

Adherence to Isoniazide Prevention Therapy in HIV positive patients at Rethabile Community Health Centre Polokwane, Limpopo Province, South Africa

by

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DECLARATION

I, Dr. Mohammad Ishtiaq Hassan Khan declare that the work herein submitted as a thesis from my own investigation and that it has neither wholly nor partially been presented as a thesis for a degree in University of Limpopo or any other university. Work by other authors, which served as sources of information have dully been acknowledged by references to the authors in this report.

Dr. Khan MIH

Date

DEDICATION

I dedicate this thesis to all dedicated health workers, the unsung heroes of human development who despite their relentless efforts to save lives have themselves succumbed to tuberculosis which takes thousands of lives every year.

This is done with the sincere hope that some of the findings and recommendations of this dissertation will contribute to the removal of barriers to adherence to Isoniazid Prophylaxis Therapy and to reducing the number of tuberculosis cases.

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ABSTRACT

Objectives: To assess adherence to Isoniazide Prevention Therapy (IPT) among HIV positive patients in Rethabile Community Health Centre in the Capricorn District of the Limpopo Province.

Methods: A cross-sectional study with qualitative and quantitative data collection methods was conducted among HIV positive patients in Rethabile Community Health Centre from January 2013 to December 2013. Consecutive sampling was used to select 90 participants. Adherence was assessed using patient self-rated adherence to IPT, and confirmed by urine tests for isoniazid metabolites. Data was collected using an interviewer administered questionnaire. Information was also obtained from health care workers regarding the perception about reason for non-adherence to IPT. Data was analysed using STATA software and thematic analysis.

Results: Self-rated adherence to IPT among the participant was 80% where as urine test was positive for Isoniazid metabolites in 73%. While 84% of participants reported that transportation was the main reason for non adherence, 70% also reported distance from the health care as their main reasons for non-adherence to IPT. However, health care providers reported that many patients do not adhere to treatment due to: Lack of money for transport, missed clinic appointment due to rain and fear of losing jobs, use of traditional medicine, wrong belief about IPT, medicine side effects and alcohol consumption.

Conclusion: Self – rate adherence to IPT was suboptimal and appears over – estimated among study participants. Interventions to improve adherence to IPT must ensure easy access to healthcare facilities, address wrong perceptions and promote healthy social behaviours.

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LIST OF ABBREVIATIONS AND ACRONYMS

HIV	- Human Immunodeficiency Virus
AIDS	- Acquired immune deficiency syndrome
IPT	- Isoniazid Preventive Therapy
NHLS	- National Health Laboratory Service
SA	- South Africa
TB	- Tuberculosis
WHO	- World Health Organization

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

In South Africa (SA), the dramatic spread of human immunodeficiency virus (HIV) has been a public health problem for decades and is accompanied by up to 4-folds increase in the number of TB cases between 1999 and 2007 (Abdool Karim et al., 2009; Dept. of Health, 2010). With this number increasing, the strategies to manage and control TB must now include interventions to reduce HIV infection.

The World Health Organization (WHO) report found that in 2014, 315 000 cases of TB were notified in SA. Ninety three per cent of notified cases were tested for HIV infection, of which 61% were estimated to be positive (WHO, 2014).

To deal with these burden, the SA government introduced many prevention strategies to combat TB and HIV/AIDS such as male and female condom distribution, expansion of TB control efforts, research in AIDS and TB, scale up of the free AIDS treatment programme and development of the National Strategic Plans for HIV and TB (Abdool Karim et al., 2009).

It is estimated that more than two-thirds of new adult cases of TB in South Africa are co-infected with HIV (Dept. of Health, 2010). The WHO policy on collaborative TB/HIV activities recommends Isoniazid Preventive Therapy (IPT) and early antiretroviral therapy for HIV-infected persons (Gupta et al., 2012). The IPT is the administration of Isoniazid to individuals with latent infection with *M. tuberculosis* in order to prevent progression to active TB disease. TB has been shown to accelerates HIV disease progression (Pawlowski et al., 2012; Assefa et al., 2014; Pepper et al., 2015), providing IPT reduces the morbidity and mortality due to TB among HIV-infected people (Heal et al., 1998; Golub et al., 2009; Getahun et al., 2010; Amenu et al., 2014).

A number of studies have shown that IPT reduces the overall risk of developing TB among HIV-positive population (Souza et al., 2009; Ayele et al., 2015). Other studies found that IPT decreases the risk of mortality in the completers compared to non-completers of the treatment (Kabali et al., 2011).

Recently, the Department of Health in Limpopo Province has taken the initiative to introduce IPT among HIV-infected patients who does not have active TB, non alcoholic and does not have any Liver disease. However, failure and/or poor implementation of policies is the most common barrier to the success of the program (Dong et al., 2007; Aït-Khaled et al., 2009; Abdool et al., 2009; Date et al., 2010; Moolphate et al., 2013; Gupta et al., 2014).

1.2 Problem Statement and the Rationale of the Study

Tuberculosis (TB) remains the leading cause of morbidity and mortality among people living with HIV/AIDS in low and middle income countries, particularly in sub-Saharan Africa and South Asia. Globally in 2013, almost 1.5 million deaths occurred due to TB and TB/HIV and a higher proportion of these deaths (295 thousand deaths) occurred in sub-Saharan Africa (Martinez, 2015). The World Health Organization (WHO) has recommended the use of IPT which has been shown to reduce the TB morbidity and mortality among HIV-infected people in resource constrained settings (WHO, 2011).

Isoniazid preventive therapy (IPT) adherence and completion continues to be very poor in low and middle income countries. A number of studies revealed an overall IPT adherence rate between 30% and 70% (Rowe et al., 2005; Hiransuthiku et al., 2005; Szakacs et al., 2006). However, other studies reported IPT adherence rate above 70% (; Munseri et al., 2008; Shayo et al., 2015). There were variety of reasons or factors associated with non adherence that include fear of stigmatization in relation to their HIV status, lack of money for food and transport, the belief that HIV is incurable by Western medicine, and a perceived conflict between Western and traditional medicine.

It was also reported that people who were healthy are less likely to adhere than those who are sick and are prone to stop when they are well. Couple of study also concluded that Poor relationship between healthcare workers and patients and drug non availability at peripheral pharmacies contributes for non adherence.

The level of adherence to IPT and its associated factors among HIV-infected patients have not been documented in Rethabile community health centre of the Limpopo Province. Therefore, the purpose of the study was to answer the research question outlined below.

1.3 Research Question

How adherent to IPT are HIV-infected patients at Rethabile Health Centre in Capricorn District, Limpopo Province?

1.4 Aim and Objectives of the Study

1.4.1 Aim

To assess adherence to Isoniazid Prevention Therapy among HIV positive patients at Rethabile Health Centre in Capricorn District of the Limpopo Province.

1.4.2 Objectives

1. To determine the proportion of participants who rated themselves adherent to 'Isoniazid Preventive Therapy' (IPT).
2. To explore patient views regarding barriers to non-adherence to IPT.
3. To explore health care workers view regarding barriers to adherence to IPT.

1.5 Research setting

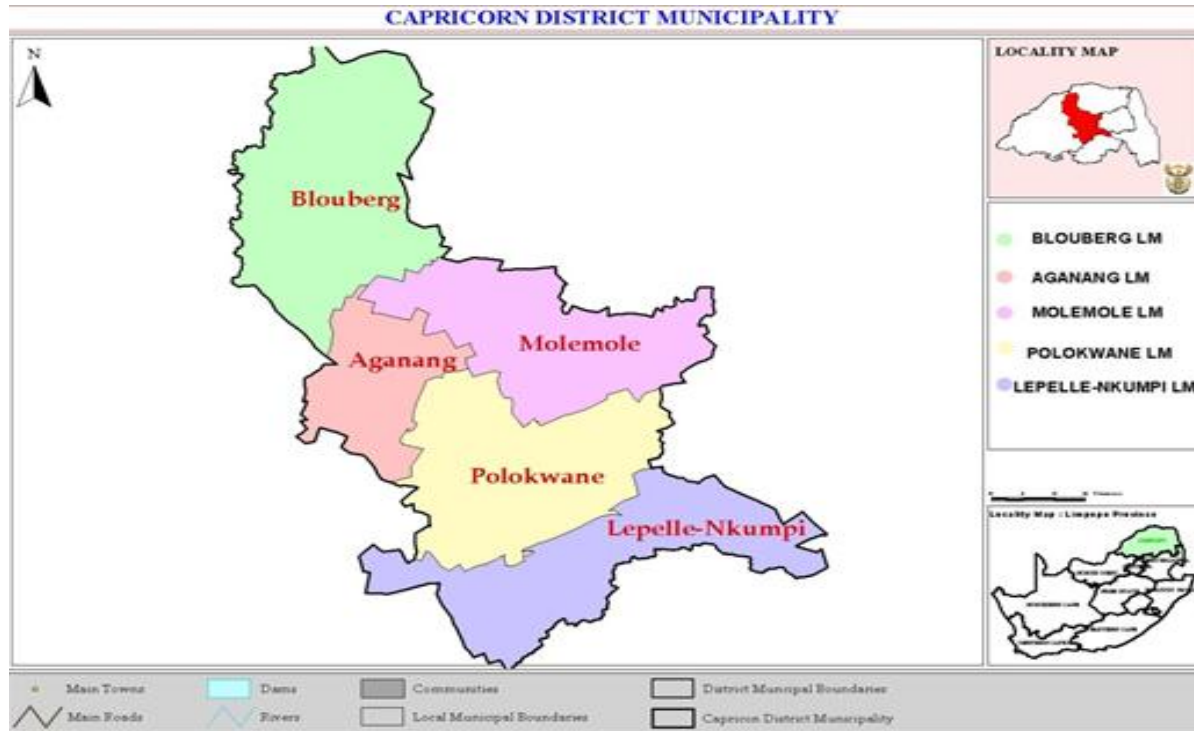


Figure 1: Map of Capricorn District Municipality

The population size in Capricorn District is 628 999, with 178 001 households, average of 4 persons per household. In the district there are 92.9% Black African, followed by 5.2% white. Other population groups make up the remaining 1.9%. For every 100 females there are 93 males. The age dependency ratio is 54, 3. 80% people use Spedi as their first language where 5% use Africans, 3% English and 12% use different other language. An estimated 17,9% of the population aged 20 years and older who had some form of higher education; whereas 29,6% has completed matric and only 6,8% had no schooling.

