

**ADHERENCE TO ISONIAZID PREVENTION THERAPY
AMONG HIV-POSITIVE PATIENTS IN SELECTED
PUBLIC HOSPITALS IN CENTRAL EMBAKASI SUB-
COUNTY, NAIROBI COUNTY, KENYA**

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**Adherence to Isoniazid Prevention Therapy among HIV-Positive
Patients in Selected Public Hospitals in Central Embakasi Sub-County,
Nairobi County, Kenya**

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**A Thesis Submitted in Partial Fulfillment of the Requirements for the
Award for a Degree of Master of Science in Public Health of the Jomo
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DECLARATION

This thesis is my original work and has not been presented for a degree in any other university

Signature Date

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This thesis has been submitted for examination with our approval as the University Supervisors

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DEDICATION

This thesis is dedicated to my parents. My Father Sammy Kahianyu Muchina who's undying believe that education is the greatest engine of personal development drove me on this academic path. My mother Josephine Wanjovi Njogu whose constant prayers for me and our family sustained me along this journey and urged me and my siblings for the support.

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ACRONYMS AND ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
ARV	Anti-retroviral therapy
ATS	American Thoracic Society
CCC	Comprehensive Care Center
CD4	Clusters of Differentiation 4
CDC	Centre for disease control
DALY	Disability-Adjusted Life Year
HAART	Highly antiretroviral therapy
HIV	Human immunodeficiency syndrome
INH	Isoniazid
IPT	Isoniazid preventive therapy
IRB	Isoniazid preventive therapy
IUAT	Integrated User Acceptance Test
LTBI	Latent tuberculosis infection
NLTD	National Leprosy, Tuberculosis, and lung disease
PLWHA	People living with HIV/AIDs
PLHIV	People Living with HIV/AIDs

PTB	Pulmonary Tuberculosis
SDGs	Sustainable Development Goals
SPSS	Statistical Packages for Social Sciences
TB	Tuberculosis
TPT	TB Preventive Therapy
UI	Uncertainty Interval
WHO	World Health Organization

DEFINITION OF OPERATIONAL TERMS

- Adherence** Refers to the consumption of all or $\geq 90\%$ or more of the monthly prescription of isoniazid or simply taking all the medication in the appropriately prescribed amounts, at the correct period, and in the correct way.
- Environmental factors** Refer to the concentration of the bacilli in the environment, small, enclosed spaces, poor ventilation, poor air circulation, poor specimen handling, and positive air pressure in the room.
- Isoniazid preventive therapy (IPT)** Is an anti-tuberculosis drug given to People Living with HIV for the prevention of tuberculosis
- Non-adherence** Taken less than 90% the prescription of the monthly prescription.
- Patient-provider interaction** Refers to the relationship between the health workers and their patients.
- Patient-related factors** Refer to those factors IPT generates from the patient such as forgetfulness, substance abuse, mental illness and psychological stress, and stigma.
- Positive Patients** Patients diagnosed with TB through sputum smear, culture and Xray tests
- Socio-cultural and economic factors** refer to cultural and lay beliefs, high non-medical costs (e.g. nutrition, high cost of transport), age, gender, and religion.

ABSTRACT

Globally, Tuberculosis is the most common infection that contributes to the high rates of mortality and morbidity among people living with HIV/AIDS (PLHIV). Tuberculosis remains one of the top ten causes of death globally. However, the Ministry of Health in Kenya introduced Isoniazid Preventive Therapy (IPT) as a prophylaxis for the development of active TB in people living with HIV/AIDS. IPT is given to HIV-positive patients for six months in Kenya. Approximately 1500 HIV-positive patients visit clinics to receive IPT per month in Kenya. Therefore, this study aimed to investigate IPT adherence amongst persons living with HIV/AIDS in selected health facilities in Central Embakasi sub county, Nairobi City County, Kenya. The study specifically focused on patient-provider interaction, patient-related, and socio-environmental factors associated with the level of IPT adherence. The study used a descriptive cross-sectional study design. The study employed a mixed methods approach utilizing both quantitative and qualitative research methods. The study respondents were sampled using systematic sampling with a predetermined interval of 2. A total sample of 250 people living with HIV in four selected facilities in Nairobi City County participated in the study. Quantitative data was collected using interviewer-administered research questionnaires with persons living with HIV/AIDS. Qualitative data was collected using key informant interviews with Healthcare Workers, Community Health, and Extension workers. Descriptive data was analyzed using SPSS version 22.0 with the aid of the Microsoft Excel program to generate frequency tables, graphs, and pie charts. Qualitative data was analyzed manually using a thematic analysis method. Qualitative data results were triangulated with quantitative data as direct quotes or narrations as presented by key informants. Inferential statistics were calculated using Chi-Square tests done at a 95% confidence interval and a margin of error of 0.05 to establish the association between study variables. The results showed that only 75.6% of the respondents adhered to the IPT. Among the socio-demographic factors single or divorced individuals (AOR) of 6.572 (95% CI: 2.365-18.266, $p < .001$), were more likely to adhere to IPT contrary to those who were married. None of the patient factors were found significant at the multivariable level. For health system factors respondents who perceived a shortage of health workers AOR of 5.953 (95% CI: 2.047-17.309, $p = .001$), and good time management during IPT AOR of 3.237 (95% CI: 1.153-9.084, $p = .026$), was associated with higher adherence. Environmental factors that were significantly associated with IPT adherence included IPT drug stockout AOR of 4.786 (95% CI: 1.778-12.883, $p = .002$) and community stigma AOR of 13.048 (95% CI: 3.347-50.865, $p < .001$). The study recommended the need for health promotion and education to provide knowledge and address issues associated with stigma.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Tuberculosis is a common communicable disease that is attributed to the *Mycobacterium tuberculosis*. It affects the lungs and at least a quarter of the global population have been infected with TB bacteria. Additionally, 5-10% of individuals who are infected with TB develop the symptoms and ultimately the disease (WHO, 2023). Globally, 1.3 million died as a result of TB which was composed of 167000 people with Human Immunodeficiency Virus (HIV). It is the second leading cause of death after COVID-19 above HIV and Acquired Immune Deficiency Syndrome (AIDS). At least 10.6 million were affected with TB worldwide in 2022 which was composed of 5.8 million, 3.5 million, and 1.3 million men, women, and children respectively (WHO, 2023).

The control of TB especially among people living with HIV has been highly dependent on the uptake of Isoniazid Preventive Therapy (IPT). However, IPT is highly underutilized which makes it difficult to ensure the prevention of TB among PLHIV (Jalo, 2020). For example, a study conducted by Oonyu *et al.* (2022) revealed an uptake level of 34.2% which is detrimental when it comes to the management of TB among PLHIV.

Developing countries, particularly in Africa are among are most affected with TB cases among PLHIV.in particular, 24% of the TB cases occurred in Africa which also encountered 32% of deaths associated with the disease. These cases were mostly high among countries with the highest prevalence of HIV (Law *et al.*, 2020). WHO (2024) also notes that TB was the second leading contributor of death in Africa affecting 2.5 million people and 424,000 people losing their lives in 2022 alone.

In Kenya, a study conducted by Ngugi *et al.* (2020) also revealed that IPT uptake among PLHIV was at 68% which fell short of the target of > 90% while the completion rate for the therapy was 82%. Key factors associated with the trend included fear

associated with the adverse reaction of the drug, pill burden, and poor integrated monitoring and evaluation systems. According to Villiera *et al.* (2022), factors such as social norms, busy work schedules, polypharmacy practice, inadequate prescription instruction by healthcare professionals, as well as medication knowledge, and also experience were among the factors contributing to poor IPT adherence among HIV-positive patients in Kenya.

1.2 Statement of the Problem

TB is among the leading causes of death in the world with the situation being more lethal for PLHIV. In Kenya study conducted by Brennan *et al.* (2020) captured a prevalence level of 38% for TB among PLHIV thus showcasing the gravity of the situation (Brennan *et al.*, 2020). Chepkondol *et al.* (2020) also revealed that patients with a CD4 count of ≤ 349 were two-times more likely to be infected with TB contrary to patients with CD4 ≥ 500 . IPT is crucial in the management of TB among PLHIV with a target uptake of $> 90\%$. However, the uptake of IPT among PLHIV in Kenya is estimated at 68% (Ngugi *et al.*, 2020).

The global Disability-Adjusted Life Year (DALY) for TB is estimated at 122 (95% uncertainty interval [UI] 98–151) million as reported in 2019 (Menzies *et al.*, 2021). Some key factors that affect the uptake of IPT include busy work schedules, polypharmacy practice, inadequate instructions, social norms, and health worker experience (Villiera *et al.*, 2022). The treatment of TB is has a significant economic impact especially among PLHIV given the high healthcare costs associated with its diagnosis and treatment. However, in Kenya, limited evidence is available regarding factors that influence the implementation of IPT for PLHIV. This research therefore investigated factors associated with IPT adherence to PLHIV in selected hospitals in central Embakasi sub county, Nairobi County.

1.3 Justification of the Study

Studies from low-burden countries have found IPT to be an effective TB control strategy for household contact with TB-infected adults. IPT has been recommended by WHO guidelines (2010) and the International Union against Tuberculosis (IUAT),

and by the local National TB control program guidelines (NAS COP, 2012). Unfortunately, maximum benefit has not been realized from this strategy as though, statistics show that Kenya has scored high in terms of hitting the target of 100% as projected by the World Health Organization. It is still lagging in progress towards achieving Sustainable Development Goal number 3. Nairobi has a population of more than 3 million and has the highest number of TB case notifications in Kenya probably due to congestion and poverty, especially in the informal settlements which are mainly found in the central Embakasi County (NAS COP, 2012). Findings from the study will be instrumental in increasing the uptake of IPT among PLHIV in turn reducing the burden. The findings will also be instrumental in guiding policymakers on proper actions to undertake when dealing with TB among PLHIV. Therefore, there is a need to investigate the factors associated with IPT adherence to PLHIV, in Nairobi's Central Embakasi County.

1.4 Research Questions

- i. What are the socio-demographic factors associated with the level of adherence to IPT among PLHIV in selected public hospitals in central Embakasi sub county, Nairobi City County?
- ii. What are the patient-related factors associated with the level of adherence to IPT among PLHIV in selected public hospitals in central Embakasi sub county, Nairobi City County?
- iii. What are the health system factors associated with the level of adherence to IPT among PLHIV in selected public hospitals in central Embakasi sub county, Nairobi City County?
- iv. What are the environmental factors associated with the level of adherence to IPT among PLHIV in selected public hospitals in central Embakasi sub county, Nairobi City County?

1.5 Research Objectives

1.5.1 Broad Objective

The general objective of the study was to determine factors associated with the level of adherence to isoniazid preventive therapy among people living with HIV (PLHIV) in central Embakasi sub county, Nairobi City County, Kenya.

1.5.2 Specific Objectives

The following were the specific objectives.

1. To determine socio-demographic factors associated with the level of adherence to IPT among PLHIV in selected public hospitals in central Embakasi sub county, Nairobi City County.
2. To identify patient-related factors associated with the level of adherence to IPT among PLHIV in selected public hospitals in Central Embakasi sub county, Nairobi City County.
3. To assess the health system factors associated with the level of adherence to IPT among PLHIV in selected public hospitals in Central Embakasi sub county, Nairobi City County.
4. To capture the environmental factors associated with the level of adherence to IPT among PLHIV in selected public hospitals in Central Embakasi sub county, Nairobi City County.

1.6 Research Hypothesis

H₀₁: Socio-demographic factors are not significantly associated with the level of adherence to IPT among PLHIV in selected public hospitals in Central Embakasi sub county, Nairobi City County.

H₀₂: Patient-related factors are not significantly associated with the level of adherence to IPT among PLHIV in selected public hospitals in Central Embakasi sub county, Nairobi City County.

H₀₃: Health system factors are not significantly associated with the level of adherence to IPT among PLHIV in selected public hospitals in Central Embakasi sub county, Nairobi City County.

H₀₄: Environmental factors are significantly associated with the level of adherence to IPT among PLHIV in selected public hospitals in Central Embakasi sub county, Nairobi City County.

1.7 Significance of the Study

The study would inform the local TB control program and other policy makers on IPT scale-up courses. The findings would also contribute towards helping Kenya achieve the Sustainable Development Goals (SDGs) target for tuberculosis, to halt and reverse TB incidences. This would be through instituting, initiating, and strengthening health programs that would improve adherence to IPT thus reverting the surging cases of TB among people living with HIV and AIDS in the country. The study would also contribute to the knowledge base on the existing literature for future reference.

1.8 Assumptions of the Study

- 1) It was assumed that the participants would provide accurate information regarding their adherence to IPT
- 2) The study also assumed that all the health facilities that were targeted provided similar health services

1.9 Limitations of the Study

- 1) The study was limited to public facilities in Central Embakasi, Nairobi County which many not represent the HIV positive patients in other regions and in private facilities
- 2) The data was self-reported as such issues such as misreporting by patients could compromise the data
- 3) The study was conducted over a short period as such factors that influenced long-term adherence could not be captured

1.10 Delimitations of the Study

- 1) The study specifically focuses on public facilities in Central Embakasi and does not capture private facilities or facilities in rural areas.
- 2) The study also focuses on HIV-positive patients who are currently undergoing IPT thus excluding those who are yet to start the therapy or those who have completed it.

1.11 Conceptual Framework

The conceptual framework is a tool for analyzing linkages among variables. An explanation of these variables outlines the matters of the dynamics expected for relationships to exist (Mathooko, 2011). The independent variables in this study were patient-provider interaction, patients' related factors, health system and environmental factors, mediating variables such as knowledge of the role of IPT and Understanding IPT and moderating variables such as family and friends' support and community stigma and the dependent variable was the level of adherence to IPT.

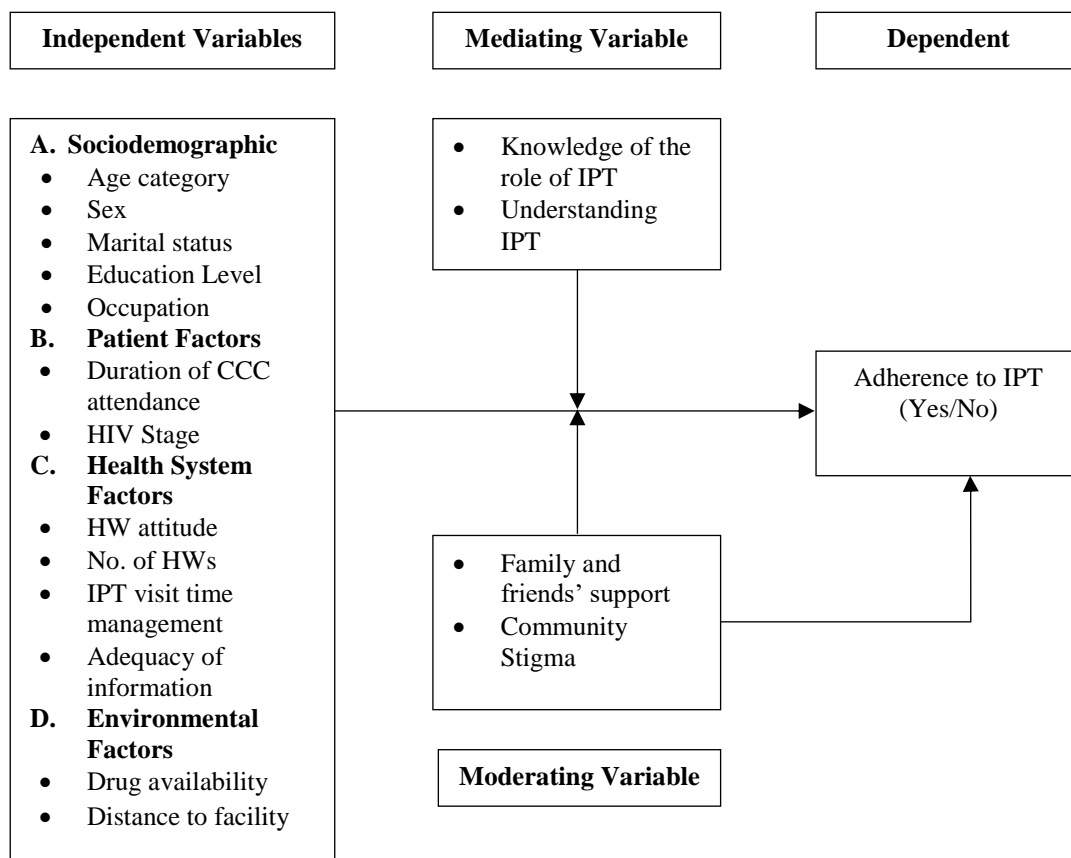


Figure 2.1: Conceptual Framework

Source: Authors Own Construct

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Several factors associated with HIV treatment and other related issues pose contributing factors to the failure to adhere to IPT in Kenya. This chapter reviews literature including books and reports on adherence to IPT and associated factors. These factors include provider-patient interaction, patient-related factors, and social environment factors. Theories related to factors influencing adherence were also reviewed and a summary of this chapter is presented exonerating the existing gaps in the literature.

2.2 Theoretical Review

Theories are articulated to give an explanation, help in predicting, and provide an understanding of a phenomenon. A theory framework is defined as a structure that supports theoretical research. This research reviewed the biomedical perspective, Behavioral (learning) perspective, and Communication Perspective.

