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KNOWLEDGE, ATTITUDES AND PRACTICES RELATED TO ISONIAZID PREVENTIVE THERAPY OF ADULTS LIVING WITH HIV AND AIDS IN BEREA DISTRICT, LESOTHO

By

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2012152316

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DECLARATION

I, Anna Masheane-Moseneke hereby declare that the dissertation submitted for the degree Magister Societatis Scientiae in Nursing at the University of the Free State is my own independent work and has not been previously submitted by me for a degree to another university or faculty. I further waive my copyright of the dissertation in favour of the University of the Free State.

A. Masheane-Moseneke

DEDICATION

To all patients living with HIV, their families and friends. Together, we pledge no more dying of tuberculosis.

ACKNOWLEDGEMENTS

- I am grateful to my family members (my husband, children and sisters), colleagues and friends for their support during the time of my study. They have been there for me for the entire period my studies.

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ABSTRACT

Isoniazid preventive therapy is an effective strategy for prevention of tuberculosis among people living with HIV/AIDS. However, its uptake amongst this people is very low. KAP related to isoniazid preventive therapy may play a role in this poor uptake. Thus, the aim of this study was to assess and describe knowledge, attitude and practices related to isoniazid preventive therapy of adults living with HIV in Berea district, Lesotho. A quantitative, descriptive design was used and participants (n=350) were conveniently selected. Structured questionnaire was administered. Descriptive statistics for continuous and categorical data were calculated.

This study was guided by theory of planned behaviour (TPB) therefore, knowledge was reflected by behavioural, normative, control beliefs, subjective norms and perceived behavioural control related to isoniazid uptake. Attitude section mirrored participants' attitude towards isoniazid uptake, whereas practice was presented as participants' intention, actual behavioural control and behaviour towards isoniazid uptake.

Results were presented as percentage positive scores leading to enhanced isoniazid uptake. Knowledge predicting isoniazid uptake was determined as behavioural beliefs (88.9%), normative beliefs (82.9%), control beliefs (0.3%) and subjective norms (69.0%). Knowledge component favoured isoniazid uptake. Attitudes (78.6%) enhanced isoniazid uptake. Practice was reflected as intention (99.4%), actual behavioural control (98.0%) and behaviour (82.9%). Practice component indicated a strong intention to use isoniazid preventative therapy.

Behavioural and normative beliefs, attitude, intention, actual behavioural control and behaviour were high, subjective norms were average, and control beliefs and perceived behavioural control were low.

Recommendations were aligned to the TPB and include health promotion, trainings, and community involvement.

LISTS OF ABBREVIATIONS AND ACRONYMS

AFB	acid-fast bacilli
AIDS	immunodeficiency syndrome
ART	antiretroviral therapy
ARV	antiretroviral
CHAL	Christian Health Association of Lesotho
CXR	chest X-ray
DHMT	district health management team
DST	drug susceptibility testing
FDC	fixed drug combination
HAART	highly active antiretroviral
HSA	health service area
HIV	human immunodeficiency virus
HTC	HIV testing and counselling
IC	infection control
ICF	intensified case finding
IEC	information education and communication
INH	isoniazid
IPT	isoniazid preventive therapy
IRIS	immune reconstitution inflammatory syndrome
KAP	knowledge, attitude and practices
LMOH	Lesotho Ministry of Health
LTBI	latent tuberculosis infection
MDR-TB	multi-drug resistant tuberculosis
MOH	Ministry of Health
NNRTI	non-nucleoside reverse transcriptase inhibitors
NRTI	nucleoside reverse transcriptase inhibitors
PHC	primary health care
PI	protease inhibitors
PLWHA	people living with HIV and AIDS
PPD	purified protein derivative

PTB	pulmonary tuberculosis
RNA	ribonucleic acid
STI	sexually transmitted infections
TB	tuberculosis
TPB	theory of planned behaviour
TST	tuberculin skin test
UFS	University of the Free State
UNAIDS	Joint United Nations Programme on HIV/AIDS
VHW	village health workers
WHO	World Health Organization

OPERATIONAL AND CONCEPTUAL DEFINITIONS

Adult: a fully grown person behaving in an intelligent and responsible way in terms of his or her actions (Lesotho Ministry of Health [LMOH], 2013b:8). In this study, adults were males and females, aged 18 years and older, attending HIV care services in Berea district hospitals, i.e. Berea and Maluti Hospitals in Lesotho.

Attitude: the degree to which a person has a favourable or unfavourable evaluation or appraisal of the behaviour in question (Ajzen, 1991:188). For the purpose of the study, the term referred to whether people living with HIV and AIDS (PLWHA) evaluated taking isoniazid preventive therapy (IPT) favourably or unfavourably as expressed by themselves through the questionnaire.

Isoniazid preventive therapy (IPT): IPT refers to the use of isoniazid in a specified dosage by all HIV-positive persons who did not have active tuberculosis (TB) over a specified period (LMOH, 2011:10). The researcher will also refer to IPT as depicted by national IPT guidelines for Lesotho.

Knowledge: one's capacity for imagining or one's way of perceiving and understanding a particular subject or topic (Gumucio, Merica, Luhmann, Fauvel, Zompi, Ronsse, Courcaud, Bouchon, Trehin., Schapman & Cheminant, 2011:4). For the purpose of this study, knowledge is presented as part of the informational foundation of the theory of planned behaviour, which comprises behavioural beliefs, normative beliefs, control beliefs, subjective norms and perceived behavioural control, as expressed by PLWHA through the questionnaire that was used.

Practice: actions of an individual in response to a stimulus (Gumucio *et al.,* 2011:4). In this study, practice is presented as part of the layout of the theory of planned behaviour, and comprises intention, actual behavioural control and actual behaviour, as expressed by PLWHA through the questionnaire that was used.

Berea: one of the ten districts of Lesotho. For the purpose of the study, **Berea** refers to Berea district hospitals, namely Berea Hospital and Maluti Hospital within Berea district.

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CHAPTER 1

Overview of study

1.1 INTRODUCTION

The human immunodeficiency virus (HIV) pandemic presents a significant challenge to global tuberculosis (TB) control. TB is the most common opportunistic infection affecting HIV-positive individuals (World Health Organization [WHO], 2012a:10). HIV increases susceptibility to infection with *Mycobacterium tuberculosis* and the risk of progression of *Mycobacterium tuberculosis* infection (latent TB) to TB disease (active TB). This risk increases with increasing immune suppression by the HIV (WHO, 2010:37). TB and HIV are thus interrelated. HIV is the single most important factor fuelling the TB epidemic in areas with a high prevalence of HIV infection. Patients infected with HIV have a higher risk of developing TB disease compared to HIV-negative people. This occurs through two mechanisms: reactivation of latent TB infection to TB disease due to HIV-related immunodeficiency and rapid progression from recent TB infection (including TB re-infection) to TB disease (Lesotho Ministry of Health [LMOH], 2013a:40).

TB is a leading preventable cause of death among people living with HIV and AIDS (Joint United Nations Programme on HIV/AIDS [UNAIDS], 2013:60). According to the WHO (2013a:68), 1.3 million people died from TB in 2013, of whom 320,000 were people who were HIV-positive. The proportion of TB cases co-infected with HIV was the highest in the African region countries (WHO, 2013a:69), and Southern Africa contributes more than 50% of TB cases co-infected with HIV worldwide (WHO, 2013a:68).

In response to the fight against this dual epidemic, the WHO (2012a:23-24) recommends a package of care to reduce the burden of TB among people living with HIV known as ‘the three Is’, namely intensive TB case finding (ICF), isoniazid preventive therapy (IPT) and TB infection control (IC). The recommended TB

preventive therapy for people living with HIV is isoniazid (INH). Isoniazid is given to individuals with latent infection with *Mycobacterium tuberculosis* in order to prevent progression to active disease. Exclusion of active TB is critically important before IPT is started. The absence of current cough, night sweats, fever and weight loss can identify a subset of adolescents and adults living with HIV who have a very low probability of having active TB and who can therefore reliably be initiated on IPT. Isoniazid is given daily as self-administered therapy for at least six months as part of a comprehensive package of HIV care for all eligible adults living with HIV, irrespective of degree of immune suppression, antiretroviral therapy (ART) use, previous TB treatment or pregnancy (WHO, 2011:5-6).

According to the WHO (2013a:66), IPT is implemented in HIV care settings globally. In 2012, 4.1 million people enrolled for HIV care were reported to have been screened for TB, up from 3.5 million in 2011. In the same period (2012), of the reported 1.6 million people newly enrolled for HIV care, almost 520,000 (32.5%) were provided with IPT (WHO, 2013a:68). The coverage needs to be increased, since about 50% of those newly enrolled for HIV care and screened for TB are likely to be eligible for IPT (WHO, 2013a:67-68). In 2015, the total number of people newly enrolled in HIV care who were started on IPT globally was 910 124. The number is still very low compared to 2 396 761 people living with HIV newly enrolled in care (WHO, 2016b: 85).

Lesotho is one of the countries in the African region, which is mostly affected by both HIV/AIDS and TB and a high co-infection rate (WHO, 2013a:74). TB among HIV-positive people still constitutes a major challenge in the country. The country has the third highest adult HIV prevalence (25%) in the world (LMOH, 2014a:134), and is one of the fifteen countries with the highest per capita TB case incidence of 639/100,000 (WHO, 2013a:13). The country reported 11 971 TB cases of all forms in 2013, of whom 10,476 were tested for HIV and 7,878 (75%) were HIV-positive (LMOH, 2014d: 34). The national co-infection rate has been high since 2008 with no significant reduction to date: 78% in 2009, 76% in 2010 as well as in 2011, 75% in 2012 and 74% in 2013 (LMOH, 2014d: 34), and still at 74% in 2017 (LMOH, 2017:7).

Lesotho adopted the WHO recommendations on TB/HIV in 2011 (WHO, 2011:10), and started implementation of six months' IPT during the same year. TB/HIV services, as

well as IPT are integrated in the HIV care clinics in Lesotho. In December 2013, there were 26,000 people living with HIV and AIDS (PLWHA) initiated on IPT in Lesotho (LMOH, 2014b:153), while in 2017(July) only 124,200 (36%) PLWHA were provided with IPT (LMOH, HIV program data, 2017) which is still low. Despite good evidence that IPT is working in reducing the incidence of TB and death from TB in HIV-infected persons with a positive tuberculin skin test (TST), coverage is still low worldwide (WHO, 2013a:69). Lesotho is also experiencing a low IPT coverage (LMOH, 2014d:19).

IPT is implemented at three levels of health care in Lesotho. The first level is the referral hospital, the second level is the district hospitals where Berea and Maluti Hospitals fall, and the third level is the health centres (LMOH, 2013c:105). There is no implementation at community level, which is the last level of care. This level is run by village health workers and community workers.

In 2013, the co-infection rate ranged between 65% and 70% in all nine districts of the country except in Berea district, where the co-infection rate ranged from 80% to 85% (LMOH, 2014d:34).

1.2 PROBLEM STATEMENT

There are two hospitals in Berea district, namely Maluti Hospital and Berea Hospital, and within each hospital, there is a stand-alone HIV care clinic. In 2013, Berea Hospital reported 647 cases of TB, 607 (94%) were tested for HIV and 520 (85%) were HIV-positive, while Maluti Hospital reported 456 cases of TB, 445 (98%) were tested for HIV and 356 (80%) were HIV-positive (LMOH, 2014d:15). This data confirms that co-infection is a big problem in Lesotho, specifically in Berea district.

Although the free IPT is provided at Berea Hospital and Maluti Hospital, there is still a low demand and uptake of IPT among people living with HIV and AIDS (PLWHA). In both hospitals, IPT is integrated in HIV care clinics within the hospitals. Berea Hospital piloted implementation of IPT in 2011, while Maluti Hospital started in 2012 and neither of the hospitals reached 50% IPT coverage by the end of 2013 (LMOH, 2014b:59). At

Berea Hospital, the total number of PLWHA enrolled for HIV care (pre-ART and ART) as at December 2013 was 10,438, while 3,114 (30%) were initiated on IPT, and at Maluti Hospital, 4,165 were enrolled for HIV care, with 1,594 (38%) initiated on IPT. The total district coverage for IPT was 28%. In the same year, the LMOH had set a target of 80% of IPT coverage but none of the hospitals in the district reached the set target (LMOH, 2014b:60).

No studies have yet been conducted to assess what PLWHA know, think and do about the usage of IPT in Lesotho. It is therefore necessary to assess and describe the knowledge, attitude and practices (KAP) of adult PLWHA on IPT in Berea district in Lesotho in order to create an evidence base from where the low uptake of IPT in this district could possibly be addressed.

1.3 RESEARCH QUESTION

The research question guiding the present research was: What are the knowledge, attitudes and practices (KAP) of adult PLWHA on IPT in Berea district, Lesotho?

1.4 RESEARCH AIM

The aim of this study was to assess and describe the KAP of adult PLWHA on IPT in Berea district hospitals, Lesotho.

1.5 OBJECTIVES OF THE STUDY

The objectives of the study were to:

- compile a demographic profile and the biographical information of adult PLWHA on IPT in Berea district hospitals;
- assess and describe knowledge of adult PLWHAs on IPT;
- assess and describe attitudes of adult PLWHA on IPT; and
- assess and describe practices of adult PLWHAs on IPT.

1.6 CONCEPTUAL AND THEORETICAL FRAMEWORK

According to Polit and Beck (2017:729), a theoretical framework is the overall conceptual model or underpinnings of a study or theory studied. It helps the researcher to organise the study, and provides a context within which he or she examines a problem and gathers and analyses data (De Vos, Strydom, Fouché & Delport, 2012:35). By developing a framework within which ideas are organised, the researcher is able to show that the proposed study is a logical extension of current knowledge (Polit & Beck, 2017:729).