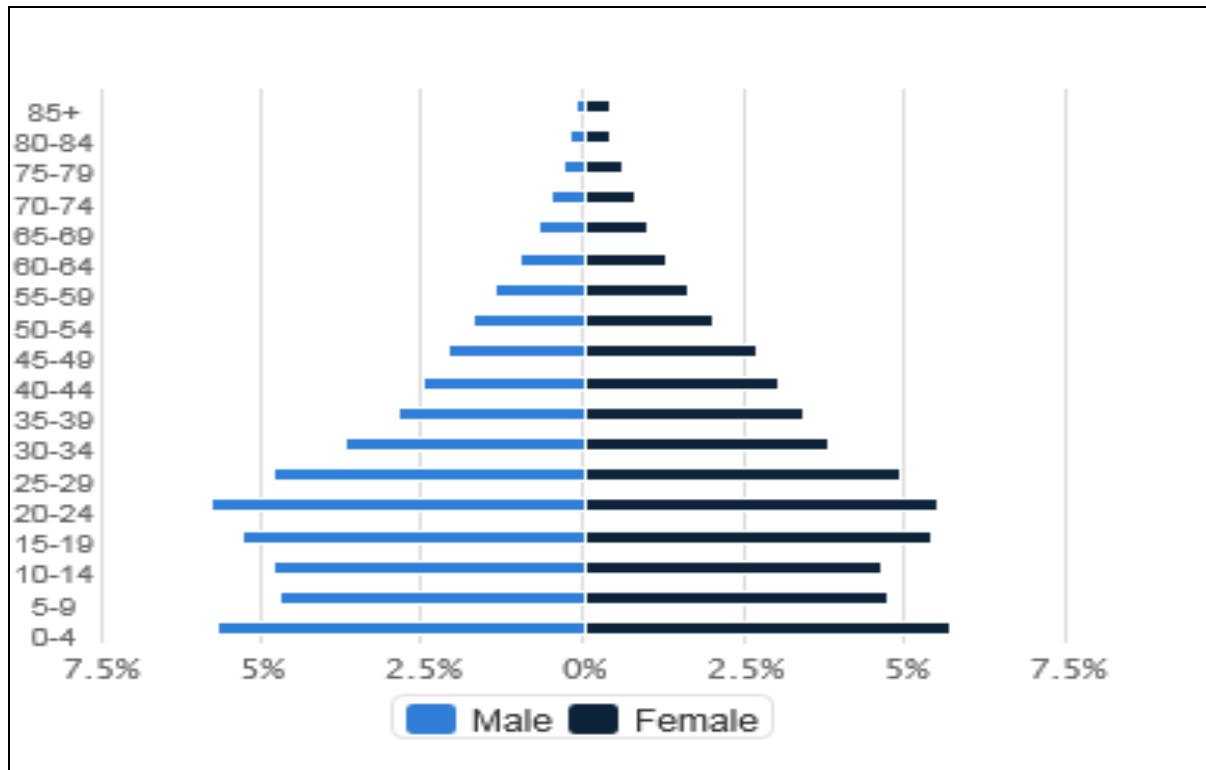


Figure 2: Age and sex distribution of the population in Polokwane municipality (Source: Statistics South Africa – census 2011)

Table 1: Demographic profile in Polokwane Municipality – census 2011

Gender		
	Female	52%
	Male	48%
Marital Status		
	Married	22,8%
	Living together like married partners	4,6%
	Never married	68%
	Widower/Widow	3,4%
	Separated	0,4%
	Divorced	0,9%
Level of Education		
	No Schooling	1,9%
	Some Primary	38%
	Completed Primary	5,8%
	Some Secondary	33,7%
	Completed Secondary	14%
	Higher Education	3,6%
	Not Applicable	3,1%

Race	
Black African	92,9%
Coloured	0,9%
Indian/Asian	0,7%
White	5,2%
Other	0,2%
Language	
Afrikaans	5,3%
English	3,1%
IsiNdebele	0,9%
IsiXhosa	0,2%
IsiZulu	1%
Sepedi	78,7%
Sesotho	0,8%
Setswana	0,7%
Sign Language	0,2%
SiSwati	0,2%
Tshivenda	2,1%
Xitsonga	2,8%
Other	1.90%
Not Applicable	2,1%

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

In this chapter, previous studies related to adherence to IPT among HIV positive patients and factors associated with adherence to IPT are reviewed. The chapter is divided into three sub-sections namely: demographics profile of patients on IPT; adherence to 'Isoniazid Preventive Therapy' among HIV positive patients and reasons for non-adherence to Isoniazid Preventive Therapy. The articles were searched by using key word IPT and ADHERENCE. I used the PubMed, Google Engine search as my source of literature.

2.2 Patients Demographics Associated with Non-adherence to Treatment

Many studies have viewed non-adherence as a significant public health concern. In a consecutive sample of 140 participants in Uganda, alcohol consumption and smoking were found to be related to non-adherence (Amuha et al., 2009). Similarly, a cross-sectional study in South Africa reported that tobacco use and alcohol were predictors for non-adherence to anti-TB drugs (Naidoo et al., 2013).

Shayo and colleagues in their study found that gender, occupation, educational level were not associated with adherence (Shayo et al., 2015). However, Makanjuola et al in their meta-analysis reported that a greater proportion of men, person with higher education and younger age group do not adhere to treatment (Makanjuola et al., 2014).

2.3 Adherence to 'Isoniazid Preventive Therapy' among HIV positive patients

Tuberculosis is the most common opportunistic infection in HIV – infected adults in developing countries. The World Health Organization (WHO) recommends the use of Isoniazid as one of the strategies to reduce TB burden among HIV-infected people, however, non-adherence to treatment and completion remains a problem.

There are many studies (refs) that evaluate adherence to IPT amongst HIV-infected people, but these studies used different strategies to assess adherence.

A cross-sectional study (Szakacs et al, Jun 2006) of adherence using a questionnaire and urine test strips for detection of INH metabolites at two hospitals in Pietermaritzberg, South Africa was done in 2006. Participants were aged at least 18 years, HIV positive, and receiving INH for prevention of tuberculosis disease. Univariate and multivariate analysis were used to identify factors relevant to adherence.

In the above study there were **301** consecutive patients recruited. 28% of participants had negative urine test. 32 (37.2%, 95% CL25.4, 45.0) of the 86 patients who received INH from peripheral pharmacies said the pharmacy had run out of INH at some times, compared with central hospital pharmacies ($p=0.0001$). In univariate analysis a negative test was associated with self-reported missed INH doses ($p=0.043$). Each 12 hour increment since last reported dose increased the likelihood of a negative test by 34% ($p= 0.0007$). Belief in INH safety was associated with a positive test ($p=0.021$). In multivariate analysis, patients who believed INH is important for prevention of TB disease were more likely to be negative ($p=0.0086$).

Another study (Rowe et al, Mar 2005) was conducted in the Bohlabela District (formerly Bushbuckridge) of South Africa's Limpopo Province, a densely settled rural area with an estimated population of 500 000. The objectives of that study were to combine

qualitative and quantitative methods and data to explore patient and health care worker perspectives on issues surrounding adherence to Tuberculosis Preventive Therapy (TBPT), and to derive lessons for improving access to care amongst HIV infected individuals in rural South Africa.

A 6-month course of Tuberculosis Preventive Therapy (TBPT), isoniazid (INH) 300 mg daily distributed on a monthly basis, is routinely offered to all eligible patients who: 1) test HIV positive on two rapid HIV tests, 2) do not have active TB based on clinical assessment (absence of reported cough, fever, weight loss, night sweats), 3) state they are able to attend the clinic once per month to pick up their medication, and 4) do not have a history of TB within the last 2 years. Patients are screened and enrolled for TBPT at their first visit, are given an appointment to return every month.

There were 229 HIV positive patients attending the clinic, 94 (41.0%) were eligible for TB preventive therapy. Of 87 patients initiating a 6 months TBPT course of isoniazid 300 mg daily, 41 (47.1%) complete TBPT. Of the 46 interrupters, 16 (34.7%) did not return to the clinic after receiving their first dose of TBPT.

The qualitative component of that research suggests that adherence to TBPT is underpinned by complex interactions between the health service and the social, economic, and cultural environment in which patients and their communities are immersed.

In Botswana, Gust and colleagues in their study defined adherence to at least 80% of scheduled clinic visits for medicine refill and the results indicates that patient adherence to treatment was 78% (Gust et al., 2011).

In Ethiopia, Mindachew and co-authors defined adherence as self-reported adherence to IPT over the last 7 days (Mindachew et al., 2011). This study has reported IPT adherence of 86.5%.

In Tanzania, IPT adherence was defined a completion of entire 6 months regimen of IPT (Munseri et al., 2008). The results of this study found that most (87%) of the patients completed the treatment.

Similarly, a cross-sectional study in South Africa by Szakacs and coworkers defined adherence by using urine tests for isoniazid metabolites. The study found that overall (72%) of the participants adheres to the treatment (Szakacs et al., 2006).

Govender and Mash (2009) in their study defined adherence as those patients who were still taking their anti-TB treatment at the end of the intensive phase. The authors found that (66%) of the patients adhere to the treatment.

Another study conducted in rural area of South Africa by Rowe et al defined adherence as the patterns of pill collection (Rowe et al., 2005). The findings of this study found that the adherence was (47.1%). Although these studies used different definition of adherence, the rates of adherence to treatment are above 40%.