2.2.1 The Biomedical Theory

This viewpoint includes the theory of biomedical in which an assumption is made that doctors' instruction is passive by the beneficiaries. The health treatment is dedicated to the patient's body since the disease is traced to biomedical causes such as bacteria or viruses (Cantor, 2020). Sometimes a person fails to adhere to prescribed mechanical preferred solutions such as pills. This is a common behavior of age and gender patients. There is the use of technology innovation to increase the level of adherence such as the use of a medical event monitoring system in this perspective. Nevertheless, even though its implicit is used in many health centers by professionals the perspective is uncommonly used explicitly in interventions. The theory emphasized on the importance of biological and physiological factors that influence a patient's health. In relation to the study, it can be applied to IPT by focusing on its biological benefits such

as preventing TB among PLHIV which healthcare providers can use to improve the adherence rates.

This theory has limitations in that it ignores factors other than the character of the patient that are believed to have an impact on patient health behaviors such as psychosocial influence and patient viewpoint of their illness. This concept is not strictly located within the biomedical viewpoint because of the notion of patient's passiveness and biomedical factor focus that makes this biomedical theory have less contribution to TB or HIV adherence treatment. The patients in most cases make an active decision that might not necessarily depend on received instruction from health professionals.

2.2.2 Behavioral (Learning) Theory

The theory incorporates a behavioral learning perspective that emphasizes how the environment influences adherence levels. It demonstrates how antecedents and consequences principles influence behaviors by demonstrating if antecedents are either external environmental or internal thought cues and how magnitudes can be rewards or punishments for certain behaviors. These variables partially depend on the probability of following specific behavior by the patients. One of the strategies used by this perspective can be a patient reminder that has greatly improved the level of adherence (Choudhry *et al.*, 2022). Based on the study, healthcare providers can leverage behavioral approaches that such as rewards that encourage adherence to IPT and improving the health outcomes of PLHIV. The lack of an individualist approach has been the critic of this theory since it does not take into consideration less conscious influences on patients' behaviors which might not necessarily link to immediate rewards (Choudhry *et al.*, 2022). These influential factors can be for example past behaviors, lack of acceptance to be diagnosed, and individuals' habits. Another limit is also to put more focus on the influence of external behaviors.

2.2.3 Communication Theory

The cornerstone of patient-health professional relationships remains in communication. The theory emphasizes the need to improve communication which will enhance the level of adherence of the patients through educating the patients by

healthcare workers using communication skills which must be clear comprehensive effective (Cantor, 2020). The theory highlights timely treatment and comprehensive instructions to the patient. Regarding the study, clear communication that is culturally sensitive can be used to enhance patients understanding in turn motivating the PLHIV to adhere to the therapy. Critics of the theory say that it ignores factors such as attitudes, motivations, and interpersonal skills that may influence the reception and translation of the message which might influence behavior (Freeland *et al.*, 2020).

2.3 Tuberculosis

Tuberculosis (TB) infectious disease which is caused by bacillus *Mycobacterium tuberculosis* affects mostly lungs and is a global health problem. Tuberculosis is considered among the top ten causes of HIV global death. Reports indicate that a third of TB deaths are due to HIV. It is estimated globally that 10.4 million TB cases contribute to over one million HIV-infected people. In recent years, tuberculosis has risen to be a major concern among health practitioners (WHO, 2023).

In Africa, TB is a major public health concern affecting 1.267 million people with an estimation of 424,000 people dying as a result of the disease in the region in 2022 alone (WHO, 2024). Mbuya *et al.* (2023) also note that the TB burden in sub-Saharan Africa alone accounts for 25% of the global burden. Another study conducted by Mebratu *et al.* (2022) also captured a prevalence of 48.5% associated with TB among non-IPT users in Ethiopia.

In Kenya, a study conducted by Mebratu *et al.* (2022) captured a prevalence of 38% for TB in the country. Another study also revealed that two-thirds of the poor outcomes mostly occurred during the first three months of the infection (Katana *et al.*, 2022). Ngugi *et al.* (2020) also note that TB is a significant burden among PLHIV which makes it difficult to ensure effective management, especially among individuals with a low CD4 count. The control is mostly associated with the uptake of IPT but this is also influenced by various factors that limit the uptake of this therapy.

2.3.1 Tuberculosis Transmission and Symptoms

According to WHO (2023), TB is a highly infectious disease that is caused by *Mycobacterium tuberculosis*. It is spread when people come into contact with small airborne droplets through talking, sneezing, or coughing. TB droplets can remain airborne for up to an hour. Bazant & Bush (2021) note that the transmission is influenced by the number of bacilli in droplets which can be exposed to UV light for degree of ventilation and occasions. When mycobacterium TB is introduced to the lung, it infects the respiratory system which in most cases spreads into other structures such as pleura, lymphatics, bone, or spine and this leads to extra pulmonary tuberculosis. The droplets settle in the airways once inhaled and lead to the trapping of bacilli in the higher part of the airways. The common signs and symptoms include coughing of any duration, coughing blood, chest pain or pain when breathing or coughing, weight loss unintentionally, and fatigue, fever, sweating at night, chills and loss of appetite. Kidney, brain or spine are other body parts that can be affected by TB even though symptoms and sign can vary depending on which body organ is involved (WHO, 2023).

The American Thoracic Society (ATS)(2024) also notes that TB generally affects individuals who experience health challenges. In America, health inequalities affect African Americans, Asians, and Hispanics thus TB is higher among these US populations. In 2021 alone, 88.1% of these cases in America were mostly based on ethnic and racial minority groups. Globally, TB bacteria is estimated to have spread to at least a quarter of the population which translates to 5-10% eventually developing the disease. Individuals who are infected but not yet ill are unlikely to transmit the disease. The treatment is only achieved through antibiotics and can at times be very fatal (WHO, 2023).

2.4 Sociodemographic Variables Associated with IPT Adherence

Multiple socio-demographic factors can be linked with IPT adherence among PLHIV. A study conducted revealed that age was a significant factor that was associated with IPT adherence. Patients aged ≥ 45 years were more likely to interrupt IPT while attending routine ART counseling sessions (Ssendikwanawa *et al.*, 2023). A study

conducted in Nigeria revealed that a majority of individuals who were most likely female and Igbo were more likely to complete IPT treatment. The results also showed that patients who were traders or farmers were more likely to complete IPT treatment compared to patients who were civil servants (Olajide *et al.*, 2022). A study conducted in Tanzania captured 171,743 patients between 2012 to 2016. Among those analyzed, 23,970 (14.38%) were mostly initiated for IPT and female sex as associated with IPT adherence (Maokola *et al.*, 2021).

Robert *et al.* (2020) also found that PLHIV between the ages 25-34 were more likely to complete IPT contrary to PLHIV of ages 15-24 years. However, this is contrary to a study conducted by Adepoju *et al.* (2020) which captured no significant association between age and IPT adherence among PLHIV. Another study conducted by Moses *et al.* (2023) captured a prevalence of 94.7% for IPT which revealed that individuals who were ≥ 50 years old and married were more likely to adhere to IPT contrary to their counterparts. Similarly, Achappa *et al.* (2022) also captured various socio-demographic factors such as age, gender, socio-economic status, marital status, and social support were all associated with adherence to IPT. The findings showed that individuals who were 30 years and older were more likely to adhere to IPT uptake contrary to their counterparts.

2.5 Patient Factors

Several factors are associated with IPT adherence around the globe. These factors include individual personal belief, INH side-effect fear, INH safety belief, complications related to TB/HIV, and understanding of IPT among other factors. A study carried out in Botswana in 2011 indicated that personal belief factors are a core contributor to adherence to IPT (Bazant & Bush, 2020). Ssendikwanawa *et al.* (2023) captured multiple factors associated with IPT adherence which included challenges such as the side effects and the pill burden associated with the uptake of IPT. The study also noted the need for counseling and reliance on IPT drugs that have fewer side effects that are associated with IPT interruptions. In Swaziland, Grande *et al.* (2020) revealed that factors such as access to community education, perceptions on the mode of delivery, disclosure of one's status which is crucial in empowering participants

towards completion, and the choice of treatment had a significant influence on IPT uptake.

In Ethiopia, Nezenega *et al.* (2020) also captured various factors associated with IPT therapy uptake which included forgetfulness, inadequate knowledge and information on TB and the treatment regimen. Additionally, patients with low educational status were less likely to complete TB medication. Patients with psychological distress were also less likely to attend follow-ups and clinic appointments. A similar study conducted in Uganda found an 83% rate for completion of IPT. This was mostly associated with the lack of IPT-related health education, the distance to the health facility, patient relocation, and the pill burden which served as key barriers (Amanya *et al.*, 2023).

Most patients fail to adhere due to unpleasant side effects of the drugs and the complications of the treatment. People regularly feel better shortly after starting treatment, so they stop taking their drugs before all the bacteria in their bodies are dead. People remain infected for a long due to poor treatment and end up dying. This is one of the contributors to drug resistance. Fear of rejection and stigmatization prevents many PLHIV from going for treatment and even disclosing their status. As Rowe and colleagues explained, people's understanding and interpretation of HIV/AIDS as an illness is related to individual culture (Freeland *et al.*, 2020). This has increased the perception that HIV is just like another disease that can be healed through traditional medicine.

2.6 Health System Factors Related to Isoniazid Preventive Treatment Adherence

When attending health services, the reception received by patients that includes effective communication has a main influence on the rate of treatment adherence. Several studies related to health system factors show that the nature of advice from health workers is most likely to be a motivator for adherence to IPT. Rowe and colleagues observed that good support remains high including care, support, and reluctance to present testing of TB (Freeland *et al.*, 2020). The case has been evidenced such as conflicts in instruction among the study staff with the advocate of agreement and a personnel physician who expresses reservation about the treatment of TB patient.

The research discloses that such cases are worse where confidence in the effectiveness of treatment is inadequate and patients are encouraged by the family members and others in the community, to try the traditional treatments as an alternative.

A study conducted by Ssendikwanawa *et al.* (2023) captured a total of 686 PLHIV in a study that investigated the factors associated with the uptake of IPT. One of the key health system-related factors was poor integration of IPT in the HIV healthcare services and limited support from the implementing partners. Another study conducted by Robert *et al.* (2020) also revealed that IPT completion was low, especially among patients who were transferred to another clinic between the ages of 25 and 34 years. The study also recommended the need for health facilities to provide IPT support to help improve the uptake.

2.7 Environmental Factors

Factors that are related to social and economic impact are in most cases mentioned as adherence barriers to IPT uptake. One of the major aspects of this is social and economic responsibility competition. There is evidence of the difficulties of maintaining a regular supply of drugs mostly when one is involved in economic activities such as during harvesting, military services, or physical distance employment. The factors are related to failure to seek treatment due to difficulty in seeking permission from their employers. It is observed that issues experienced by patients on access to TB treatment due to distance from hospitals and clinics and service providers absent their reach (Bazant & Bush, 2021). Nezenega *et al.* (2020) also note that economic constraints can influence the uptake of IPT. This includes the ability of the patients to afford adequate food and the costs associated with TB medication. Additionally, patients who were comfortable taking IPT among strangers, being busy, perceived stigma, and discrimination are significant factors associated with non-adherence.

2.8 Mediating and Moderating Variables

2.8.1 Mediating Variables

Knowledge has a significant impact on the uptake of IPT especially among PLHIV. A study conducted in Nigeria advocated for the need for increased awareness and education on the importance and need of IPT which would also influence the uptake. Increasing the level of knowledge and awareness on IPT focuses on addressing concerns about the side effects of IPT which would in turn encourage the uptake of IPT (Saidi, 2024). This also relates to a study conducted by Jalo (2020) also found low utilization of IPT among TB patients who were also affected with HIV. Factors that contributed to this trend included informal education and lack of awareness of IPT which influenced the uptake of IPT.

A similar study also revealed poor levels of knowledge of IPT among the patients contrary to high levels of self-reported adherence. The findings also showed that more than half (60.5%) of the patients displayed low levels of knowledge. This was highly associated with marital status as unmarried individuals were more likely to be knowledgeable on IPT adherence contrary to their married counterparts (Akamike *et al.*, 2020). Another study also found that both health worker and patient knowledge and understanding of IPT significantly improved after the adoption of mobile phone messaging strategies (Akamike *et al.*, 2021).

Busari *et al.* (2021) also found that the uptake of IPT was associated with the lack of awareness associated with its benefits. Additionally, the patients displayed a lack of fear associated with contracting tuberculosis. Therefore, the researchers advocated for the need for interventions that helped to create more awareness among PLHIV regarding the benefits and importance of IPT. Ssendikwanawa *et al.* (2023) also captured various barriers associated with the uptake and completion of IPT which included pill burden, poor integration of IPT within the health services package, forgetfulness, and lack of awareness.

2.8.2 Moderating Variables

A study conducted by Tram *et al.* (2020) revealed that the uptake and adherence to IPT were mostly influenced by factors such as health beliefs, perceived side effects, and social support. Grande *et al.* (2020) also noted that IPT uptake can be influenced by community, facility, and peer support. However, there is limited information regarding how these factors contribute to high levels of adherence among PLHIV. According to Moses *et al.* (2023), individuals who are married enjoy social support which is crucial in enabling IPT adherence. The study also encouraged the need to advocate for social support and behavioral interventions which are significant in encouraging patients to adhere to and complete their IPT treatment. According to Nyarubamba *et al.* (2022), factors such as negative cultural and religious values, HIV stigma, and poor funding are considered significant barriers that influence the uptake of IPT. Palacios *et al.* (2023) also revealed that most patients encountered less stigma from their family members contrary to the community. Therefore, the study advocated for the need to increase engagement from patient families to increase uptake and promote adherence.

2.9 Summary of Literature and Gaps

From the reviewed literature, it has been noted that several factors play a significant role in determining patient adherence levels with IPT among PLWHA. These factors range from the care providers, individual patient beliefs, and socio-environmental perspectives among other factors across the globe. Despite the recommendations by the World Health Organization, the uptake of IPT among HIV-positive patients has been a major concern. Kenya is among the countries in the sub-Saharan African region with low adherence levels to IPT leading to surging cases of TB among HIV-positive patients. Poor adherence to IPT may lead to increasing cases as well as resurgence of drug-resistant forms of tuberculosis. The study therefore sought to establish factors associated with adherence to IPT uptake in selected facilities in Nairobi City County.

CHAPTER THREE

MATERIALS AND METHODS

3.1 Research Design

The study adopted a descriptive cross-sectional study design. Cooper and Schindler (2003) define descriptive research as that which is concerned with results that related to the what, where and how of a phenomenon. A descriptive survey design is primarily used on initial and investigative studies to allow the investigator to collect data, summarize, organize present, and deduce with the aim of clarification (Orodho, 2002). The design sought to evaluate factors associated with IPT adherence.

3.2 Study Variables

3.2.1 Independent Variables

They include;

- a) Socio-demographic Factors such as age, gender, marital status, occupation and education
- b) Health system factors such as training on IPT, perceptions on IPT, nature of advice, relationship with care providers and communication channels.
- c) Patient related factors such as personal beliefs, fear of complications, side effects and safety of INH.
- d) Environmental factors such as regular drug supplies, family support, travel issues among other factors.

3.2.2 Mediating and Moderating Variables

- a) Mediating variables such as knowledge of the role of IPT and Understanding IPT
- b) Moderating variables such as family and friends' support and community Stigma

3.2.3 Dependent Variable

The dependent variable for this study was adherence to IPT among HIV positive patients. This was measured by determining the proportion of respondents who had completed at least 90% of the dose given for that month of IPT among HIV positive patients.

3.3 Study Area

The study was done in Nairobi City County, the capital city of Kenya with an estimated population of about 5 million. Nairobi has over 15 informal settlements, with an estimate of 3 million (70%) of the population living in informal settlements. This was a study conducted at 4 TB treatment centers within the informal settlements of Nairobi City County. The specific centers were Mama Lucy Referral Hospital, Kayole I Sub-district Hospital (Kayole), Kayole II Health Center (Dandora) and Umoja I health center.

3.4 Population of the Study

The study population comprised of people living with HIV AIDS attending TB clinics from four healthcare facilities in Central Embakasi county namely Mama Lucy Referral Hospital, Kayole I health center, Kayole II health center and Umoja I health Centre. From the hospital records, the study population comprised about 306 persons living with HIV AIDS attending the four selected facilities. All healthcare workers handling HIV positive patients in the selected healthcare facilities with the TB clinic and CCC while community health and extension workers were included as key informants for the study.

3.4.1 Inclusion Criteria for Patients

The study included PLHIV aged 18 years and above attending the HIV comprehensive care clinic at the selected health care facilities. They must have been residents in the location where the health facilities are situated to avoid imported cases. They must have been on IPT for at least 90 days and consented to participate in the study.

3.4.2 Exclusion Criteria

The study excluded HIV-positive patients who had been confirmed to have tested TB positive. Those who were too sick and unable to participate were also excluded.

3.5 Sampling Determination and Sampling Techniques

3.5.1 Sample Size Determination

Sample size determination was calculated using Fishers *et al* 1998 formula.

$$n = \frac{z^2 pq}{d^2}$$

Where:

n=minimum sample size for populations

z = Value of the standard normal deviate at 95% confidence interval (Z=1.96 at 95% CI)

p= Assumed proportion of IPT adherence among HIV patients adhering to IPT (68% =0.68) (Ngugi et al., 2020)

q= Assumed proportion of HIV positive patients who had not completed IPT (1-p=0.0.32)

d = Maximum allowable deviation or error of the estimate at 95% CI which is 5% (0.05)

Based on the above parameters n=334.37, approximately 335. For populations less than 10, 000, a correction formula was used;

$$n_f = \frac{n}{1 + n/N}$$

Where,

N= Approximate number of HIV-positive patients on IPT in selected facilities in Central Embakasi County, Nairobi City County (306).

n_f =final sample size

This gives a final sample size of 159.92, approximately 160, which was rounded up to 161, as seen in Table 3.1.

