru's urban dynamics remain understudied. Its status as a commercial hub with moderate prevalence creates unique transmission risks, including transient populations fueling sex work. PrEP, a cost-effective intervention, is underutilized here despite evidence of efficacy, limiting public health impact. Existing studies focus on high-prevalence regions, neglecting urban settings where socio-economic factors shape prevention differently. This research gap hinders tailored strategies for Nakuru, where mobility and stigma may deter PrEP uptake and retention. By investigating determinants of PrEP uptake and retention among sex workers, this study addresses critical disparities in Kenya's HIV response, offering insights to optimize prevention in urban, moderate-prevalence contexts and align programs with the needs of key populations

1.3 Purpose of the Study

While the advent of HIV PrEP has given sexually active people greater chance in reducing HIV transmission rates, sex workers continue to endure higher rates of HIV infections and carry the biggest disease burden. Having a better grasp on PrEP adoption rates among sex workers would aid in risk reduction for this at-risk group. Therefore, the purpose of this study was to look at the determinants of HIV PrEP uptake and retention among sex workers in Nakuru town Kenya. This study was critical since it created awareness on the importance

of PrEP uptake among all sex workers. Hence, it can be used by medical facilities in rolling out PrEP to facilitate in the reduction new HIV cases among sex workers and their clients.

1.4 Objectives of the Study

1.4.1 Broad Objective

To assess determinants of HIV pre-exposure prophylaxis uptake and retention among sex workers in Nakuru town Kenya.

1.4.2 Specific Objectives

i. To determine the proportion of sex workers initiated and retained on HIV PrEP in Nakuru town.
ii. To assess awareness of HIV pre-exposure prophylaxis among sex workers in Nakuru town.
iii. To determine factors associated with HIV pre-exposure prophylaxis uptake and retention among sex workers in Nakuru town.

1.5 Research Questions

The study answered the following specific research questions:

i. What is the proportion of sex workers initiated and retained on HIV PrEP in Nakuru town?
ii. What is the level on awareness on HIV pre-exposure prophylaxis among sex workers in Nakuru town?

iii. What factors are associated with HIV pre-exposure prophylaxis uptake and retention among sex workers in Nakuru town?

1.6 Justification

To improve PrEP use among sex workers and their networks, the outcomes of this research will be crucial to policymakers and organizations from a public health viewpoint. This research will be useful in bringing to light policy gaps that need to be addressed to better facilitate PrEP.

To learn more about the factors that affect HIV prevention services for sex workers in Nakuru, Kenya, who are at a higher risk of getting HIV and passing it on, this study gives information on PrEP exposure and use and insight toward PrEP uptake. This research aimed to assess determinants of HIV pre-exposure prophylaxis uptake and retention among sex workers in Nakuru town Kenya. With this knowledge, interventions can de made towards modifying factors that negatively influence uptake and retention of PrEP among sex workers while emphasizing on the factors that positively influence its uptake.

1.7 Scope of the Study

The city of Nakuru was selected as the primary location for this research. According to a report by the National AIDS and STI Control Programme (NASCOP) in 2019, the study population consisted of 16,713 sex workers in Nakuru town. The focus of the study was on investigating the determinants of HIV Pre-Exposure Prophylaxis (PrEP) uptake and retention among sex workers in Nakuru town, involving both female and male sex workers.

The study specifically examined four key areas as potential determinants of HIV PrEP uptake and retention: awareness, individual factors, health factors, and socioeconomic factors. By exploring these aspects, the research aimed to provide a comprehensive understanding of the various elements influencing PrEP use among sex workers in the region.

The scope of the study was limited to the geographical boundaries of Nakuru town and did not extend to other areas or cities in Kenya. This focused approach allowed for a more in-depth analysis of the local context and specific challenges faced by sex workers in Nakuru regarding HIV prevention and PrEP use.

1.8 Study Limitations

Several challenges arose during the course of the research. One significant issue was the reluctance of some respondents to freely disclose their PrEP usage. This hesitation was likely due to the stigma associated with being identified as a PrEP user or the sensitive nature of their work. To address this limitation and encourage honesty, the researcher assured participants that the data collected would be used exclusively for research purposes and that no personally identifiable information, such as names, would be recorded.

Another challenge was the difficulty in locating sex workers due to the clandestine nature of their work and irregular working hours. To mitigate this issue, the researcher employed the snowball sampling technique. This method involved initial participants referring the researcher to other sex workers within their network, facilitating access to a broader sample of participants who might have otherwise been difficult to reach. The snowball sampling

technique proved advantageous in building trust and ensuring that a diverse range of sex workers in Nakuru town could be included in the study.

These measures ensured that data collection was both ethical and comprehensive, providing a reliable basis for understanding the determinants of HIV PrEP uptake and retention among male and female sex workers in Nakuru town. Despite these efforts, the potential for social desirability bias and sampling limitations should be considered when interpreting the findings.

1.9 Delimitations of the Study

The scope of this study was confined to examining the uptake and retention of pre-exposure prophylaxis (PrEP) among sex workers in Nakuru town, one of the major urban centers in Kenya. It is important to acknowledge that sex work is a widespread phenomenon across the country, with sex workers operating in all 47 counties. Consequently, the findings of this study may not be entirely representative of the experiences and challenges faced by sex workers in other regions of Kenya.

1.10 Assumptions of the Study

In conducting this research, several assumptions were made regarding the participants and their responses. Firstly, it was assumed that the individuals participating in the study were sexually active and engaged in multiple concurrent romantic or sexual relationships. This assumption was crucial as the study aimed to investigate the uptake and adherence to PrEP among individuals at high risk of contracting HIV through sexual transmission. Additionally, the assumption of sexual activity and multiple partners was essential for

understanding the potential risks and behaviors that could influence PrEP uptake and adherence.

Furthermore, it was presumed that the respondents would be cooperative and provide truthful and accurate responses to the questions posed during the data collection process. This assumption was essential for ensuring the validity and reliability of the findings, as the study heavily relied on self-reported information from the participants. However, it is important to acknowledge the potential for response bias, where participants may have provided socially desirable or inaccurate responses due to various factors, such as stigma, fear of judgment, or misunderstanding of the questions. Recognizing this potential limitation, the researchers took steps to mitigate its impact.

To mitigate the impact of these assumptions, the researchers employed several strategies. Firstly, the inclusion criteria for the study were clearly defined, and participants were screened to ensure they met the criteria of being sexually active and engaged in multiple concurrent relationships. Secondly, the research team emphasized the confidentiality and anonymity of the data collection process, aiming to create a safe and non-judgmental environment that would encourage honest and open responses. Additionally, the researchers utilized validated and reliable data collection instruments, such as structured questionnaires and in-depth interviews, to gather comprehensive and accurate information from the participants.

1.11 Operational Definition of Key Terms

Health factors: these are the health-related characteristics and attributes that facilitate or hinder the uptake of PrEP.

Individual factors: These are the demographic characteristics of individuals that influence the uptake of PrEP among sex workers.

Knowledge: This is information gained about PrEP by sex workers in Nakuru town.

Pre-exposure prophylaxis: This is medicine taken by sex workers in Nakuru town to prevent getting HIV.

Retention: This is the continued use of PrEP by sex workers in Nakuru town.

Socio-economic factors: These are factors related to the social standing of sex workers within a community in Nakuru town.

Uptake: This is the action of making use of PrEP by sex workers in Nakuru town.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

A survey of the available empirical literature is presented below. The research gaps that will be filled by this study are also highlighted by the existing empirical literature. This chapter also discusses the theoretical underpinnings of the research. Following a brief overview of the consulted literature, this chapter concludes with a discussion of the conceptual framework.

2.2 Empirical literature

2.2.1 Level of Awareness on Pre-Exposure Prophylaxis

Globally, PrEP implementation studies demonstrate significant variability in uptake and retention among sex workers (SWs), influenced by program design and integration with existing health systems. Jana et al., (2021) conducted a demonstration trial among female sex workers (FSWs) in Kolkata, India, reporting exceptional retention (89% at 15 months) and adherence (65% achieving target plasma tenofovir levels) when PrEP was integrated into a community-based HIV prevention program. This success contrasts with typical LMIC challenges, where structural barriers often suppress uptake. For instance, Hensen et al. (2021) in Zimbabwe found that despite high PrEP awareness (96%), actual use remained low (34%) due to stigma and financial constraints. Such disparities highlight the critical role of community-driven models in optimizing retention, even in resource-limited settings. These global examples highlight the need for standardized metrics to compare uptake across contexts and identify transferable best practices.

In SSA, studies reveal divergent trends in PrEP uptake and retention, shaped by delivery models and structural barriers. Mpirirwe et al., (2024), in a meta-analysis of 23 studies across SSA, found higher initial uptake in facility-based models (70%) compared to community-based approaches (49%), but superior 6-month retention in community programs (83% vs. 66%). This suggests a need for hybrid delivery systems to balance these strengths. Supporting this, Rugir et al., (2023) in Rwanda reported moderate uptake (45.55% among FSWs) but strong retention (78.5%), demonstrating how clinic-based programs can achieve durability with institutional support. However, Hensen et al., (2021) in Zimbabwe identified persistent gaps: despite increased awareness, structural barriers like stigma and costs suppressed uptake among young FSWs. These findings collectively emphasize SSA's urban-rural and model-specific disparities, with understudied populations (e.g., rural SWs) remaining invisible in retention metrics.

Kenyan studies highlight localized challenges in PrEP uptake and retention, particularly in optimizing service delivery for diverse populations. Ogolla et al., (2023) in Kisumu County documented low PrEP eligibility and stark declines in continuation (37% at 1 month to 12% at 6 months), signaling systemic issues in sustaining engagement. This contrasts with Martin et al., (2023) in Tanzania, where community-based programs achieved 55% uptake, driven by positive attitudes and parity (FSWs with ≥3 children were 2.4x more likely to use PrEP). While Kenya's urban hubs like Nairobi and Mombasa have established PrEP programs, secondary cities like Nakuru lack data on how hybrid models—combining facility and community approaches—could address retention gaps. Furthermore, Kenyan research often overlooks subpopulations such as male SWs and transient workers, mirroring SSA-wide urban biases (Mpirirwe et al., 2024).

Three critical gaps emerge from this synthesis. First, while hybrid delivery models show promise in SSA meta-analyses (Mpirirwe et al., 2024), their feasibility in Kenyan secondary cities remains untested, particularly in settings with fragmented healthcare access. Second, standardized metrics for uptake and retention are lacking: studies variably define "uptake" as enrollment (Jana et al., 2021), prescription rates (Rugir et al., 2023), or self-reported use (Hensen et al., 2021), complicating cross-context comparisons. Third, Kenyan data disproportionately focus on urban FSWs, neglecting male SWs, transgender SWs, and rural populations—a gap exacerbated by the absence of disaggregated retention data in studies like Ogolla et al., (2023). Addressing these gaps requires context-specific investigations into Nakuru's PrEP delivery ecosystem, including its mix of public clinics and NGO-led initiatives.

2.2.2 Level of Awareness of PrEP

Awareness of PrEP among sex workers globally remains uneven, shaped by geographic disparities, healthcare infrastructure, and systemic inequities. In Tanzania, Faini et al., (2022) demonstrated that structured, repeated PrEP education within a cohort of 700 female sex workers (FSWs) elevated awareness from 67% to 97% over 12 months, emphasizing the efficacy of sustained, community-embedded interventions. This contrast sharply with South Africa, where Makhakhe (2021) found that FSWs conflated PrEP with antiretroviral therapy (ART), exacerbating stigma and distrust due to insufficient provider training and fragmented peer-led programs. Similarly, in Kenya, Mwasi (2019) identified only a moderate link between awareness and uptake, suggesting that knowledge alone is insufficient without addressing structural barriers like clinic accessibility or occupational stigma. These studies

collectively highlight the dual necessity of continuous education and systemic support to bridge the gap between awareness and sustained PrEP use.

Regional disparities further complicate PrEP awareness, revealing striking parallels between high- and low-income settings. In the U.S., Tomko et al., (2019) reported that only a minority of street-based FSWs were aware of PrEP, despite high interest in HIV prevention tools—a pattern mirrored in Mombasa, Kenya, where Rester et al. (2020) documented limited understanding of PrEP among FSWs despite their willingness to adopt it. Such findings suggest that awareness gaps persist irrespective of national development status, often rooted in inadequate integration of PrEP into routine sexual health services. For instance, Okeke et al., (2021) noted that only 3% of U.S. college students used PrEP, with most learning about it through informal channels like campus advertisements rather than structured healthcare systems. This inconsistency underscores a global failure to institutionalize PrEP as a standard prevention tool, particularly for marginalized groups who face intersecting stigmas. Misconceptions and structural inequities further undermine awareness efforts, particularly in criminalized or resource-limited contexts. In South Africa, Makhakhe (2021) attributed FSWs' confusion between PrEP and ART to poorly trained healthcare providers and a lack of public health advocacy, perpetuating cycles of misinformation. Similarly, Auerbach et al. (2015) revealed that high-risk women in the U.S. were frequently unaware of PrEP until participating in research studies, reflecting systemic failures in patient-provider communication and institutional bias. These challenges are amplified in settings like Kenya, where criminalization of sex work deters individuals from seeking information due to fear of arrest or discrimination. Jayakumaran et al., (2016) reinforced that awareness alone does not guarantee uptake: among HIV-positive individuals in the U.S., only 15.3% knew of

PrEP, yet those who did were more likely to advocate for its use, highlighting education's catalytic role in fostering prevention advocacy.

The role of dissemination channels in shaping awareness cannot be overstated. Okeke et al., (2021) found that traditional methods like campus health services and advertisements were primary PrEP information sources for U.S. students, with social media playing a negligible role—a stark contrast to regions like Kenya, where mobile health platforms and peer networks are increasingly critical for reaching marginalized populations. For example, Rester et al., (2020) noted that Mombasa's FSWs preferred receiving PrEP information through private, community-based settings rather than public clinics, underscoring the need for discreet, culturally sensitive outreach. However, peer-led programs face limitations: Makhakhe (2021) observed that South African peer educators lacked institutional support, leading to inconsistent messaging and low credibility among FSWs. This suggests that hybrid models—combining peer outreach with formal healthcare partnerships—may optimize awareness campaigns while ensuring accuracy and trust.

Critical knowledge gaps persist in understanding how socioeconomic, gender, and geographic dynamics intersect with PrEP awareness. While studies like Mwasi (2019) and Rester et al., (2020) focus on FSWs, male sex workers (MSWs) remain conspicuously absent from the literature, particularly in sub-Saharan Africa, where cultural stigma around male sexuality may further suppress awareness. Additionally, existing research prioritizes urban hubs (e.g., Dar-es-Salaam, Nairobi), neglecting secondary cities like Nakuru, where healthcare access, stigma, and sex work practices may differ significantly. For instance, Nakuru's reliance on clinic-based PrEP delivery, unlike Mombasa's community-driven models, may exacerbate accessibility challenges for mobile or transient sex workers.

Furthermore, no studies holistically analyze how awareness interacts with structural barriers—such as poverty, criminalization, or gender-based violence—to influence long-term retention

2.2.3 Individual Factors and Uptake and Retention of PrEP

Individual-level factors, including risk perception, education, demographic characteristics, and health literacy, play a critical role in shaping pre-exposure prophylaxis (PrEP) uptake and retention, though their influence varies across populations and contexts. Existing research highlights both consistencies and contradictions in how these factors operate, particularly when comparing studies focused on general at-risk populations to those examining key groups like sex workers.

Ssuna et al., (2022) demonstrated that in Ugandan fishing communities—where PrEP was not yet available—95% of respondents expressed theoretical willingness to use it, driven by self-perceived high HIV risk, recent HIV testing, and higher education levels. Similarly, Gombe et al., (2020) found that Zimbabwean Sero discordant couples (SDCs) cited partner behavior and safer conception goals as primary motivators for PrEP uptake, with users overwhelmingly preferring PrEP over other prevention methods. These studies suggest that risk perception, when coupled with health education (e.g., understanding PrEP's benefits), enhances acceptance. However, both studies focused on non-sex worker populations, where risk is often framed through interpersonal relationships rather than occupational exposure. For sex workers, risk perception may be complicated by economic pressures to engage in condomless sex, frequent client turnover, and structural stigma—factors absent in SDC or

general population studies. This gap highlights the need to reconceptualize "risk perception" in occupational contexts, where survival needs may outweigh health considerations.

Krakower et al., (2019) reported that 36% of PrEP users in Boston discontinued use, with younger age and transgender identity associated with higher dropout rates, often due to fluctuating risk perceptions. Scott et al., (2019) corroborated these findings, noting that Black individuals and transgender women faced disproportionately higher discontinuation rates compared to white MSM, even after adjusting for confounding factors. Terry-Smith (2018) further identified education as a key predictor of PrEP willingness among MSM, with those having partial college education being nearly seven times more likely to use PrEP than peers with only high school diplomas. While these studies highlight systemic disparities, their applicability to sex workers is limited. For instance, sex workers often face compounded marginalization due to criminalization, poverty, and gender-based violence—factors that may exacerbate discontinuation risks beyond what is observed in MSM populations.