The conceptual framework for this study was the theory of planned behaviour (TPB) as depicted in Figure 1.1 bellow.

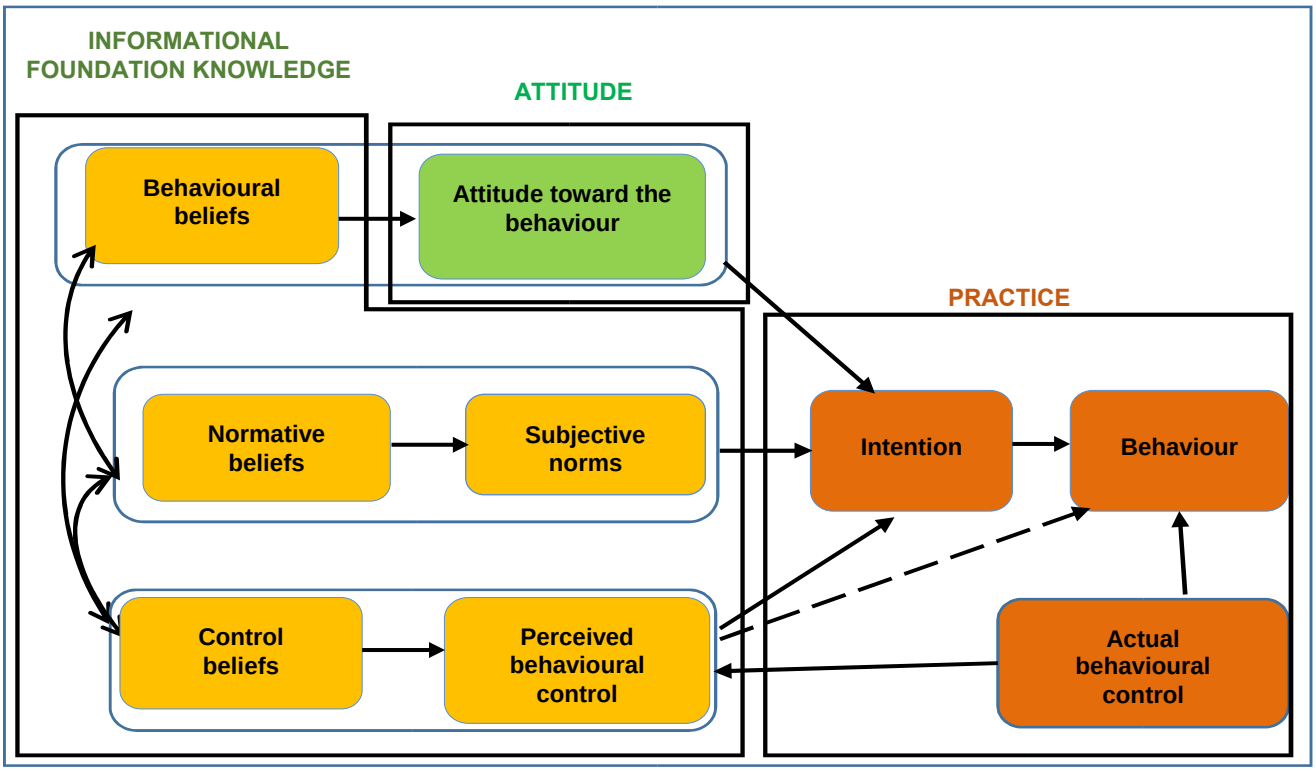

FIGURE 1.1: **Application of knowledge, attitude and practices on the theory of planned behaviour. Source: Reid (2016)**

According to this theory, a person's intention to perform a specific behaviour originates with an informational foundation that closely links with the knowledge component of this study. However, the knowledge component would not necessarily reflect the degree of knowledge PLWHA show towards IPT, but rather their beliefs that ultimately determine their behaviour or practice. Three groups of beliefs are identified, namely behavioural, normative and control beliefs.

Behavioural beliefs depict the link between a specific IPT-related behaviour and a consequence that leads from these beliefs. **Normative beliefs** reflect the link between a specific IPT-related behaviour and an expectation PLWHA may have due to the enacted behaviour. Flowing from normative beliefs are subjective norms. **Subjective norms** not only provide a link to the specific IPT-related behaviour, but now the expectation is linked to the expectations of significant others in the PLWHA's life. **Control beliefs** portray factors PLWHA perceive could either assist or hamper them being in control over IPT-related issues. Lastly, PLWHA **perceive** that **behavioural control** reflects the link between a specific IPT-related behaviour and the perception of PLWHA on their ability to perform the specific behaviour.

In line with the objectives of this study, specific attention was given to the attitude of PLWHA as an element playing a role in the actual IPT-related behaviour or practice of the PLWHA. The attitudes of PLWHA towards IPT-related issues as well as their subjective norms and perceived behavioural control of such issues all strengthen or weaken the intention of PLWHA to perform a specific IPT-related behaviour. The researcher set Ajzen's (Ajzen, 1991:188) reference to behaviour equal to what the KAP survey for the present study refers to as practice. Therefore, PLWHA's IPT-related behaviour will depend on their intention to act out behaviour as well as the actual behavioural control PLWHA have in the long run over performing such behaviour.

1.7 RESEARCH DESIGN

A quantitative descriptive design was the obvious choice for this study, since data was collected through a structured questionnaire. Therefore, data is presented numerically as is typical with quantitative designs (Polit & Beck, 2017:741). This design was selected because generalisation of the study results would thus be enhanced.

1.8 RESEARCH TECHNIQUE: Structured questionnaire

A structured questionnaire was used to collect data from adult PLWHA. The technique was chosen because it has a high response rate, and even those who could not read or write had an opportunity to participate in the study (Ellis & Standing, 2010:96).

1.9 STUDY POPULATION

The study population comprised adult PLWHA attending HIV care clinics at Berea Hospital and Maluti Hospital in Berea district, Lesotho. The latest data indicated that there was an average of 1,000 adult PLWHA at Maluti Hospital and 1,500 adult PLWHA at Berea Hospital actively attending the HIV care clinics every month (LMOH, 2015a:1).

1.10 SAMPLING

Purposefull selection of the two hospitals in Berea district was done, followed by convenient selection of PLWHA attending HIV care clinics at the two hospitals. From the appointment book used to book PLWHA every day, the researcher identified PLWHA. Among the selected PLWHA, those who had attended and were available at the HIV care clinic were marked, from which the researcher selected PLWHA who met the inclusion criteria. From among those who met the inclusion criteria, the researcher then selected the first available PLWHA to participate in the study each day until the sample size was reached at each hospital.

Patients who were included in the study comprised:

- adult males and females aged 18 years or older, and attending the HIV care clinic at Berea Hospital and Maluti Hospital;
- adult males and females aged 18 years or older who were willing to sign the consent form to participate in study; and
- males and females proficient in English or Sesotho.

Patients excluded from the study were those who were:

- intellectually disabled;
- physically too ill to participate; and
- not proficient in English or Sesotho.

1.11 PILOT STUDY

The pilot study was conducted by the researcher and five second-year student nurses trained as fieldworkers. Student nurses were on December holidays and volunteering at Berea Hospital and Maluti Hospital. The fieldworkers were recruited and trained by the researcher in terms of the questionnaire prior the pilot study, using the questionnaire guideline. Data collection for the pilot study was conducted after permission had been granted by the University of the Free State (UFS) Ethics Committee (Appendix C) and the Lesotho Ministry of Health Research Ethics Committee (Appendix D). Permission from the authorities of both hospitals was also sought before the pilot study. The sample size for the pilot study was three participants at Maluti Hospital and five at Berea Hospital, and it took two days to complete all the questionnaire at the hospitals, at Berea Hospital first and then Maluti Hospital.

1.12 DATA COLLECTION

Figure 1.2 graphically depicts the steps for data collection, which will be discussed in detail in Chapter 3. The pilot study as well as the actual data collection at each of the identified hospitals was conducted in the same manner.

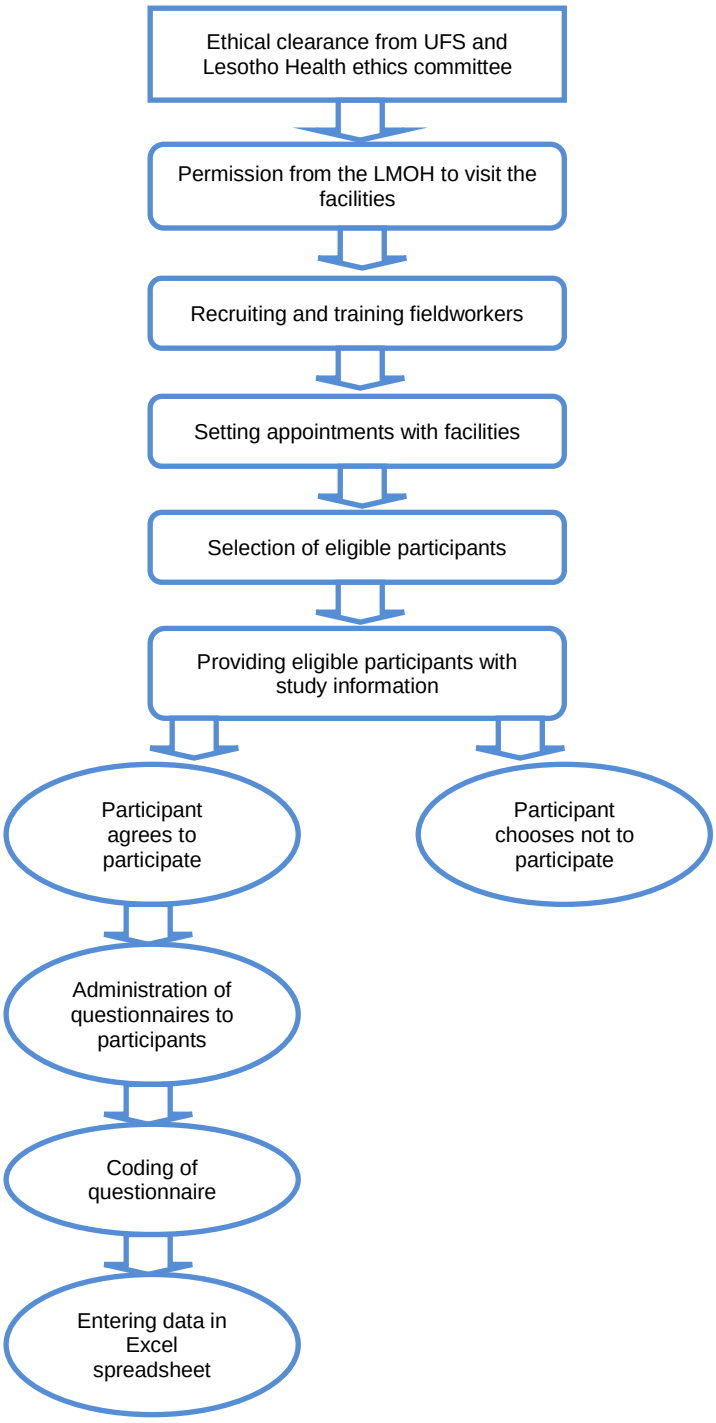

FIGURE 1.2: Steps for data collection

1.13 VALIDITY

Content and face validity were used in the study. Their application will be discussed in detail in Chapter 3.

1.14 RELIABILITY

Internal consistency was applied in in this study. The application will be discussed in Chapter 3.

1.15 ETHICAL CONSIDERATIONS

The study was guided by the three ethical principles on which the standards of ethical conduct in research on human participants should be based as expressed in the Belmont Report (National Commission for the Protection of Human Subjects of Biomedical and Behavioural Research, 1979). The three principles are the principles of beneficence, respect for human dignity and justice. The application of these principles will be discussed in depth in Chapter 3.

1.16 DATA ANALYSIS

During data analysis, descriptive statistics such as frequencies and percentages for categorical data, means, medians and percentiles for continuous data were calculated. The analysis was done with the assistance of the Department of Biostatistics at the UFS.

1.17 CONCLUSION

In this chapter, the problem statement of the study was introduced as well as the aim and objectives. The research design, technique and conceptual framework underlying the study were briefly discussed. The population of the study and the way sampling was done will be discussed in Chapter 3 in detail, as well as the way the pilot study and actual data collection were conducted. Validity, reliability and ethical issues and

the way these were maintained throughout the study were also described. Lastly, a brief explanation was given of how the data was collected and analysed.

The next chapter, Chapter 2, will report on the review of the literature on IPT. Chapter 3 will provide the details of the research methodology that was followed in order to answer the research question. Data analysis and interpretation of the research findings will be explained in Chapter 4, while Chapter 5 will present the recommendations based on the scientific evidence provided by the study findings.

CHAPTER 2

Literature overview

2.1 INTRODUCTION

The previous chapter introduced the overall research contents, and gave a description of the research problem, the purpose of the research, the research design and methods, the significance of the research and the ethical considerations during the study.

The literature review provides an opportunity to discuss the background related to this research study. In this chapter, I begin with an explanation of TB/HIV co-infection, which is a major challenge for Lesotho public health, followed by a detailed discussion about what plays a role in understanding the management and treatment of TB/HIV co-infection, and by an overview of IPT, which is one of the strategies used to reduce the burden of TB among PLWHA. TB/HIV co-infected patients receive their care within a well-established health care system. Therefore, the Lesotho health system will be analysed and evaluated. Within, this health system the knowledge, attitude and practices (KAP) of PLWHA need to be taken into consideration. Finally, I discuss the literature regarding the theory of planned behaviour (TPB) with respect to a group of adults in Lesotho using IPT to prevent TB/HIV co infection.