Table 3.1: Sampling Frame

Health facility	Centre Population	Sample size
Mama Lucy Kibaki Hospital	193	101 (63.1%)
Kayole I Health Centre	36	19 (11.8%)
Kayole II Health Centre	45	24 (14.7%)
Umoja I Health Centre	32	17 (10.4%)
Totals	306	161 (100.0%)

To cater for incomplete or missing data a nonresponse rate of 10% was applied to the sample size to give a final sample size of 179.

3.5.2 Sampling Techniques

Nairobi City County was purposively sampled. This is because the county is the capital city of the country with the most informal settlements with surging cases of HIV AIDS. The four health facilities were purposively selected for inclusion in the study. Mama Lucy Referral hospital, Kayole I, Kayole II and Umoja I health centers selected because they are TB treatment centers within the informal settlements in Nairobi. The primary respondents were systematically sampled using a predetermined sampling interval calculated by dividing the total estimate population with the required sample size. The first respondent was randomly selected using folded pieces of paper using yes/no riffles. The subsequent respondents were systematically sampled at an interval of two. Every second successful respondent was selected until a sample size of 250 was reached. The respondents selected were proportional to the number of HIV positive patients in selected facilities. The study also purposively selected two healthcare workers and two community health workers from each of the hospitals as key informants in the study. Therefore, a total of 16 key informants were included.

3.6 Data Collection Tools

A questionnaire was used to collect quantitative data from primary respondents. Since self-completion questionnaire are standardized instrument for measurement, it has an advantage to be used in this kind of research given the fact that the respondents had same phrase of questions (Lobe *et al.*, 2020). The questionnaires in this case enabled the investigator to collect data from numerous respondents at the same time which is useful in time saving and cost reduction (Lobe *et al.*, 2020). The study questionnaire contained questions that covered all the objectives of the study. These included provider-patient interaction, patient related and socio-environmental factors associated with IPT adherence (see Appendix iv).

A key informant interview schedule was used to collect qualitative data from key informants. Qualitative research methods is considered as one of the important inquiry modes in social sciences and applied fields (Feng *et al.*, 2021). This has a personal natural strength that creates unique relations between the respondent and interviewer therefore leading to an opportunity for respondents willing to share personal opinion. Feng *et al.* (2021). attribute interview as a tool that can be used to search opinions, perceptions and attitudes toward some topic which other method cannot assist in collection. The key informant interview schedule covered all the objectives and targeted the healthcare workers and community health workers (Appendix iv).

3.6.1 Instrument Validity

The evidence in which theory support a test score interpretation in defining the test of validity. The ability of an instrument to be able to measure what it intended to measure and the meaningful and accuracy of research inferences result (Mugenda, 1999). It defines the degree of the results that is obtained data which has been analysed to give actual representation of study variable. The researcher validated research instruments through face of validity and terms of content validity items reflecting the specific study areas. Validity was ensured through expert review of the study tools with the supervisors. The study adopted sampling methods that resulted in a randomized and a representative sample. Random sampling techniques and uniformity of sampled

population ensured internal validity. To ensure external validity, a large sample was randomly selected.

3.6.2 Instrument Reliability

This is the measurement of the degree of research instrument that yield to dependable outcomes or data after several trial the strength of questions will be measured in terms of test-retest reliability (Ortega-Toro *et al.*, 2019). Reliability is the capability of instrument of a research measure regularly the characteristics of interest over period. It is the amount to which a study tool produces reliable outcomes or statistics in subsequent trials. If an investigator oversees an examination to a matter twice and obtains similar result on the second administration as the earliest examination, then there is reliability of the tool (Mugenda & Mugenda, 2003). The investigator tested the reliability of the questionnaire to determine if its consistency in testing and measurement was what it was intended to achieve. The test re-test method was adopted in order to come out with estimate of the reliability of the tools. This included directing the same test twice to the same group of respondents who the researcher chose for the same purpose. Reliability of research instruments was also ensured by appropriate selection of research assistants. They were adequately trained and familiarized with the study area and topic of research. The research instruments were pre-tested in the field prior to the conduct of the actual study.

3.7 Data Collection Procedures

The researcher obtained an introductory letter and authorization from Jomo Kenyatta University of Agriculture and Technology. The principal investigator also sought permission from the hospitals authorities to collect data. Data collection was done by the principal investigator and with the assistance of trained research assistants. The selected respondents from the four facilities were distributed with questionnaires to fill by research assistants and were collected immediately once completed. They were guided by the research assistants for collection of quantitative data. Data was collected between June and August 2020. Qualitative data was collected using key informant interview guides. This was done with selected facility healthcare workers and community health and extension workers. Appointments were done prior to data

collection and the interviews were done in their respective offices. Their views, opinions and suggestions were recorded in form of notes. The research instruments were kept in double locked cabinets and only accessible by the principal investigator.

3.8 Data Management and Analysis

After data collection, the research instruments were adequately checked for completeness. This was to ensure that the output is free from outliers and the effect of missing responses is at minimum. The information was coded by the researcher before entering them into a spreadsheet followed by analysis using statistical package for social sciences (SPSS) version 20.0. Descriptive statistics for quantitative data were calculated and later presented in frequency tables, pie charts and graphs. Inferential statistics were also calculated using Chi square tests at 95% confidence interval with p-values less than 0.05 considered significant and presented in cross-tabulations. This was used to show the association between independent and dependent variables. The multivariate analysis was significant in gaining a proper understanding of the association between multiple variables while enabling the control of the existing confounders. Adherence was determined by investigating the number of patients that were currently on IPT treatment. Qualitative data was analyzed using thematic analysis. A coding framework was developed after thorough reading of the transcripts, and it was further discussed and applied to the transcripts in Atlas.ti as per the thematic analysis guidelines of Creswell (Creswell, 2009).

3.9 Ethical Considerations

Research approval and authorization (Appendix iv) was sought from the JKUAT board of postgraduate studies (BPS). Ethical approval (Appendix vi) was obtained from KNH/UON ethics and research committee REF P883/11/2019 as the institutional review board (IRB) before commencing the recruitment of participants. Research authorization and permit (Appendix vi) was sought from the National Commission for Science Technology and Innovation (NACOSTI). Copies of the proposal, knowledgeable permission form as well as several succeeding alterations to either article were submitted to the committee for endorsement. All required clearance and permission were sought from the selected health facilities prior to data collection. The

researcher also obtained written informed consent from participants after disclosure of all the information pertaining the study. Strict confidentiality was observed during the whole research period. The study participants were given study identification codes and no personal identification data was recorded on the questionnaire. No information concerning individual study participants was disclosed to any third party.

CHAPTER FOUR

RESEARCH RESULTS

4.1 Response Rate

The study captured a 93.85% response rate as 168 responses were captured from a target of 179.

4.2 Results

4.2.1 Adherence to IPT

The results showed that at least three-quarters (75.60%) of the respondents were adherent to IPT while a quarter were not (24.40%)

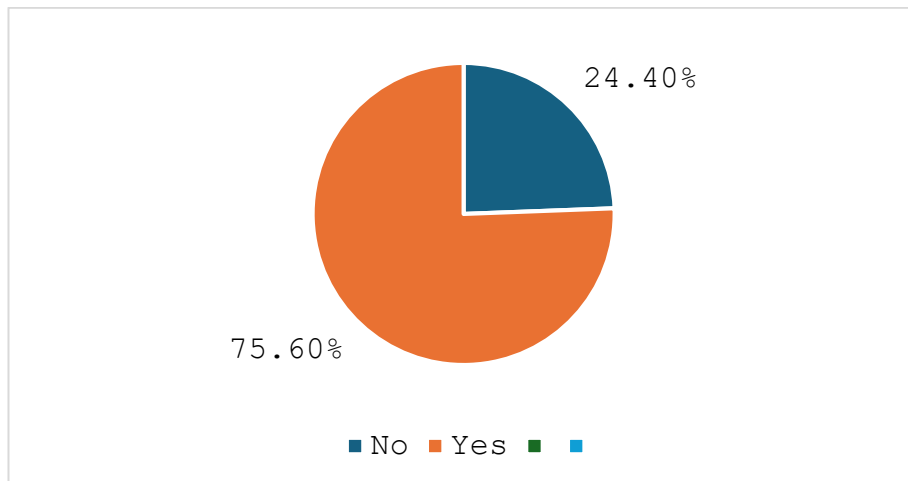


Figure 4.1: Adherence to IPT among Respondents

4.2.2 Socio-Demographic Factors

A majority of the respondents were female (n=88, 52.4%), married (n=88, 52.4%) and between the age of 18-30 (n=97, 57.7%). Additionally, a majority had completed tertiary education (n=122, 72.6%) and a majority were employed (n=91, 54.2%)

Table 4.1: Sociodemographic Characteristics of Respondents

Characteristic	Category	Frequency (n)	Percent (%)
Sex	Male	80	47.6
	Female	88	52.4
Marital status	Single/divorced	80	47.6
	Married	88	52.4
Age category	18-30 years	97	57.7
	31+ years	71	42.3
Education level	Primary/secondary	46	27.4
	Tertiary	122	72.6
Occupation	Unemployed/self-employed	77	45.8
	Employed	91	54.2

In the univariable logistic regression analysis of sociodemographic characteristics associated with IPT adherence, two statistically significant relationships were identified. Firstly, marital status was significantly associated with IPT adherence, with single/divorced individuals having higher odds of adherence compared to married individuals (OR: 4.508, 95% CI: 1.989-10.218, $p < .001$). Secondly, occupation was also significantly associated with IPT adherence, with unemployed/self-employed individuals showing higher odds of adherence compared to employed individuals (OR: 4.098, 95% CI: 1.809-9.282, $p = .001$). These findings suggest that being single/divorced or unemployed/self-employed increases the likelihood of adhering to IPT.

Table 4.2: Univariable Logistic Regression of Sociodemographic Characteristics Associated with IPT Adherence

Characteristic	Category	Adherence to IPT				OR	CI	P-value
		no		yes				
		n	%	n	%			
Sex	male	19	46.3	61	48.0	1.070	0.528-2.167	.851
	female	22	53.7	66	52.0	REF		
Marital status	single/divorced	9	22.0	71	55.9	4.508	1.989-10.218	<.001
	married	32	78.0	56	44.1	REF		
Age category	18-30 years	24	58.5	73	57.5	0.958	0.469-1.955	.905
	31+ years	17	41.5	54	42.5	REF		
Education level	primary/secondary	10	24.4	36	28.3	1.226	0.545-2.758	.622
	tertiary	31	75.6	91	71.7	REF		
Occupation	unemployed/self-employed	9	22.0	68	53.5	4.098	1.809-9.282	.001
	employed	32	78.0	59	46.5	REF		

4.2.3 Patient Factors

More than three-quarters of the respondents enrolled in CCC in ≤ 3 years ($n=130$, 77.4%). Slightly more than half were of the stages 1 and 2 ($n=97$, 57.7%) but majority did not understand IPT ($n=102$, 60.7%). However, a majority have knowledge of the role of IPT ($n=112$, 66.7%).

Table 4.3: Distribution of Patient Factors

Characteristic	Category	Frequency (n)	Percent (%)
Period enrolled in CCC	≤ 3 years	130	77.4
	4-7 years	38	22.6
HIV stage	Stages 1 and 2	97	57.7
	Stages 3 and 4	71	42.3
Understands IPT	No	102	60.7
	Yes	66	39.3
Knowledge of the Role of IPT	No	56	33.3
	Yes	112	66.7

In the univariable logistic regression analysis of patient factors associated with IPT adherence, the knowledge of the role of IPT emerged as a statistically significant factor. Respondents who had knowledge of the role of IPT were significantly more likely to adhere to the therapy compared to those who did not (OR: 3.167, 95% CI: 1.528-6.564, $p = .002$). This indicates that understanding the importance of IPT greatly increases adherence rates. For the period enrolled in CCC, the odds ratio was not computed (nc) because one of the cells contained a zero, violating the assumption of logistic regression that requires all cells to have non-zero counts. Other factors, such as HIV stage and understanding of IPT, were not significantly associated with IPT adherence.

Table 4.4: Univariable Logistic Regression of Patient Factors Associated with IPT Adherence

Characteristic	Category	Adherence to IPT				OR	CI	p-value
		No		yes				
		n	%	n	%			
Period enrolled in CCC	<=3 years	3	2.3	127	97.7	<i>nc</i>		.997
	4-7 years	38	100.0	0	0.0	REF		
HIV stage	Stages 1 and 2	28	28.9	69	71.1	REF		.118
	Stages 3 and 4	13	18.3	58	81.7	1.810	0.860-3.813	
Understands IPT	No	22	21.6	80	78.4	1.470	0.721-2.995	.289
	Yes	19	28.8	47	71.2	REF		
Knowledge of the Role of IPT	No	22	39.3	34	60.7	REF		.002
	Yes	19	17.0	93	83.0	3.167	1.528-6.564	

nc – not computed

4.2.4 Health System Factors

Only a fifth of the respondents experienced bad health worker attitude (n=36, 21.4%) and two-fifths experienced few health workers (n=68, 40.5%). A majority of the respondents were not treated well at the facility (n=123, 73.2%), given adequate information (n=97, 57.7%) and good time management during IPT (n=117, 69.6%).

Table 4.5: Distribution of Responses to Health System Factors

Characteristic	Category	Frequency (n)	Percent (%)
Bad Health worker attitude	No	132	78.6
	Yes	36	21.4
Few Health workers	No	100	59.5
	Yes	68	40.5
Treated well at the facility	no	123	73.2
	Yes	45	26.8
Adequate information given	No	97	57.7
	Yes	71	42.3
Good Time management during IPT	No	117	69.6
	Yes	51	30.4

In the univariable logistic regression analysis of health system factors associated with IPT adherence, two factors were statistically significant. A negative health worker attitude was significantly associated with lower adherence to IPT, with respondents who did not experience a bad health worker attitude being more likely to adhere (OR:

4.739, 95% CI: 2.144-10.475, $p < .001$). Additionally, the perception of having few health workers was significantly associated with higher IPT adherence, with respondents perceiving a shortage of health workers showing higher adherence rates (OR: 3.085, 95% CI: 1.362-6.988, $p = .007$). Other factors, including treatment at the facility, adequacy of information given, and time management during IPT, were not significantly associated with adherence.

Table 4.6: Univariable Logistic Regression of Health System Factors Associated with IPT Adherence

Characteristic	Category	Adherence to IPT				OR	CI	P-value
		No		yes				
		n	%	n	%			
Bad Health worker attitude	no	23	17.4	109	82.6	4.739	2.144-10.475	<.001
	yes	18	50.0	18	50.0	REF		
Few Health workers	no	32	32.0	68	68.0	REF		.007
	yes	9	13.2	59	86.8	3.085	1.362-6.988	
Treated well at the facility	no	32	26.0	91	74.0	0.711	0.309-1.637	.423
	yes	9	20.0	36	80.0	REF		
Adequate information given	no	21	21.6	76	78.4	1.419	0.699-2.880	.322
	yes	20	28.2	51	71.8	REF		
Good Time management during IPT	no	32	27.4	85	72.6	0.569	0.249-1.301	.182
	yes	9	17.6	42	82.4			

4.2.5 Environmental Factors

A majority of the respondents experienced IPT drug stockouts ($n=99$, 58.9%), nearly a quarter had facilities that were too far ($n=39$, 23.2%), nearly two-fifths received support from family and friends ($n=65$, 38.7%) and a majority did not experience community stigma ($n=120$, 71.4%).

Table 4.7: Distribution of Responses to Environmental Factors

Characteristic	Category	Frequency (n)	Percent (%)
IPT Drug Stockout	No	69	41.1
	Yes	99	58.9
Health facilities too far	No	129	76.8
	Yes	39	23.2
Received Support from family and friends	No	103	61.3
	Yes	65	38.7
Community stigma	No	120	71.4
	Yes	48	28.6

Two factors were statistically significant in the univariable logistic regression analysis of environmental factors associated with IPT adherence. Experiencing an IPT drug stockout was significantly associated with higher adherence to IPT, with those who experienced a stockout being more likely to adhere (OR: 2.250, 95% CI: 1.101-4.600, $p = .026$). Additionally, community stigma was significantly associated with higher adherence to IPT, with those who did not experience stigma showing lower adherence rates than those who did (OR: 4.904, 95% CI: 1.641-14.649, $p = .004$). Other factors, such as the distance to health facilities and support from family and friends, were not significantly associated with IPT adherence.

Table 4.8: Univariable Logistic Regression of Environmental Factors Associated with IPT Adherence

Characteristic	Category	Adherence to IPT				OR	CI	p-value
		no		yes				
		n	%	n	%			
IPT Drug Stockout	No	23	33.3	46	66.7	REF		
	Yes	18	18.2	81	81.8	2.250	1.101-4.600	.026
Health facilities too far	No	31	24.0	98	76.0	1.090	0.478-2.486	.838
	Yes	10	25.6	29	74.4	REF		
Received Support from family and friends	No	21	20.4	82	79.6	1.735	0.851-3.538	.129
	Yes	20	30.8	45	69.2	REF		
Community stigma	No	37	30.8	83	69.2	REF		
	Yes	4	8.3	44	91.7	4.904	1.641-14.649	.004

4.3 Multivariable Logistic Regression Analysis

In the multivariable logistic regression analysis of factors associated with IPT adherence, several variables were found to be statistically significant. However, it is important to note that occupation and knowledge of the role of IPT, despite being

significant in the univariable analysis, were excluded from the multivariable model due to multicollinearity issues. The collinearity diagnostics revealed high multicollinearity involving these variables, with high variance proportions in several dimensions. For instance, occupation had high variance proportions of 0.50 in Dimension 5 and 0.31 in Dimension 7, while knowledge of the role of IPT had high variance proportions of 0.46 in Dimension 8 and 0.21 in Dimension 3. The condition indices in these dimensions exceeded 10, and in some cases 30, indicating severe multicollinearity. Consequently, to improve the stability and interpretability of the regression model, these variables were excluded despite their initial significance. The inclusion of variables in the multivariable model was based on their statistical significance in the univariable analysis, with a threshold of $p < .05$. This ensures that only the most relevant predictors, based on their initial associations with IPT adherence, were considered in the multivariable analysis.