Higher education levels are frequently correlated with PrEP uptake, but this relationship may be mediated by structural factors such as healthcare access and stigma, particularly among marginalized groups. Terry-Smith (2018) found that education, rather than employment or healthcare access, was the strongest predictor of PrEP willingness among MSM, suggesting that health literacy and empowerment play pivotal roles. However, this finding contrasts with Gombe et al., (2020), where SDCs in Zimbabwe—many with limited formal education—still adopted PrEP when motivated by tangible risks like sero discordance. For sex workers, the relationship between education and PrEP use is likely more complex: while higher education may improve health literacy, systemic barriers such as clinic hours

conflicting with work schedules, fear of provider discrimination, or inability to navigate bureaucratic healthcare systems may suppress uptake regardless of education level. Furthermore, sex workers with lower education may rely on peer networks rather than formal health messaging for PrEP information, a dynamic absent in studies of MSM or SDCs. This disparity highlights the need to disentangle education's direct effects from its intersection with structural inequities in sex worker-specific research.

A critical gap in the literature is the lack of intersectional analyses examining how individual factors interact with structural and occupational realities to shape PrEP outcomes among sex workers. For example, while Ssuna et al., (2022) and Terry-Smith (2018) identify education as a key motivator, sex workers with limited schooling may face unique barriers, such as mistrust of medical institutions or language barriers in clinic settings, which are rarely examined. In Nakuru, for instance, sex workers may prioritize immediate income over PrEP adherence, particularly if clinic visits require time off work or incur transportation costs—a trade-off unaddressed in studies of SDCs or MSM. Additionally, existing research predominantly focuses on individual agency (e.g., "willingness" or "motivation") while neglecting how structural violence, such as police harassment or healthcare discrimination, constrains choice. For example, Scott et al., (2019) attribute higher PrEP discontinuation among Black and transgender populations to individual-level factors, yet systemic racism and transphobia in healthcare systems likely play a more significant role.

Three major gaps emerge from this synthesis, which the Nakuru study aims to address. First, the conceptual gap in defining "risk perception" for sex workers: current frameworks derived from MSM or SDC studies fail to account for occupational risks, economic pressures, and survival strategies that uniquely shape decision-making. Second,

the methodological gap in studying intersectionality: existing research silos individual factors (e.g., education, race) without exploring how they interact with structural determinants (e.g., criminalization, poverty) to produce disparities. For instance, while Terry-Smith (2018) links education to PrEP willingness, no studies examine how educated sex workers in criminalized settings navigate stigma differently than less-educated peers. Third, the geographic and population gap: most evidence comes from urban centers in high-income countries or capital cities in Africa (e.g., Kampala, Harare), neglecting secondary hubs like Nakuru, where healthcare infrastructure, law enforcement practices, and SW demographics differ markedly.

2.2.4 Healthcare system Factors and Uptake and Retention of PrEP

Healthcare system factors, including service accessibility, provider attitudes, and integration with existing programs, play a pivotal role in shaping PrEP uptake and retention, though their impact varies across geographic and socioeconomic contexts. Studies highlight the importance of clinic flexibility, supportive infrastructure, and stakeholder collaboration, yet critical gaps persist in understanding how these factors operate in low-resource settings and among marginalized populations like sex workers.

Accessibility and convenience of PrEP services are consistently identified as determinants of uptake, though implementation strategies must adapt to local healthcare infrastructures. Laborde et al., (2020) found that PrEP users in San Francisco prioritized walk-in clinics, simplified testing protocols, and extended prescriptions (e.g., 90-day supplies), while also requesting ancillary services like mental health and housing support. Similarly, Lancaster et al., (2020) reported that female sex workers (FSWs) in Malawi preferred PrEP delivery through family planning clinics and NGO-run drop-in centers, citing convenience and reduced stigma compared to traditional healthcare facilities. These studies suggest that colocation of PrEP with familiar, non-stigmatizing services enhances acceptability, particularly for marginalized groups

Djomand et al., (2020) analyzed PEPFAR-funded PrEP programs across 15 countries, including Kenya, and found that successful scale-up relied on national stakeholder engagement, ministry of health advocacy, and partnerships with global bodies like WHO and UNAIDS. While these programs expanded access to key populations, retention data were notably absent, and interventions often prioritized urban centers over rural or secondary cities. For instance, Kenya's PrEP rollout focused on Nairobi and Mombasa, leaving gaps in

smaller hubs like Nakuru, where healthcare infrastructure and community trust may differ. Furthermore, PEPFAR's dependence on donor funding introduces sustainability challenges, as seen in Zimbabwe and Uganda, where economic instability disrupted service continuity. These findings highlight the need for decentralized, community-owned PrEP programs that can adapt to local realities while maintaining national oversight.

Provider attitudes and systemic healthcare barriers significantly influence retention, particularly in settings where stigma and resource limitations intersect. Spinelli et al., (2019) documented that marginalized groups in San Francisco faced PrEP discontinuation due to competing healthcare priorities, stigma, and burdensome follow-up requirements (e.g., quarterly visits and blood tests). The study emphasized the role of primary care providers in sustaining engagement through supportive communication and flexible appointment scheduling. Similarly, Lancaster et al., (2020) noted that Malawian FSWs valued nonjudgmental counseling, suggesting that provider training in stigma reduction is as critical as service accessibility. These parallels indicate that while provider attitudes are universally important, systemic interventions must account for localized structural inequities.

Three key gaps emerge from the literature. First, existing studies disproportionately focus on high-income or capital city contexts, neglecting secondary urban hubs like Nakuru, where healthcare access may rely on fragmented public-private partnerships. For instance, while PEPFAR programs in Kenya prioritized Nairobi, Nakuru's sex workers—who navigate a mix of public clinics and NGO-led initiatives—remain understudied. Second, retention data are conspicuously absent in multi-country evaluations (Djomand et al., 2020), masking challenges in sustaining PrEP use amid economic or political instability. Third, the role of donor dependency in shaping service delivery is poorly understood: while NGO-run drop-in

centers boost uptake in Malawi (Lancaster et al., 2020), their long-term viability in donor-reliant regions like Kenya is uncertain.

2.2.5 Social-Economic Factors and Uptake and Retention of PrEP

Socioeconomic factors, including income, education, employment, and social networks, significantly influence PrEP uptake and retention, though their impact varies across populations and geographic contexts. Existing research highlights disparities in access driven by economic inequality, stigma, and peer dynamics, yet critical gaps remain in understanding how these factors intersect with structural barriers among marginalized groups like sex workers, particularly in criminalized or low-resource settings.

Economic status consistently predicts PrEP engagement, though its effects are mediated by healthcare infrastructure and social marginalization. Ndaga (2020) demonstrated that wealthier female sex workers (FSWs) in Kisii County, Kenya, were more likely to initiate PrEP, with uptake concentrated among higher socioeconomic status (SES) groups in both rural and urban areas. Similarly, Tran et al., (2016) found stark socioeconomic disparities in antiretroviral therapy (ART) access in Vietnam, where affluent individuals achieved better health outcomes due to their ability to afford treatment and navigate healthcare systems. These studies suggest that economic privilege enhances health literacy and reduces logistical barriers (e.g., transportation costs, clinic fees), which are critical for PrEP adherence. However, Ndaga (2020) also reported high dropout rates even among wealthier FSWs, indicating that economic stability alone cannot ensure retention without addressing systemic issues like stigma or clinic accessibility. This paradox highlights the need to contextualize SES within broader structural inequities, particularly in regions like Nakuru, where sex workers may face income instability despite relative urban proximity to services.

Stigma and social networks play dual roles in shaping PrEP engagement, with peer influence often mitigating structural barriers in marginalized communities. Jackson-Gibson et al., (2021) identified stigma around antiretroviral drugs as a key barrier to PrEP use among young women in Kisumu, Kenya, where misconceptions about HIV prevention deterred uptake. Sex workers' networks may prioritize survival strategies (e.g., client referrals) over health advocacy, and LGBTQ+ criminalization in Kenya complicates peer-driven interventions. This contrast highlights the need to explore how stigma and social networks operate differently across legal and cultural contexts, particularly where sex work and same-sex relationships are stigmatized.

Three critical gaps emerge from the literature. First, existing studies disproportionately focus on non-sex worker populations (e.g., MSM, young women), neglecting how socioeconomic factors intersect with occupational risks, such as client dependence or police harassment, to shape PrEP outcomes. Second, while peer networks are recognized as facilitators (Quinn et al., 2020), their role in criminalized settings remains underexplored; Nakuru's sex workers may rely on clandestine networks that differ from formalized LGBTQ+ communities in the U.S. Third, the inconsistent relationship between employment and PrEP use (Duncan et al., 2016; Ndaga, 2020) suggests the need for nuanced analyses of informal economies, where income volatility, rather than unemployment, may drive discontinuation. Additionally, regional disparities in research focus—e.g., heavy emphasis on urban Kenya (Ndaga, 2020) versus limited data on secondary cities—limit insights into localized socioeconomic dynamics.

2.3 Theoretical framework

The idea of planned behavior and the AIDS risk reduction model will serve as the foundation for this research project's conceptual framework.

2.3.1 Theory of Planned Behavior

Ajzen (1991) came up with the Theory of Planned Action (TPB), which is designed to predict a person's intention to engage in a certain activity at a certain time and place. TPB details all individuals are responsible for and must exert self-control over. The behavioral intent of the person is the most important aspect of this model. This intent is impacted by the individual's expectations about the outcome of the action, as well as the individual's subjective assessment of the potential drawbacks and benefits of the action's repercussions (Sussman, 2019). TPB was extensively used as a tool for anticipating and explaining various health-related behaviors. Cigarette smoking, health-seeking behavior, alcohol intake, nursing practices, and drug usage were among the behaviors covered. According to the TPB, success in a given activity is dependent on a person's intrinsic desire (intention) and capacity (behavioral control). This categorizes three types of beliefs: behavioral, moral, and authoritative. Six guiding principles make up the TPB and together represent an individual's real behavioral control: one's behaviors and preferences, one's subjective norms, societal standards, perceptions of power, and perceptions of behavioral control. While the TPB has found broader applicability in public health than the Health Belief Model, its limitations remain since it implies that people who want to change their behavior already have the resources to do so (Ajzen, 1991).

The theory contends that the intention of a person to take part in a specific behavior predicts the probability of its performance. Behaviour is dictated by attitudes, self-efficacy, and subjective norms; the three components are also the propellers of behaviour. The perception of control of an individual over a particular behaviour is a critical indicator in circumstances where there is a violation of behaviour (Ajzen & Madden, 1986). It entails the perception of a person on the ease or difficulty of engaging in particular behaviours and is in most instances conceptualized to follow the ideology of perceived self-efficacy by Bandura (2004). In this regard, a key limitation of the theory is the lack of understanding of what to measure when evaluating self-efficacy. Specifically, Ajzen and Madden (1986) explained that the external (opportunities) and the internal (skills to engage in behaviour) components of self-efficacy influenced the intention to take part in a particular behaviour.

The theory makes different assumptions, one of which posits that an individual has gained resources and opportunities to become successful in taking part in a desired behaviour, despite the intention. It does not cover other factors that contribute to motivational and behavioural goals including threat, fear, previous experience, and fear (Sussman, 2019). Despite perceiving normative effects (the influence of other people that leads one to conform to be liked and accepted by them), it does not consider the economic and environmental factors influencing the intention of an individual to undertake a behaviour. The assumption made by the theory is that an individual's behaviour emanates from a single decision-making process and does not put into consideration the variation over time.

The Theory of Planned Behavior (TPB) provides a critical framework for understanding how individual attitudes, subjective norms, and perceived behavioral control shape sex workers' intentions to initiate and adhere to PrEP in Nakuru, Kenya. First, the study will

examine attitudes toward PrEP by assessing participants' beliefs about its effectiveness, safety, and alignment with their health priorities. For instance, sex workers' perceptions of PrEP as a stigmatizing intervention (linked to HIV assumptions) versus a tool for empowerment will be explored. Second, subjective norms will be evaluated by analyzing how peer networks, healthcare providers, and societal expectations influence uptake. If sex workers perceive that peers or clinics endorse PrEP, their intention to use it may increase, even in stigmatized contexts. Third, perceived behavioral control will focus on self-efficacy and structural barriers, such as access to clinics, cost, or mobility. By mapping these TPB constructs, the study will identify how cognitive and social factors interact to drive or hinder PrEP engagement, offering insights into targeted behavioral interventions (Ajzen, 1991; Croucher, 2015).

While TPB emphasizes individual agency, this study will extend the framework to incorporate structural and occupational factors that theory traditionally overlooks. For example, perceived behavioral control in TPB assumes individuals have autonomy over their choices, but sex workers in Nakuru may face external constraints—such as police harassment, client demands for condomless sex, or economic precarity—that override intentions to use PrEP. The study will thus contextualize TPB by analyzing how **structural violence** (e.g., criminalization, poverty) moderates the relationship between intention and behavior. Additionally, the temporal limitation of TPB, which assumes static decision-making, will be addressed by exploring how fluctuating risks (e.g., seasonal income changes, HIV outbreak fears) dynamically influence intentions over time. By integrating TPB with a structural lens, the study will bridge the theory's individual-focused assumptions with the

systemic inequities shaping sex workers' health behaviors, advancing a more holistic understanding of PrEP uptake and retention (Bandura, 2004; Sussman, 2019).

2.3.2 AIDS Risk Reduction Model (ARRM)

Since 1990, when it was first used, the AIDS Risk Reduction Model (ARRM) has provided a framework for analyzing and predicting the effectiveness of different interventions meant to lower the risk of HIV and AIDS being spread through sexual contact (Catania et al., 1990). The three stages of the model were shaped by the Health Belief Model, psychological factors, the idea of "efficacy," and how people interact with each other. These are the three frameworks: 1) Self-reflection and problem-framing based on the idea that a person's sexual activity is linked to their risk of getting HIV and that they are at risk of getting HIV; 2) Commitment to change in the form of less risky sexual behavior and more low-risk behavior; and 3) Action-informed solutions (Ndaga, 2019).

The ARRM's three stages—problem recognition, commitment to change, and action—will guide analysis of PrEP adoption among Nakuru's sex workers. The study will assess how occupational HIV risks (e.g., condomless sex) and structural barriers (e.g., criminalization) shape risk perception (Stage 1), influence intentions to adopt PrEP (Stage 2), and affect adherence practices (Stage 3). This approach identifies intervention points to strengthen risk awareness and sustained engagement

The study extends ARRM by integrating structural (e.g., healthcare access) and occupational factors (e.g., economic precarity) that mediate behavior change. It critiques ARRM's linearity by examining cyclical risk fluctuations (e.g., client violence, seasonal work) and

community-driven solutions (e.g., peer navigation) to bridge gaps between intention and action (Anyona, 2019; Catania et al., 1990).