2.2 TB/HIV CO-INFECTION

TB and HIV have been closely linked since the emergence of HIV, and they are frequently referred to as co-epidemics or dual epidemic (UNAIDS, 2014:1) due to their high rate of co-infection (UNAIDS, 2014:1). When a person with HIV develops TB, this is called TB/HIV co-infection (UNAIDS, 2015a:2).

According to the recent estimates by UNAIDS, 1.2 million (12%) of the 9.6 million people who developed TB worldwide were HIV-positive; 74% of these HIV-positive TB

cases were in the African region, while TB deaths among HIV-positive people accounted for 25% of all TB deaths (WHO, 2015d:78). Lesotho, landlocked by South Africa in the southern part of Africa, has the highest TB incidence of 852 per 100,000 population in the world, while the TB/HIV co-infection incidence is 578 per 100,000 population (WHO, 2016b:163). More than three quarters, i.e. 76% of TB patients, are HIV infected (LMOH, 2015b:10). HIV prevalence is also high at 26% (LMOH, 2014a:116). TB incidence in Lesotho is rising compared to the declining global trend (WHO, 2016b:163).

2.2.1 Pathogenesis of TB/HIV co-infection

HIV infection and infection with TB bacteria are two completely different infections, affecting the normal functioning of the body differently. Firstly, the pathophysiology of TB infection will be explained, followed by that of HIV before looking at the pathophysiology of the co-infection.

Pathophysiology of TB infection

TB results from infection by the rod-shaped, non-spore-forming, aerobic bacterium called Mycobacterium tuberculosis bacilli. TB is transmitted by airborne droplets from person to person, and infection can be acquired only from individuals with active pulmonary TB through coughing or sneezing. Once inhaled, the infectious droplets settle throughout the airway. The majority of the bacilli are trapped in the upper parts of the airways where the mucus-secreting goblet cells exist (Knechel, 2009: 35). The mucus produced catches foreign substances, and the cilia on the surface of the cells constantly beat the mucus and its entrapped particles upward for removal. Bacteria in droplets that bypass the mucociliary system and reach the alveoli are quickly surrounded and engulfed by alveolar macrophages. Macrophages and T lymphocytes (immune cells) act together to try to contain the infection by forming granulomas (nodular-type lesions, which create a microenvironment that limits replication and the spread of the mycobacteria) around the Mycobacterium tuberculosis. This process can either result in successful control of the infection, followed by latent tuberculosis, or progression to active disease, called primary progressive tuberculosis. The outcome

this process is essentially determined by the quality of the host defences (Heemskert, Caws, Marais & Farrar, 2015:11-12).

Pathophysiology of HIV infection

HIV is a *single-stranded*, enveloped RNA virus causing AIDS disease. HIV is transmitted through sexual contact, needle or syringe sharing, HIV infeceted instruments/devices, medical use of blood or blood components, organ or tissue transplantation, and artificial insemination as well as from mother to child during pregnancy, at birth, and postpartum through breastfeeding (CDC, 2013:208). HIV may be transmitted occupationally to health care workers who are exposed to blood and other potentially infectious bodily fluids via percutaneous injury or splash exposures to mucous membranes or non-intact skin (Dowling & Yap, 2014:21). HIV attacks the immune system, the body's natural defence system. The virus infects the T-helper cells often referred to as CD4 cells or T4 cells as well as other types of white blood cells (immune cells) including monocytes and macrophages. The HIV attaches itself to the CD4 +T cells (they trigger the body's response to infection) on the surface of the host cell. Then the outer envelope of the virus and the outer membrane of the host cell fuse together to form one unit (Van Dyk, 2012:29). The HIV sheds its outer layer and injects its genetic material (RNA, i.e. ribonucleic acid) with the assistance from the following enzymes: reverse transcriptase enzyme, which transcribes single-stranded viral RNA into double-stranded DNA, integrase enzyme, which assists the proviral DNA to fuse with the host DNA and use the host genetic material to manufacture viral RNA for new viruses (Van Dyk, 2012:30-31). The protease enzyme enables the newly produced viral RNA and viral protein to be assembled into new copies of the former virus. Millions of new viruses are produced. The cell dies and the new viruses are released into the blood to infect uninfected cells (Van Dyk, 2012:32). The CD4 cell count then declines due to failure of the regenerative capacity of the immune system to provide immune cells, and as more lymphocytes (immune cells) are attacked and rendered ineffective, the immune system of the body is weakened and less able to fight off infections (WHO, 2014b:98-99). The already mentioned viral enzymes are the main targets for antiretroviral therapy (Van Dyk, 2012:29).

Pathophysiology of the co-infection

In *co-infection,* each disease (TB or HIV infection) speeds up the progress of the other. HIV infection speeds up the progression of TB from latent to active TB. TB bacteria also accelerate the progress of HIV infection. TB occurs earlier in the course of HIV infection than many other opportunistic infections because of the HIV ability in destroying the immune system (WHO, 2010:37). The risk of death in co-infection is also twice that of HIV-infected individuals without TB, even when the CD4 cell count and antiretroviral therapy are taken into account (Sontakke, Waghmode & Khade, 2015: 51). In patients with HIV infection, TB probably follows as a result of changes in immune response against *M. tuberculosis*, especially inside the granulomas by failing to contain initial or latent *M. tuberculosis* infection (Davies, 2014:272-273). HIV and TB co-infection disrupts the granuloma structurally and functionally. HIV replication is increased at sites of *M. tuberculosis* infection. HIV induces primary or reactivated TB through the killing of CD4+T cells control the virulence of *M. tuberculosis* inside and outside the granulomas) within granulomas. The granuloma wall loses integrity and the bacilli are able to escape and spread to other alveoli or other organs. There are also functional changes in macrophages, as they release lower levels of tumour necrosis factor which activates macrophages to inhibit bacilli intracellular growth (Sontakke *et al.*, 2015:52). HIV further decreases the ability of *M. tuberculosis*-infected macrophages to acidify vesicles in the granuloma. HIV induces functional changes in *M. tuberculosis*-specific T cells. Apart from killing *M. tuberculosis*-specific T cells, HIV infection induces some functional changes in those cells decreasing their ability to contain *M. tuberculosis* (Shankar, Vignesh, Ellegard, Barathan, Chong, Bador, Rukumani, Sabet, Kamarulzaman & Velu 2014:111-112).

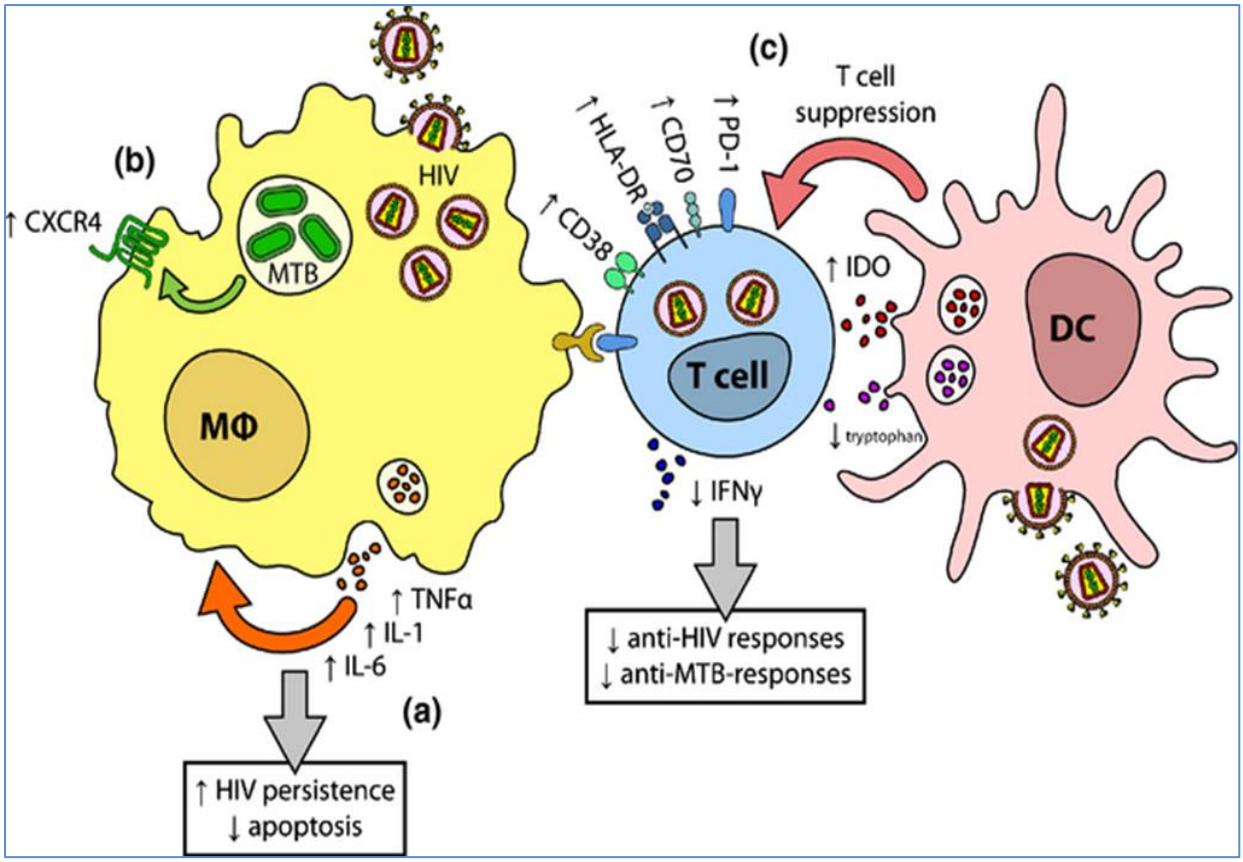

FIGURE 2.1: **HIV–*Mycobacterium tuberculosis* co-infection: a 'danger-couple model' of disease pathogenesis. Source: Shankar *et al.* (2014:112)**

2.2.2 Clinical presentation of TB/HIV co-infection

TB disease is often the first opportunistic infection occurring in HIV-positive people. In these cases, TB may affect the lungs (pulmonary TB) and other organs of the body (extrapulmonary TB) (Dowling & Yap, 2014:18).

The clinical presentation of TB is heavily influenced by the degree of underlying immunodeficiency (Davies, 2014:131-132). In the earlier stages of HIV infection, TB is similar to that seen in patients without HIV infection. Pulmonary TB is most frequent, and is often smear-positive. As the CD4 count falls as a result of HIV infection, TB disease becomes atypical and disseminated (Dowling & Yap, 2014:18). Granulomas have very scanty or few tubercle bacilli. In advanced immunodeficiency, the macrophage reaction is diminished, granulomas are rare and tubercle bacilli are abundant. During this stage, extrapulmonary presentations become more common.

Patients with extrapulmonary TB may present with signs and symptoms specific to the involved site, such as lymphadenopathy, headache, abscess formation, back pain, and abdominal pain. These findings in HIV-infected patients can present a diagnostic challenge (Heemskert *et al.,* 2015:18).

Signs and symptoms of pulmonary TB in HIV co-infected patients are the same whether the patient is infected with HIV or not. Symptoms are cough of any duration, night sweats, loss of appetite, chest pain, fever, weight loss and coughing up bloodstained sputum (Davies, Gordon & Davies, 2014:134).

2.2.3 Diagnosing of TB in HIV-positive people

Diagnosis of TB is made based on clinical signs and symptoms and may be confirmed with investigations such as sputum smear microscopy, sputum culture, Gene X-pert testing or X-ray (Davies *et al.*, 2014:112). For extrapulmonary TB, a specimen from the affected site is required to establish a bacteriologic diagnosis of disseminated or extrapulmonary TB (WHO, 2010:25). HIV patients with extrapulmonary symptoms or signs of TB should have samples taken from the appropriate anatomic site(s) to increase the likelihood of TB diagnosis. For latent TB, diagnosis is done through standard tuberculin test, i.e. purified protein derivative (Sontakke *et al.*, 2015:57).

2.2.3.1 Sputum smear microscopy

This testing is sometimes called acid-fast bacilli (AFB) testing (LMOH, 2013d:14). AFB testing involves using a microscope to look for the actual *Mycobacterium tuberculosis* bacilli in a sample of sputum or other biological specimen that has been fixed on a glass slide and then stained with a dye that adheres to the waxy coat of the mycobacteria and remain visible even after rinsing with water. Each slide is then examined under a microscope and the number of organisms counted and recorded. Smear microscopy is the quickest and easiest procedure that can be performed (Garcia & Del-Rey, 2015:22-23). The test is done for presumptive TB cases presenting with cough whether HIV positive or not, even though sputum smear microscopy has a particularly low sensitivity for detecting TB among people living with HIV/AIDS

(PLWHA) (LMOH, 2013d:14). This is because people in later stages of HIV infection and with compromised immune systems often release fewer organisms into their sputum and at concentrations below the threshold for visual detection under a microscope (Davies *et al.*, 2014:278).