The multivariable logistic regression analysis yielded several significant associations with IPT adherence. Single or divorced individuals were significantly more likely to adhere to IPT compared to married individuals, with an adjusted odds ratio (AOR) of 6.572 (95% CI: 2.365-18.266, $p < .001$), suggesting that being single or divorced increases the likelihood of IPT adherence by approximately 6.6 times. Respondents who perceived a shortage of health workers were more likely to adhere to IPT, with an AOR of 5.953 (95% CI: 2.047-17.309, $p = .001$), indicating that these individuals are about 6 times more likely to adhere to IPT. Good time management during IPT was associated with higher adherence, with an AOR of 3.237 (95% CI: 1.153-9.084, $p = .026$), implying that those who reported good time management were over 3 times more likely to adhere to IPT. Experiencing an IPT drug stockout was linked to higher adherence, with an AOR of 4.786 (95% CI: 1.778-12.883, $p = .002$), suggesting that respondents who experienced a drug stockout were nearly 5 times more likely to adhere to IPT. Additionally, community stigma had a strong positive association with IPT adherence, with an AOR of 13.048 (95% CI: 3.347-50.865, $p < .001$), indicating that those who experienced stigma were about 13 times more likely to adhere to IPT compared to those who did not face stigma. These findings highlight the importance of marital status, health worker availability, time management, drug stockouts, and community stigma in influencing IPT adherence. By addressing these factors,

interventions can be better tailored to support patients in adhering to their treatment regimens.

Table 4.9: Multivariable Logistic Regression of Factors Associated with IPT Adherence

Characteristic	Category	AOR	CI	p-value
Marital status	Single/divorced	6.572	2.365-18.266	<.001
	Married	REF		
Few health workers	No	REF	2.047-17.309	.001
	Yes	5.953		
Good Time management during IPT	No	REF	1.153-9.084	.026
	Yes	3.237		
IPT Drug Stockout	No	REF	1.778-12.883	.002
	Yes	4.786		
Community Stigma	No	REF	3.347-50.865	<.001
	Yes	13.048		

4.4 Qualitative Analysis

4.4.1 Adherence to IPT

The key respondents noted low adherence from the patients only sought the drugs for certain period and absconded clinic visits. This is also a challenge attributed to the difficulty in tracing the patients to make follow-ups.

“...Some of the patients come and pick the IPT drugs for a period and abscond subsequent visits to the clinic. This has been a challenge since we are unable to trace all of them. However, as a facility we are trying to make follow ups with the patients and their colleagues...” (KII 015).

4.4.2 Socio-Demographic Factors

Based on the key informants, women were more likely to complete their IPT drug dosage compared to men. Patients also note considerable issues such household chores, work and lack of funds to visit the facility.

“...Throughout my nursing experience, I have seen more women taking keen interest in completing their IPT drug dosages. Most men drop out of their treatment because of peer pressure and personal perceptions which need to be addressed so that this

could be resolved. Also, those patients who feel supported by their spouses feel motivated to comply with the treatment guidelines...” (KII 014)

“...During clinics, I receive excuses from patients who sometimes miss to attend clinics as indicated in their booking cards as they claim to be involved in demanding chores and work engagements to provide for their families... Money also is another issue because they have to facilitate themselves to visit this facility for medication...” (KII 010).

4.4.3 Patient Factors

Patient factors that could have contributed to low IPT adherence include fear of being seen while seeking HIV medication and perceived stigma and discrimination directed towards PLHIV.

“...Some of my staff members say that their patients tell them they fear being seen by their friends that they are using HIV medication. They prefer attending facilities which they believe they are likely not to meet someone they know...These issues surrounding stigma and discrimination especially among people living with HIV has been a challenge for administering these IPT drugs in this region...” (KII 007).

4.4.4 Health System Factors

The key respondents noted that facilities strive to provide relevant information to the patients on enrollment in IPT and the importance of adhering to the guidelines. However, there are instances where these needs may not be met due to the workload.

“We try to provide the patients with relevant information regarding their need for enrollment in IPT and the importance of adhering to the strict guidelines. However, sometimes because of the workload they may not be able to meet the individual needs of every patient. As the facility, we share information through charts, posters and brochures which we give to patients during clinics and advise them to read...” (KII 006).

4.4.5 Environmental Factors

A key contributor to the low IPT adherence among the key respondents was the stockouts.

“...Sometimes we run out of stock for IPT drugs. So patients may come and miss them during their scheduled clinics. This discourages them and they may fail to come even when the drugs are available thinking still the drugs are not there affecting their compliance rates. I think most essential drugs should be given more priority in terms of procurement by respective departments.” (KII 009).

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a summary, conclusions and recommendations of the study and suggestion for further studies. This comprises on adherence of isoniazid preventive therapy, patient-provider interaction, patient-related and socio-environmental factors associated with adherence of isoniazid preventive therapy.

5.2 Discussion

5.2.1 Adherence to IPT

The results revealed that only 75.6% of the respondents adhered to the IPT citing the need for further action directed towards improving adherence among PLHIV. This also relates to a study conducted by Adepoju *et al.* (2020) who sought to investigate the completion rates for IPT among PLHIV. The study relied on a retrospective cohort approach that spanned for a period of 5 years between 2010-2016. The results showed that only 40% of patients who initiated the IPT treatment completed the course while 17.2%, 44.9%, 22.9%, 7.1% and 7.9% defaulted by the 1st month, 2nd month, 3rd month, 4th month and 5th months respectively. Dhungana *et al.* (2019) conducted a retrospective cohort study that investigated the IPT initiation and completion rates among PLHIV. The findings from the study revealed that among 141 who were initiated on IPT, 133 complete the treatment within 6 months. This was also associated with factors such as age (>60 years, occupation (migrant workers) and initiation on ART.

Okedo *et al.* (2020) also explored the adherence of IPT among PLHIV in Nigeria. The study was a cross-sectional approach that was conducted in 2019 which revealed that 55% of the respondents had received IPT and only 17.5% were on IPT the study. This was mostly associated with poor level of knowledge on the role and importance of IPT. More than three-quarters (91.4%) also reported good adherence 30 days preceding the survey. In a study done in Kenya, long treatment regimen/duration and

fear of side effects was the key barrier to adherence to IPT (Mwangi *et al.*, 2019). Finally, the researcher sought to enquire whether the respondents understood the role of IPT. The results showed that majority of the respondents indicated that the role of IPT was to treat TB. This means that they did not give the main reason for IPT treatment which prevents development of active TB among HIV positive patients. The results were similar to a study done in Nigeria where majority were not aware of isoniazid preventive therapy's role (Akamike *et al.*, 2021).

5.2.2 Sociodemographic Factors

The multivariable logistic regression revealed that single or divorced individuals were more likely to adhere to IPT contrary to those who were married. This suggested that being single or divorced increases the likelihood of IPT adherence. The findings relate to a study conducted by Akamike *et al.* (2021) that captured a significant association between marital status and IPT adherence. This is probably because the respondents interviewed were more than 18 years hence most likely to be in stable marriages. Another study also captured a significant statistical association between marital status and adherence to IPT. This may be attributed to the fact that married couples could easily get psychosocial support from their partners who could encourage them to complete their IPT drugs as most married individuals adhered to isoniazid preventive therapy. The results were similar to a study done in Tanzania, where the marital status of being married was a significant predictor of IPT adherence (Sabasaba *et al.*, 2019).

However, a study done in rural Uganda revealed that gender was strongly associated with IPT adherence among HIV positive patients received differentiated and non-differentiated HIV care (Tram *et al.*, 2020). The results did not agree with a cross-sectional analytical study done on IPT completion determinants in Dar es Salaam, Tanzania where gender was not significantly associated with completion of IPT (Robert *et al.*, 2020). In another study done in southeast Nigeria majority of those who participated were aged between 30-49 years (Akamike *et al.*, 2021). However, there was no significant statistical association between age and adherence to isoniazid preventive therapy. The results were contrary to a study done in Tanzania where age was a significant factor that influenced adherence to IPT among people living with

HIV (Robert *et al.*, 2020). According to a study done in Nepal on IPT completion rates, it was reported that being a migrant worker was more likely to adhere to IPT completion (Dhungana *et al.*, 2019).

5.2.3 Patient Factors

None of the patient factors were found significant at the multivariable level. This is contrary to a study conducted in Brazil which showed that there was an association between WHO stage of HIV and adherence to IPT. This decreases with increase in HIV stage as those in stage 3 and 4 were less likely to adhere to IPT (Picone *et al.*, 2020). Further, the results revealed that majority of the respondents were in a walking functional status. There was no significant statistical association between functional status and adherence to isoniazid preventive therapy. However, majority of those who were in walking functional status were more likely to adhere to IPT. The results were contrary to a study done by Mekonnen *et al.* (2019) who found out that functional status was associated with adherence to IPT among HIV positive patients.

According to Ssendikwanawa *et al.* (2023) factors that influenced IPT adherence included side effects and pill burden associated with the uptake of IPT. The study also noted the need for counseling and reliance on IPT drugs that have fewer side effects that are associated with IPT interruptions. Nezenega *et al.* (2020) also revealed that issues such as forgetfulness, inadequate knowledge and information on TB and the treatment regimen. Additionally, patients with low educational status were less likely to complete TB medication. Patients with psychological distress were also less likely to attend follow-ups and clinic appointments. Amanyanya *et al.* (2023) also noted that IPT adherence was associated with lack of IPT-related health education, the distance to the health facility, patient relocation, and the pill burden which served as key barriers. Maokola *et al.* (2021) also notes that clinically ill patients are more likely not to adhere to IPT due to difficulties among clinicians to rule out TB.

5.2.4 Health System Factors

The results showed that respondents who perceived a shortage of health workers and good time management during IPT was associated with higher adherence. Similar

results were reported by a study done by Selehelo *et al.*, (2020), on the provision of IPT among HIV positive patients in Mafikeng PHC facilities which showed that there were enough healthcare workers. The results were contrary to a study done in Arua District in Uganda where it was noted that the healthcare workers were not enough with frequent stock-out of drugs which affected HIV positive patients' adherence to IPT (Okethwangu *et al.*, 2019).

In a study done in Eswatini on completion of IPT, long travel and wait times was reported by most of the respondents. Long waiting time and spending a lot of time in the hospital during service provision may discourage patients from seeking subsequent services in the health facilities. However, there was no statistical association between effectiveness of the time taken for IPT and adherence to isoniazid preventive therapy (Adams *et al.*, 2019). In another study done in Uganda, contrary results were also reported where time for medication during IPT treatment was statistically significant related to IPT adherence among patients (Kadota *et al.*, 2020).

In another study done in Nigeria, majority of the respondents had low understanding of IPT (Akamike *et al.*, 2021). There was a significant statistical association between having a better understanding of IPT and its adherence among respondents. This is probably because they were given adequate information concerning the therapy including the consequences of not completing the treatment and its side effects. In a Zimbabwean study done among HIV positive patients, it was noted that patients initiated with good understanding on IPT have high adherence levels since they already knew its importance (Nyathi *et al.*, 2019).

5.2.5 Environmental Factors

The multivariable logistic regression revealed that experiencing an IPT drug stockout and community stigma had a strong positive association with IPT adherence. This relates to a study conducted in Karnataka in India, the main reason for non-completion of isoniazid preventive therapy was interruption of drug supplies in health facilities (Reddy *et al.*, 2020). Another study done in Southern Ethiopia where it was reported that only thirty percent of the HIV positive patients seeking IPT treatment felt they got social support from family and friends (Shiferaw & Gebremedhin, 2020).

According to Nezenega *et al.* (2020) economic constraints can influence the uptake and adherence of IPT. Issues such as the ability of the patients to afford adequate food and the costs associated with TB medication can have a significant impact on IPT adherence. Additionally, patients who were comfortable taking IPT among strangers, being busy, perceived stigma, and discrimination are significant factors associated with non-adherence.

Similar results were reported in a study done in Swaziland where fear of HIV status disclosure was associated with non-adherence to IPT among HIV positive patients (Adams *et al.*, 2019). Another study done among adolescents and adults HIV patients in resource constrained settings showed that they feared to seek permission to attend IPT treatment (WHO, 2023). Another study done in Lesotho on KAP related to IPT among adult HIV patients which associated cultural beliefs on HIV to low adherence on IPT (Masheane-Moseneke *et al.*, 2019). Presence of myths and misconceptions has been a key barrier to adherence to IPT among HIV positive patients across the globe (Selehelo *et al.*, 2020).

5.3 Conclusions

5.3.1 Conclusion on Objective One

Single or divorced individuals were more likely to adhere to IPT contrary to those who were married

5.3.2 Conclusion on Objective Two

None of the patient factors were found significant at the multivariable level

5.3.3 Conclusion on Objective Three

Respondents who perceived a shortage of health workers and good time management during IPT was associated with higher adherence

5.3.4 Conclusion on Objective Four

Experiencing an IPT drug stockout and community stigma had a strong positive association with IPT adherence

5.4 Recommendations

5.4.1 Recommendations from the Study

1. Further studies should be conducted to capture the other socio-demographic factors associated with IPT adherence to develop key strategies that enable their control.
2. There is a need for health promotion interventions to provide knowledge on the importance of IPT and encourage its uptake and adherence. The county government of Nairobi together with the healthcare facilities providing IPT should also scale up sensitization programs among people living with HIV so as to dispel myths and misconception about HIV/AIDS thus improved adherence levels on IPT.
3. The County government of Nairobi City and respective facilities should scale up continued medical education training on IPT to improve healthcare workers' attitude and disseminate relevant information thus leading to higher adherence levels among HIV positive patients.
4. The ministry of health, the county government of Nairobi and respective facilities should ensure well stocked IPT drugs to ensure they are readily available for use among HIV positive patients thus increased adherence level towards IPT.

5.4.2 Recommendations for Further Research

Further research is recommended to assess the quality of isoniazid preventive therapy services among HIV positive patients in Kenya.

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APPENDICES

Appendix I: Informed Consent

This is a consent form for people interviewed on the research topic: Factors Associated with Isoniazid Preventive Therapy Adherence on HIV Positive Patients in Selected Public Hospitals In Central Embakasi county, Nairobi County, Kenya

Researcher: Name: Gladys Muthoni Kahianyu.

ADM: TM310 – 3132/2015

PART I: INFORMATION SHEET

Introduction

I am Gladys Muthoni Kahianyu taking a study on factors associated with isoniazid preventive therapy adherence on HIV positive patients in Kenya: a case study of hospitals in Nairobi Eastland, Nairobi County to be submitted in partial fulfillment of the requirement for the award of Master's degree in public health in the college of health sciences of Jomo Kenyatta University of Agriculture and Technology. Please fill in all parts of the questionnaire and give additional information in the blank space provided. The information will be treated with the utmost confidentiality it deserves.

Purpose of the research

There is a greater risk to acquire TB for people living with HIV infection than the general population with more risk of progression from latent to active TB infection. Intervention for IPT uptake and information of PLHIV is an important step in the prevention of the effect of disease on the community at large. By investing in the prevention of the spread of TB among PLHIV new cases of infection can reduce drastically in the community and in health centers. As WHO recommendation on IPT uptake as a key intervention to reduce the burden of TB on PLHIV, the role of government and the entire community of achieving the success of this program is vital.

Description of the Study Procedures

If you agree to participate in this study, you will be requested to come to the clinic just once, and on this day, you shall be interviewed on the factors associating with uptake of IPT.

Participant selection

We are inviting all people living with HIV and the health and social workers who daily work with PLHIV in Nairobi Eastland in Kenya. You were selected as a possible participant because you meet the criteria required for one to participate including; a Positive HIV status, 18 years and above of age or working with people living with HIV.

Voluntary Participation

Your participation in this study is exclusively voluntary. It is entirely your choice to or not to participate. You will continue to receive all the services you have been accessing from this clinic whether you choose to participate in the study or not. If you choose not to participate in this study, you will still receive the routine services that you always get from here. You are also free to stop participating at any time even if you have earlier agreed to participate.

Risks/Discomforts of Being in this Study

There are no reasonably foreseeable risks associated with this study. The information given will be confidential and only be used for academic purpose.

Benefits of Being in the Study

There may be no direct benefit to you at the moment but your participation is likely to help find an answer to the research question which in future may inform the programs on the best approach to increase level of IPT adherence in Kenya.

Confidentiality

We will not share the identity of those participating in this study with anyone. Any information collected from you for the purpose of this research shall remain confidential and all the records of this study will be kept under lock and key accessible to the researchers only. Any information about you will be identified by a number/code and not your names known only to the researchers. Your number will not be shared with anyone except the researchers and your clinician.

Sharing the Results

The knowledge gained through this study will be shared with you through your gatherings before it is made widely available to the public. Personal and confidential information will not be shared.

Right to Refuse or Withdraw

You do not have to take part in this study if you do not wish to and that will not stop you from accessing any of the services you receive from this clinic, you will still have all the benefits you get from this clinic. You may still stop participating in this study anytime you wish without losing any of your right as a client here.

Right to Ask Questions and Report Concerns

In case you have any questions, you may ask now, later or even after the study has started. Feel free to contact me by cell phone at 0711 88 42 06.

This proposal has been reviewed and approved by department of Public Health in the College of Health Sciences of Jomo Kenyatta University of Agriculture and Technology.