2.4 Barriers for Non-adherence to Isoniazid Preventive Therapy

The problem of non-adherence to treatment remains a challenge in many developing countries. There are various reasons linked to non-adherence to treatment such as those related to the patient, healthcare worker and the health system.

A number of studies found that fear of INH side effect, understanding of IPT and its importance and belief in IHN safety, forgetfulness, denial or disclosure of HIV status, pill burden, economic dependence on family, economic resource limitations, distance from home to clinic, concern about family, support group and family responsibilities are the main factors contributing to the adherence of IPT by patients (Govender and Mash, 2009; Makanjuola et al., 2014; Mindachew et al., 2014).

In the study (Rowe et al, Mar 2005) important barriers to adherence noted among HIV positive was fear of stigmatization in relation to their HIV status, lack of money for food and transport, the belief that HIV is incurable by Western medicine, and a perceived conflict between Western and traditional medicine.

Their research confirmed that people who were healthy are less likely to take tablets than those who are sick and are prone to stop when they are well. Disclosure of HIV status, the presence of social and family support, and a confidential and caring clinic environment were identified as positively influencing adherence.

There was some suggestion from the study that women were more likely to complete their course of treatment than men, but no difference was noted between age groups or between those who started in the early or late part of the study.

Several studies found that lack of knowledge and experience among health care workers (Lester et al., 2010) and non-adherence to the IPT guideline (Hiransuthikul et al., 2005) are the limitation to the wide spread use of IPT. Similar study by Moolphate and colleagues reported that unclear direction of national policy; fear of emerging Isoniazid resistant tuberculosis and fear of poor adherence were also barriers to the widespread use of IPT (Moolphate et al., 2013). It was also reported (Szakacs et al Jun 2006) that INH non availability in the peripheral hospital and clinic was another contributing factor for non adherence.

2.5 Conclusion

Most of the study review showed a greater proportion of patients adhere to treatment, however, alcohol and tobacco use were predictor for non-adherence to anti-TB drugs. Moreover, literature reveals various reasons for non-adherence such as fear of INH side effect, lack of understanding of IPT and lack of money for food, distance from home to

clinic and transport. Therefore, knowing and understanding these factors will help to find strategies to improve adherence to IPT among HIV-infected patients.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter describes the study design, settings, study population, inclusion and exclusion criteria, data collection and data analysis, reliability, validity, bias and ethical considerations.

3.2 Study Design

A cross-sectional descriptive study was conducted in Rethabile Health Centre in the Capricorn District of the Limpopo Province, over 12-months from 01 January to 31 December 2013. A cross-sectional study design was chosen because it analyses data collected from a sample at a specific point in time or short period of time.

3.3 Settings

The study was conducted at Rethabile Health Centre which was established in 2000 as a primary health care clinic. It was then promoted to a community health centre with a capacity of 12 approved beds. The clinic provides daily services for general Out Patient Department (OPD) run by the doctors and nurses, Maternity, Immunization, Voluntary Counselling and Testing (VCT) centre, HIV clinic, TB Clinic, Wellness Clinic. The Clinic also provides once a week service for Dental, Speech therapy, Psychology and ophthalmology.

The clinic is situated in the centre of Polokwane city near the Pietersburg Provincial Hospital of Limpopo province. The estimated population catered for by the clinic is about 526 234 according to 2008 mid-year estimate. The name of the HIV clinic is 'Tirishano' meaning in the local language "working together". The Wellness Clinic is mainly runs by nurses and receives patient from OPD, VCT centre, TB clinic and other clinics around the town.

Every month there are about **500** patients seen by the Wellness clinic nurses and among them about 5% patient qualifies for INH preventive therapy (Clinic Statistics). The clinic also has a Pharmacy and a laboratory technician (phlebotomist) who collect specimen according to the doctor's advice and take it to the National Health Laboratory Service (NHLS) based at Pietersburg Hospital.

3.4 Study population

The study population included people living with HIV/AIDS without active TB attending the Wellness Clinic at Rethabile Community Health Centre and, who were on IPT and on follow up during the study period. There were 2896 patients seen during the period of the study, of which 122 patients qualified for INH prophylaxis therapy.

3.5 Sample Size and Sampling Techniques

Consecutive sample of patient from 01 January to 30 June 2013 were asked to participate in the study and were followed up for six months during their therapy. The sample size of 73 was calculated on the assumption that 5% of the patient qualifies for INH preventive therapy in this health centre, with 95% confidence interval, sampling error of 5%. The formula used to calculate the sample size is show below:

$$n = \frac{Z^2 p(1-p)}{e^2}$$

Where n is the sample size, Z is the 95% confidence interval, e is the sampling error and p is the proportion of patient qualifies for INH preventive therapy. The sample was increased by 20% non-response rate (approximated to 90).

3.6 Inclusion Criteria

Patients were included if:

- They were HIV positive attending Wellness clinic at Rethabile Health Centre
- Aged between 14 and 65 years(to avoid paediatric group and also co-morbid condition like Hypertension, Diabetes)
- Do not have active TB and qualifying for INH prophylaxis therapy.

3.7 Exclusion Criteria

Patients were excluded if:

- they have any suspicion of current TB (cough, fever, adenopathy greater than 2 cm in diameter or abnormal chest radiograph),
- abnormal liver enzymes
- life threatening intercurrent illness
- pregnant
- Seriously ill

3.8 Data Collection

The data was collected using structured questionnaire (**Appendix C and G**) which was prepared by reviewing relevant literatures. The questionnaires collected information on patient-related factor such as age, gender, alcohol use, tobacco smoking and substance use, level of education and self-rated confidence in the ability to adhere to the treatment.

It also collected information on socio-economic factors such as urban or rural residences, income, employment, social grants and previous social support. Other information collected include: health service factors mainly satisfactions with the hospital (cleanliness, waiting time, attitude and quality of assistance received from staff) and barriers to accessing care.

Adherence to treatment was defined as patient self-rated adherence to IPT and this was confirmed by urine tests for isoniazid metabolites. Every month when patients come to collect their INH prophylaxis in the wellness clinic they were asked about their adherence to the treatment and also urine was collected for isoniazid metabolites strip test.

Isoniazid Test Strips are a qualitative, colorimetric, chemical assay for detecting isonicotinic acid and its metabolites in urine. It is a chemical reaction based to monitor patients on Isoniazid therapy without relying on self-reporting or direct observation of Isoniazid ingestion. There is a colorimetric reaction between reagents and isoniazid metabolites in urine, isonicotinic acid and isonicotinoyl glycine. Color development occurs in 15-30 minutes. This technology is similar to urinalysis reagent strips for detection of pH, bilirubin, blood, etc.

Limitations of the test:

A large proportion of the INH administered may be acetylated rapidly to isonicotinic acid in some patients. Urine to be tested for the metabolites of INH must be collected within 10 – 12 h of drug administration to maximize the sensitivity of the test.

The potential for interfering substances has not been evaluated for this test.

Clinical studies revealed that 2 hrs after 100 mg. of isoniazid orally 17 out of 18 tested specimens of urine were positive. In the interval 4 to 24 hrs after the same dose all specimens were positive. After an oral dose of 200 mg isoniazid all 9 tested urine specimens were positive within 1 to 24 hrs after administration of the drug.

The information from the patient was recorded in the file and also the tablet count was captured in the data collection tools (appendix G). Data collection was performed by nurses who have experience working in the Wellness clinics. The data collectors were trained on how to collect the data.

Data was collected over 6 month's period after commencing treatment in each visit during the month. Patients were followed up to determine those who adhere to treatment and successfully complete their treatment and those who did not successfully completed treatment.

3.9 Data Analysis

The data collected was entered and analysed using Microsoft Excel and STATA version 11.1 software, respectively. Data was summarised using descriptive statistics by running the frequencies. The demographic profile and self-rated adherence to 'Isoniazid Preventive Therapy' were interpreted using percentage. Tesch's description method of open coding was used to analyse the interview transcripts by the researcher. The wording for the topics was grouped into themes.

3.10 Reliability, Validity and Bias

The questionnaires used for the study were pretested to test the reliability and validity. Triangulation was used to ensure reliability and validity for qualitative data. Selection bias was minimised by including all participants who qualified for the study. The out patient department of the facility opens for 24 hours but the wellness clinic opens only during the weekdays and from 08 to 16.30 hours to provide services which also minimised selection bias. On a daily basis, the researcher has checked data completeness and consistency.

3.11 Ethical Considerations

Permission for the study was sought from Department of health Limpopo province, Department of Family Medicine Research Committee and the Rethabile Health Centre Management. Ethics approval was obtained from the Medunsa Research Ethics Committee (MREC) and Research Ethics Committee Department of health Limpopo. The participants were asked to sign the consent form before participating in the study. Consent was obtain from the patient both verbally and written in either English or Spedi by the nurse of the wellness clinic.

Additional assent was obtained from the parents or legal guardians for those under 18 years of age. Confidentiality was ensured by using separate file where only the folder number to match questionnaire data with adherence. No patient identifiers were used in subsequent data analysis.

CHAPTER 4

PRESENTATION AND INTERPRETATION OF THE RESULTS

4.1 Introduction

In this chapter, the results of the study are presented and interpreted. This chapter is divided into five sub-sections: (1) socio-demographic profile of the participants, (2) Satisfaction with Services Received, (3) Self-rated adherence to 'Isoniazid Preventive Therapy' (IPT), (4) Urine confirmation of adherence to treatment, (5) Reasons for Non-adherence to IPT from Patient and Health Provider Views

4.2 Socio-Demographic Information of the Participants

There wear a total of 2896 HIV-infected patients seen during the period of the study, of which 122 patients were qualifying for INH prophylaxis therapy. Of these, 98.36% (120/122) patients signed consent form and completed the questionnaire. Of the 120 selected participants, 75% (90/120) were follow-up for a period of six month, 16.66% (20/120) were transferred to their local clinics after their 1st month of treatment, and 8.33% (10/120) were transferred to their local clinic after their second months of treatment.