2.2.3.2 Sputum culture and drug susceptibility testing (DST)

Culture remains the gold standard for diagnosing TB (LMOH, 2013d:16). Culture is more sensitive than smear microscopy; however, it is an expensive and slow diagnostic technique that takes up to six weeks to provide a definitive result (LMOH, 2013d:16). Culture results may therefore not be helpful in making a rapid individual diagnosis. Given the cost and slow turnaround time, DST is not routinely used under programme conditions (Davies *et al.*, 2014:113). For PLHIV with a negative smear microscopy result but who are still presumed to have TB, bacterial culture is the other option test for TB diagnosis (WHO, 2010:42). However, culture can often be undertaken at central-level laboratories, and results are normally only available after a number of weeks or months (WHO, 2010:38-39). Culture is therefore not good enough for people living with HIV, who need a speedy TB diagnosis and prompt treatment (Garcia & Del-Rey, 2015:25).

2.2.3.3 Gene X-pert MTB/RIF (Mycobacterium TB/Rifampicin)

This is a fully automated molecular test used to diagnose *M. tuberculosis* infection and detect rifampicin resistance (WHO, 2014b:22-23). Compared to sputum smear microscopy, which has limited utility among PLHIV, Gene X-pert is able to detect TB cases regardless of HIV status (Garcia & Del-Rey, 2015:38). It is sensitive and specific for detection of TB when it is used as an initial diagnostic test in patients suspected of having HIV-associated TB. For this reason, it is recommended as a primary diagnostic test for –

- all people living with HIV who have signs and symptoms of TB;
- people with unknown HIV status presenting with strong clinical evidence of HIV infection;
- people who are seriously ill and suspected of having TB regardless of HIV status; and
- those at high risk of MDR-TB (multidrug-resistant TB).

Gene X-pert facilitates earlier diagnosis and reduced time to initiation of TB treatment, especially for smear-negative pulmonary TB. Results are available within two to three hours (WHO, 2013c:1).

2.2.3.4 Chest X-ray (CXR)

This test is sometimes called radiography, and it produces images of the internal organs such as lungs, heart, blood vessels as well as bones of the spine and chest. Imaging with X-ray involves exposing a part of the body to a small dose of ionising radiation to produce a picture of the inside of the body (WHO, 2013b:98).

CXR examination for TB should only be considered after two sputum smears had been found negative. CXR in combination with other clinical evidence provides support for diagnosing pulmonary tuberculosis (PTB). HIV infection is known to be associated with CXR abnormalities, even without tuberculosis (Henostroza, Harris, Kancheya, Nhundu, Besa, Musopole, Kruuner, Chileshe, Dunn & Reid, 2016:6). However, CXR plays an important role in the diagnosis of tuberculosis among people living with HIV. The CXR can also be an important entry point to diagnosing non-tubercular chest diseases, which are common among people living with HIV. No CXR pattern is absolutely diagnostic of PTB, especially with underlying HIV infection (Henostroza e*t al.,* 2016:6).

Patients with HIV infection and immune suppression will have different radiographic findings or even normal radiographs. If immune-competent, there are upper lobe infiltrates, bilateral infiltrates, cavitation, pulmonary fibrosis and shrinkage and if immune-suppressed, the CXR shows interstitial infiltrates, intrathoracic lymphadenopathy, no cavitation and no abnormalities (Garcia & Del-Rey, 2015:10).

2.2.3.5 Standard tuberculin test, i.e. purified protein derivative (PPD)

This test is used to identify people with *M. tuberculosis* who do not have clinically active TB disease (Ai, Ruan, Liu, & Zhang, 2016:6). However, in people with HIV, the PPD is not reliable. Cross-reaction with other mycobacteria can give wrong results, and more important is that the weakened immune system may be unable to respond to the test because PPD positivity declines with increasing immunosuppression (WHO, 2014b:56).

2.2.4 Complications of TB/HIV co-infection

The complications of the two diseases (HIV and TB) in a co-infected patient, present issues related to the treatment of TB in TB/HIV patients and the treatment of HIV in TB patients. These issues include immune reconstitution inflammatory syndrome (IRIS), drug-drug interactions, overlapping ARV and TB drug side-effects and case fatality during TB treatment in patients with HIV.

2.2.4.1 Immune reconstitution inflammatory syndrome (IRIS)

IRIS refers to an illness experienced by people with HIV who have recently started antiretroviral therapy (WHO, 2014b:63). This partial recovery of the immune system could result in an exaggerated inflammatory response against any concurrent opportunistic infection. Therefore, optimisation of treatment of the underlying opportunistic infection is an important aspect of treatment (Walker, Scriven, Meintjes & Wilkinson, 2015:55).

In case of TB-IRIS, TB is clinically 'silent' and undiagnosed before the start of HIV antiretroviral treatment, and this is known as the 'unmasking' form of TB-IRIS (Davies *et al.*, 2014:283). By contrast, the 'paradoxical' form of TB-IRIS is found when a person has previously been diagnosed with TB and he or she starts with HIV antiretroviral therapy (ART) when already on TB treatment. The symptoms of unmasking TB-IRIS is that a few weeks after starting ART, the patient will have an inflammatory and/or accelerated presentation of TB. The symptoms of paradoxical TB-IRIS are that there will be recurrent, new or worsening TB symptoms, signs and/or radiological findings. Typically, there will be a fever 1-4 weeks after the start of ART (Sontakke *et al.*, 2015:55).

2.2.4.2 Drug–drug interactions

In co-treatment of TB and HIV treatment of both TB disease and HIV at the same time is complicated by drug-drug interactions between anti-TB drugs (rifampicin) and ARVs. Rifampicin stimulates the activity of the cytochrome P450 liver enzyme system, which metabolises the ARVs (Davies *et al.*, 2014:282). This can lead to decreased blood levels of ARVs. ARVs can also enhance or inhibit this same enzyme system, and lead to altered blood levels of rifampicin. These potential drug-drug interactions may result in ineffectiveness of ARV drugs, ineffective treatment of TB or an increased risk of drug toxicity (Center for Diseace Control [CDC], 2013:4). Based on this, the WHO (2014a:61) recommends that TB treatment should be started first, followed by ART as soon as possible thereafter, which is within two to eight weeks of the start of TB treatment.

2.2.4.3 Overlapping ARV and TB drug side-effects

Anti-TB and ARV drugs have similar side-effect profiles. When given together, there is a potential of added toxicity (WHO, 2014a:60). These overlapping side-effects also make it difficult to differentiate the causative drug when they occur during treatment of TB and HIV concurrently (Sontakke *et al.*, 2015:55). In case of overlapping side-effects, the WHO (2014a:60) recommends that patients should be assessed two

weeks after the start of TB treatment for monitoring side-effects and tolerability of TB drugs before ART initiation.

2.2.4.4 Case-fatality

HIV-positive TB patients have a much higher case-fatality rate during and after anti-TB treatment compared to HIV-negative patients. Most HIV-positive smear-positive TB patients die before the end of treatment. Early deaths (within 30 days of TB treatment) are often due to TB while later deaths are related to complications of HIV (Van der Walt & Shean, 2016:4). The prognosis is worse in HIV-positive smear-negative TB patients than in smear-positive TB patients. The more severe the HIV infection (as indicated by the CD4 count) and/or the TB disease (as indicated by the pattern of TB disease or organ(s) affected), the worse the case fatality (Van der Walt & Shean, 2016:4).

2.2.5 Management of TB/HIV co-infection

Management of TB/HIV co-infection includes aspects of health education and support in order to promote adherence to treatment. This is followed by prescription of anti-TB drugs, ARVs and preventive therapy for opportunistic infections.

2.2.5.1 Health education

Health education refers to the provision of accurate and appropriately contextualised information on health (e.g. according to age, sex and culture) that is aimed at assisting individuals to make informed choices to improve their health (UNAIDS, 2015b:23). Information regarding TB/HIV co-infection is given to all co-infected patients immediately after diagnosis (Davies *et al.*, 2014:394). This information is provided by health care workers, especially doctors and nurses, and it includes basic information on TB/HIV, such as mode of transmission, treatment, prevention and control. Investing in educating the patients pays dividends in the longer term (Davies *et al.*, 2014:397).

2.2.5.2 Support

Support for TB/HIV co-infected patients is highly recommended to provide adequate support to the patient to complete full treatment (Davies *et al.*, 2014:357). Psychosocial support, which is an ongoing process aiming to meet the physical, emotional, social, mental and spiritual needs of TB/HIV co-infected patients, is provided (LMOH, 2013c:52). PLWHA can be referred to local support groups where patients can support and encourage each other, share ideas and experiences and empower each other (Davies *et al.*, 2014:357).

2.2.5.3 Anti-TB drug initiation

This is done immediately on diagnosis while HIV treatment is started within 2-8 weeks of TB treatment among people who develop TB while not yet on ARV (WHO, 2012b:29). This is done in order to monitor anti-TB drug tolerance before introducing ARVs. For those already on ARVs, TB treatment is initiated immediately after diagnosis. Five drugs are currently available to treat active TB: isoniazid (H), rifampin (R), pyrazinamide (Z), ethambutol (E) and streptomycin (S) (WHO, 2010:30). These drugs have three main properties, namely bactericidal, bacteriostatic/sterilising activity, and the ability to prevent resistance. For anti-TB treatment to be effective, a combination of these properties is required in a treatment regimen (WHO, 2010:32. Isoniazid and rifampicin are the most powerful bactericidal drugs, active against all populations of TB bacilli. Pyrazinamide and streptomycin are also bactericidal against certain populations of TB bacilli. Pyrazinamide is active in an acid environment against TB bacilli inside macrophages. Streptomycin is active against rapidly multiplying extra-cellular bacilli. Ethambutol is bacteriostatic and is effective in preventing development of resistance against other anti-TB drugs (Davies *et al.*, 2014:211-217). The fixed-dose combinations (FDCs) are used for both adults and children (WHO, 2010:30). The standard regimen is RHZE in the first two months of treatment (initial phase), followed by four months of RH (continuation phase). The anti-TB drugs require 6-9 months of continued treatment to be effective (WHO, 2014a:4-5). TB treatment is the same, whether HIV positive or not (WHO, 2010:67).

ARVs suppress replication of HIV, restore and/or preserve immune function and also reduce HIV-related morbidity and mortality and improve survival (Davies *et al.*, 2014:281). ART consists of the combination of three ARVs, namely

- non-nucleoside reverse transcriptase inhibitors (NNRTIs) – examples are Nevirapine or Efavirenz, which block the HIV reverse transcriptase;
- nucleoside reverse transcriptase inhibitors (NRTIs) also block the HIV reverse transcriptase enzyme and prevent the copying of the viral RNA into the DNA of the infected host – examples are Tenofovir, Zidovudine, Emitricitabine; and
- protease inhibitors (PIs) block the enzyme protease and prevent the assembly and release of HIV particles from infected cell – examples are Lopinarvir, atazanavir (Berretta, Caragila, Martellatto, Zappavigna, Lombardi, Fierro, Atripaldi, Muto, Valente, De Paoli, Tirelli & Di Francia 2016:2-4).

The commonly used first-line treatment consists of two NRTIs plus one non-nucleoside reverse transcriptase inhibitor (NNRTI). The choice of ART regimen for TB patients is guided by overlapping side-effects, and toxicity profiles. The preferred first-line ART regimen for adults with TB is Tenofovir (TDF) plus Lamivudine (3TC) plus Efavirenz (EFV). Alternative NRTIs can be used. If TB is diagnosed after a patient has already been initiated on ART, then TB treatment must be started, and adults who are on Nevirapine-based regimens must be switched to Efavirenz (WHO, 2015b:14-15). ARVs do not kill the virus but prevent replication, as there is no cure for the HIV virus. ARVs are effective, safe and easier to take as a single daily dose treatment (Clayden, Collins, Frick, Harrington, Horn, Jefferys, Lessem, McKenna & Swan, 2015:1).

2.2.5.4 Preventive therapy for opportunistic infection

Cotrimoxazole prophylaxis is effective in preventing respiratory infections in TB/HIV infections, for example; pneumonia. HIV-infected TB patients and HIV-positive patients with a CD4 count below 350 qualify for cotrimoxazole prophylaxis (Suther, Victria, Nagata, Anglaret, Mbori-Ngach, Sued, Kaplan, & Doherty, 2015:149). In response to the challenge of TB/HIV co-infection, IPT is recommended to PLWHA after active TB has been excluded. Isoniazid preventive therapy is effective in

preventing TB among PLWHA (WHO, 2015a:8). In 2.3, a detailed discussion on IPT is provided.

2.3 ISONIAZID PREVENTIVE THERAPY (IPT)

HIV infection is the strongest risk factor for developing TB disease in those with latent or new *Mycobacterium tuberculosis* infection. The risk of developing TB is approximately 20 to 37 times greater among people living with HIV than among those with no HIV infection (WHO, 2011:1). TB is responsible for more than a quarter of deaths in people living with HIV. Since 1998, IPT is an intervention recommended by the WHO and UNAIDS for people living with HIV/AIDS for TB prevention (WHO, 2015a:7).

IPT is the administration of isoniazid (INH) to people with latent tuberculosis infection (LTBI) to prevent progression to active TB disease. IPT use is a component of the TB/HIV collaborative activities recommended by the WHO to decrease the burden of TB in people living with HIV (WHO, 2011:10).

2.3.1 IPT duration

The use of IPT for at least six to nine months has been recommended by the WHO for HIV-infected children and adults without active TB, including pregnant women, those receiving ART, and those who have successfully completed TB treatment (WHO, 2011:1). Furthermore, the WHO Three Is guidelines also emphasise that a tuberculin skin test (TST) is no longer required for the initiation of IPT in people living with HIV (WHO, 2011:9). However, the WHO recommends that INH at 300 mg per day remains the drug of choice for chemotherapy to prevent TB in adults living with HIV (WHO, 2011:6). The 300 mg IPT daily dose has higher benefits than the 900-mg twice-weekly dose in reducing all types of TB risk (Ayele, Mouric, Debray & Bonten, 2015:8). However, the WHO recommends the use of 36 months of TB preventive therapy (as a proxy for lifelong or continuous treatment) for HIV-infected people in high TB prevalence and transmission settings (WHO, 2015a:6).