If you have any questions on your rights as a research participant, you can contact Kenyatta National Hospital Ethics and Research Committee (KNH-ESRC) by calling +2542726300-19 or email uonknh-erc@uonbi.ac.ke

PART II: Certificate of Consent

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I consent voluntarily to participate as a participant in this research.

Print Name of Participant _____

Signature of Participant _____

Date _____

Statement by the researcher/person taking consent

I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the participant understands the study procedure.

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

A copy of this Consent form has been provided to the participant.

Print Name of Researcher/person taking the consent _____

Signature of Researcher /person taking the consent _____

Date _____

Appendix II: Idhini ya Taarifa

Hii ni fomu ya idhini kwa watu waliohojiwa kuhusu mada ya utafiti: Mambo Yanayohusiana na Tiba ya Kinga ya Isoniazid Kuzingatia Wagonjwa Wanaoishi na VVU katika Hospitali Zilizochaguliwa za Umma Katika kaunti ya Embakasi ya Kati, Kaunti ya Nairobi, Kenya.

Mtafiti: Jina: Gladys Muthoni Kahianyu.

ADM: TM310 - 3132/2015

SEHEMU YA I: KARATASI YA HABARI

Utangulizi

Mimi ni Gladys Muthoni Kahianyu ninafanya utafiti kuhusu mambo yanayohusiana na ufuasi wa tiba ya kinga ya isoniazid kwa wagonjwa walio na VVU nchini Kenya: uchunguzi wa hospitali za Nairobi Eastland, Kaunti ya Nairobi utakaowasilishwa kwa utimilifu wa hitaji la kutunukiwa shahada ya Uzamili katika afya ya umma katika chuo cha sayansi ya afya cha Chuo Kikuu cha Kilimo na Teknolojia cha Jomo Kenyatta. Tafadhali jaza sehemu zote za dodoso na utoe maelezo ya ziada katika nafasi tupu iliyotolewa. Taarifa itashughulikiwa kwa usiri mkubwa inavyostahili.

Madhumuni ya utafiti

Kuna hatari kubwa ya kupata TB kwa watu wanaoishi na maambukizi ya VVU kuliko watu wengi walio na hatari zaidi ya kuendelea kutoka kwa maambukizo ya TB iliyofichwa hadi amilifu. Kuingilia kati kwa IPT na taarifa za WAVIU ni hatua muhimu katika kuzuia athari za magonjwa kwa jamii kwa ujumla. Kwa kuwekeza katika kuzuia kuenea kwa TB miongoni mwa WAVIU visa vipya vya maambukizi vinaweza kupungua sana katika jamii na katika vituo vya afya. Kama pendekezo la WHO kuhusu kuchukua IPT kama afua muhimu ya kupunguza mzigo wa TB kwa WAVIU, jukumu la serikali na jumuiya nzima la kufikia mafanikio ya mpango huu ni muhimu.

Maelezo ya Taratibu za Utafiti

Ukikubali kushiriki katika utafiti huu, utaombwa kuja kliniki mara moja tu, na siku hii, utahojiwa kuhusu mambo yanayohusiana na matumizi ya IPT.

Uchaguzi wa mshiriki

Tunawaalika watu wote wanaoishi na VVU na wafanyakazi wa afya na kijamii ambao kila siku wanafanya kazi na WAVIU huko Nairobi Eastland nchini Kenya. Ulichaguliwa kama mshiriki anayewezekana kwa sababu unakidhi vigezo vinavyohitajika ili mtu ashiriki ikiwa ni pamoja na; hali nzuri ya VVU, umri wa miaka 18 na zaidi au kufanya kazi na watu wanaoishi na VVU.

Kushiriki kwa Hiari

Ushiriki wako katika utafiti huu ni wa hiari pekee. Ni chaguo lako kabisa kushiriki au kutoshiriki. Utaendelea kupokea huduma zote ambazo umekuwa ukipata kutoka kwa kliniki hii iwapo utachagua kushiriki katika utafiti au la. Ukichagua kutoshiriki katika utafiti huu, bado utapokea huduma za kawaida ambazo kila mara unapata kutoka hapa. Pia uko huru kuacha kushiriki wakati wowote hata kama hapo awali umekubali kushiriki.

Hatari/Masumbufu ya Kuwa katika Utafiti huu

Hakuna hatari zinazoonekana ipasavyo zinazohusiana na utafiti huu. Taarifa iliyotolewa itakuwa ya siri na itatumika tu kwa madhumuni ya kitaaluma.

Faida za Kuwa Katika Utafiti

Huenda kusiwe na manufaa ya moja kwa moja kwako kwa sasa lakini ushiriki wako unaweza kusaidia kupata jibu la swali la utafiti ambalo katika siku zijazo linaweza kufahamisha programu kuhusu mbinu bora ya kuongeza kiwango cha ufuasi wa IPT nchini Kenya.

Usiri

Hatutashiriki utambulisho wa wale wanaoshiriki katika utafiti huu na mtu yeyote. Taarifa zozote zitakazokusanywa kutoka kwako kwa madhumuni ya utafiti huu zitaendelea kuwa siri na rekodi zote za utafiti huu zitawekwa chini ya kufuli na ufunguo kupatikana kwa watafiti pekee. Taarifa yoyote kukuhusu itatambuliwa kwa nambari/msimbo na si majina yako yanayojulikana na watafiti pekee. Nambari yako haitashirikiwa na mtu yeyote isipokuwa watafiti na daktari wako.

Kushiriki Matokeo

Maarifa yanayopatikana kupitia utafiti huu yatashirikiwa nawe kupitia mikusanyiko yako kabla ya kufanywa kupatikana kwa umma. Taarifa za kibinafsi na za siri hazitashirikiwa.

Haki ya Kukataa au Kujitoa

Si lazima ushiriki katika utafiti huu ikiwa hutaki na hiyo haitakuzuia kupata huduma zozote unazopokea kutoka kwa kliniki hii, bado utakuwa na manufaa yote utakayopata kutoka kwa kliniki hii. Bado unaweza kuacha kushiriki katika utafiti huu wakati wowote unapotaka bila kupoteza haki yako yoyote kama mteja hapa.

Haki ya Kuuliza Maswali na Kuripoti Maswala

Iwapo una maswali yoyote, unaweza kuuliza sasa, baadaye au hata baada ya funzo kuanza. Jisikie huru kuwasiliana nami kwa simu ya kiganjani kwa 0711 88 42 06.

Pendekezo hili limepitiwa na kuidhinishwa na idara ya Afya ya Umma katika Chuo cha Sayansi ya Afya cha Chuo Kikuu cha Kilimo na Teknolojia cha Jomo Kenyatta.

Ikiwa una maswali yoyote kuhusu haki zako kama mshiriki wa utafiti, unaweza kuwasiliana na Kamati ya Maadili na Utafiti ya Hospitali ya Kenyatta (KNH-ESRC) kwa kupiga simu +2542726300-19 au barua pepe uonknh-erc@uonbi.ac.ke

SEHEMU YA II: Cheti cha Idhini

Nimesoma habari iliyotangulia, au imesomwa kwangu. Nimepata fursa ya kuuliza maswali kuhusu hilo na maswali yoyote ambayo nimeuliza yamejibiwa kwa kuridhika kwangu. Ninakubali kwa hiari yangu kushiriki kama mshiriki katika utafiti huu.

Chapisha Jina la Mshiriki _____

Sahihi ya Mshiriki _____

Tarehe _____

Taarifa ya mtafiti/mtu anayekubali

Nimesoma karatasi ya habari kwa usahihi kwa mshiriki anayetarajiwa, na kwa uwezo wangu wote nilihakikisha kuwa mshiriki anaelewa utaratibu wa utafiti.

Ninathibitisha kwamba mshiriki alipewa fursa ya kuuliza maswali kuhusu utafiti, na maswali yote yaliyoulizwa na mshiriki yamejibiwa kwa usahihi na kwa uwezo wangu wote. Ninathibitisha kuwa mtu huyo hajalazimishwa kutoa idhini, na idhini imetolewa kwa hiari na kwa hiari.

Nakala ya fomu hii ya Idhini imetolewa kwa mshiriki.

Chapisha Jina la Mtafiti/mtu anayepokea kibali _____

Sahihi ya Mtafiti/mtu anayechukua ridhaa

Tarehe _____

Appendix III: Questionnaire for Patients

I am GLADYS MUTHONI KAHIANYU taking a study on Factors Associated With Isoniazid Preventive Therapy Adherence On HIV Positive Patients In Selected Public Hospitals In Central Embakasi county , Nairobi County, Kenya.

To be submitted in partial fulfillment of the requirement for the award of Master's degree in public health in the college of health sciences of Jomo Kenyatta University of Agriculture and Technology. Please fill in all parts of the questionnaire and give additional information in the blank space provided. The information will be treated with utmost confidentiality and will be used for this research only Thesis. Answer all questions by either filling in the blank spaces or ticking in the option that applies to you.

Part A: Socio-demographic Information

1. Gender/sex: Male Female

2. Marital status: Single Married Divorced Separated

Age: 18-25 Years 26-30 Years 31-35 Years 36-40 Years 41-50 Years 51-55 Year 56-60 Years 61-65 Years 66-70 years 70 years and above

4. Education level: Primary Secondary College University
Any other (Specify) _____

5. Employment of Caregiver: Unemployed Employed Retired
Student Self-employed Any other (Specify)_____

6. What stage of HIV are you? Stage 1 Stage 2 Stage 3 Stage 4

7. What is your functioning status? Working/student Ambulatory
Bedridden

8. Are you currently on Isoniazid preventive therapy treatment? Yes No

9. If yes, for how long have you been enrolled in the care?

Less than 3 years 4 – 7 years 7 – 10 years More than 10 years

10. If no what was the reason for non-completion. Health care worker initiated due to Confirmed TB Suspected TB Side effects Poor adherence
 Self-initiated due to Confirmed TB Suspected TB Side effects

11. In your understanding what is the role of isoniazid preventive therapy?

Prevent TB Treat TB

Not sure Any other (Specify) -----

Section B: Factors Associated with Isoniazid Preventive Therapy Adherence

Impact of Patient-Provider Interaction

To what extent do you agree with the following statement relating to impact of patient-provider interaction factors associated with isoniazid preventive therapy adherence in this health facility?

1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=strongly agree.

Statement	1	2	3	4	5
Health Workers attitude has impact on patient adherence					
The hospital do not have enough healthcare workers for the IPT					
I have a better understanding of IPT which has enhanced adherence					
I get treated well whenever I visit the clinic for the IPT					
The mode of communication by health workers has enhanced adherence					
Health workers provides an adequate information about IPT					
The time taken for IPT in the hospital are effective					
There is a lot of stigmatization by the providers leading to non-adherence					
I receive good advice from the hospital regarding the treatment of IPT					

Patients' Related Factor

To what extent do you agree with the following statement relating to Patient factors associated with isoniazid preventive therapy adherence in this health facility?

1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5 =strongly agree.

Statements	1	2	3	4	5
I feel persuaded to continue with IPT treatment faithfully					
Fear of INH safety has influenced my non-adherence of IPT					
Cultural belief by patients of HIV is blamed for non-adherence					
I do not have faith in the safety of INH					
I do not have adequate understanding of IPT					
The fear of stigmatization has influenced my participation in IPT					
I do not believe in the IPT treatment					

Socio-Environmental Factors

To what extent do you agree with the following statement relating to socio-environmental factors associated with isoniazid preventive therapy adherence on a scale of 1-5 where 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5 =strongly agree. (please tick appropriately)

Statements	1	2	3	4	5
I sometimes come and miss my medication due to stock depletion					
Its difficult come to the clinic regularly because the health facility is very far away					
Sometimes my employer fail to give me permission to attend the clinic					
My family and friends are always there for me to give me support					
There is a lot of stigmatization from the community which makes me sometimes fail to go for treatment					
I always feel afraid to seek permission from my supervisor/employer to seek IPT.					

Thank you.

Appendix IV: Interview Guide for Health Care Providers and Community Health Workers

1. Profession.....
2. Age (years).....
3. Sex.....
4. Level of education.....
5. Work experience in the health care facility (years).....
6. Based on your knowledge and experience of providing IPT for PLHIV; what do you understand about Isoniazid preventive therapy?.....
7. In your opinion, what are the benefit and protective effect of IPT?.....
8. What is the eligibility criteria for provision of IPT?.....
9. What is your opinion with regard to drug resistance?.....
10. In your opinion, how has the health care facility factors influenced the adherence to IPT for PLHIV?.....
11. Do you have the IPT Training and how has the staff training on IPT influenced the adherence to IPT for PLHIV?.....
12. In your view, how has the number of health care providers compared to the workload in healthcare facilities influenced the adherence to IPT for PLHIV?.....
13. Can tell me how the supply of Isoniazid and pyridoxine have influenced adherence to IPT for PLHIV?.....
14. To what extent do you think the patients' knowledge of IPT influenced their adherence to IPT for PLHIV?.....

15. How has stigma influenced the patient's adherence to IPT for PLHIV?.....

16. In your opinion, how has social support influenced the patients' adherence to IPT for PLHIV?.....

17. To what extent has the distance to health care facility influenced the adherence to IPT for PLHIV?.....

18. From your experience, how has the forgetfulness of drug collection dates influenced the adherence to IPT for PLHIV?.....

19. What are your recommendations for future effort to scale up the program (implementation of IPT for PLHIV)?

Thank you

**Appendix V: Research Authorization from Jomo Kenyatta University of
Agriculture and Technology Board of Post-graduate Studies**



2

**JOMO KENYATTA UNIVERSITY
OF
AGRICULTURE AND TECHNOLOGY
BOARD OF POSTGRADUATE STUDIES (BPS)
OFFICE OF THE DIRECTOR**

P.O. BOX 62000
NAIROBI - 00200
KENYA
Email: director@bbs.jkuat.ac.ke

TEL: 254-67-5870000/3-5

REF: JKU/2/11/TM310-3132/2015

13TH MAY, 2021

KAHIANYU GLADYS MUTHONI
C/o SoPH
JKUAT

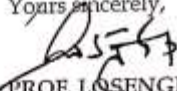
Dear Ms. Muthoni,

RE: APPROVAL OF RESEARCH PROPOSAL AND APPOINTMENT OF SUPERVISORS

Kindly note that your MSc. research proposal entitled: "FACTORS ASSOCIATED WITH ISONIAZID PREVENTIVE THERAPY ADHERENCE ON HIV POSITIVE PATIENTS IN SELECTED PUBLIC HOSPITALS IN EASTLANDS, NAIROBI COUNTY, KENYA" has been approved. The following are your approved supervisors:-

1. Dr. Jackline Mosinya Nyaberi
2. Dr. Jane Rahedi Ong'ang'o

Yours sincerely,


PROF. LOSENGE TUROOP
DIRECTOR, BOARD OF POSTGRADUATE STUDIES

Copy to: Dean, SoPH
/cm



JKUAT is ISO 9001:2015 and ISO 14001:2015 Certified
Setting Trends in Higher Education, Research, Innovation and Entrepreneurship



Appendix VI: Ethical Clearance from UON-KNH Ethics and Review Committee



UNIVERSITY OF NAIROBI
COLLEGE OF HEALTH SCIENCES
P O BOX 19676 Code 00202
Telegrams: varsity
Tel:(254-420) 2726300 Ext 44355

KNH-UON ERC

Email: uonknh_erc@uonbi.ac.ke
Website: <http://www.erc.uonbi.ac.ke>
Facebook: <https://www.facebook.com/uonknh.erc>
Twitter: @UONKNH_ERC https://twitter.com/UONKNH_ERC



KENYATTA NATIONAL HOSPITAL
P O BOX 20723 Code 00202
Tel: 725300-9
Fax: 725272
Telegrams: MEDSUP, Nairobi

Ref: KNH-ERC/A/110

Gladys Muthoni Kahianyu
Reg. No. TM310-3132/2015
School of Public Health
College of Health Sciences (CoHES)
J.K.U.A.T

Dear Gladys,



25th March 2020

RESEARCH PROPOSAL – FACTORS ASSOCIATED WITH ISONIAZID PREVENTIVE THERAPY ADHERENCE ON HIV PATIENTS IN SELECTED PUBLIC HOSPITALS IN EASTLANDS, NAIROBI COUNTY, KENYA (P883/11/2019)

This is to inform you that the KNH- UoN Ethics & Research Committee (KNH- UoN ERC) has reviewed and **approved** your above research proposal. The approval period is 25th March 2020 – 24th March 2021.