4.2.1 Gender Distribution

Of the 90 patients in the study, the majority 72 (80%) were females and only 18 (20%) were males (**Figure: 4.1**).

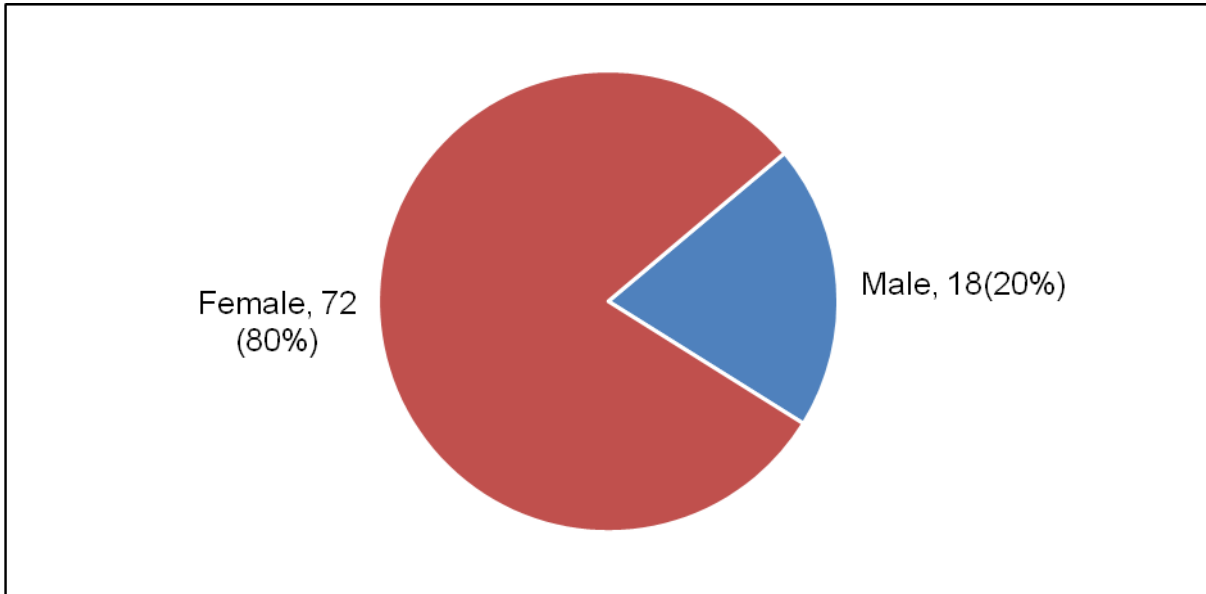


Figure 4.3: Gender Distribution

4.2.2 Participant's level of education

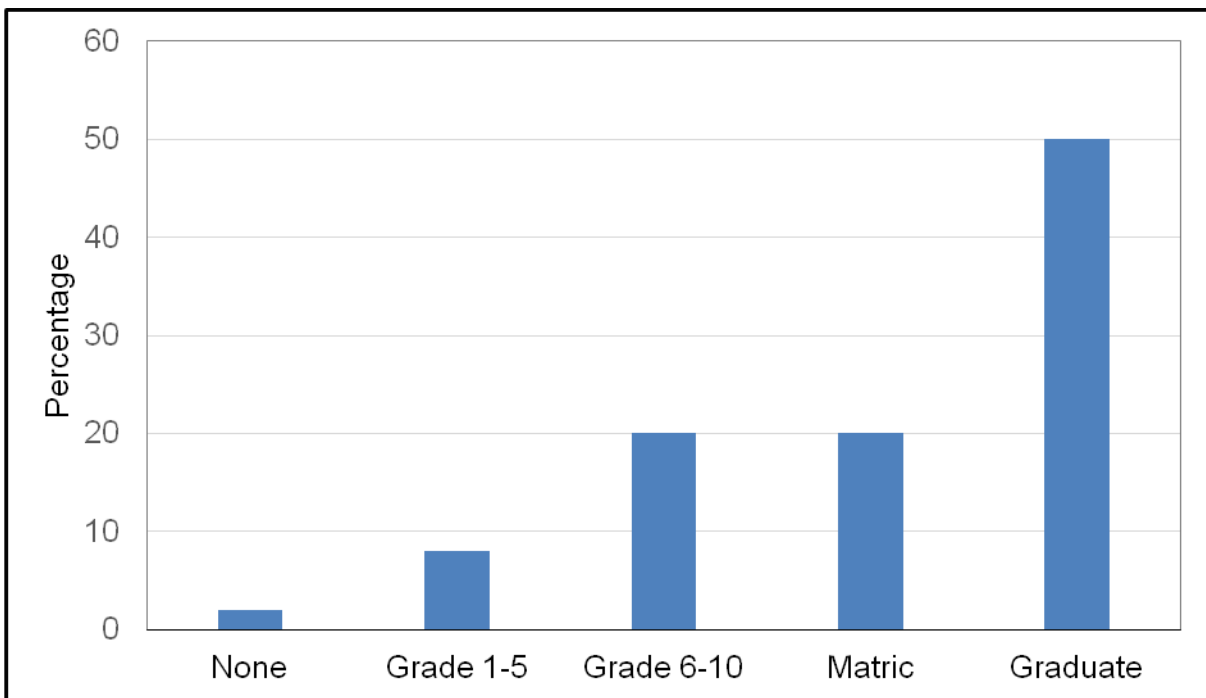


Figure 4.4: Level of education, n=90

The patient's level of education is shown in **Figure 4.2**. Half 45 (50%) of the participants had tertiary education and matric education 20%.

4.2.3 Employment status

Figure 4.3 shows the distribution of employment status of the participants. Sixty nine (76.6%) patients in this study were unemployed, 14 patients (15.5%) were self-employed and only 7(7.7%) were employed.

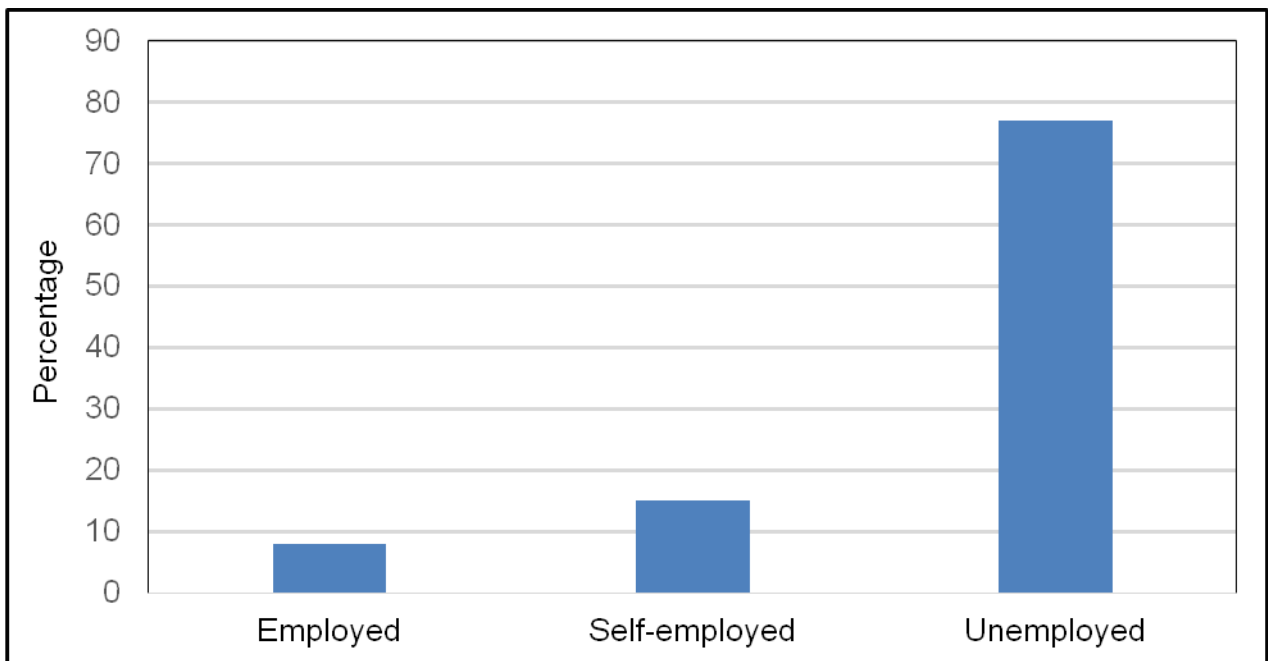


Figure 4.5: Employment status, n=90

4.2.4 Salaries/Incomes of employed participants

Of the patient working, 11(71%) patients monthly salary ranged between R1000 – R2499. 2(14%) patients salary ranged between R2500 - R5000, 1 (7%) salary ranged below R1000 and 1(7%) patients salary were more than R5 000. (**Figure 4.4**).

Of the unemployed patients 69, the majority 50 (72.4%) of patients do not receive social grant, 14 (20.2%) patients previously received but not now and only 5 (7.2%) patients receive social grant (**Figure 4.5**). 74(82.2%) of the respondents in this study were from other areas and only 16 (17.7%) were from local communities (**data not shown**).