2.4 Conceptual Framework

A diagram of the study's variables serves as the conceptual framework. This Venn diagram illustrates the interplay between dependent and independent variables. Acquisition and retention are the dependent variables. Factors that influence whether or not someone takes PrEP against HIV are the independent variable. Figure 2. 1 is a conceptual framework demonstrating the interaction between awareness, individual variables, health factors, socio-economic status, and knowledge, as well as the uptake and retention of PrEP

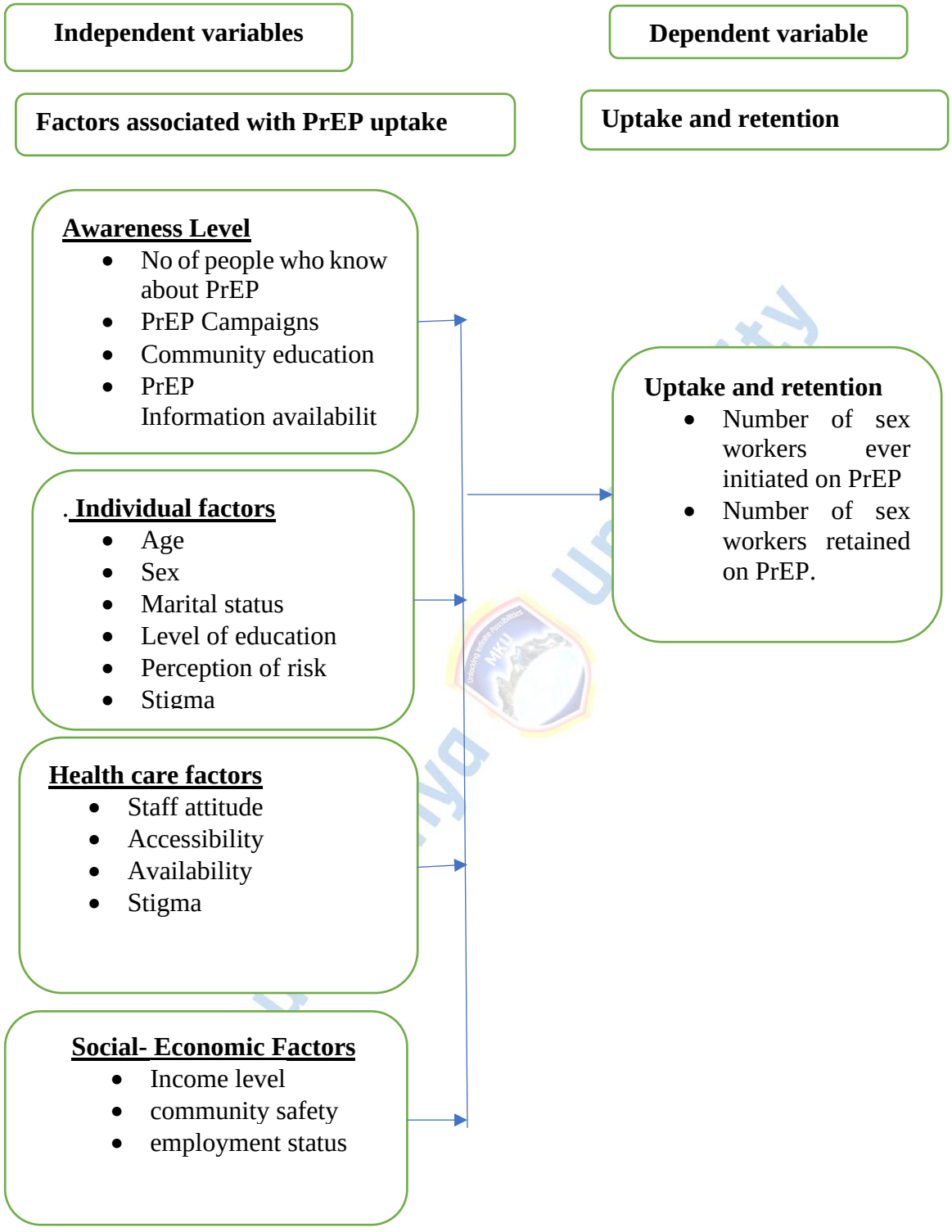


Figure 2. 1 Conceptual Framework

2.5 Recap of Literature Review

Different scholars have researched the uptake and retention of HIV PrEP (Ssuna et al., 2022; Gombe et al., 2020; Jackson-Gibson et al., 2021). The literature reviewed has identified PrEP as a prevention option for HIV. Despite this acknowledgment, the prevalence of HIV is still high, especially among at-risk groups such as sex workers and MSM. Therefore, it is prudent to assess the determinants of the uptake and retention of HIV PrEP. Scholars (Krakower et al., 2019 in Boston; Laborde et al., 2020 in San Francisco and Lancaster et al., 2020 in Malawi) found that individual factors and health factors influence the uptake of prep. The studies however were based in international countries, presenting a geographical gap. This study will be based in Kenya and specifically, in Nakuru County. The focus of Nakuru County is borne from the fact that the studies reviewed from Kenya were based in other counties such as Rester et al., (2020) in Mombasa County; Jackson-Gibson et al., (2021) in Kisumu County.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This section details the approach that was used to achieve the goals of the research. Included are the study's rationale, setting, demographic, participants, study instruments, validity and reliability testing, data analysis, and ethical issues.

3.2 Research Methodology

The research was quantitative. Analyzing numerical data to conclude is the focus of quantitative data analysis (Adams et al., 2014). Quantitative information was gleaned from responses to semi-structured surveys. In addition, an inferential analysis was performed on the quantitative data collected to demonstrate the link between the research variables (independent variables – awareness, individual factors, health factors, and social-economic factors; and the dependent variable – uptake and retention of PrEP).

3.3 Research Design

When conducting research, it is crucial to develop a well-structured plan for data collection and analysis (Mugenda & Mugenda, 2008). In this study, a cross-sectional, analytical research design was employed. Use of Likert scale allowed respondents to indicate their level of agreement with certain statements this approach was deemed appropriate as it allowed for an in-depth examination of time- and population-specific phenomena (Bryman, 2016). The cross-sectional design enabled the researcher to capture a snapshot of the target population at a specific point in time, providing insights into their current attitudes, behaviors, and experiences.

The cross-sectional research design was particularly suitable for this study as it facilitated the creation of a representative snapshot of the entire population of interest (Mugenda & Mugenda, 2008). By collecting data from a diverse range of samples drawn from the target population, the researcher could obtain a comprehensive understanding of the phenomenon under investigation. This design allowed for the generalization of findings to situations with similar characteristics, enhancing the study's external validity and applicability.

Furthermore, the cross-sectional approach enabled the researcher to explore potential associations between various factors and the outcome of interest (Bryman, 2016). By gathering data on multiple variables simultaneously, the researcher could examine the relationships between socio-demographic characteristics, behavioral patterns, and the uptake and adherence to PrEP among the target population.

3.4 Location of the Study

The research was carried out in Nakuru town in Nakuru County, Kenya. The researcher met the subjects at their favorite hangouts (hotspots), which were scattered throughout a few key streets and joints. In 2019, Nakuru County was the third most populated in Kenya, after Nairobi and Kiambu. Its population was 2,162,202. Being one of the most populated counties in Kenya, the population of sex workers in the region is also high at 16,713 according to a report by NASCOP (2019). Notably, Nakuru town over the past years has recorded a rise in HIV infections from 900 in 2015 to 1,869 in 2020. With the rise in HIV infections, the county government of Nakuru has partnered with USAID to increase HIV comprehensive health centers to 110 up from 60, to expand access to effective HIV care and preventive services (Mwangi & Chepkemoi, 2022). Nakuru gained its city status in 2021 and is a fast-growing

town, it is a transit town with stop overs for travelers and it is in the middle of most major towns. It is also a stopover for trackers using the northern corridor, these factors make it favorable for sex work to thrive and thus a good place to research the factors that determine sex workers' decisions to start and stay on HIV PrEP.

3.5 Target Population

The target population is defined as the entire group of respondents who meet the predetermined research criteria (Cooper & Schindler, 2014). For this study, the target population comprised sex workers in Nakuru town who were at least 18 years old. According to a report by the National AIDS and STI Control Programme (NASCOP) (2019), there are 16,516 female sex workers and 197 male sex workers in Nakuru county. Thus, the target population for this research consisted of 16,713 sex workers.

Focusing on this demographic aimed to provide insights into the uptake and retention of PrEP among a representative sample of sex workers in Nakuru. By restricting the study to individuals aged 18 and above, the research ensured adherence to ethical standards, particularly regarding informed consent. Moreover, this specific focus allowed for a nuanced understanding of how PrEP interventions are received among different subsets of the sex worker population, including variations in gender and age.

Additionally, the study's focus on Nakuru town provided a concentrated population for analysis, enabling more targeted and in-depth research. Consequently, the findings from this target population could potentially inform broader strategies for enhancing PrEP uptake and retention among sex workers in other regions with similar characteristics.

3.5.1 Inclusion Criteria

The inclusion criteria for this study were carefully developed to ensure that the participants accurately represented the target population and aligned with the research objectives. To be eligible for participation, individuals had to meet specific requirements. Firstly, participants were required to be 18 years of age or older, adhering to ethical guidelines and legal requirements regarding the involvement of minors in research studies. This criterion was essential to protect vulnerable populations and uphold ethical standards.

Secondly, the study focused exclusively on individuals engaged in sex work within the town of Nakuru. This criterion was crucial to ensure that the research findings were directly relevant to the intended population of interest and reflected the local context. Additionally, participants were required to have been actively involved in sex work within Nakuru for at least six months prior to the study. This criterion aimed to capture the experiences and perspectives of individuals with sufficient exposure to the local sex work industry, enhancing the depth and richness of the data collected.

Furthermore, the study embraced an inclusive approach by welcoming both male and female sex workers to participate. This decision was made to capture a comprehensive understanding of the phenomenon under investigation, as the experiences and challenges faced by sex workers may vary across genders. By including diverse perspectives, the researchers aimed to enhance the generalizability and applicability of the study's findings.

Lastly, and perhaps most importantly, participation in the study was strictly voluntary, and individuals were included only after providing informed consent. This criterion was fundamental to upholding ethical principles and ensuring that participants were not coerced or unduly influenced to participate. The researchers recognized the importance of respecting

individual autonomy and protecting the rights and well-being of the participants throughout the research process.

3.5.2 Exclusion Criteria

Firstly, individuals under the age of 18 were excluded from the study. This criterion was strictly enforced to comply with ethical guidelines and legal regulations regarding the involvement of minors in research studies. Protecting vulnerable populations, such as minors, is a fundamental ethical principle in research, and the researchers adhered to this principle to safeguard the well-being of potential participants.

Secondly, sex workers who had been engaged in the profession within the town of Nakuru for less than six months were excluded from the study. This criterion was implemented to ensure that the participants had sufficient experience and exposure to the local context, which could potentially influence their attitudes, behaviors, and experiences related to the research topic. By excluding those with limited experience, the researchers aimed to capture more accurate and representative data from individuals with a deeper understanding of the local sex work industry.

Furthermore, individuals who did not provide informed consent were automatically excluded from participation in the study. Informed consent is a fundamental ethical requirement in research involving human participants, and the researchers strictly adhered to this principle. Individuals who declined to provide consent, either verbally or in writing, were not included in the study, as their participation would have been a violation of ethical standards and principles of autonomy.

3.6 Sampling Procedures and Techniques

According to Mugenda & Mugenda (2008), a sample population is a subset of people picked from a broader group for data collecting. In this case, a stratified sample strategy was used to determine specific places frequented by sex workers. The streets, clubs, bars were categorized into strata, the strata to be sampled were then identified through random sampling. Subsequently, the snowball sampling technique was used to choose study participants, Sex work is illegal in Kenya and there is a lot of stigma associated with the trade this makes it difficult to identify them and thus the use of snowballing technique. In this study, a sex worker was identified who was the leader of the group, she led the researcher to the next participant and subsequently referred the researcher to other sex workers. This technique worked well because it used sex workers' referrals to connect with other members of the sex worker community in Nakuru Town. Given the nature of the work undertaken by sex workers, the snowballing technique was effective in ensuring adequate data is gathered. Identifying the sex workers who did not line up on the streets was a challenge, therefore, the snowballing technique was effective. The male sex workers in this study were the men who exchange sex for money. Since the majority of MSWs do not stand by the road for clients, the researcher talked to the FSWs who were easily available and sought information about the MSW and where they would be found. The snowballing technique was effective in identifying both the FSWs and the MSWs.

3.7 Sample Population

The Krejcie and Morgan (1970) formula was adopted to calculate the sample size of the study. The formula is as follows:

$$n = \frac{\chi^2 * N * P * (1 - P)}{d^2 * (N - 1) + \chi^2 * P * (1 - P)}$$

Where:

n = required sample size.

χ^2= the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841).

N = the population size.

P = the population proportion (assumed to be .50 since this would provide the maximum Sample size).

D = the degree of accuracy (the margin of error) expressed as a proportion (.05).

Using the Krejcie and Morgan (1970) formula the sample size was 375 respondents. The study adopted disproportionate sampling to ensure that the two strata (MSWs and FSWs) are represented for the study. Following the disproportionate sampling, the sample size presented in

Table 3. 1

Table 3. 1: Sample Size

Sex workers	**Target Population**	**Sample size**
FSW	16,516	370
MSW	197	5
Total	**16,713**	**375**

Source: Field Data

3.8 Construction of Research Instruments

The study employed a structured questionnaire as the primary data collection instrument for gathering quantitative information through face-to-face interviews. This approach ensured the collection of first-hand, primary data, which provided valuable insights into the interplay between the variables under investigation (Cooper & Schindler, 2014). The questionnaire was carefully constructed to address the research objectives and facilitate the systematic collection of relevant data. Furthermore, the use of a structured questionnaire allowed for standardization, enhancing the reliability and comparability of the data collected across different respondents and research assistants.

The questionnaire was divided into five distinct sections, each designed to capture specific information pertinent to the study. Section A focused on gathering demographic data from the respondents, including age, gender, educational level, and other relevant background information. This section aimed to provide a comprehensive understanding of the sample's characteristics and enable subsequent analyses of potential relationships between demographic factors and the variables of interest. Additionally, the demographic data could be used to assess the representativeness of the sample and ensure the generalizability of the study's findings.

Section B concentrated on assessing the prevalence of sex work within the study population. This section was crucial in establishing the representativeness of the sample and ensuring that the data collected accurately reflected the experiences and perspectives of individuals engaged in sex work. Furthermore, the information gathered in this section was used to contextualize and interpret the findings within the specific context of the sex work industry in Nakuru.

Section C delved into the respondents' knowledge and awareness of pre-exposure prophylaxis (PrEP) as an HIV prevention strategy. This section employed a series of statements to which respondents were asked to indicate their level of agreement or disagreement using a closed-ended Likert scale. This approach allowed for the quantification of knowledge levels and facilitated statistical analyses. Additionally, the use of a Likert scale enabled the researchers to capture nuanced variations in respondents' knowledge and attitudes, enhancing the richness of the data collected.

Section D explored the factors associated with PrEP uptake among the study population. By examining various potential determinants, such as accessibility, affordability, and sociocultural influences, this section aimed to identify key barriers and facilitators to PrEP adoption. The information gathered in this section could inform the development of targeted interventions and strategies to promote PrEP uptake among the target population.

Finally, Section E investigated the impact of socioeconomic factors on the uptake of HIV PrEP. This section recognized the potential influence of socioeconomic variables on health-seeking behaviors and aimed to elucidate the interplay between these factors and PrEP uptake within the study population. The findings from this section could contribute to a more comprehensive understanding of the complex dynamics influencing PrEP adoption and inform the development of holistic, context-specific interventions.

3.9 Testing Validity and Reliability

Ensuring the validity and reliability of research instruments is a crucial aspect of conducting rigorous and trustworthy research. Validity refers to the extent to which an instrument accurately measures the intended construct (Cooper & Schindler, 2014). In other words, it

assesses whether the instrument truly captures the concept or phenomenon under investigation. To establish content validity, the researcher sought feedback from experts in the field, who evaluated the extent to which the items, tasks, or questions in the questionnaire adequately reflected the relevant concepts. This expert review process ensured that the research instrument accurately represented the theoretical and conceptual foundations of the study.

Reliability, on the other hand, pertains to the consistency and repeatability of the measurement instrument (Saunders et al., 2007). It assesses the degree to which the instrument yields consistent results across multiple administrations or applications. In this study, Cronbach's Alpha was employed to evaluate the internal consistency of the various scales used in the questionnaire. Cronbach's Alpha is a widely-recognized measure of internal consistency, indicating the extent to which a set of items can be considered cohesive or related to one another.

The value of Cronbach's Alpha ranges from 0 to 1, with higher values indicating greater internal consistency among the items. A coefficient close to 1 suggests that the items on the scale have high internal consistency, while a value closer to 0 implies low internal consistency (Cooper & Schindler, 2014). Cronbach's Alpha was chosen as the preferred measure of internal consistency because it allows for the use of multiple-item measures of constructs, a common practice in social science research.

According to established guidelines, predictive studies involving participants aged 25-50 should aim for a Cronbach's Alpha of at least 0.5, while basic and applied studies are recommended to have a Cronbach's Alpha of at least 0.7 (Bryman, 2016). Considering the nature and objectives of this study, the researcher set a threshold of 0.7 for internal

consistency, ensuring that the research instrument possessed an acceptable level of reliability.

By rigorously testing and ensuring the validity and reliability of the research instrument, the researcher aimed to enhance the credibility and trustworthiness of the study's findings. Valid and reliable instruments are essential for accurately measuring the constructs of interest and drawing meaningful conclusions from the data collected. This attention to validity and reliability not only strengthens the quality of the research but also contributes to the advancement of knowledge and the development of effective interventions and strategies within the field of study.

3.10 Data Collection Methods and Procedures

A pilot study was done in Gilgil town to pretest the questionnaire, this helped in identifying some ambiguity in some questions that were not well understood by the respondents and corrections done before the main data collection. The process of data collection for this study was carefully planned and executed to ensure a high response rate and accurate data. Each completed questionnaire was accompanied by a cover letter that provided an overview of the study and its significance. The cover letter also served to establish credibility and emphasize the importance of the respondents' participation. The researcher personally delivered the survey to the target population, which allowed for direct interaction and increased the likelihood of participation.

To streamline the data collection process, the researcher recruited and trained two research assistants. These assistants were thoroughly educated on the study's goals, objectives, and methodologies, ensuring a consistent and standardized approach throughout the data

collection phase. The research assistants were also briefed on the importance of maintaining professionalism and objectivity during their interactions with respondents. After distributing the questionnaires, the researcher and research assistants remained on-site to assist the respondents in filling them out and addressing any queries or clarifications they might have. The decision to have the researcher and research assistants present during the data collection process was strategic. Due to the nature of the respondents' occupations, it would have been challenging to track them down at a later time for follow-up or clarification. By providing immediate assistance, the researchers aimed to maximize the response rate and ensure the accuracy and completeness of the data collected. Additionally, the presence of the research team allowed for real-time monitoring and quality control of the data collection process. Furthermore, the researchers took the time to brief the participants on the significance of the study and its potential impact. This step was crucial in fostering a sense of investment and commitment among the respondents, which could further contribute to the quality of the data obtained. The briefing also served to establish trust and transparency, reinforcing the importance of providing honest and thoughtful responses to the survey questions.

3.11 Data Analysis Techniques and Procedures

Once the data was collected, it was checked and coded in the SPSS software to facilitate the data analysis. The research utilized both descriptive and inferential statistics. Awareness of PrEP; Individual Factors; Health and Socioeconomic Factors; and Inferential Statistics to Show Correlations between Study Variables. The Likert scale data was tabulated after statistical analysis by mean and standard deviation.