2.3.2 Effects of IPT

TB preventive therapy among HIV-infected individuals, particularly therapy involving INH, reduces TB incidence and is cost-effective and safe (Churchyard, Fabino, Alison & Richard, 2015:60). Isoniazid (INH) alone reduces the TB incidence by 33% overall and by 64% among individuals with positive TST results (WHO, 2011:6). A study conducted in Ethiopia demonstrated that IPT use was associated with 50% reduction in new cases of TB, and the probability of developing TB was higher in the non-IPT group. Implementing the widespread use of IPT has the potential to reduce TB rates among HIV-infected individuals. Providing IPT for people living with HIV not only reduces the individual patient's risk but also helps to mitigate TB transmission to others (Assebe, Reda, Wubeneh, Lerebo & Lambert, 2015:8).

2.3.3 Durability of IPT

The study conducted by Assebe *et al.* (2015:6) found that IPT offers a long-term benefit in HIV-infected individuals against TB with a higher TB-free survival particularly during the first three years of follow-up among IPT users. However, a study conducted by Hermans *et al.* (2016:6-7) in South Africa among gold miners found that the durability of protection by IPT was lost within 6-12 months in that population with a high annual risk of *M. tuberculosis* infection and a high HIV prevalence. The observed TB incidence in the first year after IPT was higher than the crude estimate of the TB incidence attributable to reinfection, suggesting that reactivation of persistent latent infection played a role in the rapid return to baseline TB incidence (Hermans, Grant, Chihota, Lewis, Vynnycky, Churchyard & Fielding, 2016:7). Another study showed that a 6-months regimen of IPT is sufficient to reduce tuberculosis risk for as long as seven years, but failing to complete the IPT regimen may yield a high tuberculosis risk (Golub, Cohn, Sacaceni, Cavalcante, Pacheco, Moulton, Durovini & Chaisson, 2015: 644).

2.3.4 IPT adverse events

Like most other medications, anti-TB medications are primarily metabolised by the liver and could potentially lead to drug-induced hepatitis and other adverse events, such as nausea, vomiting, gastritis, peripheral neuropathy and rashes (WHO, 2015c:22). Hepatotoxicity is a serious adverse effect that may result in death if INH is not withdrawn soon after symptoms of hepatitis develop (Davies *et al.*, 2014:331). However, with clinical monitoring and with educating patients to discontinue INH immediately if symptoms suggestive of hepatitis develop, the risks of hepatitis and death are very small (Churchyard *et al.,* 2015:54). Vitamin B6 (pyridoxine) is prescribed together with INH in order to prevent peripheral neuropathy (Davies *et al.*, 2014:331).

2.3.5 IPT-ART combination

In a study conducted by Ayele *et al.* (2015:12) on IPT for the prevention of Tuberculosis in HIV Infected Adults it was found that IPT combined with ART reduced the risk of TB disease. IPT reduced the risk of all types of TB in participants also treated with ART (Ayele *et al.,* 2015:10). The WHO recommends that ART should not preclude the use of IPT (WHO, 2011:15). IPT significantly reduces the risk of TB and death during early ART and the combination of IPT and ART results in a significantly greater reduction in the TB risk than does either treatment alone (Churchyard *et al.*, 2015:56). However, a study conducted in Cambodia found that discontinuation of IPT due to toxicity was common among those initiated on ART while on IPT (Griensven *et al.,* 2015: 1828).

2.3.6 IPT initiation requirement

Screening for active TB disease is required before commencing IPT to minimise the risk of developing drug resistance by inadvertently treating active TB with an inadequate regimen (WHO, 2015c:15). Screening is done using a symptom screen of current cough, night sweats, fever and weight loss (Churchyard *et al.*, 2015:56). TB

screening before starting IPT may detect TB cases earlier, thereby reducing transmission and TB-associated mortality (WHO, 2015c:15).

2.4 HEALTH SYSTEM IN LESOTHO

A health system consists of all organisations, people and actions whose primary intent is to promote, restore or maintain health (LMOH, 2013e:4). It involves the broad range of individuals, institutions and actions that help to ensure the efficient and effective delivery and use of products and information to provide prevention, treatment, care and support for those who need such services (UNAIDS, 2015b:24). In Lesotho, the Ministry of Health is charged with the responsibility of providing quality health services to all Basotho, with the ultimate goal of ensuring that every Mosotho has the opportunity for good health and acceptable quality life (LMOH, 2015c:1-2).

2.4.1 Health system organisation

Lesotho adopted the primary health care (PHC) strategy in 1979 (LMOH, 2013e:1). The health care system initially comprised of health service areas (HSAs) with the hospital as the pinnacle within the area (LMOH, 2014a:4). With the decentralisation of government, the services are now delivered through 10 districts in the country, 18 general and 2 referral hospitals and about 158 health centres (LMOH, 2013a:10). The public facilities are almost equally divided in ownership between government (nine hospitals and about 50% of the health centres) serving 52% of the population, and the Christian Health Association of Lesotho (CHAL), a conglomerate of facilities owned by six churches, serving 48% of the mainly rural population (LMOH, 2014a:2). The three referral hospitals are all in the capital Maseru: Central Referral Hospital, Mental Hospital, and Leprosy and Multidrug-Resistant/Extensively Drug-Resistant Tuberculosis (MDR/XDR-TB) Hospital. There is also one military hospital, four private hospitals and privately owned facilities providing outpatient and other services and owned by medical doctors of different cadres but primarily general practitioners, as well as nurses are spread across all the 10 districts (LMOH, 2013d:2-3; LMOH, 2013a:10).

The community-level services are delivered through community-owned village health posts. There are also village health workers (VHWs) at community level (LMOH, 2012:2). The country's health system is further described by the formal and informal domains. In the formal system, health facilities are divided into national (tertiary), regional and district (secondary) and community (primary) levels (LMOH, 2014a:4). The informal system, which is inclusive of the VHWs and members of civil societies focuses on providing preventive service within the communities (LMOH, 2013e:8).

2.4.2 Programmes offering IPT services within Ministry of Health (MOH)

The central ministry of health is comprised of nine programmes which are mandated to develop and oversee implementation of health policy and strategies. For the purpose of the present study however, the focus will be on the programmes which provide IPT services as they are platforms through which IPT services are introduced, expanded and strengthened. IPT services include health education and promotion, TB screening among PLWHA in order to identify those illegible for IPT, and to detect TB presumptive cases for early diagnosis and treatment, triage, IPT initiation and monitoring (detailed information provided below under IPT services). Sexually Transmitted Infections (STI), HIV and AIDS programme is mandated to provide HIV care, treatment and support (LMOH, 2014a:58. The national TB programme provides TB screening among the TB/HIV co-infected patients and provide secondary prevention for TB with IPT immediately after completion of TB treatment. Prevention of mother to child transmission of HIV and adolescent health programmes provide the same services as the STI, HIV and AIDS programme but focus on pregnant and lactating mothers and their HIV-positive children (LMOH, 2016:105).

At district level, there are District Health Management Teams (DHMTs) that supervise implementation of health care services (IPT included) at all health facilities (hospitals and health centres). The DHMTs are supervised by the central ministry. At community level, VHWs provide IPT health promotion and social mobilisation, TB screening, referrals to the health facilities for presumptive TB cases and track defaulters (LMOH, 2012:9).

2.4.3 IPT service delivery

IPT services are implemented and delivered at all levels of health system from primary to tertiary. In Lesotho, HIV and AIDS services are nurse-led at all levels of care. IPT is included as part of a basic package of HIV and AIDS care for PLWHA, which is offered at HIV care clinic by nurses. Trained nurses on aspects of IPT provide patient with information about IPT, exclusion of TB among PLWHA, starting them on IPT and preventing and managing IPT-associated side-effects, and lastly monitor PLWHA on IPT.

2.4.3.1 Patient education

'Education of patients' refers to the process by which a health professional and others impart information to patients and their caregivers that will alter patients' health behaviours or improve their health status by increasing their knowledge or influencing their attitudes (WHO, 2012b:14). Patients should be properly educated in order to know the importance of IPT and thus be able to demand prescription of IPT from their providers (Akolo, Bada, Okpokoro, Nwanne, Iziduh, Ussoroh, Ali, Ibeziako, Oladimej & Odo, 2015:110). Education sessions on IPT are offered to PLWHA every day by nurses. Education includes the importance of IPT, side-effects, and prevention and management of those side-effects. PLWHA health talk sessions could reduce the risk of serious IPT-related side-effects or toxicity. PLWHA are also warned about alcohol consumption while on IPT in order to reduce the chances of developing hepatotoxicity WHO, 2015c:22).

2.4.3.2 Exclusion of TB

TB exclusion among all HIV-positive patients through screening at every visit to a health facility using TB screening algorithm is essential. Not only is this important for identifying those who are unlikely to have TB and who can be offered IPT, but it also identifies those who may have TB and need referral for diagnosis and treatment (LMOH, 2011:13. The screening algorithm recommended by WHO involves asking about four symptoms: current cough, night sweats, fever and weight loss (WHO, 2011: 6). People living with HIV who report an absence of all of these symptoms have a very low probability of having active TB (WHO, 2011:26).

2.4.3.3 Provision of IPT and pyridoxine (vitamin B6)

This is offered to all HIV-infected adults who do not have signs and symptoms of TB and who have no contraindications to IPT, whether on ART or not and regardless of their CD4 count. Patients who have successfully completed their TB treatment are immediately initiated on IPT. The recommended daily adult dosage of INH is 300 mg (maximum) and is taken daily for six months. Patients returning for monthly INH refills are seen by nurses. All patients initiated on IPT receive 25 mg of pyridoxine daily to help prevent peripheral neuropathy (Heemskert *et al.*, 2015:52).

2.4.3.4 Monitoring

Monitoring of PLWHA who are receiving IPT regularly is crucial. Regular monitoring for TB symptoms using symptom-based algorithms at every contact with nurses is important (LMOH, 2011:15). At each visit, nurses evaluate patients for unintentional weight loss, drug intolerance and side-effects of INH (e.g. jaundice or hepatitis) or signs or symptoms of active TB disease. Patient adherence to therapy is also assessed via pill count and recorded in the IPT register. Any patient with signs of active TB disease receives a full medical examination and a sputum-smear examination (Davies *et al.*, 2014:332).

2.5 APPLICATION OF THE THEORY OF PLANNED BEHAVIOUR

The theory of planned behaviour (TPB) as described by Ajzen (1991) was a theoretical approach that is used in the present study to predict a variety of health behaviours. It used attitudes, subjective norms and perceived behavioural control to predict intention, while these (attitude, subjective norms and perceived behavioural control) toward behaviours stemmed from underlying beliefs, namely behavioural, normative and control beliefs. In order to understand the KAP of people living with HIV regarding IPT, the constructs from the TPB were used in this study.

TPB constructs

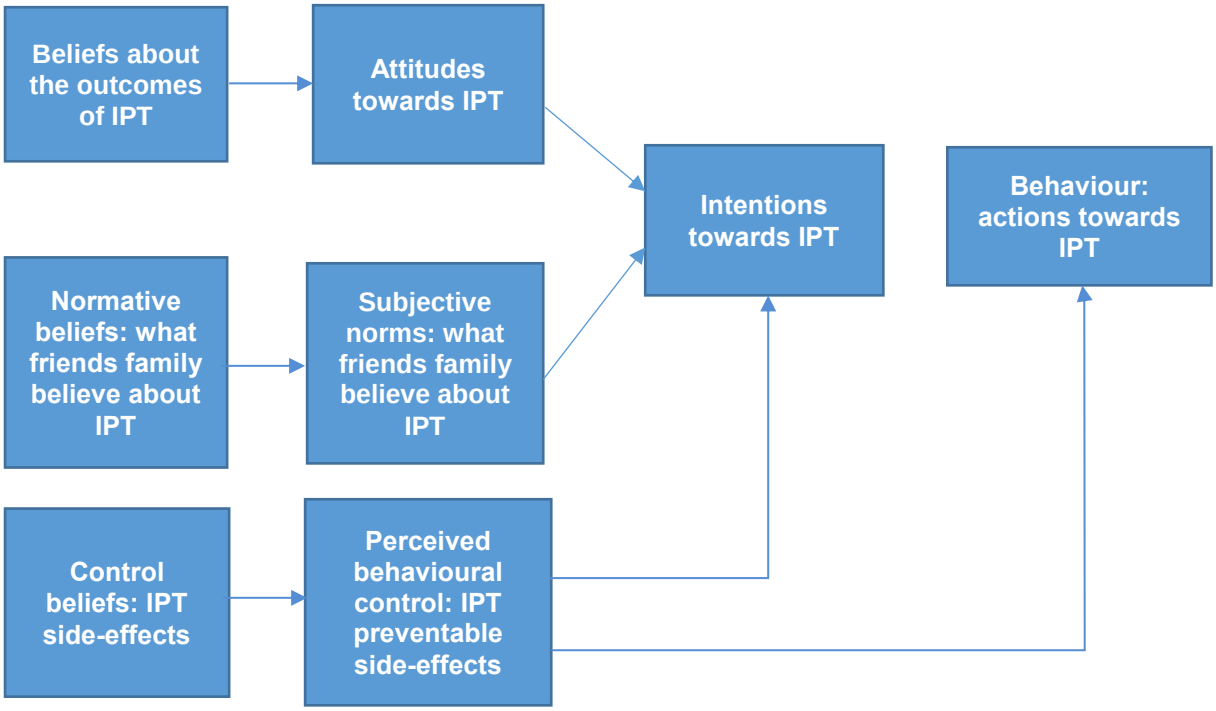

FIGURE 2.2: Application of knowledge, attitude and practices on the theory of planned behaviour. Source: Reid (2016)

2.5.1 Knowledge

In this study, knowledge was presented as part of the informational foundation of the theory of planned behaviour, comprising of behavioural beliefs, normative beliefs, control beliefs, subjective norms and perceived behavioural control.