This approval is subject to compliance with the following requirements:

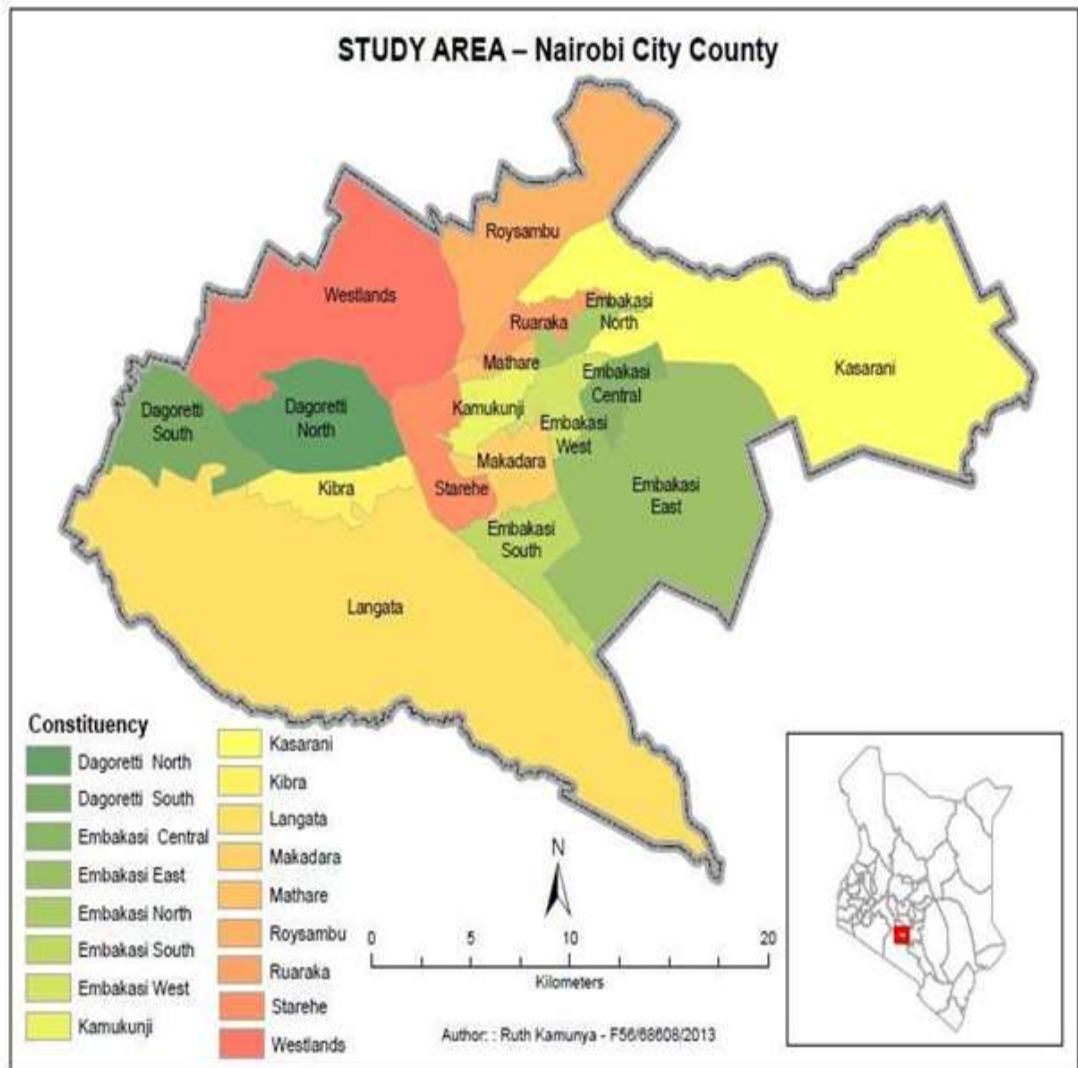
- Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
- All changes (amendments, deviations, violations etc.) are submitted for review and approval by KNH-UoN ERC before implementation.
- Death and life threatening problems and serious adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH-UoN ERC within 72 hours of notification.
- Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH- UoN ERC within 72 hours.
- Clearance for export of biological specimens must be obtained from KNH- UoN ERC for each batch of shipment.
- 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*)
- Submission of an *executive summary* report within 90 days upon completion of the study. This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/ or plagiarism.

Protect to discover

Appendix VII: Research Permit from National Council for Science, Technology and Innovation

 REPUBLIC OF KENYA	 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
Ref No: 192141	Date of Issue: 17/April/2020
RESEARCH LICENSE	
	
<p>This is to Certify that Ms. Gladys Muthoni Kahianyu of Jomo Kenyatta University of Agriculture and Technology, has been licensed to conduct research in Nairobi on the topic: Factors associated with isoniazid preventive therapy adherence on HIV positive patients in selected public hospitals in Eastland's, Nairobi County, Kenya for the period ending : 17/April/2021.</p>	
License No: NACOSTI/P/20/4804	
192141 Applicant Identification Number	 Director General NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
	Verification QR Code 
<p>NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.</p>	

Appendix VIII: Maps of the Study Area



Appendix IX: Manuscript

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Isoniazid Preventive Therapy Adherence among HIV Positive Patients in Selected Public Hospitals in Eastlands, Nairobi County, Kenya

Gladys Muthoni Kahianyu¹, Dr. Jackline Mosinya Nyaberi², Dr. Jane Rahedi Ong'ang'o²
Dr. Francis Masiye⁴

ABSTRACT

Aim: Globally, tuberculosis is the most common infection that contributes to the high rates of mortality and morbidity among people living with HIV/AIDS (PLHIV). Tuberculosis remains one of the top ten causes of death globally. The study specifically focused on patient-provider interaction, patient-related factors, and socio-environmental factors associated with the level of IPT adherence.

Methods: The study used a descriptive cross-sectional study design. The study employed a mixed-methods approach, utilizing both quantitative and qualitative research methods. The study respondents were sampled using systematic sampling with a predetermined interval of 2 for the quantitative component of the study and purposive sampling for the qualitative part of the study.

Results: The level of treatment adherence among PLHIV was 72.2% in Nairobi City County. The main reason for non-adherence was suspected active tuberculosis by healthcare providers. The majority of socio-patient-provider interaction factors were associated with IPT adherence, including provider attitude ($p = 0.033$), information ($p = 0.008$), and understanding of IPT ($p = 0.049$). Most patient-related factors, such as being persuaded to complete IPT ($p = 0.028$), fearing INH safety ($p = 0.018$), having cultural beliefs ($p = 0.016$), and believing in IPT treatment ($p = 0.001$), were significantly associated with IPT adherence.

Conclusion: The study concludes that the rate of IPT adherence was below the acceptable standard of 90% in Nairobi City County.

Key words: Isoniazid Preventive Therapy, Adherence, People living with HIV/AIDS, Tuberculosis)

1. Introduction

Infection of Tuberculosis (TB) disease which is triggered by bacillus *Mycobacterium tuberculosis* affects mostly lungs and is a global health problem. According to WHO in 2016, TB is among the top ten killers of PLHIV globally.¹ Out of 1.4 million deaths, four thousand are of persons living with HIV. Globally, it is estimated that over ten million tuberculosis cases included over one million people living with HIV. Reemerged as a major threat to global public health, TB cases have been reported mostly in countries with high HIV prevalence².

Uptake of Isoniazid Preventive Therapy (IPT) to reduce increased cases of tuberculosis sickness has been poor, mostly in areas with high tuberculosis burden. Only one million PLHIV freshly registered in HIV care were confirmed to have taken IPT in the year 2015³. For instance out of 16 high TB burden nations who confirmed treatment of IPT had a low cover of as little as 2%⁴. The medication cost, human resources to deal with treatment completion and chain of supply remains a programmatic concern and evidence as significant barriers. Even as the uptake of IPT has been increasing another challenge arises from methods of an appropriate shift to some tasks of management of the patient and medical dispensing which need to be minimized if the burden for both patients and healthcare workers is to be reduced. Continued monitoring remains one of the main options used to deal with cases globally⁵.

Africa leads with the most HIV positive TB cases at 74% of all the cases globally⁴. With 81% accounted cases since the year 2000, about 22 high burden countries (HBCs) have received attention at the global level⁵. Tuberculosis is an opportunist disease that is easily acquired by HIV positive persons in their first months of antiretroviral treatment (ART) in both resource constrained and industrialized settings.

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² Institute of Tropical Medicine and Tropical Diseases, Kenya Medical Research Institute, Kenya

Even though ART is significant in reducing HIV cases, there are many cases where it is found not to entirely reduce TB disease risks in the continent⁶. There are high cases of mortality and morbidity because of drug resistant and sensitive TB amongst HIV positive patients. Regular screening is vital of all PLHIV for active TB to provide them with treatment or encourage preventive therapy. The World Health Organization recommends TB preventive therapy for both young and aged HIV infected people to be isoniazid daily for at least 6 months⁷.

In Kenya, case notification has gone up at an average of 16% yearly. The implementation guidelines target is to ensure 70% of the cases are detected and 85% of them cured⁸. As such, Tuberculosis (TB) and HIV coinfection in Kenya has remained the major threat and challenge to the health sector. In 2016 the overall TB incidences for Kenya was 169,000 that is approximately 348 per 100,000 population. Nonetheless, there was noticeable reduction of cases of HIV/TB rate that fall to 30% from 45% between the years 2006 and 2008 in Kenya⁴.

The WHO recommend three interventions that can aid in reducing TB burden amongst PLHIV in Kenya. These three interventions are, isoniazid preventive therapy (IPT), Intensified TB case finding (ICF) and infection control for TB. It is proof that use of IPT helped in the successful reduction of TB risk in PLHIV between 34% to 68% up to four years⁹. IPT is suggested for persons with standard underlying Mycobacterium tuberculosis infection to stop its development into disease. WHO recommended a dose of 10 mg/kg daily for young children and 300 mg/kg for adults. It also recommended minimum of IPT for children and adults for six months especially for pregnant mothers, people with active AIDS infections and persons who have undergone complete TB treatment successful. Kenya then adopted a six months IPT regimen for eligible individual in the year 2011.

2. Materials and Methods.

The study was conducted among HIV positive patients in TB treatment centers of 4 Public Health Facilities in Eastlands Nairobi County in Kenya.

2.1 Study Design: This was a descriptive cross-sectional study design that adopted a mixed methods approach using both quantitative and qualitative methodologies in data collection.

2.2 Study location: The study was done in Nairobi City County, which has an estimated population of about 5 million. Nairobi has over 15 informal settlements, with an estimate of 3 million (70%) of the population living in informal settlements. This was a study conducted at 4 TB treatment centers within the informal settlements of Nairobi City County. The specific centers were Mama Lucy Referral Hospital, Kayole I Sub-district Hospital (Kayole), Kayole II Health Center (Dandora) and Umoja I health center.

2.3 Sample size: 266 participants ,250 participants took part in the quantitative part and 16 respondents for the qualitative part which was done purposively.

Sample size calculations: Sample size determination was calculated using Fishers *et al* 1998 formula.

$$n = Z^2 p(1-p) / d^2 \quad n = (1.96)^2 (0.5) (0.5) / 0.05^2 = 384.16$$

For populations less than 10, 000, a correction formula was used.

$$nf = \frac{n}{1+n/N} = \frac{384}{1+384/553} = 226.63 \approx 227$$

An addition 10% (23) of respondents was also included to cater for non-respondents making the total sample size to be 250 people. The table below shows the proportionate sampling from four facilities.

2.4 Sampling techniques: Nairobi City County was purposively sampled. This is because the county is the capital city of the country with the most informal settlements with surging cases of HIV AIDS. The four health facilities were purposively selected for inclusion in the study. Mama Lucy Referral hospital, Kayole I, Kayole II and Umoja I health centers selected because they are TB treatment centers within the informal settlements in Nairobi. The primary respondents were systematically sampled using a predetermined sampling interval calculated by dividing the total estimate population with the required sample size. The first respondent was randomly selected using folded pieces of paper using yes/no raffles. The subsequent respondents were systematically sampled at an interval of two. Every second successful respondent was selected until a sample size of 250 was reached. The respondents selected were proportional to the number of HIV positive patients in selected facilities. The study also purposively selected two healthcare workers and two community health workers from each of the hospitals as key informants in the study. Therefore, a total of 16 key informants were included.

2.5 Inclusion criteria: The study included PLHIV aged 18 years and above attending the HIV comprehensive care clinic at the selected health care facilities. They must have been residents in the location where the health facilities are situated to avoid imported cases. They must have been on IPT for at least 90 days and consented to participate in the study.

2.6 Exclusion criteria: The study excluded HIV positive patients who had been confirmed to have tested TB positive. Those who were too sick and unable to participate were also excluded.

2.7 Procedure methodology: A Research questionnaire was used to collect quantitative data from primary respondents. A key informant interview schedule was used to collect qualitative data from key informants. **Statistical analysis:** Information was coded by the researcher before entering them into a spreadsheet followed by analysis using statistical package for social sciences (SPSS) version 20.0. Descriptive statistics for quantitative data were calculated and later presented in frequency tables, pie charts and graphs. Inferential statistics were also calculated using Chi square tests at 95% confidence interval with p-values less than 0.05 considered significant and presented in cross-tabulations. This was used to show the association between independent and dependent variables. Qualitative data was analyzed using thematic analysis. A coding framework was developed after thorough reading of the transcripts, and it was further discussed and applied to the transcripts in Atlas.ti as per the thematic analysis guidelines of Creswell [Creswell 2009] and Moustakas [Moustakas 1994].

2.8 Ethical Considerations: Research approval and authorization was sought from the JKUAT board of postgraduate studies (BPS). Ethical approval was obtained from KNH/UON ethics and research committee REF P883/11/2019 as the institutional review board (IRB) before commencing the recruitment of participants. Research authorization and permit was sought from the National Commission for Science Technology and Innovation (NACOSTI)

3. Results

3.1 Response rate

The study administered 250 questionnaires to selected HIV positive patients in selected public hospitals in Eastlands, Nairobi City County, Kenya. Duly filled and returned questionnaires were taken into account and considered for analysis. After data checking and cleaning, 227 questionnaires were deemed fit for analysis representing a response rate of 90.8%.

Health facility	Centre Population	Sample size	Response rate
Mama Lucy Kibaki Hospital	349	158 (63.2%)	143
Kayole I Health Centre	65	29 (11.6%)	26
Kayole II Health Centre	82	37 (14.8%)	33
Umoja I Health Centre	57	26 (10.4%)	25
Totals	553	250 (100.0%)	227(90.8%)

3.2 Socio-demographic characteristics of the respondents

The study sought to understand the socio-demographic characteristics of the participants and more than half 125 (55.1%) of the respondents were male while the rest 102 (44.9%) were females. Regarding the respondents' marital status results showed that 133 (58.6%) of the respondents were married followed by 63 (27.8%) of them who were single and 31 (13.7%) were separated/divorced. On respondents' age, 78 (34.4%) of them were aged between 28-37 years followed by 69 (30.4%) who were aged between 18-27 years. The mean age was 31.6 years. Concerning the respondents' highest level of education attained results revealed that more than half 127 (55.9%) of the respondents had attained secondary level followed by 60 (22.0%) who had tertiary level of education and 36 (15.9%) had primary level education.

Slightly more than half 118 (52.0%) of the respondents were self-employed followed by 63 (27.8%) who were employed and 46 (20.3%) were unemployed. Concerning the respondents' stage of HIV, results showed that 75 (33.0%) were in Stage 1 followed by 58 (25.6%) who were in Stage 2, 42 (18.5%) were in stage 3 and 52 (22.9%) were in stage 4 of HIV. More than half 126 (55.5%) of the respondents were in Walking Functioning status followed by 59 (26.0%) who were bedridden and 42 (18.5%) were ambulatory. Regarding duration the respondents had been under comprehensive care clinic (CCC), slightly more than half 119 (52.4%) of them had been under the care between 4-7 years followed by 59 (26.0%) who had been under the care for a period of 3 years and below and 49 (21.6%) had been under care for more than 8 years as shown in table 3.1.

Table 3.2: Distribution of socio-demographic characteristics among respondents (n=227)

Variable	Respondent response	Frequency (N)	Percentage (%)
Gender	Male	125	55.1
	Female	102	44.9
Marital status	Single	63	27.8
	Married	133	58.6
	Separated/divorced	31	13.7
Age in years	18-27	69	30.4
	28-37	78	34.4
	38-47	32	14.1
	48-57	26	11.5
	≥ 58	22	9.7
	Mean age	31.6 years	
Highest level of education attained	No formal education	14	6.2
	Primary	36	15.9
	Secondary	127	55.9
	Tertiary	60	22.0
Occupation	Unemployed	46	20.3
	Self-employed	118	52.0
	Employed	63	27.8
Stage of HIV	Stage 1	75	33.0
	Stage 2	58	25.6
	Stage 3	42	18.5
	Stage 4	52	22.9
Functioning status	Walking	126	55.5
	Ambulatory	42	18.5
	Bedridden	59	26.0
Duration in CCC care	≤ 3 years	59	26.0
	4-7 years	119	52.4
	≥ 8 years	49	21.6

3.3 Adherence to Isoniazid Preventive Therapy

3.3.1 Proportion of respondents completed IPT

The study sought to find out the proportion of respondents who adhered to isoniazid preventive therapy which was measured by determining those completing at least 90% of IPT among HIV positive patients. The results showed that 164 (72.2%) of the respondents adhered to isoniazid preventive therapy while the rest 63 (27.8%) had not adhered. Results were as shown in the figure 3.3 below:

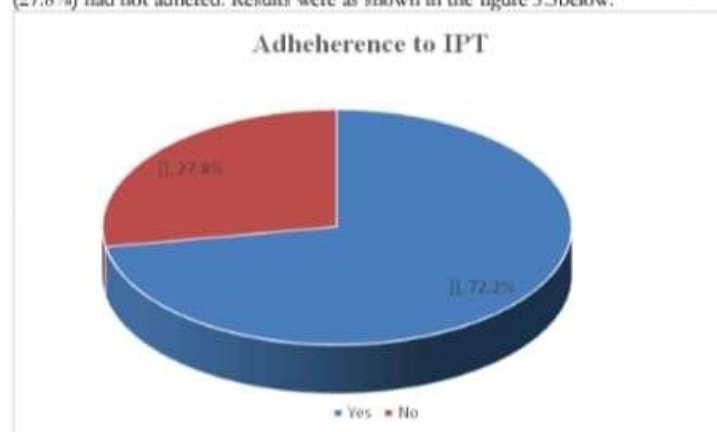


Fig 3.3: Rate of adherence to IPT among respondents

3.3.2. Reasons for not completing IPT

The researcher sought to find out the reasons for not completing isoniazid preventive therapy among the respondents. Results revealed that 19 (27.5%) of the respondents had not completed due to them being suspected of having TB by health care provider followed by 17 (24.6%) who did not complete because of their self-initiative. Results were as shown in figure 3.2 below. However, this was not supported by qualitative results as one of the healthcare providers reported.