To address the first and second objective, descriptive statistics was adopted. The data presented in numbers and percentage to show the proportion and the level of awareness about PrEP uptake among the sex workers in Nakuru County. To address the second and third research question both descriptive and inferential statistics was adopted.

The chi-square statistic was used. When there is no association between the two variables, the chi-squared statistic provides a single value that indicates the magnitude of the discrepancy.

To show the relationship of the variables under investigation, I used a logistic regression model. See below for a diagram of the regression approach that was employed:

$$\mathbf{Y=\beta_0+\beta_1X_{1+}\ \beta_2X_{2+}\ \beta_3X_{3+}\ \beta_4X_{4+}\varepsilon}$$

Y= Retention among sex workers

β_0 = Constant

X_1 = Knowledge of PrEP

X_2 = Individual factors

X_3 = Health factors

X_4 = Social economic factors

β_1- β_4 = The regression co-efficient or change introduced in Y by each independent variable.

ε is the random error term accounting for other variables not captured in the model that influences HIV PrEP uptake and retention among sex workers.

3.12 Ethical Consideration

Ethical requirements were strictly followed before and during primary data collection. The Institutional Scientific Ethical Review Committee (ISERC) at Mount Kenya University granted ethical clearance, reference number ERC 1710. Approvals were also obtained from the National Commission for Science, Technology, and Innovation (NACOSTI), license number P/23/25381, and the Department of Health in Nakuru County. These approvals ensured that the research adhered to ethical standards and protected the rights and well-being of the participants.

Prior to data collection, the researcher and research assistants provided participants with detailed information about the study objectives. This briefing aimed to ensure participants had the necessary knowledge to engage with the research instruments and make informed decisions about participation. Participants were informed that their involvement was entirely voluntary, and they could withdraw at any time without consequences. The briefing also established trust and rapport with the participants, creating a comfortable environment for data collection.

The researcher and assistants assured participants that their responses would remain confidential and anonymous, used solely for research purposes. Participants were instructed not to provide any personally identifiable information, such as names or contact details. This measure protected participants' privacy and confidentiality. The confidentiality assurance was crucial for encouraging honest and accurate responses from the participants.

Consent was obtained from all participants before their involvement. The purpose, procedures, potential risks, and benefits of the research were explained, and participants' concerns were addressed. Participants were given the opportunity to make an informed

decision about participation, and their consent was documented. The consent process was conducted in a clear and understandable manner to ensure participants fully comprehended the implications of their participation.

Throughout the research process, the highest ethical standards were maintained, prioritizing participants' well-being, dignity, and rights. Ethical considerations were integral to the research design, execution, and reporting, ensuring adherence to the principles of respect, beneficence, and justice. The ethical approach adopted contributed to the integrity of the research and the advancement of knowledge in an ethical and responsible manner.

CHAPTER FOUR
RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

This chapter covers the investigation's findings, beginning with details on the response rate and progressing to the participants' sociodemographic profiles. It then investigates the percentage of sex workers in Nakuru town who began and sustained HIV PrEP, their understanding of HIV PrEP, and the factors impacting the starting and continuous use of HIV PrEP among these persons.

4.2. Response Rate

This study was undertaken in Nakuru town, in Nakuru East sub county, Nakuru County, Kenya. The researcher met with research subjects at their favorite hangouts, which are scattered throughout the town. This being interviewer, administered questionnaire a 100-response rate was recorded. Nevertheless, some items were not responded.

4.3 Sociodemographic Information

Majority of the respondents who were interviewed were female 371 (98.9%) five (1.06%) males were available for the study. This can be attributed to the fact that this study was based in African context where men, even though they are engaging in the trade may not be willing to talk about it. As a matter of fact, while the researcher contacted many male partners during the data collection, only four were willing to talk to the researchers.

The participation group was skewed towards a younger population, with an average age of 22 years and a standard deviation of 3.45 years, with 82.7% of respondents under 40 years old and only a small minority (1.3%) older than 50.

Eakle et al. (2017) discovered that the vast majority of commercial sex workers were between the ages of 20 and 45. This increase is consistent with observations that younger people are more sexually active (Franchino, 2021), more prone to seek new experiences, and have not yet reached the financial stability that would prevent them from engaging in sex work (Fedina, 2021).

In regard to their marital status, majority of the respondents were either single, or separated from their spouse, or divorced. Cumulatively, respondents with these characteristics accounted for 98.4% of the respondents included in the study. Married respondents accounted for 1.6% of the respondents.

In regard to respondent education attainment, 88.3 of the respondents had educational attainment of secondary school and below. Only 11.7% had achieve tertiary level of education.

In terms of income source, the majority of respondents (56%) reported that they worked as casual laborers. Only 4.5% were formally employed. Table 4. 1 displays the distribution of the respondents' sociodemographic characteristics.

Table 4. 1: Respondent's social demographic information

	Frequency	Percent	Valid Percent
age of the respondent			
20-29	176	46.9	46.9
30-39	134	35.7	35.7
40-49	60	16.0	16.0
50 years and above	5	1.3	1.3
Total	375	100.0	100.0
Education attainment			
primary level	144	38.4	38.4
secondary level	187	49.9	49.9
Tertiary level	44	11.7	11.7
Total	375	100.0	100.0
Marital status			
Married	6	1.6	1.6
Single	232	61.9	61.9
Separated	61	16.3	16.3
Divorced	76	20.3	20.3
Total	375	100.0	100.0

A chi square test was used to establish whether socio demographic characteristics were associated with the adoption of PrEP by the respondent.

Table 4. 2: Chi Square test

		If the respondent has ever taken prep				
age of the respondent		yes	No	χ2	df	P-Value
	20-29	87	89	18.4	374	p = 0.000
	30-39	91	43			
	40-49	29	31			
	50 years and above	0	5			
Total		207	168	375		
		yes	No			
Marital status				χ2	df	P-Value
Married		3	3	16.30	374	p = 0.00
Single		87	145			
Separated		54	7			
Divorced		63	13			
Total		207	168			
Gender		Yes	No	**χ2**	**df**	**P-Value**
Male		5	0	17.24,	374	p = 0.000
Female		207	160			
Total		215	160			
Education		Yes	No	χ2	df	P-Value
Primary level		56	88	53.4,	374	p = 0.000
Secondary level		138	49			
Tertiary level		13	31			
Total		207	168			

In Table 4. 2 Chi square test shows statistically significant differences in all tests, including age (X^2 (3, N = 375) = 18.4, p < 0.001), gender (X^2 (1, N = 375) = 17.24, p < 0.001), education (X^2(2, N = 375) = 53.4, p < 0.001), and marital status (X^2(2, N = 375) = 16.3, p < 0.001.

These findings are consistent with research undertaken in other regions. For example, research in the United States discovered that 64% of 595 young women aged 20 to 29 were

willing to use PrEP. Similarly, a study of Kenyan and South African girls and women aged 14 to 24 found unequivocal interest in PrEP (Mark et al., 2014).

The majority of participants in this study were women, which could be attributed to men's reluctance to interact with research assistants given the study's patriarchal context. Furthermore, the stigma associated with the sex trade in Kenya may dissuade men from sharing information about their involvement in the profession. Another large US study of 1,509 women reported a higher propensity for PrEP use among women at higher risk of HIV who had less education, had several sexual partners, and were affected by supportive provider and peer norms about PrEP (Wingood et al., 2013).

4.4 Duration as a sex worker

On duration the respondents have been commercial sex workers, majority of the respondents (62.7%) have been in the trade for between one and five years. Only 9.1 % have been in the trade for longer than 11 years. Table 4. 3 below shows the distribution of the respondents' duration of stay as commercial sex work trade.

Table 4. 3: Duration in commercial sex work trade

Duration as a sex worker			
1-5 years	235	62.7	62.7
6-10 year	106	28.3	28.3
11-15 years	34	9.1	9.1
Total	375	100.0	100.0

This study found that the majority of the respondents had been in commercial sex work trade for between 1 and 5 years. Duration of time in the trade was positively correlated with use of PrEP, X^2 (2, N = 375) =13.4, p = 0.002. Sex workers who were new to the industry were shown to be more likely to adopt PrEP than their more experienced counterparts. This observation is consistent with findings from other studies. For example, Bowring et al., (2020) investigated PrEP use among commercial sex workers to prevent mother-to-child HIV transmission during unplanned pregnancies and discovered that PrEP adherence decreased as time spent in sex work increased. A similar tendency was observed in a study conducted by O'Connell (2021), which investigated the effects of PrEP counseling on knowledge and attitudes concerning PrEP among women seeking family planning services. The short duration in commercial sex work may be associates with the fact that the context in which the trade happen in Kenyan is not friendly as it is not legally allowed (Barrientos et al., 2019), and the fact that the trade is seen as misnomer in the social context (Adeoti et al., 2021).

Duration of time as sexual commercial workers has been related to both risk perception and utilization of technology aimed at reducing the risk. Numerous studies have looked into the possibilities of risk compensation, such as interacting with additional partners or reduced condom use, as a result of PrEP. Across trials, most individuals did not anticipate that receiving PrEP would increase their risk-taking behavior. This is consistent with the findings of a meta-analysis on PrEP impact, which discovered that PrEP use did not significantly affect sexual habits (Fonner, 2016).

4.5 Proportion of sex workers initiated and retained on HIV pre-exposure prophylaxis

The study evaluated the of sex workers initiated and retained on HIV PrEP in Nakuru town. In this regard, respondents were asked to indicate whether they had ever used HIV prophylactic drugs. In this regard 207 (55.2%) indicated that they had used while 168 (44.8%) indicated that they had not. Figure 4.1 below indicate the distribution of PrEP use by the respondents.

Studies done elsewhere has indicated that the level of adherence to PrEP changes with time. For example, study on PrEP use among commercial sex workers in South Africa indicated varying adherence rates ranging from 70% to 85%. In contrast, more than 90% of participants reported taking their medications on a daily basis throughout the early phases of antiretroviral therapy (Eakle et al., 2017). The same study indicates a decline in retention over time.

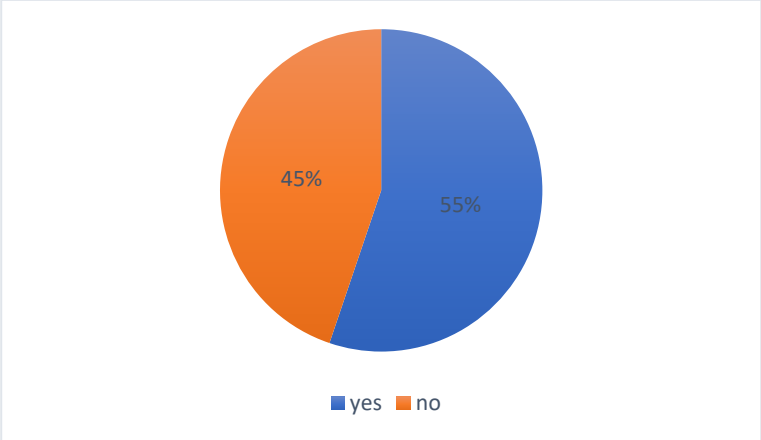


Figure 4. 1: Distribution of PrEP use by the respondents

A further analysis was done to determine the percentage of those who have ever taken PrEP that are currently taking the drug on a regular basis. Out of 207 (55%) who had ever taken PrEP only (39) 19% who reported to currently taking PrEP

The Figure 4. 2: Comparison of those who have ever taken PrEP and respondents who continue to take the Drugs

below shows the comparison.

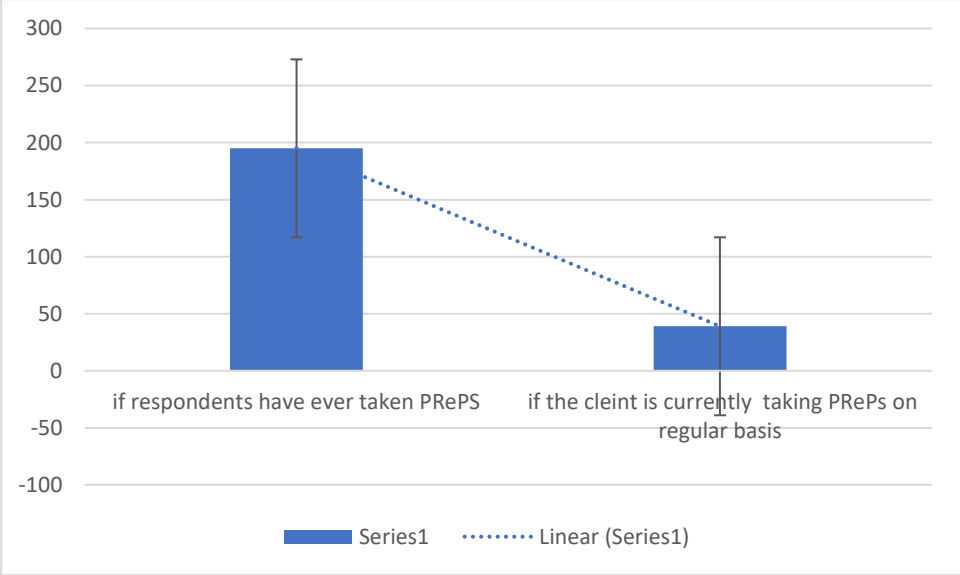


Figure 4. 2: Comparison of those who have ever taken PrEP and respondents who continue to take the Drugs

The findings above shows that effective retention rate from this self-reported survey is 19%. Findings in the current study corresponds to findings elsewhere. In three separate studies in China, PrEP awareness was examined among a total of 2,778 female sex workers, with an

awareness rate ranging from 12% to 50% and a reported usage rate above 50% (Peng et al., 2017; Ye et al., 2014; Zhao et al., 2011). When exposed to the notion of PrEP, FSWs worldwide expressed a strong initial interest in its implementation in seven distinct studies. Nonetheless, this enthusiasm tended to fade over time (Eisingerich et al., 2012; Galea et al., 2011; Mack et al., 2014; Peng et al., 2017; and Qiu et al., 2012). Furthermore, sex workers who had not used PrEP were asked about their reasons for abstaining, with the results shown in the table below. Table 4. 4 shows the distribution of the responses from the respondents.

Table 4. 4: Reasons for not taking PrEP

	Frequency	**Percent**
I have never heard about it	27	6.4
I do not think that am at risk of acquiring HIV	35	15.7
taking PrEP is cumbersome	39	8.0
I don't like taking medicine	67	35.5
Total	**168**	**65.6**

In this study several reasons were given for nonuse of the drugs including lack of awareness and lack of information among other things. These corresponds with studies done elsewhere. In a clinical trial focusing on women, the low uptake of PrEP was partly attributed to its perceived ineffectiveness, reluctance of taking a daily pill, and negative feedback from colleagues, partners, and community members, which led to women choosing not to take the medication (Corneli et al., 2016). In contrast, adherence and risk reduction measures that included external prompts, reminders, and assistance were observed to increase its use (Corneli et al., 2015).

Pillay et al., (2020) discovered in their South African research of people who were not taking

oral PrEP that the major obstacle to adoption was a lack of an offer from healthcare professionals. Among individuals who were not given oral PrEP, 56% (n = 27) still considered themselves at risk for HIV. Meanwhile, 43% (n = 37) of those provided oral PrEP chose not to use it, with the most common reason being a fear of negative effects (41.7%, n=15). In this study, during interviews, all participants who had never used oral PrEP were aware of it, and the majority had received PrEP counseling. Those counseled described a variety of reasons for not starting, including a lack of time on the counseling day or a need for additional information from a PrEP-using acquaintance. Five out of nine "never users" reported an interest in using oral PrEP in the future, with some concerned about potential side effects.

Majority of the respondents indicated drop in facilities as the main source of PrEP drugs. Other main sources of PrEP included government facility, from friends and none directly purchased from chemist in town. Figure 4. 3 below shows the distribution of the main sources of the drugs for the respondents.

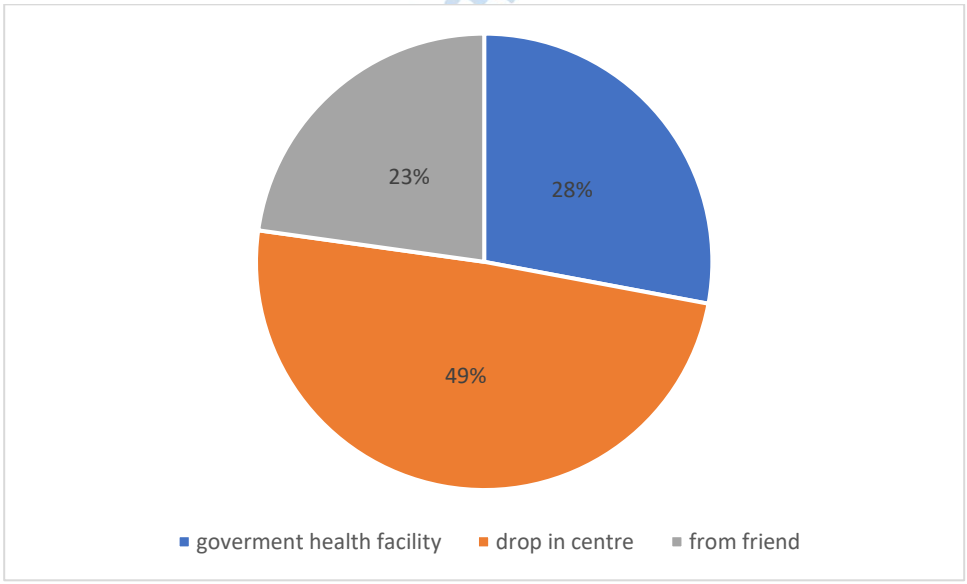


Figure 4. 3: distribution of the main sources of the drugs for the respondents

4.6 Awareness on HIV Pre-Exposure Prophylaxis among sex workers in Nakuru town.

The study evaluated the level of awareness on HIV PrEP among sex workers in Nakuru town. The results are presented in Table 4. 5 below.