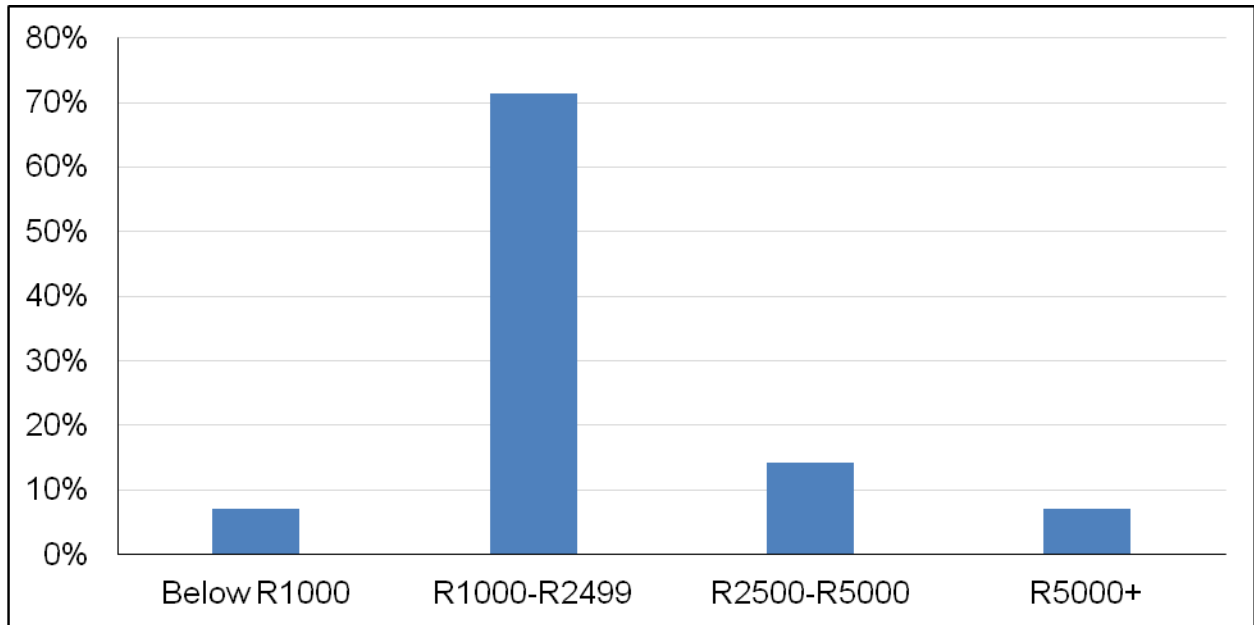


Figure 4.6: Monthly income, n=14

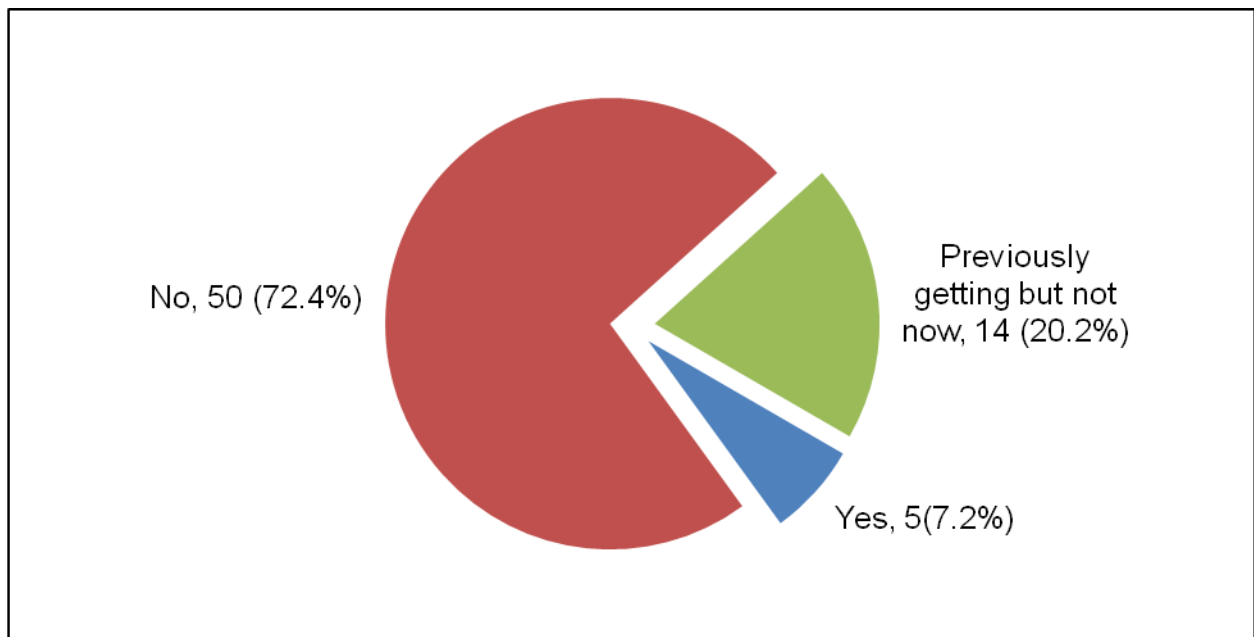


Figure 4.7: Recipients Social Grant in unemployment group, n=69

4.2.5 Use of alcohol, tobacco, and other substances

The use of alcohol, tobacco and substances by patients is shown in **Table 4.1**. Most (84.4%) of the patient did not consume alcohol, (87.8%) do not smoke and (94.4%) do not use substances.

Table 4.2: Use of alcohol, tobacco and substance

	No	%
Alcohol use		
Yes	14	15.6
No	76	84.4
Tobacco smoking		
Yes	11	12.2
No	79	87.8
Illicit substance use(eg. cannabis, opiates etc)		
Yes	5	5.6
No	85	94.4

4.3 Satisfaction with Services Received

14 (15.6%) participants were fully satisfied with the health facility, while 61 (67.8%) were fully satisfied with the assistance from the staff (**Figure 4.6**). 88 (97.8%) said that doctors and nurses fully explained the IPT.

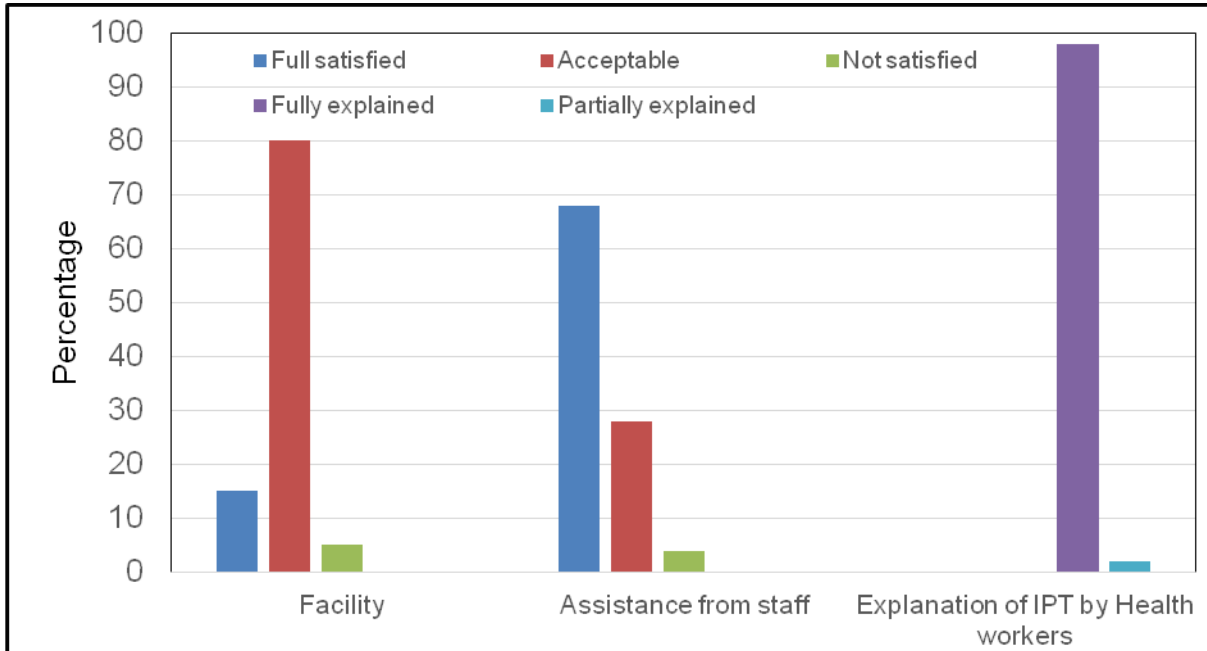


Figure 4.8: Satisfaction with health facility services

4.4 Self-rated adherence to 'Isoniazid Preventive Therapy' (IPT)

Figure 4.7 illustrates patient self-rated adherence to the treatment. Most 72 (80%) of the patients were fully confident that they have the ability to adhere to the treatment.

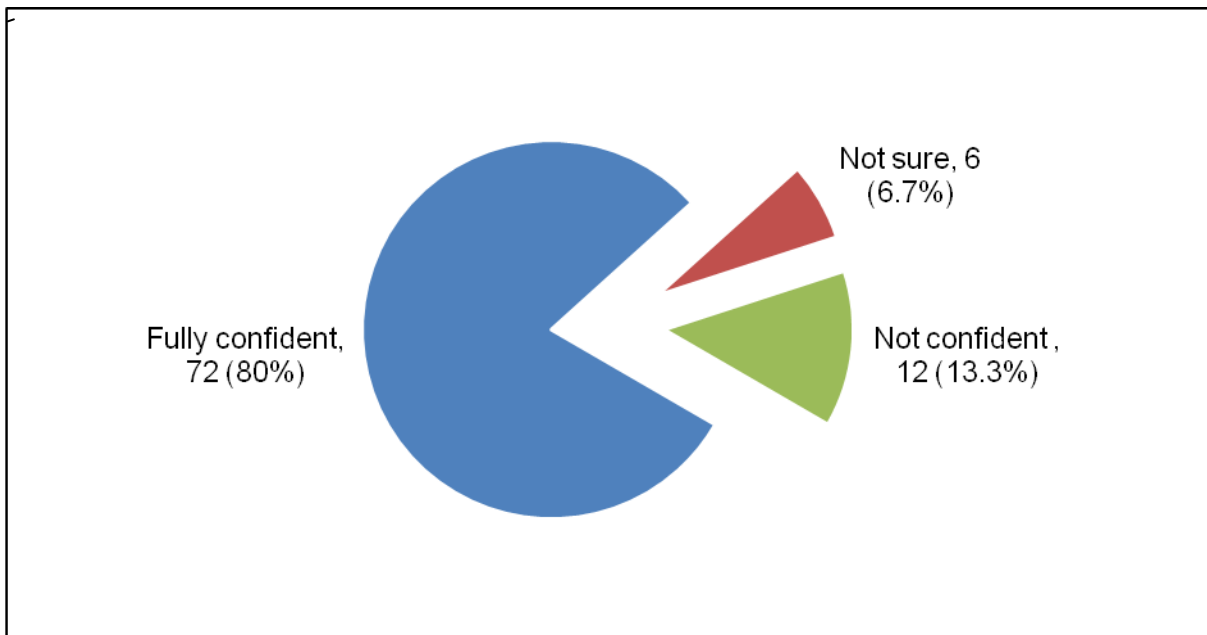


Figure 4.9: Self-rated adherence to treatment

4.5 Urine confirmation of adherence to treatment

With regard to urine test, during the research period 6 times Isoniazid Strip Test was done for each participants, of the 90 participants, 63 (70%) participants had 6 times, 12(13.33%) had 5 times, 9(10%) had 4 times and rest of 6(6.66%) had 3 times positive urine test throughout the six months of their follow up period.