"...Some of the patients come and pick the IPT drugs for a period and abscond subsequent visits to the clinic. This has been a challenge since we are unable to trace all of them. However, as a facility we are trying to make follow ups with the patients and their colleagues..."(KII 015).

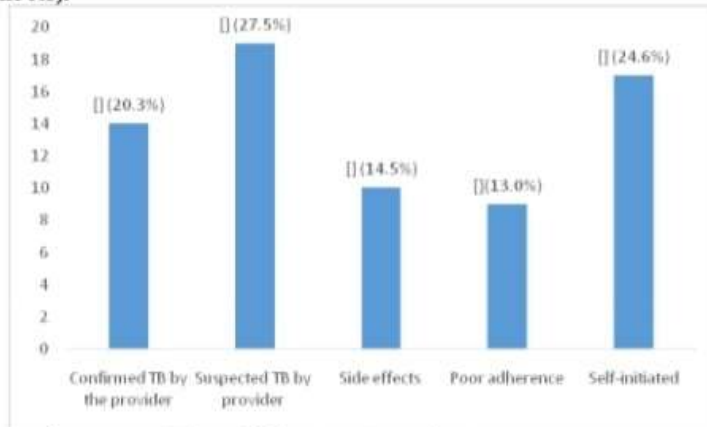


Fig 3.3: Reasons for non-completion of IPT among respondents

3.3.3 Role of IPT

The researcher sought to enquire whether the respondents understood the role of isoniazid preventive therapy. Results showed that more than half 133 (58.6%) indicated that the role of isoniazid preventive therapy was to treat TB followed by 64 (28.2%) who revealed that it helped in preventing TB. Results were as shown in figure 3.3:

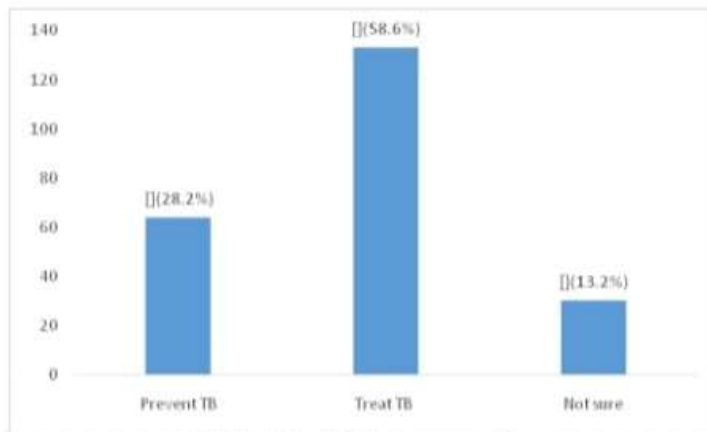


Fig 3.4: Role of IPT among respondents

3.3.4 Socio-demographic factors associated with IPT on adherence

On the association of IPT adherence, most 49 (77.8%) of the respondents who had not adhered to isoniazid preventive therapy were male. There was no significant statistical association between gender and adherence to isoniazid preventive therapy ($p=0.492$). More than half 94 (57.3%) of the respondents who were married had adhered to isoniazid preventive therapy.

There was a significant statistical association between marital status and adherence to isoniazid preventive therapy ($p=0.018$). These findings were supported by qualitative results. One of the key informants explained.

"...Throughout my nursing experience, have seen more women taking keen interest in completing their IPT drug dosages. Most men drop out of their treatment because of peer pressure and personal perceptions which need to be addressed so that this could be resolved. Also, those patients who feel supported by their spouses feel motivated to comply with the treatment guidelines..." (KII 014)

The results revealed that 64 (39.0%) of the respondents who were aged between 28-37 years had adhered to isoniazid preventive therapy. There was no significant statistical association between age and adherence to isoniazid preventive therapy ($p=0.071$). More than half 89 (54.3%) of the respondents who had attained secondary level of education had adhered to isoniazid preventive therapy. There was a statistically significant association between highest level of education attained and adherence to isoniazid preventive therapy ($p=0.001$).

Slightly less than half 81 (49.4%) of the respondents who were self-employed had adhered to isoniazid preventive therapy. There was a significant statistical association between occupational status and adherence to isoniazid preventive therapy among the respondents ($p=0.001$). Regarding stage of HIV results revealed that 59 (36.0%) of the respondents who were in stage 1 had adhered to isoniazid preventive therapy. There was a significant statistical association between stage of HIV and adherence to isoniazid preventive therapy ($p=0.013$). One of the key informants explained during the KII sessions.

"...During clinics, I receive excuses from patients who sometimes miss to attend clinics as indicated in their booking cards as they claim to be involved in demanding chores and work engagements to provide for their families... Money also is another issue because they have to facilitate themselves to visit this facility for medication..." (KII 010)

Majority 101 (61.6%) of the respondents who were in walking functional status had adhered to isoniazid preventive therapy. There was a significant statistical association between functional status and adherence to isoniazid preventive therapy ($p=0.054$). More than half 91 (55.5%) of the respondents who had been under the CCC between 4-7 years had adhered to isoniazid preventive therapy. There was an association between duration under CCC and adherence to isoniazid preventive therapy ($p=0.002$). The results are as presented in table 4.3 below:

Table 3.3: Socio-demographics associated with IPT adherence among respondents (n=227).

Independent variable	Respondent response	Adherence to IPT		Statistical significance
		Yes (N=164)	No (N=63)	
Gender	Male	76(46.3%)	49(77.8%)	$\chi^2=5.473$ df=1 $p=0.492$
	Female	88(53.7%)	14(22.2%)	
Marital status	Single	48(29.3%)	15(23.8%)	$\chi^2=7.993$ df=2 $p=0.018$
	Married	94(57.3%)	39(61.9%)	
	Separated/divorced	22(13.4%)	9(14.3%)	
Age in years	18-27	44(26.8%)	25(39.7%)	$\chi^2=23.971$ df=4 $p=0.071$
	28-37	64(39.0%)	14(22.2%)	
	38-47	24(14.6%)	8(12.7%)	
	48-57	15(9.1%)	11(17.5%)	
	≥ 58	17(10.4%)	5(7.9%)	
Highest level of education attained	No formal education	8(4.9%)	6(9.5%)	$\chi^2=7.029$ df=3 $p=0.001$
	Primary	26(15.8%)	10(15.9%)	
	Secondary	89(54.3%)	38(60.3%)	
	Tertiary	41(25.0%)	9(14.3%)	
Occupation	Unemployed	35(21.3%)	11(17.5%)	$\chi^2=27.990$ df=2 $p=0.001$
	Self-employed	81(49.4%)	37(58.7%)	
	Employed	48(29.3%)	15(23.8%)	
Stage of HIV	Stage 1	59(36.0%)	16(25.4%)	$\chi^2=14.645$ df=3 $p=0.013$
	Stage 2	31(18.9%)	27(42.8%)	
	Stage 3	31(18.9%)	11(17.5%)	
	Stage 4	43(26.2%)	9(14.3%)	
Functioning status	Walking	101(61.6%)	25(39.7%)	$\chi^2=10.437$ df=2 $p=0.054$
	Ambulatory	29(17.7%)	13(20.6%)	
	Bedridden	34(20.7%)	25(39.7%)	
Duration in CCC care	≤ 3 years	41(25.0%)	18(28.6%)	$\chi^2=2.459$ df=2 $p=0.002$
	4-7 years	91(55.5%)	28(44.4%)	
	≥ 8 years	32(19.5%)	17(27.0%)	

3.4 Patient-provider interaction and adherence to IPT

3.4.1 Patient-provider interaction factors

More than half 132 (58.1%) of the respondents revealed that the attitude of health care workers was fair followed by 55 (24.2%) who felt the attitude was poor. On whether the hospital had enough workers, 88 (38.8%) agreed followed by 70 (30.4%) who disagreed. Whether the respondents felt they were being treated well whenever they visited the clinics, 95 (41.9%) were neutral followed by 68 (30.0%) who agreed.

Less than half 101 (44.5%) of the respondents agreed that healthcare workers provided them with adequate information on isoniazid preventive therapy followed by 81 (35.7%) who disagreed. On whether the time taken for isoniazid preventive therapy at the hospital was effective, 90 (39.6%) disagreed followed by 78 (34.4%) who agreed. Slightly below half 111 (48.9%) of the respondents agreed that they had a better understanding of isoniazid preventive therapy followed by 82 (36.1%) who disagreed. The results were as presented in table 3.3 below:

Table 3.4: Distribution of patient-provider interaction factors among respondents (n=227)

Variable	Respondent response	Frequency (N)	Percentage (%)
Healthcare workers attitude	Poor	55	24.2
	Fair	132	58.1
	Good	40	17.6
The hospital has enough workers for IPT	Disagree	70	30.8
	Neutral	69	30.4
	Agree	88	38.8
I get treated well whenever I visit the clinic	Disagree	64	28.2
	Neutral	95	41.9
	Agree	68	30.0
Healthcare workers provide adequate information on IPT	Disagree	81	35.7
	Neutral	45	19.8
	Agree	101	44.5
Time taken for IPT in the hospital is effective	Disagree	90	39.6
	Neutral	59	26.0
	Agree	78	34.4
I have a better understanding of IPT	Disagree	82	36.1
	Neutral	34	15.0
	Agree	111	48.9

3.4.2 Influence of patient-provider interaction on adherence to IPT

The researcher sought to determine the influence of patient-provider interaction on adherence to isoniazid preventive therapy. Results revealed that most 113 (68.9%) of the respondents who had reported fair healthcare workers' attitude had adhered to isoniazid preventive therapy. There was a significant statistical association between perceived healthcare workers' attitude and adherence to isoniazid preventive therapy ($p=0.033$). More than half 34 (54.0%) of the respondents who had disagreed that the clinic had enough health workers had not adhered to isoniazid preventive therapy. There was no statistical association between hospital having enough workers for IPT and adherence to isoniazid preventive therapy ($p=0.220$).

Slightly less than half 30 (47.6%) of the respondents who were neutral on whether they were treated well whenever they visited the clinic did not adhere to isoniazid preventive therapy. There was no significant statistical association between getting treated well and adherence to isoniazid preventive therapy ($p=0.407$). Results also revealed that 69 (42.1%) of the respondents who had agreed that healthcare workers provided adequate information on IPT had adhered to isoniazid preventive therapy. There was significant statistical association between healthcare workers providing adequate information and adherence to isoniazid preventive therapy ($p=0.008$). However, according to one of the key informants.

"We try to provide the patients with relevant information regarding their need for enrollment in IPT and the importance of adhering to the strict guidelines. However, sometimes because of the workload may not be able to meet the individual needs of every patient. As the facility, we share information through charts, posters and brochures which we give to patients during clinics and advise them to read..." (KI1 006).

Concerning effectiveness of time taken for IPT in the hospital 66 (40.2%) who had disagreed had adhered to isoniazid preventive therapy. There was no statistical association between effectiveness of the time taken for IPT and adherence to isoniazid preventive therapy ($p=0.536$).

Regarding respondents' better understanding of IPT, results revealed that 73 (44.5%) who agreed they had a better understanding had adhered to isoniazid preventive therapy. Further results revealed that there was a significant statistical association between having a better understanding of IPT and adherence to isoniazid preventive therapy ($p=0.049$). The results were as presented in table 4.5 below:

Table 3.5: Patient-provider interaction characteristics among respondents (n=227)

Variable	Respondent response	Adherence to IPT		Statistical significance
		Yes (N=164)	No (N=63)	
Perceived healthcare workers attitude	Poor	28(17.1%)	27(42.8%)	$\chi^2=6.814$ df=2 $p=0.033$
	Fair	113(68.9%)	19(30.2%)	
	Good	23(14.0%)	17(27.0%)	
The hospital has enough workers for IPT	Disagree	36(22.0%)	34(54.0%)	$\chi^2=3.028$ df=2 $p=0.220$
	Neutral	53(32.3%)	16(25.4%)	
	Agree	75(45.7%)	13(20.6%)	
I get treated well whenever I visit the clinic	Disagree	46(28.0%)	18(28.6%)	$\chi^2=1.798$ df=2 $p=0.407$
	Neutral	65(39.6%)	30(47.6%)	
	Agree	53(32.3%)	15(23.8%)	
Healthcare workers provide adequate information on IPT	Disagree	58(35.4%)	23(36.5%)	$\chi^2=9.584$ df=2 $p=0.008$
	Neutral	37(22.5%)	8(12.7%)	
	Agree	69(42.1%)	32(50.8%)	
Time taken for IPT in the hospital is effective	Disagree	66(40.2%)	24(38.1%)	$\chi^2=1.248$ df=2 $p=0.536$
	Neutral	45(27.4%)	14(22.2%)	
	Agree	53(32.3%)	25(39.7%)	
I have a better understanding of IPT	Disagree	67(40.9%)	15(23.8%)	$\chi^2=6.032$ df=2 $p=0.049$
	Neutral	24(14.6%)	10(15.9%)	
	Agree	73(44.5%)	38(60.3%)	

3.5 Patient-related factors associated with adherence to IPT

3.5.1 Patient-related factors

Majority of 158 (69.6%) of the respondents felt persuaded to complete the isoniazid preventive therapy while the rest 69 (30.4%) were not. More than half 131 (57.7%) of the respondents did not fear INH side effects while on IPT while the rest 96 (42.3%) feared. Most 177 (78.0%) of the respondents indicated that there were no cultural beliefs on HIV/AIDS while the rest 50 (22.0%) felt that there were some cultural beliefs about HIV/AIDS.

Majority 144 (63.4%) of the respondents felt stigmatized when they used IPT while the rest 83 (36.6%) did not. Most 163 (71.8%) of the respondents believed in isoniazid preventive therapy in the facility while the rest 64 (28.2%) did not. The results were as presented in table 4.6 below:

Table 3.6: Distribution of patient-related factors among respondents (n=227)

Variable	Respondent response	Frequency (N)	Percentage (%)
I feel persuaded to complete IPT	Yes	158	69.6
	No	69	30.4
Fear of INH safety	Yes	96	42.3
	No	131	57.7
Existence of some cultural beliefs about HIV/AIDS	Yes	50	22.0
	No	177	78.0
I feel stigmatized when I participate in IPT	Yes	144	63.4
	No	83	36.6
I believe in IPT treatment in this facility	Yes	163	71.8
	No	64	28.2

3.5.2 Influence of patient-related factors on IPT adherence

The researcher sought to establish the influence of patient-related factors on adherence to isoniazid preventive therapy among the respondents.

Results revealed that most 117 (71.3%) of the respondents who felt persuaded to complete IPT had adhered to isoniazid preventive therapy. There was a significant statistical association between feeling persuaded to complete IPT and adherence to isoniazid preventive therapy ($p=0.028$). Majority 100 (61.0%) of the respondents who did not fear INH safety had adhered to isoniazid preventive therapy. There was a statistically significant association between fear of INH safety and adherence to isoniazid preventive therapy ($p=0.018$).

The results revealed that most 128 (78.0%) of the respondents who adhered to isoniazid preventive therapy were not aware on the existence of any cultural beliefs about HIV/AIDS. There was a significant statistical association between existence of cultural beliefs about HIV/AIDS and adherence to isoniazid preventive therapy ($p=0.016$). Most 103 (83.5%) of the respondents who felt stigmatized when they participated in IPT adhered to isoniazid preventive therapy. There was no significant statistical association between feeling stigmatized when participating in IPT and adherence to isoniazid preventive therapy ($p=0.750$). One of the key informants said.

"...Some of my staff members say that their patients tell them they fear being seen by their friends that they are using HIV medication. They prefer attending facilities which they believe they are likely not to meet someone they know... These issues surrounding stigma and discrimination especially among people living with HIV has been a challenge for administering these IPT drugs in this region..." (Healthcare provider).

Majority 137 (83.5%) of the respondents who believed in IPT treatment adhered to isoniazid preventive therapy. There was a statistically significant association between believing in IPT treatment in the facility and adherence to isoniazid preventive therapy among the respondents ($p=0.001$). The results were as presented in table 4.7 below:

Table 3.7: Patient-related factors associated with adherence to IPT among respondents (n=227)

Variable	Respondent response	Adherence to IPT		Statistical significance
		Yes (N=164)	No (N=63)	
I feel persuaded to complete IPT	Yes	117(71.3%)	41(65.1%)	$\chi^2=9.844$ df=1
	No	47(28.7%)	22(34.9%)	$p=0.028$
Fear of INH safety	Yes	64(39.0%)	32(50.8%)	$\chi^2=2.583$ df=1
	No	100(61.0%)	31(49.2%)	$p=0.018$
Existence of some cultural beliefs on HIV/AIDS	Yes	36(22.0%)	14(22.2%)	$\chi^2=7.002$ df=1
	No	128(78.0%)	49(77.8%)	$p=0.016$
I feel stigmatized when I participate in IPT	Yes	103(62.8%)	41(65.1%)	$\chi^2=5.102$ df=1
	No	61(37.2%)	22(34.9%)	$p=0.750$
I believe in IPT treatment in this facility	Yes	137(83.5%)	26(41.3%)	$\chi^2=53.668$ df=1
	No	27(16.5%)	37(58.7%)	$p=0.001$

3.6 Socio-environmental factors and adherence to IPT

3.6.1 Socio-environmental factors

Slightly more than half 123 (54.2%) of the respondents agreed that sometimes there was stock out of drugs in the facility followed by 63 (27.8%) who disagreed. On distance to the facility, results revealed that 95 (41.9%) of the respondents were neutral followed by 75 (33.0%) of those who disagreed that the distance to the facility from their homes was far.