Table 4. 5: Awareness on HIV PrEP among sex workers in Nakuru town

awareness of PrEP	SD	D	U	A	SA	MEAN	STD
The public hospitals in Nakuru town normally hold campaigns educating people on the importance of PrEP	0%	18.9%	0%	19.5%	37.1%	3.8	1.5
I learnt about PrEP from my friends	0%	22.7%	0%	25.3%	40.3%	3.8	1.2
The private hospitals offer education on PrEP	0%	46.7%	75.5%	0%	33.3%	3.2	1.3
Information on PrEP is readily available	0%	29.6%	19.7%	0%	37.1%	3.5	1.3
Information on the guidelines of using PrEP is freely available to sex workers in Nakuru town	0%	24.5%	16.6%	21.9%	37.1%	3.7	1.2
The sex workers in Nakuru town have information on PrEP	3.5%	24.5%	4.3%	9.1%	41.6%	3.6	1.3
NGOs normally educate sex workers on the use of PrEP	3.5%	39.7%	11.7%	6.9%	38.1%	3.4	1.4

The majority of participants in this study had an average score of 3.2 out of a possible 5, indicating high awareness. This is consistent with the findings of many other researchers conducted around the world. While there is substantial support for PrEP among many populations, numerous studies show a significant lack of understanding regarding PrEP, with

actual use largely limited to trial settings. When exposed to PrEP, the vast majority of participants in these studies acknowledged its potential value as a prophylactic measure for themselves and others. In the United States, research indicated that women's understanding of PrEP varied greatly, ranging from essentially nonexistent (Auerbach, 2012) to approximately 8% familiar with it (Harris et al., 2011). Studies (Prem et al, 2013, Ye et al 2016, and Zhao et al 2011) have shown that high level of awareness tend to increase utilization of PrEP

4.7 Factors associated with HIV Pre-Exposure Prophylaxis uptake and retention among sex workers in Nakuru town.

The third objective of the study was to determine factors associated with HIV PrEP uptake and retention among sex workers in Nakuru town. To determine this a set of questions with items testing various factors were asked to the respondents in a Likert scale of 1 to 5 The results were presented in **Table 4. 6** below.

Table 4. 6: Individual factors associated with HIV PrEP uptake and retention among sex workers in Nakuru town

Individual factors	SD	D	U	A	SA	MEAN	STD
I can freely talk about my uptake of PrEP	10%	17.9%	7%	15.5%	50.%	2.8	1.1
I don't think I need PrEP	11%	27.7%	13.3%	29.3%	18.7%	1.3	1.2
I believe I am too young to take PrEP	28.3%	33.7%	21.5%	10%	7%	2.2	1.3
I believe I am too old to take PrEP	0%	29.6%	19.7%	0%	37.1%	3.5	1.3
I think PrEP is a good and ensures the protection against HIV.	0%	23.5%	16.6%	24.9%	37.1%	1.7	1.2

The uptake of PrEP is prevalent among female sex workers	3.5%	14.5%	4.3%	9.1%	42.6%	3.6	1.3
The uptake of PrEP is prevalent among male sex workers	3.5%	39.7%	11.7%	6.9%	38.1%	3.4	1.4
Married sex workers are more likely to take PrEP as compared to unmarried sex workers	13.5%	24.5%	4.3%	9.1%	41.6%	3.6	2.3

Some of the individual factors that respondents scored poorly included ability to freely talk about my uptake of PrEP Mean score of 2.8 out of possible 5) and attitude about PrEP (mean score of 1.3 out of possible 5). Majority of the respondents were of the opinion that the uptake of PrEP is prevalent among male sex workers (mean score of 3.6), and that married sex workers are more likely to take PrEP as compared to unmarried sex workers (mean score of 3.4).

Table 4. 7: Health care system factors associated with HIV PrEP uptake and retention among sex workers in Nakuru town

Health Care System Factors							
The healthcare professions in the Government medical institutions are receptive to offering PrEP education to sex workers	13.5%	24.5%	4.3%	9.1%	42.6%	4.6	1.6
The healthcare professions in the non-government medical institutions are receptive to offering PrEP education to sex workers	2.5%	21.5%	4.2%	6.1%	41.6%	2.1	1.7

Sex workers willing to take PrEP are usually looked down on by healthcare professions	3.8%	22.5%	4.3%	2.1%	33.5%	1.6	1.4
PrEP is easily accessible to sex workers in Nakuru town	23.5%	21.5%	4.3%	19.1%	44.6%	2.5	1.2
Sex workers in Nakuru town often visit medical facilities	1.5%	22.5%	5.3%	7.8%	41.4%	3.9	14

In regard to health system factors affecting uptake of PrEP among sex workers, majority of the respondents were of the opinion that healthcare workers were very open to educating on PrEP (mean Score 4.6 out of the possible five), availability of healthcare facility to support PrEP program followed with a mean a score of 3.6 out of the possible 5). The general observation from the data is that Nakuru healthcare system as it is currently supporting PrEP program.

To determine social and economic factors affecting the uptake of PrEP among sex workers, a set of three questions were used to determine this. The following table indicate the finding of the study.

Table 4. 8: Socio-Economic factors associated with HIV PrEP uptake and retention among sex workers in Nakuru town

Socio-Economic factors							
PrEP is offered for free in Nakuru County	3.5%	21.5%	3.3%	9.7%	51.6%	3.6	1.2
Sex workers in Nakuru town face stigma from the community members	3.5%	14.5%	2.6%	6.2%	43.2%	3.4	1.9

The sex workers in Nakuru town do not go for PrEP since they are sidelined by other patients.	3.5%	24.5%	4.3%	9.1%	41.6%	3.1	1.6

A further an analysis using multiple logistic regression indicated that there was a collective significant effect between the awareness, health system factors, socio economic and individual factors and use of PrEP among sex workers P, ($F(1, 394) = 20.82$, $p < .001$, $R2 = .32$).

The Table 4. 9:

below shows a Step wise Logistic regression on factors influencing PrEP use among sex workers.

Table 4. 9:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.161[a]	.026	.021	.470	.026	5.263	1	197	.023
2	.293[b]	.086	.077	.457	.060	12.856	1	196	.000
3	.393[c]	.154	.141	.441	.068	15.699	1	195	.000
4	.598[d]	.357	.344	.385	.203	61.299	1	194	.000

a. Predictors: (Constant), awareness

b. Predictors: (Constant), awareness, health system factors

c. Predictors: (Constant), awareness, health system factors, socio economic

d. Predictors: (Constant), awareness, health system factors, socio economic individual factors

As can be seen above based on R Square Change, put together, the four predictor variables explained 20.3% of variation on PrEP retention factors that influences the respondents taking PrEP On further analysis on each of the predictor factors, contribution of awareness significantly predicted PrEP use among commercial sex workers, □= -.34, f (197) = 5.263, $p < .02$. awareness significantly explained a significant proportion of variance in PrEP use among commercial sex workers, $R^2 = .026$, F (1, 196) = 5.263, $p < .005$. These finding are similar to a study conducted by Pacific et al., (2019) that sort to determine HIV PrEP awareness and acceptability among trans women the US. In the study, elevated level of awareness complimented with services availability, promoted the uptake or PrEP among the women (Pacifica et al., 2019).

Contribution of health system factors significantly predicted PrEP use among commercial sex workers, b= 34, f (197) = 12.86, $p < .005$. Health system factors significantly explained a significant proportion of variance in PrEP use among commercial sex workers, $R^2 = .034$, F (1, 196) = 12.96, $p < .005$. Consistent with the findings of this study, Trisha et al., (2017) sought to gather insights on PrEP adoption and ongoing engagement in care among HIV-affected communities, particularly young men who have sex with men (YMSM) in the Deep South. This study discovered that a variety of factors influenced PrEP use and retention, including structural issues such as the cost and availability of financial aid for medications and healthcare services, social considerations such as stigma and relationship dynamics, behavioral elements such as sexual risk behaviors, and clinical aspects related to both perceived and actual side effects of PrEP (Trisha et al., 2017).

Contribution of socioeconomic factors significantly predicted PrEP use among commercial sex workers, □= -.24, F (197) = 15.731, p < .02. socioeconomic factors significantly explained a significant proportion of variance in PrEP use among commercial sex workers, R^2 = .0008, F (1, 196) = 15.721, p < .005. Contribution of individual factors significantly predicted PrEP use among commercial sex workers, □= -.34, f (197) = 61.30, p < .02. awareness significantly explained a significant proportion of variance in PrEP use among sex workers, R^2 = 0.135, F (1, 196) = 61.22, p < .005. these findings are similar to finding from a study by Gliik et al., (2020) that sort to determine individual factors that influence the uptake of Preps among commercial sex workers. The study's multivariable analysis revealed no significant changes in PrEP uptake based on demographic or socioeconomic characteristics. The findings suggest that a combination of objective and subjective assessments of HIV risk, as well as psychological factors such as stigma, pharmaceutical beliefs, and self-efficacy, may impact PrEP initiation decisions (Sarit et al., 2019). These findings are consistent with research undertaken in other situations. Lankowski (2019) used multivariable logistic regression to identify characteristics that independently affect retention over six months. It was observed that various factors influence retention rates, including sexual orientation, the kind of healthcare services, and knowledge levels. Notably, people who got their medications from their primary care physicians were more likely to remain engaged in care.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter concludes the study. It begins with a succinct summary of the important findings, followed by the drawn conclusions. The study's findings are then used to make suggestions. The chapter finishes by outlining prospective areas for further research and identifying the gaps discovered throughout the investigation. Here is a summary of the key findings in accordance with the study's aims.

5.2 Summary of the findings

5.2.1 Proportion of sex workers initiated and retained on HIV pre-exposure prophylaxis

The first objective sought to evaluate the proportion of sex workers initiated and retained on HIV PrEP in Nakuru town. In this regard, respondents were asked to indicate whether they had ever used HIV prophylaxis drugs. In this regard 52.2% indicated that they had used while 44.8% indicated that they had not. In this study several reasons were given for nonuse of the drugs including, lack of awareness, among other things. The finding in the study corresponded with studies elsewhere which indicated a low intake of PrEP among sex workers.

Further, this study found that even among the respondents who had used PrEP, only a small proportion 20% indicated to regularly take PrEP, this finding was in agreement with studies done elsewhere that demonstrated that retention and adherence to PrEP declines with time and that it is influenced by many factors.

In regard to the source of PrEP, majority of the respondents indicated drop in facilities as the main source of PrEP drugs. Other main sources of PrEP included government facility, from friends and none directly purchased from chemist in town.

5.2.2 Awareness on HIV Pre-Exposure Prophylaxis among sex workers in Nakuru town.

Secondly, the study evaluated the level of awareness on HIV PrEP among sex workers in Nakuru town. In this study there was generally a high level of awareness having a mean of 3.2 out of the possible 5 in the Likert scale. The findings of this study are consistent with those of countless other studies conducted around the globe. While PrEP is widely supported across demographics, there is still a significant information gap, and its real-world applicability is frequently confined to anecdotal evidence outside of scientific trials. Nonetheless, once people are told about PrEP, a significant proportion of them see it as a helpful preventative measure, both for themselves and for others.

5.2.3 Factors associated with HIV Pre-Exposure Prophylaxis uptake and retention among sex workers in Nakuru town.

Thirdly, the study assessed the factors associated with HIV PrEP uptake and retention among sex workers in Nakuru town. To achieve this, several factors including awareness, health system factors, socio economic individual factors, were evaluated through the use of a set of questions in a Likert scale touching on each of the factor. The data was presented in frequency distribution tables.

A further analysis using multiple logistic regression indicated that there was a collective significant effect between the awareness, health system factors, socio economic individual factors and use of PrEP among sex workers. a further analysis showed that, put together, the four predictor variables explained 20.3% of variation on PrEP retention factors that influences the respondents taking PrEP

5.3 Conclusion

The study looked at the proportion of sex workers initiated and retained on HIV PrEP in Nakuru town. In this regard, respondents were asked to indicate whether they had ever used HIV prophylaxis drugs. In this regard 52.2% indicated that they had used while 44.8% indicated that they had not. Further, this study found that even among the respondents who had used PrEP, only a small proportion 20% indicated to regularly take PrEP In this regards the study concluded that there was low PrEP and retention was poor.

The study also evaluated the level of awareness on HIV PrEP among sex workers in Nakuru town. Response to Likert questions indicated a high level of awareness. The study concluded that respondents had a high-level awareness.

Lastly, the study evaluated the factors associated with HIV PrEP uptake and retention among sex workers in Nakuru town. To achieve this, several factors including awareness, health system factors, socio economic individual factors, were evaluated through the use of a set of questions in a Likert scale touching on each of the factor. The data was presented in frequency distribution tables.

A further analysis using multiple logistic regression indicated that there was a collective significant effect between the awareness, health system factors, socio economic individual factors and use of PrEP among sex workers. a further analysis showed that, put together, the four predictor variables explained 20.3% of variation on PrEP retention factors that influences the respondents taking PrEP. The study concluded that PrEP uptake and retention is influenced by an array of factors.

5.4 Recommendations

1. On uptake and retention of PrEP, the study recommends provision of education in regard to consistency of PrEP use among sex workers, by the department of health.
2. While the rate of awareness is high among the respondents, the study recommends continuous education on PrEP by the health department to keep the level of awareness high
3. In regard to factors influencing the utilization of PrEP among sex workers, an array of factors that influence PrEP Use were identified. The study recommends sectoral approach to address the factors

5.5. Area of further study

In this study only few male sex workers volunteered information. Consequently, this study was highly biased towards female. Therefore, we recommend a multivariate study on factors influencing utilization of PrEP specifically among male sex workers.

Further this study focused on whether the clients utilized or did not utilize PrEP s. A study focusing on commodity and the PrEP services may help understand client's commodity preference and the level of satisfaction with the services.

REFERENCES

Adams, J., Khan, H. T., & Raeside, R. (2014). *Research methods for business and social science students*. SAGE Publications India.

Adepoju, P. (2021). *Africa's success in rapidly rolling out HIV prevention measure, PrEP*. DEVEX. Retrieved from https://www.devex.com/news/africa-s-success-in-rapidly-rolling-out-hiv-prevention-measure-PrEP -99070.

Adeoti, A. O., Desalu, O. O., & Oluwadiya, K. S. (2021). Sexual practices, risk perception and HIV self-testing acceptability among long-distance truck drivers in Ekiti State, Nigeria. *Nigerian Postgraduate Medical Journal*, *28*(4), 273-277.

Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179–211.

Ajzen, I., & Madden, T. J. (1986). Prediction of goal-directed behavior: Attitudes, intentions, and perceived behavioral control. *Journal of Experimental Social Psychology*,*22*, 45,374

Anyona, M. O. (2019). *Determinants of Continuation on Pre-exposure Prophylaxis: A Case of Nairobi County, Kenya* (Doctoral dissertation, University of Nairobi).

Auerbach, J. D., Kinsky, S., Brown, G., & Charles, V. (2015). Knowledge, attitudes, and likelihood of PrEP (PrEP) use among US women at risk of acquiring HIV. *AIDS patient care and STDs*, *29*(2), 102-110.

Baeten JM., & McDonnell, D. (2018). *antiretroviral prophylaxis for HIV prevention in heterosexual men and women.* 367(5):399–410.

Begnel, E. R., Escudero, J., Mugambi, M., Mugwanya, K., Kinuthia, J., Beima-Sofie, K., ... & Pintye, J. (2020). High PrEP awareness and willingness to pay for PrEP among

young adults in Western Kenya: results from a population-based survey. *International journal of STD & AIDS*, *31*(5), 454-459.

Begnel, E. R., Escudero, J., Mugambi, M., Mugwanya, K., Kinuthia, J., Beima-Sofie, K., ... & Pintye, J. (2020). High PrEP awareness and willingness to pay for PrEP among young adults in Western Kenya: results from a population-based survey. *International journal of STD & AIDS*, *31*(5), 454-459.

Beyrer, C., Crago, A. L., Bekker, L. G., Butler, J., Shannon, K., Kerrigan, D., ... & Strathdee, S. A. (2015). An action agenda for HIV and sex workers. *The Lancet*, *385*(9964), 287-301.

Barrientos, S., Bianchi, L., & Berman, C. (2019). Gender and governance of global value chains: Promoting the rights of women workers. *International Labour Review*, *158*(4), 729-752.

Bryman, A. (2016). *Social research methods*. Oxford university press.