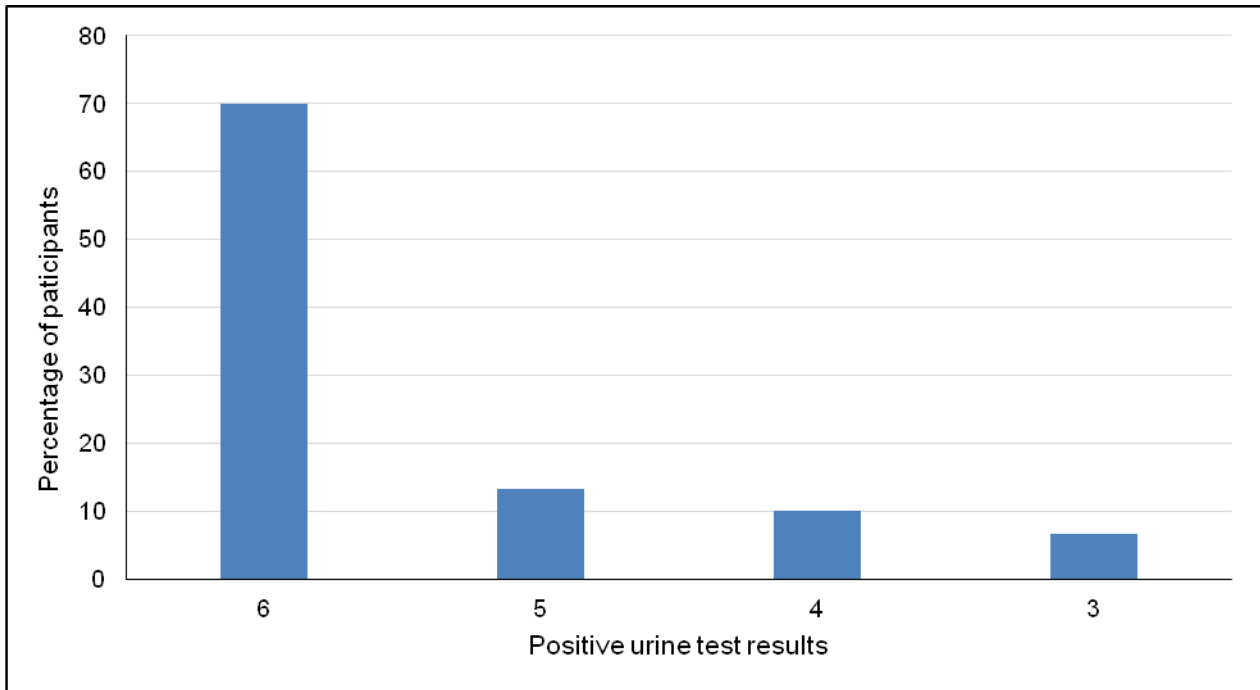


Figure 4.8: Urine test results

4.6 Reasons for Non-adherence to IPT from Patient and Health Provider Views

The reason for non-adherence was divided into patient factors and health care workers factors. This subsection is divided into two parts: (1) patient factors and (2) health care worker factors.

4.6.1 Patient views:

The majority of the patients said transport (84%, n=76) and 63 distance (70%, n=63) were the main barriers to access to health care services (**Table 4.2**).

Table 4.3: Barriers to treatment adherence

	no	%
Fear of stigmatization	1	1.1
Transport	76	84.4
Reluctance to take medicine in the absence of symptoms	8	8.9
Clinic is distant	63	70
Lack of family support	9	10

4.6.2 Healthcare workers views

Three professional nurses who were working in the Wellness clinic and collecting data participated in the face-to-face interview with the researcher. The main themes that came out of the interviews include the following:

4.6.2.1 Financial problem

Patients sometimes miss their date of appointment due to lack of money for transport.

When missed their scheduled date and the patient came late, the nurse asked the patient, "Why did not you come last week to collect your treatment?" Most of the time the patient replied,

"I did not have money for the transport to come here"

4.6.2.2 Employment

Patients who are employed sometimes miss their date because they do not get day off from their employer which insecure them to lose their jobs.

Some patient replied when they were asked the reason of absence,

“I could not tell my employer that I need to go to the clinic to collect treatment. Boss may think I am sick and not fit for work.”

“My work place is too busy and my employer pays me well, if I ask for leave he may terminate me from the job”

4.6.2.3 Cultural and Social belief

There are some rumours in the community that IPT is going to dominate inside their blood and prevent them from baring child.

One nurse said: *“poor patient adherence was a major problem because patient lack information and proper counselling on IPT.”* When the nurse asked the patient *“why didn’t you take the pill?”* couple of them replied

“I heard, I will not become pregnant if I take this medicine (IPT).”

“You make this medicine (IPT) from TB patient sputum; if I take it I will become sick”

“I don’t believe your medicine, I still believe on traditional medicine”

Some patients believe that to take IPT is the waste of time because if you have TB then you take TB treatment for six months and cure but if you are taking IPT you are going to take it for six months and after two years you are going to take it again, for that they refuse.

4.6.2.4 Weather

During rainy season people miss their follow-up date and fail to collect treatment

One nurse said: “most of the patients don’t use the facilities near their home, leave far from Rethabile Health Centre - transportation is a major problem during rainy season”.

During the rainy season when the patient missed their appointment and were asked

“Why didn’t you come yesterday?” they replied

“It is very difficult to get taxi while raining”

4.6.2.5 Side effect

People decide to leave the treatment because they believe side effects of IPT are same like TB treatment.

4.6.2.5 Lifestyle

Patient drinks alcohol during the weekend and forget to take medicine

4.6.2.6 False address

Sometimes patient gives incorrect trace address and contact.

CHAPTER 5

DISCUSSION AND CONCLUSION

5.1 Introduction

In this chapter, the results of the study are discussed and compared with the literature relevant to this study. The chapter is divided into two subsections: Adherence to 'Isoniazid Preventive Therapy' among HIV positive patients and Barriers of adherence.

5.2 Adherence to 'Isoniazid Preventive Therapy' among HIV positive patients

The main purpose of this study was to assess adherence to IPT among HIV positive patients. This study found that while (80%) of participants reported a self-rated adherence to treatment, only 70% of participants had positive evidence of adherence on urine testing. Of the several reasons reported for non-adherence, transport problems and distance to healthcare facility were the most common.

There are many studies conducted in sub-Saharan Africa to evaluate adherence to IPT among HIV-infected people. Although there is no universally accepted definition of adherence, many studies reported rates above 40%. In order to facilitate TB cure, patients are expected to have adherence level rate greater than 90% (Awofeso, 2008). The failure for cure increases the spread of TB in the community and the risk of development of drug resistant strains.

The adherence rate was slightly lower (78%) in a study conducted in Botswana (Gust et al., 2011) compared to studies (86.5%) in Ethiopia (Mindachew et al., 2011); and (87%) Tanzania (Munseri et al., 2008). As compared to the finding of this study, several studies

conducted in South Africa found lower adherence rates of 47.1%; 66% and 72%, respectively (Rowe et al., 2005; Szakacs et al., 2006; Govender and Mash, 2009). However, these studies used various methods to defined non-adherence such as refusing tablet ingestion (Gust et al., 2011), self-rated assessment and urine test (Rowe et al., 2005; Szakacs et al., 2006; Govender and Mash, 2009). It is worth note that the self-reporting is the simplest and least expensive method of measuring adherence. However, it has the problem of over-estimating adherence (Turner, 2002; George et al., 2007).

This study found that the self-rated adherence was more than two-thirds (80%), while the adherence rate for urine tests for isoniazid metabolites was 70%. This indicates that the medication adherence in this facility is suboptimal, and interventions and coordinated care for people living with HIV/AIDS needs an urgent attention. To solve problems of distance and transportation, the services could be bring closer to where the patients live (i.e. mobile clinics) or provide transport or refer the patient early to their nearest local clinic to receive the treatment.

Many studies have viewed non-adherence as a significant public health concern. In a consecutive sample of 140 participants in Uganda, alcohol consumption and smoking were found to be related to non-adherence (Amuha et al., 2009). Similarly, a cross-sectional study in South Africa reported that tobacco use and alcohol were predictors for non-adherence to anti-TB drugs (Naidoo et al., 2013).

In the study (Rowe et al, Mar 2005) important barriers to adherence noted among HIV positive was fear of stigmatization in relation to their HIV status, lack of money for food and transport, the belief that HIV is incurable by Western medicine, and a perceived conflict between Western and traditional medicine.

Their research confirmed that people who were healthy are less likely to take tablets than those who are sick and are prone to stop when they are well. Disclosure of HIV

status, the presence of social and family support, and a confidential and caring clinic environment were identified as positively influencing adherence.

There was some suggestion from the study that women were more likely to complete their course of treatment than men, but no difference was noted between age groups or between those who started in the early or late part of the study.

Shayo and colleagues in their study found that gender, occupation, educational level was not associated with adherence (Shayo et al., 2015). However, Makanjuola et al in their meta-analysis reported that a greater proportion of men, person with higher education and younger age group do not adhere to treatment (Makanjuola et al., 2014).