2.5.1.1 Behavioural beliefs

These beliefs link the behaviour of interest to expected outcomes (Ajzen, 2008:532). A behavioural belief is the subjective probability that the behaviour will produce a given outcome. Behavioural beliefs are based on personal experience, information sources and inferences (Ajzen, 2008:532). A positive result means that a person believes good outcomes are likely to result from the behaviour, or that bad outcomes are not likely to occur. A negative result means that a person perceives negative outcomes will likely occur after engaging in the behaviour, or that good outcomes are unlikely to occur after performing the behaviour (Ajzen, 2008:533). In order to understand the behavioural beliefs PLWHA hold regarding IPT and HIV outcomes or disadvantages in relation to TB, several IPT- and TB/HIV-related outcomes were assessed using a questionnaire. The assessment was guided by literature on the outcomes of HIV, TB and IPT.

According to the WHO (2011:1), HIV is the strongest risk factor for developing TB disease in those with latent or new *Mycobacterium tuberculosis* infection. Furthermore, the WHO (2015b:5) indicated that for persons whose immune systems are weak, especially those with HIV infection, the risk of developing TB disease is much higher than for persons with a normal immune system, particularly those who are HIV-negative. The WHO (2016a:198) then recommends that all people living with HIV should be screened regularly for TB using a clinical symptom algorithm. Provision of IPT to all eligible HIV-infected individuals is an important approach to prevent and control TB. IPT confers a significant reduction in TB incidence among HIV-infected individuals (Assebe *et al.*, 2015:8). Prevention of TB through provision of IPT is one of the most important measures needed to reduce morbidity and mortality among PLWHA, especially in countries with a high TB and HIV burden (Briggs, Emerson,

Modi, Taylor & Date, 2015:299). Counselling of patients for timely prevention, detection and management of side-effects associated with isoniazid (anti-TB drug used for IPT) will help in minimising further occurrences of TB (Shaheda, Ali Baig, Syed & Anasari, 2016:376). Given the potential for increased life expectancy through averted TB deaths as a result of IPT, life expectancy has also risen (Yan, Bendavid & Korenromp, 2016:7).

2.5.1.2 Normative beliefs

These beliefs follow the similar pattern as behavioural beliefs, using normative belief strength (specific referent group or individual thinks that one should perform a behaviour) and motivation to comply (how much does one want to do what the specific referent mentioned in previous item thinks you should do) (Ajzen, 2008:533). PLWHA beliefs on how their families viewed HIV/TB and IPT (whether they approved or disapproved based on the information their families had) were also assessed based on what patients believed their families thought about TB and HIV on human health as well as IPT, and also what they thought should be done to control and prevent those two diseases. According to Baulougoura and Seriti (2016:192), a failure or an alteration of the quality or level of the protective immune response due to HIV leads to reactivation of TB infection into active TB disease. Screening HIV-positive people for TB is essential for increasing the TB case detection and lowering the burden of TB among HIV-positive people (Mueller-Using, Feldt, Sarfo & Eberhardt, 2016:5). The absence of all current cough, night sweat, fever or weight loss can identify a subset of adolescents and adults living with HIV who have a very low probability of having TB disease and who can be initiated on IPT (WHO, 2011:23). Briggs *et al.* (2015:S302) confirm that available data demonstrated the effectiveness of IPT in reducing the incidence of TB among PLWHA. The highest level of adherence is required in order to combat the threat posed by TB in patients living with HIV infection (Makanjuolo, Taddese & Booth, 2014:12). It is important to avoid the temptation of claiming the effectiveness of immune boosters based on their antimicrobial activities for prevention and treatment of infectious diseases, such as TB and HIV (Ngcobo & Gqaleni, 2015:3).

2.5.1.3 Subjective norms

This refers to the perceived social pressure to engage or not to engage in a behaviour. It is assumed that subjective norms are determined by the total set of accessible normative beliefs concerning the expectations of important referents. That was established by normative beliefs, the belief or view of the behaviour by the people with whom they associate, and by the individual's motivation to comply with these expectations (Ajzen, 2008:534). PLWHA were assessed based on whether they thought their families perceived IPT important and working or not. Ayele *et al*, (2015:11) confirm that in their study, IPT was generally efficacious to prevent TB disease among HIV-positive people. IPT should be provided to all PLWHA without TB or presumptive TB when tuberculin skin test (TST) is not available, regardless of CD4 count or ART (Briggs *et al.,* 2015:303). Despite the increase in pill burden, IPT was well tolerated with concurrent highly active antiretroviral therapy (HAART), and with a high completion rate (Lim, Wong, Pereirasamu, Aug, Leong & Chow, 2016:3). Mueller-Using *et al.* (2016:5) confirm that screening HIV-positive patients for TB is essential for increasing the TB case detection.

2.5.1.4 Control beliefs

These beliefs have to do with the perceived presence of factors that may facilitate or impede performance of a behaviour (Ajzen, 2008:533). Each control factor has a perceived power associated with it, and this contributes to perceived behavioural control in direct proportion to a person's subjective probability that that control factor is present (Ajzen, 2008:533). The control questions did not ask whether the PLWHA perceived having control over IPT, but rather the information they have about illnesses (side-effects) associated with IPT. With the widespread use of IPT for TB, side-effects have become a concern (Ai *et al*, 2016:4). Lim *et al.* (2016:2) have identified the following side-effects associated with IPT: hepatotoxicity (hepatic disorder), rash (skin disorder), diarrhoea and nausea (gastrointestinal disorder), peripheral neuropathy (peripheral nervous system), sleepiness and light-headedness (central nervous system).

2.5.1.5 Perceived behavioural control

Perceived behavioural control reflects the measure of perceived control over the behaviour, i.e. how easy or difficult displaying this behaviour will be. It also refers to people's perceptions of their ability to perform a given behaviour (Ajzen, 2008:534). Perceived behavioural control is determined by control beliefs, which consist of the barriers or facilitators to the behaviour, along with perceived power, or the influence each factor has on the behaviour, whether it be in a positive or negative way. Perceived behavioural control can also have a direct influence on behaviour. Performance of a behaviour not only depends on motivation, but also on the individual's control of the behaviour. If a person has limited to no control over a behaviour, the behaviour might not be implemented, even in the presence of strong motivational factors (Ajzen, 2008:535)**.** In the present study, perceived behavioural control was assessed based on the side-effects or illnesses associated with IPT, which were preventable and not preventable. IPT is associated with a high rate of peripheral neuropathy (Tekley, Teklu, Befikadu, Tedla & Klinkenberg, 2016:5). Management of peripheral neuropathy focuses on prevention of the development of this condition. In terms of prevention, all patients with INH treatment should be started on pyridoxine supplementation (Mafutidza, Calnan & Furin, 2016:6-8). Some of the illnesses associated with IPT are not preventable but rather manageable and treatable, such as hepatotoxicity and rash because there are no preventive treatments associated with them (Tekley *et al.*, 2016:5).

2.5.2 Attitude

Attitude refers to whether people living with HIV and AIDS (PLWHA) evaluate IPT as favourable or unfavourable. In the present study, there was positive and negative information regarding IPT, and PLWHA attitude was assessed based on that information.

According to Kufa, Chihota, Mogomezulu, Charalambous, Verver, Churchyard and Martien (2016:6), the incidence of tuberculosis was high in the population of HIV-positive individuals in their study. Mueller-Using *et al.* (2016:5) confirm that screening HIV-positive patients for TB is essential in order to exclude TB in this population. There is a protective effect of IPT on development of TB in HIV-infected people (Ayele *et al*, 2015:38). Briggs *et al.* (2015:305) emphasise that IPT should be provided to PLWHA for the reduction of TB incidence among these people. However, IPT is linked to HIV, and people do not want their HIV status to be disclosed (Makanjuolo *et al.*, 2014:11). Ngcobo and Gqaleni (2015:3) found that traditional medicines do not prevent TB. The relationships with family and friends appear to determine whether patients feel comfortable about taking IPT or not (Makanjuolo *et al.*, 2014:7). Makanjuolo *et al.* (2014:11-12) further indicate that people are more inclined to take treatment when they are symptomatic than when asymptomatic.

In a study conducted by Kapoor, Gupta and Shar (2016:91), it was found that increased use of IPT could potentially reduce HIV-related morbidity and mortality, averting TB deaths; hence, increased life expectancy. The knowledge and understanding of the importance of IPT among PLWHA is critical (Makanjuolo *et al.*, 2014:10). Shayo, Mashiro, Aboud, Bakari and Mugusi (2016:4) indicate that in their study, IPT was associated with side-effects, which caused PLWHA to stop taking it against their physician's advice. People who are HIV-positive and who turned out to have presumptive TB or who have active TB are prevented from reaching the waiting area (triage for prevention of TB transmission) (WHO, 2011:6). Spiritual healers frequently claim to treat lung diseases, including TB, which they attributed to food, alcohol and sexual intercourse with a menstruating woman (Ngcobo & Gqaleni, 2015:3). IPT should be provided to all PLHIV without TB disease or presumptive TB when TST is not available, regardless of CD4 count or ART (Briggs *et al.,* 2015:302). Unavailability of the adult dose of isoniazid resulted in a pill burden for PLWHA as instead of one, three tablets of the paediatric doses were provided to adults (Tekley *et al.*, 2016:5). The WHO (2016a:198) recommends that all PLWHA should be screened for TB at every visit to the facility.

2.5.3 Practice

Practice was presented as part of the layout of the theory of planned behaviour according to Ajzen (2008:535), and was based on what PLWHA were planning to do (intentions), whether they had practical means of doing what they had planned to do (actual behaviour) or whether they had been able do what they had planned to do (behaviour) with regard to IPT.

Communities should seek and be provided with information, education and communication (IEC) materials with key messages on the benefits of IPT, thereby marketing the programme and clearing myths and misconceptions about IPT (Makoni, Chemhuru, Mufuta, Gombe, Mungati & Bangure, 2015:4). PLWHA should also make sure that they are routinely screened for TB using an algorithm containing fever, cough of any duration, weight loss and night sweats, which will help to identify people who should either be expedited for TB diagnosis or given preventive TB therapy (WHO, 2016a:196). Briggs *et al.* (2015:303) indicate that IPT should be provided to all PLHIV without presumptive TB.

Drug-specific adverse reactions could occur in individuals who receive treatment for latent tuberculosis infection (LTBI) who are usually in good condition and not sick. As a result, PLWHA are urged to seek medical assistance for better management and prevention (Lim *et al.*, 2016:3). According to the WHO (2015b:8), there are IPT side-effects such as hepatitis, which are aggravated by daily consumption of alcohol; hence, the recommendation to reduce alcohol intake while taking IPT. PLWHA on IPT should report any TB signs to the health workers because the main reason, among others for discontinuation of IPT, is development of active TB (Tadesse *et al.,* 2016).

HIV disclosure is one of the important aspect of the management of HIV. In a study conducted by Makanjuolo *et al.* (2014:5), it was found that denial or non-disclosure of HIV status was the most common barrier to treatment.

2.6 CONCLUSION

The literature review was structured in such a way that it first described the relationship between HIV and TB as well co-infection with these diseases. IPT as a strategy to reduce the burden of TB among HIV-infected people was discussed, followed by the Lesotho health system in order to describe clearly how health care services, particularly IPT, are structured in the country. The theory of planned behaviour was described, and its link with knowledge, attitude and practices of PLWHA regarding IPT was indicated. The next chapter will report on the research methodology of this study.

CHAPTER 3

Research methodology

3.1 INTRODUCTION

This chapter presents strategies the researcher utilised in order to obtain answers to the identified problem (see section 3.2). The discussion here will be on quantitative, descriptive research as a design for the study, in order to answer the research question. The research technique that was used to collect information from the participants who met the selection criteria for participating in the study, will be fully explained (see section 3.3). Focus on the pilot study (see section 3.6), which was performed prior to the actual data collection in order to find out whether the instructions, questions and wording on the data collection tool were clear and understandable will also be discussed. Furthermore, validity and reliability of the study are fully described (see sections 3.8 and 3.9) and the ethical considerations of the study outlined (see section 3.10). Finally, the prosess of analysis will be discussed (see section 3.11).

3.2 RESEARCH DESIGN

The research design is a plan for collecting and analysing evidence that will make it possible for the researcher to answer the research questions and for handling challenges that can undermine the study evidence (Flick, 2011:65; Polit & Beck, 2017:743). A quantitative, descriptive design was used for the study in order to answer the research question, namely *"What are the knowledge, attitudes and practices (KAP) of adult PLWHA on IPT in Berea district, Lesotho?"*

For any investigation, the selection of an appropriate research design is crucial in enabling the researcher to arrive at valid findings and conclusions (Kumar, 2014:39).

3.2.1 Quantitative research

Quantitative research is described as a formal, objective, rigorous, systematic process for generating numerical information about the world, and it is conducted to describe situations, events or concepts while examining relationships among variables (Ellis & Standing, 2010:62; Grove, Burns & Gray, 2013:706; Polit & Beck, 2017:741). In order to generate numerical information to describe the knowledge, attitudes and practices (KAP) of PLWHA regarding IPT, the researcher assigned codes to the answers on the structured questionnaire. This allowed for a structured manner in which data was numerically presented.