Bowring, A. L., Ampt, F. H., Schwartz, S., Stoové, M. A., Luchters, S., Baral, S., & Hellard, M. (2020). HIV pre-exposure prophylaxis for female sex workers: ensuring women's family planning needs are not left behind. *Journal of the International AIDS Society*, *23*(2), e25442.

Catania, J. A., Kegeles, S. M., & Coates, T. J. (1990). Towards an understanding of risk behavior: An AIDS risk reduction model (ARRM). *Health education quarterly*, *17*(1), 53-72.

Cooper, D., & Schindler, P. (2014). *Business research methods* (10th ed.). New York, McGraw-Hill/Irwin.

Croucher, S. M. (2015). *Understanding Communication Theory: A Beginner's Guide*. Routledge.

Djomand, G., Bingham, T., Benech, I., Muthui, M., Savva, H., Alamo, S., ... & Mital, S. (2020). Expansion of HIV preexposure prophylaxis to 35 PEPFAR-supported early program adopters, October 2016–September 2018. *Morbidity and Mortality Weekly Report*, *69*(8), 212.

Duncan, D. T., Hickson, D. A., Goedel, W. C., Callander, D., Brooks, B., Chen, Y. T., ... & Schneider, J. A. (2019). The social context of HIV prevention and care among black men who have sex with men in three US cities: the neighborhoods and networks (N2) cohort study. *International journal of environmental research and public health*, *16*(11), 1922.

Faini, D., Munseri, P., Sandstrom, E., Hanson, C., & Bakari, M. (2022). Awareness, Willingness and Use of HIV PrEP Among Female Sex Workers Living in Dar-es-Salaam, Tanzania. *AIDS and Behavior*, 1-9.

Fedina, L., Williamson, C., & Perdue, T. (2019). Risk factors for domestic child sex trafficking in the United States. *Journal of interpersonal violence*, *34*(13), 2653-2673.

Glick, J. L., Russo, R., Jivapong, B., Rosman, L., Pelaez, D., Footer, K. H., & Sherman, S. G. (2020). The PrEP care continuum among cisgender women who sell sex and/or use drugs globally: a systematic review. AIDS and Behavior

Gombe, M. M., Cakouros, B. E., Ncube, G., Zwangobani, N., Mareke, P., Mkwamba, A., ... & Prust, M. L. (2020). Key barriers and enablers associated with uptake and continuation of oral PrEP (PrEP) in the public sector in Zimbabwe: Qualitative

perspectives of general population clients at high risk for HIV. *PLoS One*, *15*(1), e0227632.

Golub, S. A., Fikslin, R. A., Goldberg, M. H., Peña, S. M., & Radix, A. (2019). Predictors of PrEP uptake among patients with equivalent access. *AIDS and Behavior*, *23*, 1917-1924.

Grant RM, & Lama JR, (2019). Pre exposure chemoprophylaxis for HIV prevention in men who have sex with men.; 363: 2587–2599

Hensen, B., Machingura, F., Busza, J., Birdthistle, I., Chabata, S. T., Chiyaka, T., ... & Cowan, F. M. (2021). How can we support the use of oral PrEP among young women who sell sex? A PrEP cascade analysis. *JAIDS Journal of Acquired Immune Deficiency Syndromes*, *88*(1), 45-56.

Jackson-Gibson, M., Ezema, A. U., Orero, W., Were, I., Ohiomoba, R. O., Mbullo, P. O., & Hirschhorn, L. R. (2021). Facilitators and barriers to HIV PrEP (PrEP) uptake through a community-based intervention strategy among adolescent girls and young women in Seme Sub-County, Kisumu, Kenya. *BMC public health*, *21*(1), 1-13.

Jana, S., Ray, P., Roy, S., Kadam, A., Gangakhedkar, R. R., Rewari, B. B., ... & Becker, M. L. (2021). Successful integration of HIV pre-exposure prophylaxis into a community-based HIV prevention program for female sex workers in Kolkata, India. *International journal of STD & AIDS*, *32*(7), 638-647.

Jayakumaran, J. S., Aaron, E., Gracely, E. J., Schriver, E., & Szep, Z. (2016). Knowledge, attitudes, and acceptability of PrEP among individuals living with HIV in an urban HIV clinic. *PloS one*, *11*(2), e0145670.

Kagaayi, J., Batte, J., Nakawooya, H., Kigozi, B., Nakigozi, G., Strömdahl, S. & Serwadda, D. (2020). Uptake and retention on HIV pre-exposure prophylaxis among key and priority populations in South-Central Uganda. *Journal of the International AIDS Society*, *23*(8), 25588.

Kiragu M. (2016). *PrEP Roll-out in Kenya. Oral presentation at the International AIDS Conference;* Durban South Africa.

Krakower, D., Maloney, K. M., Powell, V. E., Levine, K., Grasso, C., Melbourne, K., ... & Mayer, K. H. (2019). Patterns and clinical consequences of discontinuing HIV preexposure prophylaxis during primary care. *Journal of the International AIDS Society*, *22*(2), e25250.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and psychological measurement*, *30*(3), 607-610.

Laborde, N. D., Kinley, P. M., Spinelli, M., Vittinghoff, E., Whitacre, R., Scott, H. M., & Buchbinder, S. P. (2020). Understanding PrEP persistence: provider and patient perspectives. *AIDS and Behavior*, *24*(9), 2509-2519.

Lancaster, K. E., Lungu, T., Bula, A., Shea, J. M., Shoben, A., Hosseinipour, M. C., ... & Miller, W. C. (2020). Preferences for PrEP service delivery among female sex workers in Malawi: a discrete choice experiment. *AIDS and Behavior*, *24*(5), 1294-1303.

Lankowski, A. J., Bien-Gund, C. H., Patel, V. V., Felsen, U. R., Silvera, R., & Blackstock, O. J. (2019). PrEP in the real world: predictors of 6-month retention in a diverse urban cohort. *AIDS and Behavior*, *23*, 1797-1802.

Makhakhe, N. F. (2021). *Let's talk about pre-exposure prophylaxis: a participatory HIV prevention intervention with and for female sex workers in Durban, South Africa* (Doctoral dissertation).

Martin, V. O., Tesha, N. A., & Sunguya, B. F. (2023). Uptake of oral HIV pre-exposure Prophylaxis (PrEP) and Associated Factors among Female Sex Workers in Tanga, Tanzania. *Viruses*, *15*(10), 2125.

Masyuko, Mukui, Njathi, Kimani, Oluoch, Wamicwe, & Cherutich, (2018). PrEP rollout in a national public sector program: the Kenyan case study. *Sexual health*, *15*(6), 578-586.

McKinnon L.R. & Ireri N. (2019). High HIV risk in a cohort of male sex workers from Nairobi, *Kenya. Sex Transm Infect*.; 90: 237-242

Ministry of Health (MOH) (2014a). *Guidelines on Use of Antiretroviral Drugs for Treating and Preventing HIV Infection in Kenya.* Available at: https://aidsfree.usaid.gov/sites/default/files/tx_kenya_2014.pdf.

Mpirirwe, R., Segawa, I., Ojiambo, K. O., Kamacooko, O., Nangendo, J., Semitala, F. C., ... & Mujugira, A. (2024). HIV pre-exposure prophylaxis uptake, retention and adherence among female sex workers in sub-Saharan Africa: a systematic review. *BMJ open*, *14*(4), e076545.

Mugenda, A. G., & Mugenda, A. (2008). Social science research: Theory and principles. *Nairobi: Applied*.

Muwonge, T. R., Nsubuga, R., Brown, C., Nakyanzi, A., Bagaya, M., Bambia, F., ... & Haberer, J. E. (2020). Knowledge and barriers of PrEP delivery among diverse groups of potential PrEP users in Central Uganda. *PloS one*, *15*(10), e0241399.

Mwangi, E., & Chepkemoi, C., (2022). *Nakuru County Intensifies Fight Against HIV*. Kenya News Agency, [online] https://www.kenyanews.go.ke/nakuru-county-intensifies-fight-against-hiv/. Retrieved on 21/06/2022.

Mwasi, A. M. (2019). *Analysis Of Knowledge and Attitude of PrEP by Clients: The Case of Special Treatment Centre* (Doctoral dissertation, University of Nairobi).

National AIDS and STI Control Programme (NASCOP) & Ministry of health (MOH) (2018) *Turning the Tide: Preventing New HIV Infection & Optimizing Treatment Outcomes.* 2018 HIV Prevention, Care & Treatment Scientific Conference, Nairobi.

National AIDS and STI Control Programme (NASCOP) (2019). *Key population mapping and size estimation in selected counties in Kenya: Phase 1; Key findings.* Retrieved from [online] https://hivpreventioncoalition.unaids.org/wp-content/uploads/2020/02/KPSE-Phase1-Final-Report.pdf.

National AIDS Control Council (NACC, 2019). Kenya AIDS Strategic Framework. 2014/15-2018/19. Nairobi, 2019

Ndaga, A. E. A. (2020). *Socioeconomic Inequality in HIV Prevention Amongst Female Sex Workers: An Analysis of PrEP Use* (Doctoral dissertation, University of Nairobi).

Ng'ethe, R. M. B. (2020). *Factors associated with uptake of HIV and aids combination prevention strategies among female sex workers in Nakuru County, Kenya* (Doctoral dissertation, Kenyatta University).

O'Connell, H. R., & Criniti, S. M. (2021). The impact of HIV pre-exposure prophylaxis (PrEP) counseling on PrEP knowledge and attitudes among women seeking family planning care. *Journal of Women's Health*, *30*(1), 121-130.

Okeke, N. L., McLaurin, T., Gilliam-Phillips, R., Wagner, D. H., Barnwell, V. J., Johnson, Y. M., ... & Mitchell, J. T. (2021). Awareness and acceptability of HIV PrEP (PrEP) among students at two historically Black universities (HBCU): a cross-sectional survey. *BMC public health*, *21*(1), 1-9.

Pacífico de Carvalho, N., Mendicino, C. C. P., Cândido, R. C. F., Alecrim, D. J. D., & Menezes de Padua, C. A. (2019). HIV pre-exposure prophylaxis (PrEP) awareness and acceptability among trans women: a review. *AIDS care*, *31*(10), 1234-1240.

Quinn, K. G., Christenson, E., Spector, A., Amirkhanian, Y., & Kelly, J. A. (2020). The influence of peers on PrEP perceptions and use among young black gay, bisexual, and other men who have sex with men: a qualitative examination. *Archives of sexual behavior*, *49*(6), 2129-2143.

Restar, A. J., Tocco, J. U., Mantell, J. E., Lafort, Y., Gichangi, P., Masvawure, T. B., ... & Sandfort, T. G. (2017). Perspectives on HIV pre-and post-exposure prophylaxes (PrEP and PEP) among female and male sex workers in Mombasa, Kenya: implications for integrating biomedical prevention into sexual health services. *AIDS Education and Prevention*, *29*(2), 141-153.

Restar, A. J., Tocco, J. U., Mantell, J. E., Lafort, Y., Gichangi, P., Masvawure, T. B., ... & Sandfort, T. G. (2017). Perspectives on HIV pre-and post-exposure prophylaxes (PrEP and PEP) among female and male sex workers in Mombasa, Kenya: implications for integrating biomedical prevention into sexual health services. *AIDS*

education and prevention: official publication of the International Society for AIDS Education, *29*(2), 141.

Rugira, E., Biracyaza, E., & Umubyeyi, A. (2023). Uptake and persistence on HIV Pre-exposure prophylaxis among female sex workers and men having sex with men in Kigali, Rwanda: a retrospective cross-sectional study design. *Patient preference and adherence*, 2353-2364.

Sarr, M., Gueye, D., Mboup, A., Diouf, O., Bao, M. D. B., Ndiaye, A. J., ... & Mboup, S. (2020). Uptake, retention, and outcomes in a demonstration project of PrEP among female sex workers in public health centers in Senegal. *International journal of STD & AIDS*, *31*(11), 1063-1072.

Saunders, M., Lewis, P. H. I. L. I. P., & Thornhill, A. D. R. I. A. N. (2007). Research methods. *Business Students 4th edition Pearson Education Limited, England*, *6*(3), 1-268.

Scott, H. M., Spinelli, M., Vittinghoff, E., Morehead-Gee, A., Hirozawa, A., James, C., ... & Buchbinder, S. (2019). Racial/ethnic and HIV risk category disparities in preexposure prophylaxis discontinuation among patients in publicly funded primary care clinics. *Aids*, *33*(14), 2189-2195.

Shannon, K., Strathdee, S. A., Goldenberg, S. M., Duff, P., Mwangi, P., Rusakova, M., ... & Boily, M. C. (2015). Global epidemiology of HIV among female sex workers: influence of structural determinants. *The Lancet*, *385*(9962), 55-71.

Spinelli, M. A., Scott, H. M., Vittinghoff, E., Liu, A. Y., Gonzalez, R., Morehead-Gee, A., ... & Buchbinder, S. P. (2019, April). Missed visits associated with future preexposure prophylaxis (PrEP) discontinuation among PrEP users in a municipal

primary care health network. In *Open forum infectious diseases* (Vol. 6, No. 4, p. ofz101). US: Oxford University Press.

Ssuna, B., Katahoire, A., Armstrong-Hough, M., Kalibbala, D., Kalyango, J. N., & Kiweewa, F. M. (2022). Factors associated with willingness to use oral PrEP (PrEP) in a fisher-folk community in peri-urban Kampala, Uganda. *BMC public health*, *22*(1), 1-8.

Sussman, R. (2019). "Causality in the Theory of Planned Behavior". *Personality and Social Psychology Bulletin.*, 45 (6): 920–933.

Terry-Smith, J. B. (2018). *Factors Influencing Use of PrEP Among Men Who Have Sex with Men* (Doctoral dissertation, Walden University).

Tomko, C., Park, J. N., Allen, S. T., Glick, J., Galai, N., Decker, M. R., ... & Sherman, S. G. (2019). Awareness and interest in HIV PrEP among street-based female sex workers: results from a US context. *AIDS patient care and STDs*, *33*(2), 49-57.

Tran, B. X., Hwang, J., Nguyen, L. H., Nguyen, A. T., Latkin, N. R. K., Tran, N. K., ... & Latkin, C. A. (2016). Impact of socioeconomic inequality on access, adherence, and outcomes of antiretroviral treatment services for people living with HIV/AIDS in Vietnam. *PLoS One*, *11*(12), e0168687.

Wahome, E. W., & Graham, S. M. (2020). PrEP uptake and adherence in relation to HIV-1 incidence among Kenyan men who have sex with men. *EClinical Medicine*, *26*, 100541.

WHO (2018). WHO Expands Recommendation on Oral PrEP of HIV Infection (PrEP). 2018. Geneva: WHO.

WHO, (2021). *Global data shows increasing PrEP use and widespread adoption of WHO PrEP recommendations*. Available at: https://www.who.int/news-room/feature-

stories/detail/global-data-shows-increasing-PrEP -use-and-widespread-adoption-of-who-PrEP -recommendations

Eakle, R., Gomez, G. B., Naicker, N., Bothma, R., Mbogua, J., Cabrera Escobar, M. A., & TAPS Demonstration Project Team. (2017). HIV PrEP and early antiretroviral treatment among female sex workers in South Africa: results from a prospective observational demonstration project. *PLoS medicine, 14*(11), e1002444.

Rubtsova A, Wingood G, Dunkle K, Camp C, DiClemente R. Young adult women and correlates of potential adoption of preexposure prophylaxis (PrEP): results of a national survey. Curr HIV Res. 2014;11(7):543–8.

Mack N, Evens EM, Tolley EE, et al. The importance of choice in the rollout of ARV-based prevention to user groups in Kenya and South Africa: a qualitative study. J Int AIDS Soc. 2014;17(3 Suppl 2):19157

Peng B, Yang X, Zhang Y, et al. Willingness to use PrEP for HIV prevention among female sex workers: AIDS Behav (2017) 21:1325–1335 1333 123 a cross-sectional study in China. HIV/AIDS—Res Palliat Care. 2012; 4:149–58.

Ye L, Wei S, Zou Y, et al. HIV PrEP interest among female sex workers in Guangxi, China. PLoS ONE. 2014;9(1):e86200

Zhao Z, Sun Y, Xue Q, et al. [Acceptability of PrEP among female sex workers in Xinjiang]. Zhejiang Da Xue Xue Bao Yi Xue Ban [J Zhejiang Univ, Med Sci]. 2011;40(3):281–5.

Eisingerich AB, Wheelock A, Gomez GB, Garnett GP, Dybul MR, Piot PK. Attitudes and acceptance of oral and parenteral HIV preexposure prophylaxis among potential user groups: a multinational study. PLoS ONE. 2012;7(1): e28238.

Galea JT, Kinsler JJ, Salazar X, et al. Acceptability of PrEP as an HIV prevention strategy:

barriers and facilitators to PrEP uptake among at risk Peruvian populations. Int J STD AIDS. 2011;22(5):256–62.

Mack N, Evens EM, Tolley EE, et al. The importance of choice in the rollout of ARV-based prevention to user groups in Kenya and South Africa: a qualitative study. J Int AIDS Soc. 2014;17(3 Suppl 2):19157

Peng B, Yang X, Zhang Y, et al. Willingness to use PrEP for HIV prevention among female sex workers: AIDS Behav (2017) 21:1325–1335 1333 123 a cross-sectional study in China. HIV/AIDS—Res Palliat Care. 2012; 4:149–58.