The majority 72 (80%) were females and only 18 (20%) were males in our study where most (84.4%) of the patient did not consume alcohol, (87.8%) do not smoke and (94.4%) do not use substances. There were half 45 (50%) of the participant had tertiary education and matric education 20% at the same time sixty nine (76.6%) patients in this study were unemployed, 14 patients (15.5%) were self-employed and only 7(7.7%) were employed.

We strongly believe that on-going education about treatment and side effect, involve patient in decision making and adequate health information will improve adherence to IPT. At the same time positive and warm welcome to the clinic that allow the patient to question and to get the possible answer. Discuss follow up visits with patients when initiating IPT will play a good role to improve the adherence to IPT.

5.3 Barriers for Non-adherence to IPT

Even though, the WHO has recommends the use of Isoniazid (INH) as a strategy to reduce morbidity and mortality among HIV-infected people, non-adherence to treatment continues to be a problem.

Studies have shown that patient factors such fear of INH side effect, understanding of IPT and its importance and belief in IHN safety, forgetfulness, denial or disclosure of HIV status, pill burden, economic dependence on family, economic resource limitations contribute to higher rate of non-adherence to treatment (Makanjuola et al., 2014; Mindachew et al., 2014).

Previous studies in South Africa found that poverty, fear of stigmatization, reluctance to take medication when asymptomatic and perception that Isoniazid (INH) is unsafe were the barriers to adherence to IPT amongst HIV-infected patients (Rowe et al., 2005; Szakacs et al., 2006; Govender and Mash, 2009). Other studies have reported that attitude of health care provider's increases non-adherence rates (Wares et al., 2003; Jaiswal et al., 2003).

Studies that assessed healthcare workers factors found that lack of knowledge and experience among health care workers, non-adherence to the IPT guideline and unclear direction of national policy were found to be the barriers to the widespread use of IPT (Hiransuthikul et al., 2005; Lester et al., 2010; Moolphate et al., 2013).

With regard to health system, distance, location of hospital or clinic and non-availability of service providers were highlighted as problem faced by patients in accessing TB treatment (Makanjuola et al., 2014).

Consistent with other studies, in this study, the predominant reason mentioned by patients for non-adherence to IPT was transport and distance to health facility. Evidently, a number of patients in this community health centre were referred back to their nearest health facilities due to transport problem.

Moreover, the health care providers indicated that many patients do not adhere to treatment due to lack of money for transport, afraid to lose their jobs, still using traditional medicine, miss appoint due to rain, leave the treatment because of side effects; alcohol consumption and gives incorrect trace address and contact.

The use of mobile clinics has shown to improve access to health services in underserved communities (Lindgren et al., 2011; Gardner et al., 2012; Geoffroy et al., 2014; Hill et al., 2014). In Limpopo, mobile clinics operate in every sub-district across the province and provide a wide range of services, tailored to the community specific needs. Introducing IPT in the mobile clinics might improve adherence to IPT.

5.4 Limitation of the Study

This study has several limitations:

- Self-rated adherence were used and usually overestimate adherence levels
- The sample size was relatively small and the results may not be generalized to the entire population of HIV-infected patients in Limpopo province.
- The exclusion criteria limit generalization to the entire population of HIV infected population.

5.5 Conclusion and Recommendations

In conclusion, this study found suboptimal self-rated adherence level to IPT among HIV-infected patients at Rethabile CHC, Polokwane. While several personal and healthcare providers-related reasons were reported for non-adherence, providing IPT at facilities that are in close proximity to patients' homes and dealing with transport problems are two key interventions that may improve adherence to IPT among HIV –infected patients.

This study recommends the following:

- To solve problems of distance and transportation, the services could be bring closer to where the patients live (i.e. mobile clinics) or provide transport.

- Refer the patient early to their nearest local clinic to receive the treatment.
- On-going education and support for patients and healthcare workers.
- Adequate health information about treatment and side effect.
- Involve patient in decision making.
- Positive and warm welcome to the clinic to allow the patient to question and possible answer.
- Discuss follow up visits with patients when initiating IPT.

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APPENDIX A: INFORMATION LEAFLET

I Dr. M I H Khan, is conducting a study titled “Adherence to ‘Isoniazide Preventive Therapy’ in HIV positive patients at Rethabile Community Health Centre Polokwane, Limpopo Province, South Africa”

The purpose of the study is to see the rate of adherence to the TB Preventive Therapy. Participation in the study is completely voluntary and has no effect on the treatment you are getting from the clinic.

This research study has been approved by the relevant Research Ethics Committee
There is no potential risk or harm related to participate in the study.

A questionnaire will be provided to you to gather the required information about yourself and the treatment you are receiving.

The information received from you will never be used to disclose your identity in person at any stage.

Once you agree to take part in the study you will be requested to sign a consent form to that effect.

You may withdraw your participation at any stage and it may not affect your treatment from the clinic.

I am looking forward to your cooperation.

APPENDIX B: LETLAKALANA LA TSHEDIMOŠO

Nna Ngaka M I H Khan, ke ithuta ka ga “Kobamelo go ‘Taolo ya Thibelo ya Aesoniasaete’ go balwetši ba go ba le HIV mo Senthareng ya tša Maphelo ya Setšhaba ya Rethabile mo Polokwane, Profenseng ya Limpopo, Afrika Borwa.”

Maikemišetšo a dinyakišišo ke go bona maemo a kobamelo go Taolo ya Thibelo ya TB.

Go tšea karolo go dinyakišišo ke ka go ikgethela mme ga go na seabe godimo ga kalafo yeo o e hwetšago kliniking.

Thuto ye ya dinyakišišo e amogetšwe ke Komiti ya maleba ya Maitshwaro a Dinyakišišo.

Ga go na kotsi yeo e ka e tšwelelago ge o tšea karolo go dinyakišišo tše.

O tla fiwa letlakalapotšišo go hwetša tshedimošo yeo e nyakegago ka ga gago le kalafo yeo o e amogelago.

Tshedimošo go tšwa go wena e ka se tsoge e dirišitšwe nako efe goba efe go phatlalatša gore ke wena mang.

Ge o dumela go tšea karolo go dinyakišišo o tla kgopelwa go saena foromo ya tumelelano mabapi le seo.

O ka ikgogela morago nako efe goba efe mme seo se ka se ame kalafo ya gago mo kliniking.

Ke lebeletše go šomišana le wena.

APPENDIX C: DATA COLLECTION VERSION – ENGLISH VERSION

Date: ___/___/___

File no:

<p>Age: -----</p> <p>Race: Black <input type="checkbox"/> , White <input type="checkbox"/> , Colored <input type="checkbox"/> , Asian <input type="checkbox"/></p> <p>Gender: Male <input type="checkbox"/> Female <input type="checkbox"/></p>
<p>Education: Nil <input type="checkbox"/> Grade 1 to 5 <input type="checkbox"/> Grade 6 to 10 <input type="checkbox"/> Matric <input type="checkbox"/> Graduate <input type="checkbox"/></p> <p>Employment: Employed <input type="checkbox"/> Self-employed <input type="checkbox"/> Unemployed <input type="checkbox"/></p> <p>Monthly Income: Below R 1000 <input type="checkbox"/> R1000 – 2499 <input type="checkbox"/> R 2500 – 4999 <input type="checkbox"/> R 5000 and above <input type="checkbox"/></p> <p>Social grant: Yes <input type="checkbox"/> No <input type="checkbox"/> previously getting but not now <input type="checkbox"/></p>
<p>Alcohol use: Yes <input type="checkbox"/> No <input type="checkbox"/></p>

<p>If Yes: Social Drinker <input type="checkbox"/> Over the weekends only <input type="checkbox"/></p> <p> > twice a week <input type="checkbox"/> Daily <input type="checkbox"/></p>
<p>Tobacco smoking: Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>Substance use: Yes <input type="checkbox"/> No <input type="checkbox"/></p>
<p>Residence: Local <input type="checkbox"/> Other area <input type="checkbox"/> Outside Town <input type="checkbox"/> Rural area <input type="checkbox"/></p>
<p>Satisfaction with the facility : Fully satisfied <input type="checkbox"/> Acceptable <input type="checkbox"/> Not satisfied <input type="checkbox"/></p>
<p>Assistance from the staff : Fully satisfied <input type="checkbox"/> Acceptable <input type="checkbox"/> Not satisfied <input type="checkbox"/></p> <p>Explanation of IPT by the doctor/nurse to you : Fully explained <input type="checkbox"/></p> <p>Partially explained <input type="checkbox"/> not explained at all <input type="checkbox"/></p>
<p style="text-align: center;"><u>You may choose more than one</u></p> <p>Barriers to accessing care : Fear of stigmatization <input type="checkbox"/> Transport <input type="checkbox"/></p> <p>Reluctance to take medicine in the absence of symptoms <input type="checkbox"/> Clinic time operation <input type="checkbox"/> Clinic is distant <input type="checkbox"/> Lack of family support <input type="checkbox"/></p>
<p>Self rate confidence in the ability to adherence to the treatment: ,</p> <p> Fully confident <input type="checkbox"/> Not sure <input type="checkbox"/> Not confident <input type="checkbox"/></p>