3.2.2 Descriptive design

A descriptive design is concerned with gathering information from a representative sample of a population. It is merely intended to observe, explore, describe and document aspects of a situation or phenomenon in real life (Grove *et al.*, 2013:192; Kumar, 2014:13; Polit & Beck, 2017:726). In the present study, the researcher administered a questionnaire to 350 PLWHA, attending HIV care clinics at Berea and Maluti Hospitals. The interviews conducted provided the researcher with the opportunity to describe the KAP related to IPT of adults living with HIV and AIDS in Berea district.

3.2.3 Strengths of quantitative research

The researcher selected quantitative research as an overall plan for the study due to its strengths in obtaining answers to the research question. The discussion illustrates how the strengths of quantitative research were applied in the study.

- In quantitative research, *generalisation* of the study results is enhanced, because there are a high number of subjects, which allows for a wide study and better explanation of social phenomena (Botma, Greeff, Mulaudzi & Wright, 2010:83; Goertz & Mahoney, 2012:192). The researcher capitalised on the

generalisation of the study results because the study findings are considered for all adult PLWHA living in the district;

- Quantitative research *generates* knowledge in nursing science and provides evidence for nursing practice and management (Botma *et al.*, 2010:82; Creswell, 2014:16-17). Information obtained from the study will guide health care workers, especially nurses, to develop effective health promotion services within their different health settings in order to address the health needs of PLWHA, such as health education sessions on IPT so that PLWHA can make informed decisions regarding IPT, based on evidence provided by the study;

- Samples of individuals, communities or organisations can be selected to ensure that the results will be *representative* of the population studied (Flick, 2011:18). A sample of 350 PLWHA was selected to represent the entire population of PLWHA in Berea district; and

- Quantitative research data is based on *numbers*; hence, it is easy to collate (Ellis & Standing, 2010:62; Kumar, 2014:133). Firstly, codes were assigned to answers on the structured questionnaire used to collect data, allowing numerical values to be used when analysing data.

However with strengths always come limitations, which have to be taken into consideration. The limitations of quantitative research are that:

- Research methods are *inflexible*, as the questionnaire is compiled beforehand and the instruments cannot be modified once the study starts and no variation is allowed in the way questions are asked (Creswell, 2012:13). The researcher developed the questionnaire guidelines, which were used to guide fieldworkers while administering the questionnaire so that no modification could be made during the study period;

- The administration of a structured questionnaire creates an *unusual situation* that may frighten the respondents (Ellis & Standing, 2010:94). PLWHA were

given full information about the study and the way the study would be carried out even before the questionnaire was administered to allay participants' fears. By using the consent form, they were also given an opportunity to decline participation if not comfortable (Appendix B2). A leaflet with information (Appendix A2) was also issued to participants to provide information. None of the participants reported discomfort or acted scared during data collection; and

- The use of *statistics* to analyse the data is the element that puts many people off doing quantitative research, because the mathematics underlying the methods seem complicated and frightening (Ellis & Standing, 2010:62-63; Kumar, 2014:134). The researcher entered data on Excel spreadsheets, but data analysis was done by the Department of Biostatistics at the University of the Free State, because the department is staffed with people who are experts on mathematics and computer software.

After selection of the research design, it is advisable to choose a research technique, which is appropriate to yield the best information for the study.

3.3 RESEARCH TECHNIQUE: Structured questionnaire

The purpose of a research technique is to assist the researcher to obtain information during the research study. There are different data collection techniques in quantitative research studies, such as questionnaires, surveys, structured observation and interviews, checklists, indexes and scales (Botma *et al.*, 2010:111; De Vos *et al.*, 2012:186).

In the present study a structured questionnaire was used, which was literature-based and which followed the theory of planned behaviour constructs. No validity testing was done on this instrument. A questionnaire was translated from English into Sesotho by a Sesotho home language speaker and the Sesotho questionnaire was tested during the pilot study. The structured questionnaire was collecting information on KAP related to IPT of PLWHA as seen in Figures 1.1 and 2.2. The quantitative data was obtained from closed-ended questions and few open-ended questions.

A structured questionnaire consists of a set of questions and response options, which are predetermined. They are a form of structured interviewing, where all the participants are asked the same questions in the same order, and are often offered the same options in answering them (De Vos *et al.*, 2012:186; Polit & Beck, 2017:270). A structured interview is a verbal interaction with subjects, which allows a researcher to have control over the content of the interview to obtain essential data for the study (Grove *et al.*, 2013:422).

3.3.1 Strengths of structured questionnaire

A detailed discussion on how the identified strengths were applied in the study follows below:

- A structured questionnaire was offered with exactly the same questions in the same order (Creswell, 2012:382; Ellis & Standing, 2010:48-49). The fieldworkers' confidence in asking questions was strengthened as they were fluent and systematic and avoided interpretation errors by asking the same questions in a similar way and order;

- Questions were less likely to be misinterpreted by respondents because the interviewer could determine whether questions had been understood (De Vos *et al.*, 2012:186; Kumar, 2014:179-180). The interview guidelines were used to assist the fieldworkers to understand what each question was asking so that the required information could be collected and recorded as expected;

- A structured questionnaire facilitates feedback about instruments or data collection procedures (Kumar, 2014:180). During data collection, the researcher and fieldworkers held meetings at the end of each day to refine the data collection process in order to get quality data;

- The interviewer had control over the response rate (Botma *et al.*, 2010:140; De Vos *et al.*, 2011:186). A planned sample size of 350 PLWHA participated in the study and there were no refusals. The fieldworkers also made sure that each question was answered; and

- A structured questionnaire also reduces selection bias where the literacy rate is low (Botma *et al.*, 2010:140; De Vos *et al.*, 2011:186; Ellis & Standing, 2010:96). Every patient living with HIV/AIDS who was illegible and who agreed to participate had a chance to be selected, even those who could neither read nor write because the fieldworkers were reading questions to them and recording their responses.

3.3.2 Limitations of structured questionnaire

Despite those strengths, structured questionnaires have some limitations which were addressed to avoid a negative influence on the study, namely:

- *Reluctance* of the participant to answer accurately in front of the interviewer (Creswell, 2012:384; De Vos *et al.*, 2012:186; Ellis & Standing, 2010:49). Training equipped fieldworkers with skills they used to build a rapport with participants, so that participants' trust could be gained, and it also gently persuaded participants to answer the questions asked genuinely;

- The technique is *time-consuming* (De Vos *et al.*, 2012:186; Ellis & Standing, 2010:49; Grove *et al.*, 2013:424). Engagement of five trained fieldworkers who understood the data collection tool thoroughly made it easy to get the required information within the expected 30 minutes per interview. Data was also collected within the planned time frame of four weeks; hence, no inconvenience

was caused to the researcher or fieldworkers regarding the data collection time frame; and

- Structured questionnaire are *expensive* as they require training of the fieldworkers and travelling to study sites to interview the participants (De Vos *et al.*, 2012:186; Grove *et al.*, 2013:424; Kumar, 2014:178-179). Funding from the LMOH assisted the researcher in covering some expenditure, such as travel expenses to the study sites.

3.4 POPULATION

The population is a particular group of individuals or elements who are the focus of the research (Polit & Beck, 2017:739). The target population is defined as the entire set of individuals or elements who meet the sampling criteria (Grove *et al.*, 2013:703; Polit & Beck, 2017:739). The population for the study was people living with HIV and AIDS, accessing HIV services at the public health care facilities in Berea district.

There were 24 public facilities offering HIV care services in Berea district: 22 health centres and two hospitals (Berea and Maluti Hospitals) (LMOH, 2013d:10). The total population of people living with HIV and AIDS attending HIV services in the district was 39284. The two hospitals reported the highest number of PLWHA: 15,000 and 10,000 PLWHA respectively. Berea Hospital offered HIV services to an average of 1,500 PLWHA each month or 75 PLWHA per day, and Maluti Hospital reported 1,000 PLWHA per month or 50 PLWHA per day (LMOH, 2015a:6).

3.5 SAMPLE

A sample is a subset or portion of the population identified for the study (Botma *et al.*, 2010:124; De Vos *et al.*, 2012:223; Kumar, 2014:229). Sampling, according to Flick (2011:85), is the process of selecting a few participants from a bigger group and this mostly rests on concern for the representativeness of the wider population.

Berea and Maluti Hospitals were purposefully selected as study sites because they contributed the highest rate (above 80%) of TB/HIV co-infection and lowest IPT coverage (30%) in the district (LMOH, 2014c:20).

Purpersfull selection of the two hospitals in Berea, followed by convenient selection of PLWHA attending HIV care clinics at the two hospitals was done; Maluti Hospital (n=140) and Berea hospital (n=210). The proportion per hospitalwas determined as follows, which is 0.4 (100000/25000) and 0.6 (15000/25000 respectively. This proportion was multiplied with the number of participants possible for the researcher to sample, namely 350 in total. 0.6 x350 = 210

0.4 x350 = 140

From the appointment book at the clinics, the researcher identified the PLWHA for each day. Among the PLWHA, those who attended and were available at the HIV care clinic were marked off in the appointment book, from whom the researcher – with assistance of a designated person for checking-in PLWHA – chose those who met the inclusion criteria. From those who met the inclusion criteria, the first 30 were chosen to participate in the study each day until the sample size was reached at each hospital. The sampling criteria for the inclusion and exclusion in the study were the criteria as indicated below.

3.5.1 Inclusion criteria

Inclusion criteria are the characteristics that subjects must possess in order to be included in a study (Grove *et al.*, 2013:353). PLWHA who participated in the present study were males or females aged 18 years or older attending the HIV care clinics at Berea and Maluti Hospitals, who had signed the consent form to participate in the study, and who were proficient in English or Sesotho.

3.5.2 Exclusion criteria

Exclusion criteria are those characteristics that disqualify subjects from inclusion in the study (Grove *et al.*, 2013:353). PLWHA who were excluded from the study were those

participants who were intellectually disabled, those who were physically ill, and lastly, those who could speak neither English nor Sesotho.

3.6 PILOT STUDY

A pilot study is defined as a small-scale study conducted on a limited number of participants from the population at hand, to test the practical aspects of the research study prior to the main study (Botma *et al.*, 2010:275; Grove *et al.*, 2013:703; Polit & Beck, 2017:739). A pilot study is undertaken to decide whether it is worth carrying out a detailed investigation (Kumar, 2014:13-14).

In the present study, a pilot study was conducted to –

- familiarise the researcher and the fieldworkers with the research environment;
- assist them in identifying potential problems with the design;
- determine the feasibility of the study; and
- refine the data collection tool.

The pilot test was conducted after the researcher had obtained approval from the University of the Free State (UFS) Ethics Committee (Appendix C) and from the National Health Research Ethics Committee of Lesotho (Appendix D), and after permission had been granted by the authorities of the hospitals (Appendices F). Appointments were then made to meet with each of the hospital's authorities and the staff of the HIV care clinics explaining the purpose of the study fully, and requesting nursing staff for assistance during identification of participants who met the inclusion criteria of the study.

Following the meeting, recruitment of five second-year student nurses as fieldworkers took place. Those student nurses were on school break for the December holidays and were volunteering at Berea Hospital, where data collection started first. They were familiar with HIV care services (including IPT, PLWHA and the clinic setting, such as patient flow). Two days after recruitment of the fieldworkers, a one-day training session was held at Berea Hospital. The fieldworkers were trained by the researcher on completion of the data collection tool as guided by the questionnaire guidelines (Appendix H) on coding of the questionnaire, building rapport with the participants and

ethical issues of the study. The training also included a practical session, where fieldworkers administered a questionnaire to each other and independently completed the questionnaire, after which they confirmed the data collected on all the forms to be the same. The pilot study was then conducted by the researcher and trained fieldworkers at Berea and Maluti Hospitals on 4-6 November 2015: two days at Berea Hospital and one day at Maluti Hospital. The structured questionnaire was administered to five PLWHA at Berea Hospital and three at Maluti Hospital. At the end of each day, the researcher together with the fieldworkers coded the questionnaires, and entered the coded data into the Excel spreadsheet. The spreadsheets were sent to the UFS biostatistician for analysis at the end of the pilot study. This data did not form part of the actual data analysis because amendments were made on the questionnaire which improved the quality of the questionnaire.

3.7 DATA COLLECTION

Data collection is the precise, systematic gathering of information relevant to the research purpose or the specific objectives, questions or hypotheses of a study (Botma, 2010:275; Grove *et al.*, 2013:691; Polit & Beck, 2017:725).

The actual data collection of the study started two weeks after the recommendations of pilot study had been incorporated into the questionnaire. The data collection started at Berea Hospital, where data collection took two weeks (9-25 November 2015). At Maluti Hospital, data collection took nine days (26 November to 8 December 2015). Every morning when patients arrived at the HIV care clinic, they were checked in for their appointments by designated HIV care clinic staff using the appointment book. It was during that time that the eligible participants chosen from the appointment book were verbally informed by the clinic staff about the study. Each day, the first 30 participants who had indicated their interest in participating in the study were handed the information leaflet (Appendix A2) to gather information about the study, and then they were referred to the researcher or fieldworkers who took them one by one to the private rooms within the clinic, which were used as counselling rooms. In the counselling rooms, the participants were given further information, such as why and how the study was being conducted, their right to stop the interview if they were no

longer willing to continue without being denied the services. If still willing to participate, the researcher or the fieldworkers read and explained the information on the consent form (Appendix B2) to the participant and asked him or her to sign or make a cross or by a thumb print of the right hand on the signature space (for those who could not write) as proof that they had agreed to participate in the study. Ten participants could not write, and used their thumbprint. The researcher and fieldworkers then administered the questionnaire to the participants using the approved structured questionnaire and recording responses as provided. Each interview took 30 minutes. At the end of the day, the completed questionnaires were collected by the researcher. The data was then coded by the researcher and fieldworkers, and co-checked by the same people. The coded data was then entered into the Excel spreadsheet, until the last day of the data collection when all the entered data was sent to the UFS biostatistician for analysis. The completed questionnaires were kept in the researcher's office in a lockable filling cabinet.