Qiu L, Tian K, Zhong X, et al. Investigation on acceptability of PrEP among female sex workers in Sichuan, Xinjiang and Guangxi of China. J Shanghai Jaiotong Univ. 2012;32(4):508–13

Fonner VA, Dalglish S, Kennedy CE, et al. Oral tenofovir-based HIV PrEP (PrEP) for all populations: a systematic review and meta-analysis of effectiveness, safety, behavioural, and reproductive health outcomes. AIDS. 2016;30(12):1973–83

Wingood GM, Dunkle K, Camp C, et al. Racial differences and correlates of potential adoption of preexposure prophylaxis: results of a national survey. J Acquir Immune Defic Syndr. 2013;63(Suppl 1): S95–101.

Corneli A, Perry B, McKenna K, et al. Participants' explanations for nonadherence in the FEM-PrEP clinical trial. J Acquir Immune Defic Syndr. 2016;71(4):452–61

Corneli A, Perry B, Agot K, Ahmed K, Malamatsho F, Van Damme L. Facilitators of adherence to the study pill in the FEM-PrEP clinical trial. PLoS ONE. 2015;10(4): e0125458

Pillay, D., Stankevitz, K., Lanham, M., Ridgeway, K., Murire, M., Briedenhann, E., ... &

Mullick, S. (2020). Factors influencing uptake, continuation, and discontinuation of oral PrEP among clients at sex worker and MSM facilities in South Africa. *PloS one*, *15*(4), e0228620.

Auerbach JD, Banyan A, Riordan M. Will and should women in the U.S. use PrEP Findings from a focus group study of at-risk, HIV-negative women in Oakland, Memphis, San Diego and Washington, D.C. J Acquir Immune Defic Syndr. 2012;15:193.

Prem Kumar SG, Kumar GA, Poluru R, et al. Contact with HIV prevention programmes & willingness for new interventions among truckers in India. Indian J Med Res. 2013;137(6):1061–71.

Ye L, Wei S, Zou Y, et al. HIV PrEP interest among female sex workers in Guangxi, China. PLoS ONE. 2014;9(1): e86200.

Zhao Z, Sun Y, Xue Q, et al. [Acceptability of PrEP among female sex workers in Xinjiang]. Zhejiang Da Xue Xue Bao Yi Xue Ban [J Zhejiang Univ, Med Sci]. 2011;40(3):281–5.

APPENDICES

This section consists of the questionnaire and other documents used for approval to carry out the study at various levels.

Appendix I.: Consent Form

DETERMINANTS OF HIV PREP UPTAKE AND RETENTION AMONG SEX WORKERS IN NAKURU TOWN KENYA

Introduction

I am **Martha Nyambura Kahura** from the School of Public Health at Mount Kenya University. I am conducting a study on **DETERMINANTS OF HIV PRE EXPOSURE PROPHYLAXIS UPTAKE AND RETENTION AMONG SEX WORKERS IN NAKURU TOWN KENYA**

Purpose

The study seeks to investigate the determinants of HIV PrEP uptake and retention among sex workers in Nakuru town Kenya.

Procedure

If you agree to participate in the study, a semi-structured interview will be administered by the researcher. The nature of the questions will be about HIV PrEP uptake and retention among sex workers. The semi-structured interview guide will also include questions on your demographic characteristics. Confidentiality will be strictly maintained.

Risks/Discomfort

There is no risk in participating in this study. However, you may experience some discomfort due to the personal nature of the questions but this will be asked in private and your confidentiality will be maintained at all times.

Benefits

There will be no direct benefit in participating in the study but in case you have any questions the investigator will readily assist you. The study will help in evaluating the determinants of HIV PrEP uptake and retention among sex workers in Nakuru town Kenya. This will help

understand the challenges facing sex workers and findings could be used to formulate or review existing policies to improve the distribution of PrEP across Kenya.

Confidentiality

Confidentiality will be maintained at all times. There shall be no mention of names or identifiers in the report or publications which may arise from the study.

Compensation

There will be no compensation for your participation in the study.

Voluntariness

Participation in the study is voluntary. If you choose not to participate, you will not be compelled to. You will also be free to withdraw from the study at any time. However, I humbly request your full cooperation.

Persons to contact

In case you have any questions as it pertains to this study, kindly contact me, Martha Kahura using the phone number 0723 853 981.

Your participation in the study will be highly appreciated.

I hereby voluntarily consent to participate in the study. I acknowledge that a thorough explanation of the nature of the study has been given to me, and I clearly understand that my participation is completely voluntary.

Contact Information

In case you have any queries regarding this study, you can ask me now or anytime during the study. You can also call me at 0723853981 or email me at marthakahura@gmail.com. If you have any questions on how your information will be kept confidential in this research or if you have been placed at risk, you can also contact the Mount Kenya University, Institutional Ethical Review Committee (IERC) office at rsearch@mku.ac.ke.

Appendix II: Questionnaire

The objective of this research tool is to gather data on HIV PrEP uptake and retention among sex workers in Nakuru town Kenya. Please follow the instructions provided when filling out the questions. Confidentiality for the information shared will be maintained. Further, the data you share will be applied in academic fields only. Kindly do not include your details such as name and identification number on this questionnaire.

SECTION A: DEMOGRAPHIC INFORMATION

1. Kindly indicate your gender
   - Male [ ]
   - Female [ ]
   - Transgender [ ]
2. Kindly indicate your age bracket
   - Below 20 years [ ]
   - 20-30 years [ ]
   - 31-40 years [ ]
   - 40-50 years [ ]
   - Above 50 years [ ]
3. Kindly show your highest level of education
   - Primary level [ ]
   - Secondary level [ ]
   - Tertiary level [ ]
   - None [ ]
4. Kindly indicate Marital status

Married [ ]
Single [ ]
Separated [ ]
Divorced [ ]

5. How long have you been a sex worker in Nakuru town?

Below 1 year [ ]
1-5 years [ ]
6-10 years [ ]
11-15 years [ ]
16-20 years [ ]
Above 20 years [ ]

6. Kindly indicate other sources of income

Formal employment [ ]
Business [ ]
Casual labour [ ]
None [ ]

SECTION B: PrEP UPTAKE AND RETENTION

7. Have you ever taken PrEP ?
   Yes [ ]

   No [ ]

   If no to Q 7 answer Q 8 then skip to Q15.

8. If no why?
   I have never heard about it. [ ]

   I don't think am at Risk of acquiring HIV [ ]

   Taking PrEP is cumbersome. [ ]

   I don't like taking medicine. [ ]

   Other……...

9. If yes to question 7, Are you currently taking PrEP ?
   Yes [ ]

   No [ ]

10. If not, why did you stop?
    It is no longer available at my health facility. [ ]

    I got some side effects. [ ]

    Am no longer at risk. [ ]

    Other……

11. If currently on PrEP, how often do you take it?
    Once daily [ ]

    When I remember [ ]
    When am going to meet a client [ ]
    Other……

12. If currently on PrEP, where do you get your PrEP drugs from?
    A government Health facility. [ ]

    A drop-in center. [ ]

From a Friend. [ ]

From the chemist. [ ]

Other…….

13. If currently on PrEP, how often do you visit the medical facility for PrEP refill?
    Weekly [ ]

    Monthly [ ]

    Quarterly [ ]

    Every half year [ ]
    When I need it [ ]
14. Where do you access information on HIV and PrEP?
    Media [ ]

    Friends [ ]

    Health care worker [ ]
    colleagues [ ]

    Posters [ ]

    Other.....
15. To what extent do you agree or disagree with the following statements on factors influencing the uptake of PrEP. Rate on a scale of 1 to 5 where 1= strongly disagree, 2= disagree, 3= Not Sure, 4= agree and 5 strongly agree

awareness of PrEP	**1**	**2**	**3**	**4**	**5**
The public hospitals in Nakuru town normally hold campaigns educating people on the importance of PrEP					
I learnt about PrEP from my friends					
The private hospitals offer education on PrEP					
Information on PrEP is readily available					
Information on the guidelines of using PrEP is freely available to sex workers in Nakuru town					
The sex workers in Nakuru town have information on PrEP					
NGOs normally educate sex workers on the use of PrEP					
Individual Factors	**1**	**2**	**3**	**4**	**5**
I can freely talk about my uptake of PrEP					

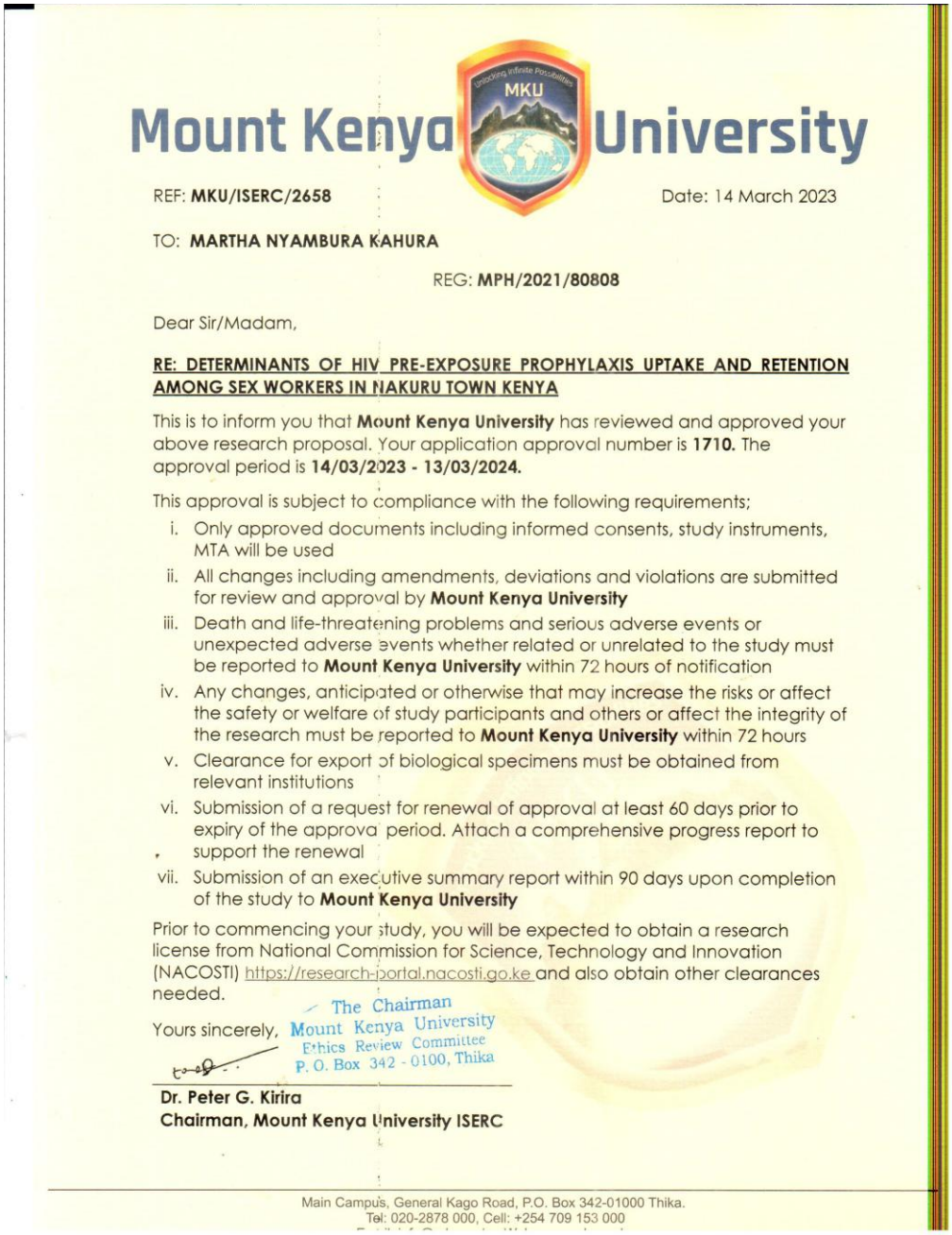
I don't think I need PrEP					
I believe I am too young to take PrEP					
I believe I am too old to take PrEP					
I think PrEP is a good and ensures the protection against HIV.					
The uptake of PrEP is prevalent among female sex workers					
The uptake of PrEP is prevalent among male sex workers					
Married sex workers are more likely to take PrEP as compared to unmarried sex workers					
Unmarried sex workers are more likely to take PrEP as compared to married sex workers					
Health Care System Factors	**1**	**2**	**3**	**4**	**5**
The healthcare professions in the Government medical institutions are receptive to offering PrEP education to sex workers					
The healthcare professions in the non-government medical institutions are receptive to offering PrEP education to sex workers					
Sex workers willing to take PrEP are usually looked down on by healthcare professions					
PrEP is easily accessible to sex workers in Nakuru town					
Sex workers in Nakuru town often visit medical facilities					
The Sex workers in Nakuru town do not take up PrEP for fear of being stigmatized by the medical professionals					
Socio-Economic factors	**1**	**2**	**3**	**4**	**5**
PrEP is offered for free in Nakuru County					
Sex workers in Nakuru town face stigma from the community members					
The sex workers in Nakuru town do not go for PrEP since they are sidelined by other patients.					

16. To what extent do you agree or disagree with the following statements on uptake and retention of PrEP. Rate on a scale of 1 to 5 where 1= strongly disagree, 2= disagree, 3= Not sure, 4= agree and 5 is strongly agree

Uptake and Retention of PrEP	**1**	**2**	**3**	**4**	**5**
I take PrEP consistently					
I am aware about PrEP					
I know where I can get PrEP					
I think PrEP is a good treatment that protects the health of sex workers from getting HIV.					
As a sex worker, I do not intend on withdrawing from taking PrEP					
PrEP uptake has helped in preventing HIV infection					

"THE END"

Appendix III: Ethics and Research Committee



Mount Kenya University

REF: **MKU/ISERC/2658** Date: 14 March 2023

TO: **MARTHA NYAMBURA KAHURA**

REG: **MPH/2021/80808**

Dear Sir/Madam,

RE: DETERMINANTS OF HIV PRE-EXPOSURE PROPHYLAXIS UPTAKE AND RETENTION AMONG SEX WORKERS IN NAKURU TOWN KENYA

This is to inform you that **Mount Kenya University** has reviewed and approved your above research proposal. Your application approval number is **1710.** The approval period is **14/03/2023 - 13/03/2024.**

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 **Mount Kenya University**
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 **Mount Kenya University** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to **Mount Kenya University** 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 **Mount Kenya University**

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,

The Chairman
Mount Kenya University
Ethics Review Committee
P. O. Box 342 - 0100, Thika

Dr. Peter G. Kirira
Chairman, Mount Kenya University ISERC

Main Campus, General Kago Road, P.O. Box 342-01000 Thika.
Tel: 020-2878 000, Cell: +254 709 153 000

Appendix IV: Introductory Letter

Mount Kenya University

DIRECTORATE OF GRADUATE STUDIES

MPH/2021/80808

14th March,2023

National Commission for Science Technology & Innovation (NACOSTI)
Off Waiyaki Way, Upper Kabete,
P.O Box 30623- 00100
NAIROBI, KENYA

Dear Sir/Madam,

RE: MARTHA NYAMBURA KAHURA – REGISTRATION NO. MPH/2021/80808

The purpose of this letter is to introduce the above named student who is pursuing **Master of Public Health** in the department of **Community Health Epidemiology and Biostatistics** in the school of **Public Health.**

The title of the research is **"Determinants of HIV Pre-Exposure Prophylaxis Uptake and Retention Among Sex Workers in Nakuru Town Kenya."**

It has been cleared by the University's Ethics Review Committee (Certificate attached) and now has to proceed to the field to collect data between **March, 2023 and May, 2023.**

Any assistance accorded to the student will be highly appreciated.

Thank you.

Mount Kenya University
P. O. Box 342 - 01000, THIKA
Office of the Director
Graduate Studies

Dr. Samuel M. Karenga, Ph.D
Director, Graduate Studies
Enc.

Appendix V: Research License

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 281459

Date of Issue: 20/April/2023

RESEARCH LICENSE

This is to Certify that Ms.. Martha Nyambora Kahora of Mount Kenya University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nakuru on the topic: DETERMINANTS OF HIV PRE EXPOSURE PROPHYLAXIS UPTAKE AND RETENTION AMONG SEX WORKERS IN NAKURU TOWN KENYA for the period ending : 20/April/2024.