Less than half 97 (42.7%) of the respondents agreed that their family and friends were always there to support them followed by 75 (33.0%) who disagreed. Further results revealed that 104 (45.8%) of the respondents did not feel afraid to seek permission from the employer to go for IPT treatment followed by 77 (33.9%) who could not tell. The results were as presented in the table 4.8 below:

Table 3.8: Distribution of socio-environmental factors among respondents (n=227)

Variable	Respondent response	Frequency (N)	Percentage (%)
Sometimes there are stock out of drugs in this facility	Disagree	63	27.8
	Neutral	41	18.1
	Agree	123	54.2
The distance to this facility from my home is far	Disagree	75	33.0
	Neutral	95	41.9
	Agree	57	25.1
My family and friends are always there to support me	Disagree	75	33.0
	Neutral	55	24.2
	Agree	97	42.7
I feel afraid to seek permission from the employer to go for IPT treatment	Yes	46	20.3
	No	104	45.8
	Cannot tell	77	33.9

3.6.2 Socio-environmental factors associated with IPT adherence

The researcher sought to determine the association between socio-environmental factors and adherence to isoniazid preventive therapy. Slightly below half 79 (48.2%) of the respondents who were neutral with regards to the distance to the facility being far had adhered to isoniazid preventive therapy. There was no significant statistical association between distance to the facility being far and adherence to isoniazid preventive therapy ($p=0.086$). Results revealed that more than half 96 (58.5%) of the respondents who agreed that sometimes there were stock out of drugs in the facility had adhered to isoniazid preventive therapy. There was a significant statistical association between occasional drug stock out and adherence to isoniazid preventive therapy ($p=0.002$). These results were supported by qualitative data in which one of the key respondents said;

"...Sometimes we run out of stock for IPT drugs. So patients may come and miss them during their scheduled clinics. This discourages them and they may fail to come even when the drugs are available thinking still the drugs are not there affecting their compliance rates. I think most essential drugs should be given more priority in terms of procurement by respective departments." (KII 009).

Concerning family and friends always being there to support them, results revealed that 65 (39.6%) of the respondents who agreed had adhered to isoniazid preventive therapy. There was a statistically significant association between family and friends being always there to support and adherence to isoniazid preventive therapy ($p=0.009$). Further, the results revealed that 83 (50.6%) of the respondents who did not feel afraid to seek permission from the employer to go for IPT treatment had adhered to isoniazid preventive therapy. There was significant statistical association between feeling afraid to seek for permission from the employer to go for IPT treatment and adherence to isoniazid preventive therapy ($p=0.001$). Results were as presented in table 4.9 below:

Table 3.9: Socio-environmental factors associated with IPT adherence among respondents (n=227)

Independent variable	Respondent response	Adherence to IPT		Statistical significance
		Yes (N=164)	No (N=63)	
Sometimes there are stock out of drugs in this facility	Disagree	35(21.3%)	28(44.4%)	$\chi^2=12.207$ df=2 $p=0.002$
	Neutral	33(20.1%)	8(12.7%)	
	Agree	96(58.5%)	27(42.9%)	
The distance to this facility from my home is far	Disagree	50(30.5%)	25(39.7%)	$\chi^2=4.898$ df=2 $p=0.086$
	Neutral	79(48.2%)	16(25.4%)	
	Agree	35(21.3%)	22(34.9%)	
My family and friends are always there to support me	Disagree	59(36.0%)	16(25.4%)	$\chi^2=9.412$ df=2 $p=0.009$
	Neutral	40(24.4%)	15(23.8%)	
	Agree	65(39.6%)	32(50.8%)	
I feel afraid to seek permission from the employer to go for IPT treatment	Yes	22(13.4%)	24(38.1%)	$\chi^2=17.382$ df=2 $p=0.001$
	No	83(50.6%)	21(33.3%)	
	Cannot tell	59(36.0%)	18(28.6%)	

4.0 Discussions

4.1 Socio-demographic factors

The study sought to find out the socio-demographic factors associated with adherence to isoniazid preventive therapy among people living with HIV/AIDS in selected facilities in Nairobi City County. The results from this study revealed that majority (55.1%) of the respondents were male. This finding was inconsistent with a study done in South Africa on IPT implementation, it was reported that majority of the respondents were female⁹. There was no significant statistical association between gender and adherence to isoniazid preventive therapy. However, most of the respondents who had not adhered to isoniazid preventive therapy were male. This may be attributed to the fact that male have poor health seeking behavior as compared to their female counterparts⁴.

The results were contrary to a study done in rural Uganda which revealed that gender was strongly associated with IPT adherence among HIV positive patients who received differentiated and non-differentiated HIV care¹¹. The results agreed with a cross-sectional analytical study done on IPT completion determinants in Dar es Salaam, Tanzania where gender was not significantly associated with completion of IPT¹².

The findings of this study showed that most of the respondents were married. This is probably because the respondents interviewed were more than 18 years hence most likely to be in stable marriages. The results concur with studies done in Nigeria and Ethiopia where most of the respondents were married respectively^{13, 14}. There was a significant statistical association between marital status and adherence to isoniazid preventive therapy. This may be attributed to the fact that married couples could easily get psychosocial support from their partners who could encourage them to complete their IPT drugs as most married individuals adhered to isoniazid preventive therapy. The results were similar to a study done in Tanzania, where the marital status of being married was a significant predictor of IPT adherence¹⁵.

Concerning the respondents age, majority of the respondents were aged between 28-37 years. This is a true reflection of the population of Kenya where majority of the population are youths with high prevalence of HIV/AIDS¹⁶. The results were similar to a study done in Addis Ababa where majority of the respondents interviewed on IPT completion and associate factors were aged between 28-37 years of age¹⁷. The results were inconsistent with a study done in Northwest Ethiopia where it was reported that most of the respondents were aged between 18-30 years¹⁸. In another study done in southeast Nigeria majority of those who participated were aged between 30-49 years¹³. However, there was no significant statistical association between age and adherence to isoniazid preventive therapy. The results were contrary to a study done in Tanzania where age was a significant factor that influenced adherence to IPT among people living with HIV¹².

Regarding education, the results revealed that most of the respondents had secondary education as their highest level attained. The results were contrary to a study done in an urban health center in Kenya where majority of the respondents had a primary level of education⁴. In another study done in Ethiopia, inconsistent results were also reported with 68.2% of respondents having primary level of education¹⁹. There was a statistically significant association between highest level of education attained and adherence to isoniazid preventive therapy. Adherence to IPT increased with increase in educational level. This is because education enables people to access more information making them more knowledgeable on the consequences associated with poor compliance to drugs. The results were not in agreement with a systematic review which concluded that educational level was not associated with adherence with IPT⁹. According to a study done by²⁰, in their study, they concluded that HIV positive patients with primary level of education were least likely to adhere to IPT.

The study findings revealed that most of the respondents were self-employed. This may be because high unemployment status among most sub-Saharan African countries resorting to start their own businesses. The results were consistent with a study done by¹⁷ who revealed that self-employment was the main source of income among patients on IPT. Contrary results were reported by a study done in Nigeria where most of the respondents on IPT were employed¹³. There was a significant statistical association between occupational status and adherence to isoniazid preventive therapy among the respondents. Those who were self-employed were more likely to adhere to IPT. The results concur to studies done in Dar es Salaam, Tanzania and Kano, Nigeria where the occupational status was one of the predictors for acceptability and adherence to IPT uptake among HIV positive patients²¹. According to a study done in Nepal on IPT completion rates, it was reported that being a migrant worker was more likely to adhere to IPT completion²².

Concerning the respondents' stage of HIV, results showed most of them were in stage 1. There was a significant statistical association between stage of HIV and adherence to isoniazid preventive therapy. This is because during the early stages, people tend to comply more with regimen due to fear of complications but as time goes by patients tend to drop out due to being overburdened by drugs. The results were contrary to a study by¹⁸ on IPT adherence, who revealed that majority of the respondents were in stage 3.

The results agreed with a study done in Brazil which showed that there was an association between WHO stage of HIV and adherence to IPT. This decreases with increase in HIV stage as those in stage 3 and 4 were less likely to adhere to IPT²³. Consistent results were reported by a study done in rural Malawi where provision of IPT at the initial stages of HIV diagnosis was associated with high successful completion rates²⁴.

Further, the results revealed that majority of the respondents were in a walking functioning status. There was no significant statistical association between functional status and adherence to isoniazid preventive therapy. However, majority of those who were in walking functional status were more likely to adhere to IPT. The results were contrary to a study done by²⁵ who found out that functional status was associated with adherence to IPT among HIV positive patients. Clinically ill patients are more likely not to adhere to IPT due to difficulties among clinicians to rule out TB²⁶.

4.2 Adherence to IPT

The study sought to find out the proportion of respondents who adhered to IPT which was measured by determining those completing at least 90% of IPT in the last months dose among HIV positive patients. The results showed that the adherence level was at 72.2%.

However, the adherence level in this study was significantly lower than other studies done across the world. This could be because of stigmatization hence the differences in adherence levels across countries. The results were contrary to studies done in Malawi where the adherence level on IPT stood at 75%²⁴; in Dar es Salaam Tanzania where the adherence level was 76%¹²; in South Africa where 86.8% of the HIV positive patients completed IPT with 11.3% permanently discontinued³⁰. In another study in USA, high IPT completion rates of 87.2% were reported due to increased follow-ups from care providers²⁷.

The study findings also noted that the main reason for non-adherence to IPT among the respondents was being suspected to be having TB by health care provider. This is because IPT is meant to prevent development of active TB among HIV positive patients thus lower the cases of TB co-morbidities. Hence, once a HIV positive patient develops active TB, they are immediately withdrawn from IPT and managed with a different standard of care. The results were inconsistent with a study done in Africa where the main reason for non-adherence was due to side effects³⁰. In another study done in Kenya, long treatment regimen/duration and fear of side effects was the key barrier to adherence to IPT²⁸. In a study done in Zimbabwe, adverse drug reactions led stopping HIV positive patients from using IPT by healthcare providers²⁹. INH shortage has also been noted as one of the factors that are associated with non-adherence to IPT among HIV positive patients in Ethiopia³⁰.

Finally, the researcher sought to enquire whether the respondents understood the role of IPT. The results showed that majority of the respondents indicated that the role of IPT was to treat TB. This means that they did not give the main reason for IPT treatment which prevents development of active TB among HIV positive patients. The results were similar to a study done in Nigeria where majority were not aware of isoniazid preventive therapy's role¹³. In another study done in Indonesia, majority of the respondents reported that IPT was important in preventing development of active TB in HIV positive patients³¹.

4.3 Patient-provider interaction factors

The study sought to determine the patient-provider interaction and its influence on adherence to IPT. The results showed that most of the respondents rated the attitude of healthcare workers as being fair. The results were consistent with a study done on KAP on IPT in South Africa which showed that the attitude of healthcare workers was favorable¹². There was a significant statistical association between perceived healthcare workers' attitude and adherence to isoniazid preventive therapy. This is because a good perceived attitude enables patients to follow instructions given to them by care providers and thus more likely to adhere to IPT. The results concur with a cross-sectional study on IPT uptake in Rwanda which showed that the attitude of healthcare workers significantly affected IPT adherence among HIV positive patients³¹. In another study done in South Africa among IPT defaulters, it was concluded that nurses and care providers should control their attitude during interaction with their patients³⁴.

The study findings noted that less than a half of the respondents were of the view that there were enough healthcare workers to provide IPT services. Having enough workers means that patients are served fast reducing the waiting time and congestion. Similar results were reported by a study done by³⁵, on the provision of IPT among HIV positive patients in Mafikeng PHC facilities which showed that there were enough healthcare workers. The results were contrary to a study done in Arua District in Uganda where it was noted that the healthcare workers were not enough with frequent stock-out of drugs which affected HIV positive patients' adherence to IPT³⁶. However, there was no significant statistical association between hospital having enough healthcare workers and adherence to isoniazid preventive therapy. When there are enough healthcare providers to offer counselling and support, HIV positive patients tend to adhere to IPT treatment³⁷.

Majority of the respondents agreed that healthcare workers provided them with adequate information on isoniazid preventive therapy. According to a study done in South Africa on barriers and facilitators of IPT adherence, it was noted that provision of information was key during provider-patient interaction as reported by majority of respondents³⁹. There was significant statistical association between healthcare workers providing adequate information and adherence to isoniazid preventive therapy. Provision of information enables patients to get a clear understanding of the importance of completing drug dosages and the consequences associated with non-adherences. The results were consistent with a study done in selected clinics in Nairobi City in Kenya where the HIV positive patients on IPT were informed on their IPT status through follow ups using mobile phones which boosted their adherence rates³⁹.

The results of this study reported that time taken for isoniazid preventive therapy at the hospital was not effective as shown by majority of those interviewed. In a study done in Eswatini on completion of IPT, long travel and wait times was reported by most of the respondents⁴⁰. Long waiting time and spending a lot of time in the hospital during service provision may discourage patients from seeking subsequent services in the health facilities. However, there was no statistical association between effectiveness of the time taken for IPT and adherence to isoniazid preventive therapy. The results were inconsistent with a study done in Indonesia where patients had to spend a lot of time waiting for medication which further affected their adherence to IPT³¹. In another study done in Uganda, contrary results were also reported where time for medication during IPT treatment was statistically significant related to IPT adherence among patients⁴¹.

Further, the results report that the respondents had a better understanding of isoniazid preventive therapy. The results were not in agreement with a study done in South Africa on barriers and facilitators of IPT adherence where majority of the respondents had a poor understanding of the need for IPT provision³⁹. In another study done in Nigeria, majority of the respondents had low understanding of IPT³³. There was a significant statistical association between having a better understanding of IPT and its adherence among respondents. This is probably because they were given adequate information concerning the therapy including the consequences of not completing the treatment and its side effects. In a Zimbabwean study done among HIV positive patients, it was noted that patients initiated with good understanding on IPT have high adherence levels since they already knew its importance⁴².

4.4 Socio-environmental factors

The study revealed that majority of the respondents agreed that sometimes there was stock out of drugs in the facility. There was a significant statistical association between occasional drug stock out and adherence to isoniazid preventive therapy. This is because the study was done in public health facilities which experience episodes of drug shortages thus affecting adherence to IPT among patients. The results were like a study done in Arua District in Uganda where it was noted that frequent stock-out of drugs affected HIV positive patients' adherence to IPT³⁶. In another study that was done in Zimbabwe, stock-out of drugs was a major barrier that significantly influenced adherence to IPT among patients⁴³. In a study done in Karnataka in India, the main reason for non-completion of isoniazid preventive therapy was interruption of drug supplies in health facilities⁴⁴.

The results revealed most of the respondents neither agreed nor disagreed that the distance to the nearest health facility from their homes was far. This was because the study was done in an urban area in Nairobi where healthcare facilities are located not far away from one another due to high population density. The results were contrary to a study done in KwaZulu-Natal in South Africa which revealed that people in rural areas travel longer distances to seek healthcare services⁴⁵. However, there was no significant statistical association between distance to the facility being and adherence to isoniazid preventive therapy. The results were similar to other studies which associated distance to the nearest health facility and adherence to IPT among HIV positive patients⁴⁶. Those closer to the nearest health facility are more likely to complete their IPT regimen compared to those away from health facilities³³.

Majority of the respondents reported that their family and friends were always there to support them while they were under IPT. Provision of psycho-social support especially to patients with long-term illnesses is key to compliance to medication. The results were inconsistent with a study done in Southern Ethiopia where it was reported that only thirty percent of the HIV positive patients seeking IPT treatment felt they got social support from family and friends⁴⁷. There was a statistically significant association between family and friends being always there to support and adherence to isoniazid preventive therapy. They feel comforted by people who are close to them thus encouraged to take treatment positively. The results agreed with a study done by⁴⁸ which reported that lack of support from family members was one of the challenges that hindered HIV patients from completing their IPT dosages. In another study done in rural Uganda, non-completion of IPT treatment among HIV patients was significantly associated with lack of adequate support from friends and family members³¹.

Further, the results revealed most of the respondents did not feel afraid to seek permission from the employer in order to go for IPT treatment. The results were contrary to a study done among adolescents and adults HIV patients in resource constrained settings which showed that they feared to seek permission to attend IPT treatment⁶. There was a significant statistical association between feeling afraid to seek for permission from the employer to go for IPT treatment and adherence to isoniazid preventive therapy. This is because HIV policies have been incorporated in all organizations to prevent stigma and discrimination among HIV positive workers thus creating an enabling environment for them to seek medical care from respective facilities.

5.0 Conclusions and Recommendations

Conclusions: In conclusion, the study found that most patient-provider interaction factors were associated with adherence to isoniazid preventive therapy. They are attitude of healthcare workers, provision of health information and understanding of isoniazid preventive therapy. The IPT adherence rate among HIV positive patients in Nairobi City County was fair. The main reason for non-completion of IPT was suspected active TB by healthcare providers. The study also revealed that most of the patient-related factors were significantly associated with isoniazid preventive therapy in Nairobi City County. They include persuasion to complete IPT, fear of INH safety, existence of cultural beliefs and beliefs in IPT treatment. Finally, the study concludes that most socio-environmental factors were associated with adherence to isoniazid preventive therapy among HIV positive patients in Nairobi City County. They are frequent stock-out of drugs, social support from family and friends and afraid to seek permission from employer.

Recommendations

The study recommends the following based on the findings of the study:

- a) The County government of Nairobi City and respective facilities should scale up continues medical education training on IPT to improve healthcare workers' attitude and disseminate relevant information thus leading to higher adherence levels among HIV positive patients.
- b) The study recommends that the county government of Nairobi together with the healthcare facilities providing IPT should scale up sensitization programs among people living with HIV to dispel myths and misconception about HIV/AIDS thus improved adherence levels on IPT.
- c) The Ministry of Health, the County government of Nairobi and respective facilities should ensure well stocked IPT drugs to ensure they are readily available for use among people HIV positive patients thus increased adherence level towards IPT.

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