APPENDIX D: DATA COLLECTION TOOL – PEDI VERSION

Letšatšikgwedi: ___ / ___ / ___

Nomoro ya Faele: _____

Mengwaga:	
Morafe: Mothomoso <input type="checkbox"/>	Mothomošweu <input type="checkbox"/>
Wa mmala <input type="checkbox"/>	Moešia <input type="checkbox"/>
Bong: Monna <input type="checkbox"/>	Mosadi <input type="checkbox"/>
<hr/>	
Tša Thuto: Lefela <input type="checkbox"/>	Kreiti ya 1 go fihla go ya 5 <input type="checkbox"/>
	Kreiti ya 6 go fihla go ya 10 <input type="checkbox"/>
Marematlou <input type="checkbox"/>	Sealoga <input type="checkbox"/>
Tša mošomo: Thwetšwe <input type="checkbox"/>	Moipereki <input type="checkbox"/>
	Yo a sa šomego <input type="checkbox"/>
Mogolo wa kgwedi ka kgwedi: Ka fase ga R1000 <input type="checkbox"/>	R1000 – R2499 <input type="checkbox"/>
	R2500 – R4999 <input type="checkbox"/>
	R5000 le go feta fao <input type="checkbox"/>
Motlaodutši: Ee <input type="checkbox"/>	Aowa <input type="checkbox"/>
	Peleng o be o amogela efela ga o sa o amogela <input type="checkbox"/>
<hr/>	
Tšhomišo ya bjala: Ee <input type="checkbox"/>	Aowa <input type="checkbox"/>
Ge eba ke Ee: O nwela go ithabiša <input type="checkbox"/>	Mafelelong a beke fela <input type="checkbox"/>
> Ga bedi ka beke <input type="checkbox"/>	Letšatši le lengwe le le lengwe <input type="checkbox"/>

<p>Go fola motsoko: Ee <input type="checkbox"/> Aowa <input type="checkbox"/></p> <p>Tšhomišo ya diokobatši: Ee <input type="checkbox"/> Aowa <input type="checkbox"/></p>
<p>Bodulo: Selegae <input type="checkbox"/> Lefelong le lengwe <input type="checkbox"/> Ka ntle ga Toropo <input type="checkbox"/> Magaeng <input type="checkbox"/></p>
<p>Kgotsofalo ka lefelo le: Kgotsofetše kudu <input type="checkbox"/> E a amogelega <input type="checkbox"/> Go se kgotsofale <input type="checkbox"/></p>
<p>Thušo go tšwa go bašomedi: Kgotsofetše kudu <input type="checkbox"/> E a amogelega <input type="checkbox"/> Go se kgotsofale <input type="checkbox"/></p> <p>Tlhaloso ya IPT ka ngaka / mooki go wena: E tlhalositšwe ka botlalo <input type="checkbox"/> E tlhalositšwe go senene <input type="checkbox"/></p> <p>Ga se ya tšwa le ga tee <input type="checkbox"/></p>
<p style="text-align: center;"><u>O ka kgetha tša go feta e tee</u></p> <p>Dišitiši tša go fihlelela kalafo: Letšhogo la go kwerwa <input type="checkbox"/> Senamelwa <input type="checkbox"/></p> <p>Go se nyake go nwa dihlare ge go hlokega dika tša bolwetši <input type="checkbox"/> Dinako tšeo kliniki e <input type="checkbox"/></p> <p>šomago <input type="checkbox"/> Kliniki e kgole <input type="checkbox"/> Tlhokego ya thekgo go tšwa ka gae <input type="checkbox"/></p>
<p>Ela boitshepo bja gago bja go kgona go obamela kalafo:</p> <p>Boitshepo bja go tlala <input type="checkbox"/> Ga ke na bonnete <input type="checkbox"/> Ga ke na boitshepo <input type="checkbox"/></p>

APPENDIX E: MEDUNSA CONSENT FORM – ENGLISH VERSION

Statement concerning participation in a Clinical Trial.

Name of Study: **Adherence to ‘Isoniazid Preventive Therapy’ in HIV positive patient at Rethabile Community Health Centre, Polokwane.”**

I have read the information on /heard the aims and objectives of the proposed study and was provided the opportunity to ask questions and given adequate time to rethink the issue. The aim and objectives of the study are sufficiently clear to me. I have not been pressurized to participate in any way.

I understand that participation in this Clinical Study is completely voluntary and that I may withdraw from it at any time and without supplying reasons. This will have no influence on the regular treatment that holds for my condition neither will it influence the care that I receive from my regular doctor.

I know that this Study has been approved by the Research, Ethics and Publications Committee of Medunsa / Ga-Rankuwa Hospital. I am fully aware that the results of this Study will be used for scientific purposes and may be published. I agree to this, provided my privacy is guaranteed.

I hereby give consent to participate in this Study.

.....

Name of patient

Signature of patient or guardian.

.....

Place.

Date.

Witness

Statement by the Researcher

I provided verbal and written information regarding this Study.

I agree to answer any future questions concerning the Study as best as I am able.

I will adhere to the approved protocol.

..... Dr. M I H Khan

.....

Name of Researcher

Signature

Date

Place

APPENDIX F: MEDUNSA CONSENT FORM – SPEDI VERSION

Setatamente mabapi le go tšea karolo ka go ya Dinyakišišo tša .

Leina la Dinyakišišo :

Ke badile/ke kwele ka ga tshedimošo mabapi le maikemišetšo le morero wa dinyakišišo tšeo di šišintšwego gomme ke ile ka fiwa monyetla wa go botšiša dipotšišo gomme ka fiwa nako yeo e lekanego gore ke naganišiše ka ga taba ye. Ke tloga ke kwešiša maikemišetšo le morero wa dinyakišišo tše gabotse. Ga se ka gapeletšwa go kgatha tema ka tsela efe goba efe.

Ke a kwešiša gore go kgatha tema Dinyakišišong tše tša Teko ya Klinikhale ke ga boithaopo gomme nka tlogela go kgatha tema nakong efe goba efe ntle le gore ke fe mabaka. Se se ka se be le khuetšo efe goba efe go kalafo yaka ya ka mehla ya maemo a ka gape e ka se huetše le ge e ka ba tlhokomelo yeo ke e humanago go ngaka yaka ya ka mehla.

Ke a tseba gore Teko Dinyakišišo tše di dumeletšwe ke Medunsa Campus Research and Ethics (MCREC), Yunibesithi ya Limpopo (Khamphase ya Medunsa) / Dr George Mukhari Hospital. Ke tseba gabotse gore dipelo tša Teko Dinyakišišo di tla dirišetšwa merero ya saense gomme di ka phatlalatšwa. Ke dumelelana le se, ge fela bosephiri bja ka bo ka tlišetšwa.

Mo ke fa tumelelo ya go kgatha tema Dinyakišišong.

Leina la molwetši/ moithaopi

Mosaeno wa molwetši goba mohlokomedi.

.....

.....

.....

Lefelo.

Letšatšikgwedi.

Tlhatse

Setatamente ka Monyakišiši

Ke fana ka tshedimošo ka molomo le/goba yeo e ngwadilwego Dinyakišišo.

Ke dumela go araba dipotšišo dife goba dife tša ka moso mabapi Dinyakišišo ka bokgoni ka moo nka kgonago ka gona.

Ke tla latela melao yeo e dumeletšwego.

Dr M I H Khan

Leina la Monyakišiši

Mosaeno

Letšatšikgwedi

Lefelo

*Phumola tšeo di sego maleba.

APPENDIX G: DATA COLLECTION TOOL – PILL COUNT RECORD

Monthly Pill Count Record							Urine Test Record			
Rx issue date	Pills issued	Review date	Pills in container	Expected pills in container	Missed days	Possible Missed weeks		Urine test date	Urine test result	
						1 st week	2 nd week		Positive	
						1 st week			Positive	
						2 nd week			Negative	
						3 rd week				
						4 th week				
						1 st week			Positive	
						2 nd week			Negative	
						3 rd week				
						4 th week				
						1 st week			Positive	
						2 nd week			Negative	
						3 rd week				
						4 th week				
						1 st week			Positive	
						2 nd week			Negative	
						3 rd week				
						4 th week				
						1 st week			Positive	
						2 nd week			Negative	
						3 rd week				
						4 th week				

APPENDIX H: ETHICS CLEARANCE LETTER



MEDUNSA RESEARCH & ETHICS COMMITTEE

CLEARANCE CERTIFICATE

MEETING: 06/2012
PROJECT NUMBER: MREC/M/143/2012: PG

PROJECT:

Title: Adherence of 'Isoniazide Therapy' in HIV positive patients at Retriable Community Health Centre Polokwane, Limpopo Province, South Africa
Researcher: Dr MIH Khan
Supervisor: Dr M Shoyab
Hospital Superintendent: Dr C Nkomo
Department: Family Medicine & PHC
School: Medicine
Degree: MMed Family Medicine

DECISION OF THE COMMITTEE:

MREC approved the project.

DATE: 07 August 2012

PROF GA OGUNBANJO
CHAIRPERSON MREC

The Medunsa Research Ethics Committee (MREC) for Health Research is registered with the US Department of Health and Human Services as an International Organisation (KOR0004319) as an Institutional Review Board (IRB00005122), and functions under a Federal Wide Assurance (FWA00006419).
Expiry date: 11 October 2016

Note:

- i) Should any departure be contemplated from the research procedure as approved, the researcher(s) must re-submit the protocol to the committee.
- ii) The budget for the research will be considered separately from the protocol.
PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES.



APPENDIX I: PROVINCIAL RESEARCH CLEARANCE LETTER



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH

Enquires: Selamolela Donald

Ref:4/2/2

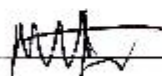
Khan MIH
University of Limpopo
Sovenga
C727

Greetings,

Re: Adherence of 'Isoniazide Therapy' in HIV positive patients at Rethabile Community Health Centre Polokwane, Limpopo Province.

1. The above matter refers.
2. Permission to conduct the above mentioned study is hereby granted.
3. Kindly be informed that:-
 - Further arrangement should be made with the targeted institutions.
 - In the course of your study there should be no action that disrupts the services.
 - After completion of the study, a copy should be submitted to the Department to serve as a resource.
 - The researcher should be prepared to assist in the interpretation and implementation of the study recommendation where possible.

Your cooperation will be highly appreciated.


P.D. Head of Department

17/12/2013
Date

18 College Street, Polokwane, 0700, Private Bag x3302, P.O. BOX 120, POLOKWANE, 0700
Tel: (015) 293 6000, Fax: (015) 289 6211/20 Website: <http://www.limpopo.gov.za>

The heartland of Southern Africa