License No: NACOSTI/P/23/25381

281459

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

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013 (Rev. 2014)
Legal Notice No. 108: The Science, Technology and Innovation (Research Licensing) Regulations, 2014

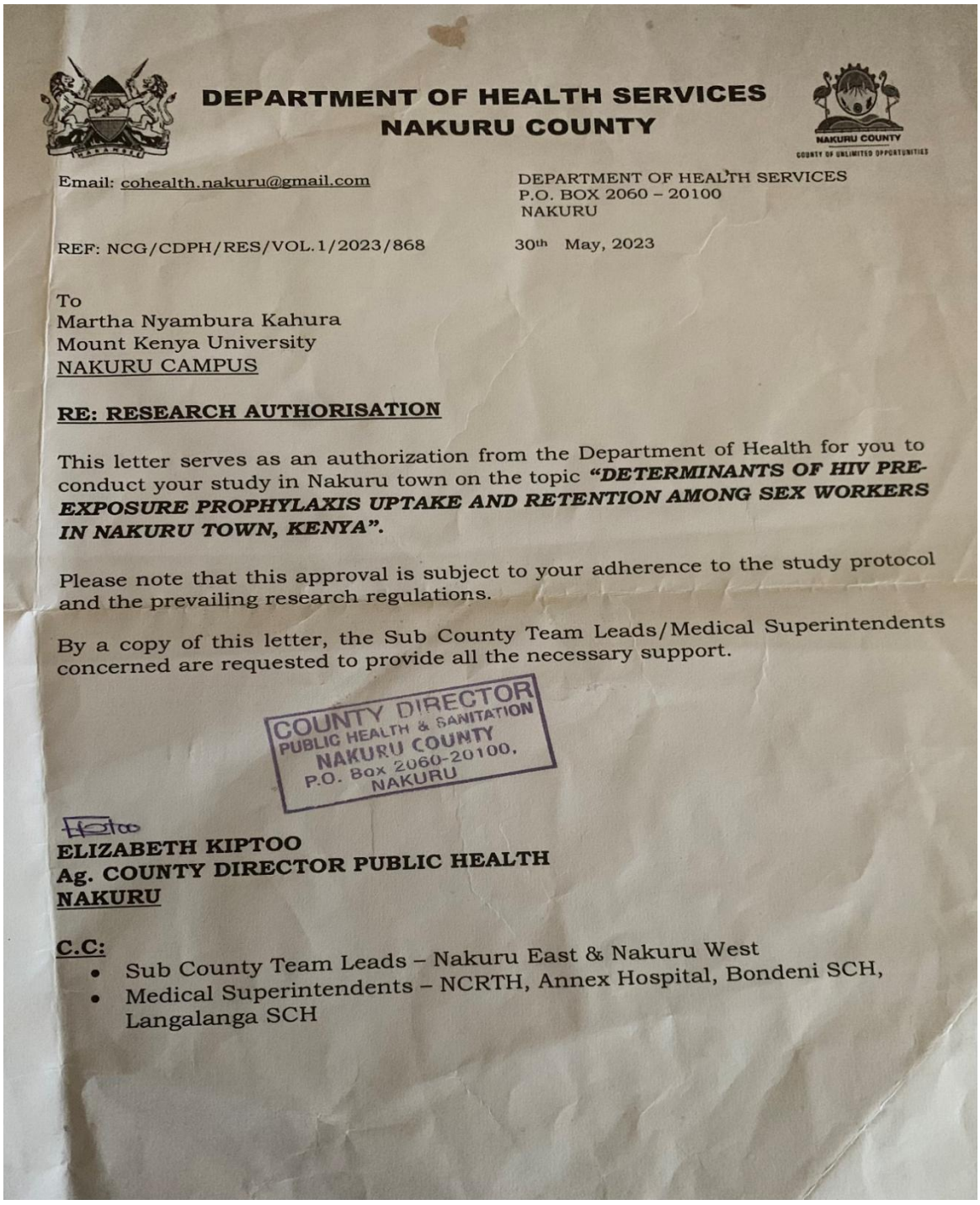
The National Commission for Science, Technology and Innovation, hereafter referred to as the Commission, was the established under the Science, Technology and Innovation Act 2013 (Revised 2014) herein after referred to as the Act. The objective of the Commission shall be to regulate and assure quality in the science, technology and innovation sector and advise the Government in matters related thereto.

CONDITIONS OF THE RESEARCH LICENSE

1. The License is granted subject to provisions of the Constitution of Kenya, the Science, Technology and Innovation Act, and other relevant laws, policies and regulations. Accordingly, the licensee shall adhere to such procedures, standards, code of ethics and guidelines as may be prescribed by regulations made under the Act, or prescribed by provisions of International treaties of which Kenya is a signatory to
2. The research and its related activities as well as outcomes shall be beneficial to the country and shall not in any way;
    i. Endanger national security
    ii. Adversely affect the lives of Kenyans
    iii. Be in contravention of Kenya's international obligations including Biological Weapons Convention (BWC), Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), Chemical, Biological, Radiological and Nuclear (CBRN).
    iv. Result in exploitation of intellectual property rights of communities in Kenya
    v. Adversely affect the environment
    vi. Adversely affect the rights of communities
    vii. Endanger public safety and national cohesion
    viii. Plagiarize someone else's work
3. The License is valid for the proposed research, location and specified period.
4. The license any rights thereunder are non-transferable
5. The Commission reserves the right to cancel the research at any time during the research period if in the opinion of the Commission the research is not implemented in conformity with the provisions of the Act or any other written law.
6. The Licensee shall inform the relevant County Director of Education, County Commissioner and County Governor before commencement of the research.
7. Excavation, filming, movement, and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
8. The License does not give authority to transfer research materials.
9. The Commission may monitor and evaluate the licensed research project for the purpose of assessing and evaluating compliance with the conditions of the License.
10. The Licensee shall submit one hard copy, and upload a soft copy of their final report (thesis) onto a platform designated by the Commission within one year of completion of the research.
11. The Commission reserves the right to modify the conditions of the License including cancellation without prior notice.
12. Research, findings and information regarding research systems shall be stored or disseminated, utilized or applied in such a manner as may be prescribed by the Commission from time to time.
13. The Licensee shall disclose to the Commission, the relevant Institutional Scientific and Ethical Review Committee, and the relevant national agencies any inventions and discoveries that are of National strategic importance.
14. The Commission shall have powers to acquire from any person the right in, or to, any scientific innovation, invention or patent of strategic importance to the country.
15. Relevant Institutional Scientific and Ethical Review Committee shall monitor and evaluate the research periodically, and make a report of its findings to the Commission for necessary action.

National Commission for Science, Technology and
Innovation(NACOSTI),
Off Waiyaki Way, Upper Kabete,
P. O. Box 30623 - 00100 Nairobi, KENYA
Telephone: 020 4007000, 0713788787, 0735404245
E-mail: dg@nacosti.go.ke
Website: www.nacosti.go.ke

Appendix VI: Department of Health Approval



DEPARTMENT OF HEALTH SERVICES
NAKURU COUNTY

NAKURU COUNTY
COUNTY OF UNLIMITED OPPORTUNITIES

Email: cohealth.nakuru@gmail.com

DEPARTMENT OF HEALTH SERVICES
P.O. BOX 2060 – 20100
NAKURU

REF: NCG/CDPH/RES/VOL.1/2023/868

30th May, 2023

To
Martha Nyambura Kahura
Mount Kenya University
NAKURU CAMPUS

RE: RESEARCH AUTHORISATION

This letter serves as an authorization from the Department of Health for you to conduct your study in Nakuru town on the topic ***"DETERMINANTS OF HIV PRE-EXPOSURE PROPHYLAXIS UPTAKE AND RETENTION AMONG SEX WORKERS IN NAKURU TOWN, KENYA".***

Please note that this approval is subject to your adherence to the study protocol and the prevailing research regulations.

By a copy of this letter, the Sub County Team Leads/Medical Superintendents concerned are requested to provide all the necessary support.

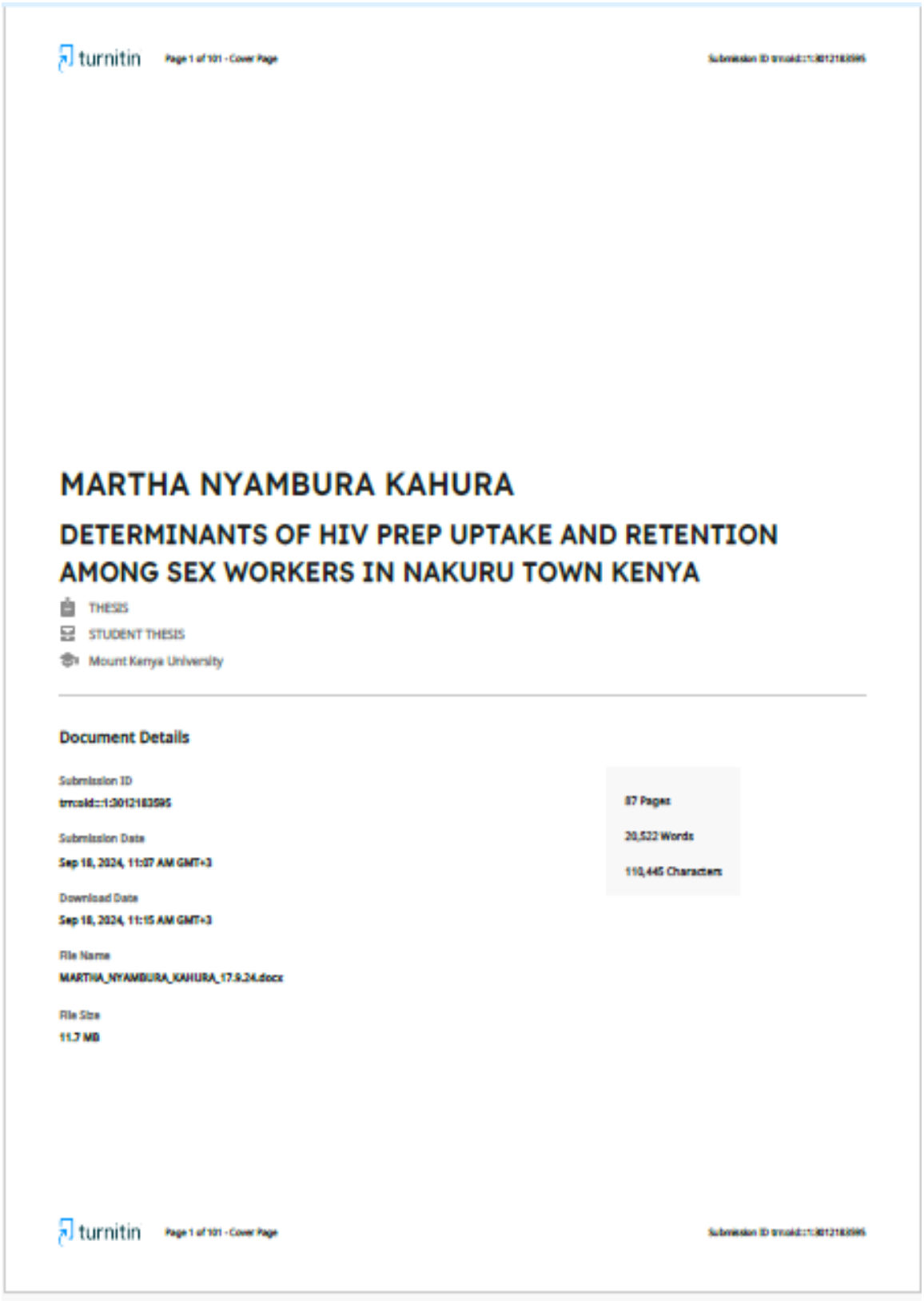
COUNTY DIRECTOR
PUBLIC HEALTH & SANITATION
NAKURU COUNTY
P.O. Box 2060-20100,
NAKURU

ELIZABETH KIPTOO
Ag. COUNTY DIRECTOR PUBLIC HEALTH
NAKURU

C.C:

- Sub County Team Leads – Nakuru East & Nakuru West
- Medical Superintendents – NCRTH, Annex Hospital, Bondeni SCH, Langalanga SCH

Appendix VII: Turnitin Report



turnitin Page 1 of 101 - Cover Page Submission ID trn:oid:::1:3012183595

MARTHA NYAMBURA KAHURA

DETERMINANTS OF HIV PREP UPTAKE AND RETENTION AMONG SEX WORKERS IN NAKURU TOWN KENYA

THESIS

STUDENT THESIS

Mount Kenya University

Document Details

Submission ID
trn:oid:::1:3012183595

Submission Date
Sep 18, 2024, 11:07 AM GMT+3

Download Date
Sep 18, 2024, 11:15 AM GMT+3

File Name
MARTHA_NYAMBURA_KAHURA_17.9.24.docx

File Size
11.7 MB

87 Pages

20,522 Words

110,445 Characters

turnitin Page 1 of 101 - Cover Page Submission ID trn:oid:::1:3012183595

turnitin Page 2 of 101 - Integrity Overview Submission ID [illegible]

20% Overall Similarity

The combined total of all matches, including overlapping sources, for each database.

Filtered from the Report

- Bibliography

Match Groups

- 280 Not Cited or Quoted 18%
  Matches with neither in-text citation nor quotation marks
- 47 Missing Quotations 3%
  Matches that are still very similar to source material
- 0 Missing Citation 0%
  Matches that have quotation marks, but no in-text citation
- 0 Cited and Quoted 0%
  Matches with in-text citation present, but no quotation marks

Top Sources

18% Internet sources
10% Publications
7% Submitted works (Student Papers)

Integrity Flags

0 Integrity Flags for Review

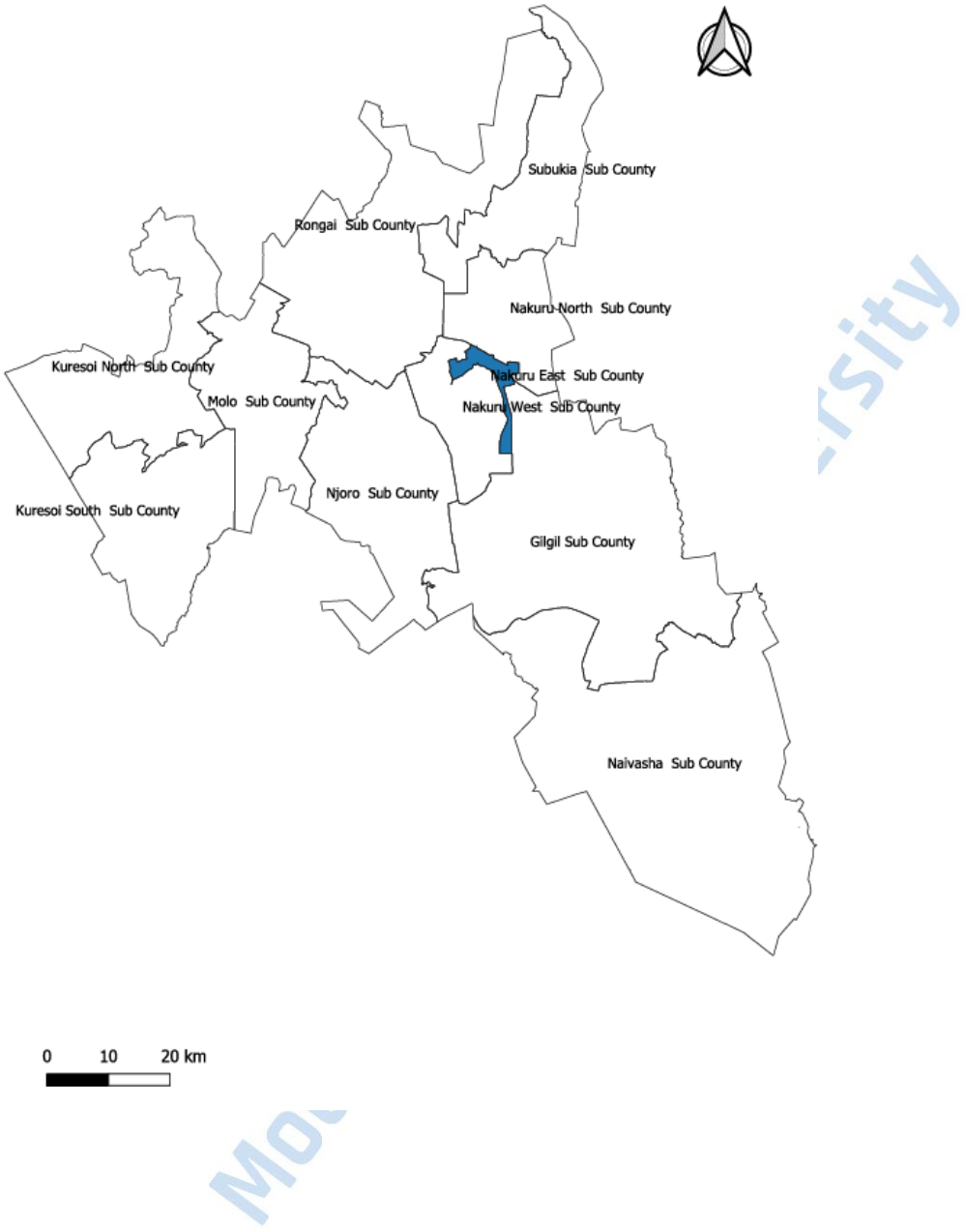
No suspicious text manipulations found.

Our system's algorithms look deeply at a document for any inconsistencies that would set it apart from a normal submission. If we notice something strange, we flag it for you to review.

A Flag is not necessarily an indicator of a problem. However, we'd recommend you focus your attention there for further review.

turnitin Page 2 of 101 - Integrity Overview Submission ID [illegible]

Appendix VIII: Research Site Map



Appendix IX: Sampling table

N	*S*	*N*	*S*	*N*	*S*
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note.—*N* is population size. *S* is sample size.

Source: Krejcie & Morgan, 1970