The same process of data collection was repeated at Maluti Hospital. The questionnaire was administered to 350 participants in total: 210 participants at Berea Hospital and 140 at Maluti Hospital. A Sesotho questionnaire was administered to all participants.

3.8 VALIDITY

Validity is the degree to which an instrument measures what it is supposed to measure (De Vos *et al.*, 2012:172; Grove *et al.*, 2013:393; Polit & Beck, 2017:747). Content and face validity are the types of validity used in the study.

Content validity: Content validity concerns the degree to which an instrument has an appropriate sample of items for the construct being measured and adequately covers the construct domain (De Vos *et al.*, 2012:173; Grove *et al.*, 2013:394). In the current study, the researcher used questions, which were literature-based. The content validity was further enhanced by involving experts in research and on the topic of the study. Those experts formed part of the committee which approved the final

questionnaire. The pilot study was also conducted to determine whether the questions prompted the responses the main research questions required.

Face validity: Face validity refers to whether the instrument seems to be measuring the target construct (De Vos *et al.*, 2012:174; Grove *et al.*, 2013:394). The structure of the questionnaire was similar to that of other questionnaires and could therefore –in terms of face value – be interpreted as a questionnaire. The questionnaire was structured according to the objectives of the study, which were to cover IPT-related knowledge, attitude and practices as well as participants' demographic and biographic characteristics. According to Brink (2008:160), face validity is useful in the instrument development process with regard to determining readability and clarity of content. The questionnaire used in the present study was further subjected to the evaluation committee of the School of Nursing in UFS, including the biostatistician who also formed part of that committee for input on the face validity of the questionnaire.

3.9 RELIABILITY

Reliability refers to the degree to which the instrument can be depended upon to yield consistent results if used repeatedly over time on the same person or if used by two researchers (De Vos *et al.*, 2012:177; Grove *et al.*, 2013:389). To ensure reliability of the structured questionnaire, which was used to collect data on KAP of PLWHA regarding IPT, the researcher conducted a pilot study in an effort to test whether the final questionnaire – before using it again during the actual data collection – would give consistent results. Involvement of trained professional HIV testing and counselling (HTC) officers as fieldworkers during the pilot study, using the same questionnaire during the study, enhanced fieldworkers' understanding of collecting information and recording it correctly; hence, reducing errors and misinterpretation of questions. Use of the questionnaire guideline (Appendix H) and instructions on the questionnaire assisted the fieldworkers in determining what each question was looking for and how to ask it. Asking respondents the same set of questions and providing participants with the same set of options for their responses also enhanced reliability of the data collection tool for the study. Therefore, even participants who could not write understand the questions.

3.10 ETHICAL CONSIDERATIONS

Grove *et al.* (2013:159) and Polit and Beck (2017:727) refer to ethics as a system of moral values that is concerned with the degree to which research procedures adhere to professional, legal and social obligations of the study subject. The study was guided by the principles of beneficence, respect for human dignity, and justice as expressed in the Belmont Report (National Commission for the Protection of Human Subjects of Biomedical and Behavioural Research, 1979). These principles are based on human rights that are needed to be protected in research: the right to self-determination, to privacy, fair treatment and protection from harm and discomfort (Grove *et al.*, 2013:162; Polit & Beck, 2017:139-142).

The researcher adhered to the above principles as discussed below. Permission to conduct the study was obtained from different authorities: research ethics committees (UFS, and Lesotho Health Research and ethics committee) and hospitals (Berea and Maluti Hospitals).

3.10.1 Beneficence

The principle of beneficence imposes a duty on researchers to minimise harm and maximise benefits (Polit & Beck, 2017:139). Beneficence involves the right to freedom from harm and discomfort, be it physical, emotional, spiritual, economic, social or legal harm, participants have to be protected (Polit & Beck, 2017:139). The content of the questions for the study did not cause distress in the participants. Neither the researcher nor the fieldworkers were aware of any harm that was caused to any of the participants, and none of the participants reported any sort of discomfort throughout the study.

The second right is that of protection from exploitation, meaning that involvement in the study should not set participants at a disadvantage or expose them to situations for which they have not been prepared (Polit & Beck, 2017:139-140). The researcher adhered to the study procedures as indicated, such as asking questions as they appeared on the questionnaire and keeping the interview time to 30 minutes as stipulated.

3.10.2 Respect for human dignity

The principle of respect for human dignity includes participants' right to self-determination, which indicates that humans are capable of controlling their own destiny and the right to full disclosure, meaning participants' right to know what the research entails. Humans should be treated as autonomous agents who have freedom to conduct their lives as they choose to without external control (Botma *et al.*, 2010:6; Polit & Beck, 2017:140). Participants were fully informed about the study before they voluntarily decided to participate in the study. Those interested in the study were further given an information leaflet (Appendix A2). Information on the consent form was also shared and participants were allowed to choose whether to participate or not and they also had the choice to withdraw from the study at any time without being penalised by the researcher or fieldworkers or the clinic staff.

3.10.3 Justice

The principle of justice means that participants need to be treated fairly and equally (Botma *et al.*, 2010:19). This principle includes subjects' right to fair selection and treatment, which refers to equitable distribution of benefits and burdens of the research, and the right to privacy, meaning the researcher should ensure that his or her research is not more intrusive than it needs to be and that participants' privacy is maintained throughout the research (Botma *et al.*, 2010:345; Brink, 2008:33; Polit & Beck, 2017:141). In order to maintain fair selection and treatment of PLWHA, the researcher conveniently selected patients meeting inclusion criteria despite their literacy level. Even those who could not read or write participated in the study. Participants were also informed that there were no incentives attached to their

participation. The right to privacy was considered by conducting interviews in quiet private rooms. When PLWHA arrived at the HIV care clinic for their appointments, they were given full information about the study verbally by staff clinic and not by the researcher and fieldworkers as they had not disclosed their HIV status to the researcher and fieldworkers. PLWHA were assured that the information obtained from their questionnaires would be kept confidential at all times, under lock and key, in a safe place where unauthorised access would be denied. PLWHA were also ensured that their identity would not be linked to data, as their names were not provided on the questionnaires.

3.11 DATA ANALYSIS

Data analysis is a systematic synthesis of research data, which is conducted to reduce, organise and give meaning to data (Grove *et al.*, 2013:691). According to Rubin and Babbie (cited by De Vos *et al.*, 2012:249), data analysis comprises the techniques by which researchers convert data to a numerical form and subject it to statistical analysis. The purpose of data analysis is to organise, provide structure to research data and elicit meaning from that data (Polit & Beck, 2017:57).

The data collected for this study was coded and entered into Excel spreadsheets with the assistance of an assistant researcher at the UFS. During data analysis, descriptive statistics, such as frequencies and percentages for categorical data, means, medians and percentiles for continuous data, were calculated. The analysis was done with assistance from the Department of Biostatistics at the UFS.

3.12 CONCLUSION

This chapter reported on the research methodology used for this study. The most appropriate design was discussed and information regarding quantitative and descriptive research was discussed as well as the strengths and limitations of quantitative research design. Details of the research technique – which was a structured questionnaire – were also discussed, focusing on the strengths and limitations of a structured questionnaire. Information was also provided on selection of

an appropriate population, sampling and conducting a pilot study as well as the actual data collection process. The way validity and reliability as well as the ethical considerations of the study were addressed and maintained throughout the study was clearly mentioned. The way the collected information was analysed in order to achieve the aim and objective study, was described. The next chapter will provide a discussion on the results of the analysed data in a form of an article.

CHAPTER 4

Study results and data analysis in a form of an article

Academic article for the *African Journal of AIDS Research (See Appendix I)*

Knowledge, attitudes and practices related to isoniazid preventive therapy of Adults living with HIV and AIDS in Berea district, Lesotho

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Abstract

Isoniazid preventive therapy is an effective strategy for prevention of tuberculosis among people living with HIV/AIDS. However, its uptake among this people is very low. KAP related to isoniazid preventive therapy may play a role in this poor uptake. Thus, the aim of this study was to assess and describe knowledge, attitude and practices related to isoniazid preventive therapy of adults living with HIV in Berea district, Lesotho. Quantitative, descriptive design was used and participants (n=350) were conveniently selected. Structured questionnaire was administered. Descriptive statistics for continuous and categorical data were calculated.

This study was guided by theory of planned behaviour (TPB) therefore, knowledge was reflected by behavioural, normative, control beliefs, subjective norms and perceived behavioural control related to isoniazid uptake. Attitude section mirrored participants' attitude towards isoniazid uptake, whereas practice was presented as

participants' intention, actual behavioural control and behaviour towards isoniazid uptake.

Results were presented as percentage positive scores leading to enhanced isoniazid uptake. Knowledge predicting isoniazid uptake was determined as behavioural beliefs (88.9%), normative beliefs (82.9%), control beliefs (0.3%) and subjective norms (69.0%). Knowledge component favoured isoniazid uptake. Attitudes (78.6%) enhanced isoniazid uptake. Practice was reflected as intention (99.4%), actual behavioural control (98.0%) and behaviour (82.9%). Practice component indicated a strong intention to use isoniazid preventative therapy.

Behavioural and normative beliefs, attitude, intention, actual behavioural control and behaviour were high, subjective norms were average, and control beliefs and perceived behavioural control were low.

Recommendations were aligned to the TPB and include health promotion, trainings, and community involvement.

Keywords: isoniazid, theory of planned behaviour, tuberculosis

Introduction

HIV infection is the most powerful risk factor for the progression of tuberculosis from latent infection to an active disease; therefore, being the major cause of the large increase in the incidence of tuberculosis (TB) in any population with a high human immunodeficiency virus (HIV) prevalence (World Health Organization [WHO], 2016). However, there are preventive strategies recommended for the control of TB among HIV-positive people. Preventive therapy against TB is defined as the use of one or more anti-tuberculosis drugs given to individuals with latent *Mycobacterium tuberculosis* infection to prevent progression to an active disease (WHO, 2015a).

To reduce the morbidity and mortality from TB in people living with HIV, the World Health Organization (WHO) recommends three Is for people living with HIV, namely intensified case finding, isoniazid preventive therapy (IPT), and infection control for TB. Intensified case finding offers health care workers the opportunity to identify those who do not have active TB; hence provision of IPT to prevent the development of TB. The current recommended dose of IPT for people living with HIV and AIDS (PLWHA) as well as those with a positive Mantoux test is 300 mg isoniazid per day with Pyridoxine 25 mg per day for six months, with 36 months conditionally recommended in areas of high TB prevalence and transmission (WHO, 2015b).

IPT has been shown to reduce the risk of active TB and death in PLWHA with few adverse events and without promoting drug-resistant disease (Churchyard, Chaisson, Maartens & Getahum, 2014). Despite being safe, efficacious and recommended, the uptake of IPT remains low at global level. Based on the Global Plan to Stop TB, approximately 50% of patients newly enrolled in HIV care are expected to be eligible for IPT globally. A total of 552,000 (53%) HIV-positive people were started on IPT out of 1 034 000 people living with HIV and who were newly enrolled in HIV care globally (WHO, 2015c). In the African region, 77% of countries did not report provision of IPT as part of HIV care in 2014, including 68% of the high TB/HIV burden countries (WHO, 2015c). Lesotho, landlocked by South Africa, in sub-Sahara Africa is no exception.

Lesotho has been experiencing low coverage of IPT since 2015, with 26% coverage by December 2015 (LMOH, National TB Report, 2014). Since then, the coverage remained low. Up to July 2017, only 124,200 (36%) PLWHA out of 345,000 were provided with IPT (LMOH, HIV programme data, 2017). All ten districts in the country are contributing to the low IPT coverage as they all experience the low uptake of IPT, but Berea district had the lowest uptake of 32% compared to the rest of the districts (LMOH, HIV programme data, 2017). Knowledge, attitudes and practice (KAP) of PLWHA could possibly influence the low uptake of IPT. The KAP of PLWHA regarding IPT is vital because it is believed to influence health behaviour and decision-making (Adams, Talbot, Otato, Blunt & Streingart, 2014). A lack of health information among communities regarding health conditions indicates that the health efforts to address such health problems effectively will be useless. When patients are well informed about health issues affecting them, they use that information to make decisions about

their health (WHO, 2014). However, there are behavioural, social or system-level barriers that prevent people from taking health actions, namely deficiencies in KAP (Maneze, DiGiacomo, Salamonson, Descallar & Davidson, 2015). Identification of such barriers could potentially assist HIV and AIDS (acquired immunodeficiency syndrome) and TB programmes to develop properly targeted interventions to address the root causes of the low uptake of IPT. The coverage of IPT could be improved and morbidity and mortality reduced among PLWHA if KAP related to its use are known. The current study was therefore conducted in order to create an evidence base from where the low uptake of IPT in Berea district, Lesotho, could possibly emerge by describing KAP related to IPT of PLWHA in this district.

Theoretical framework

The theoretical framework for this study was based upon Ajzen's (1991) theory of planned behaviour (TPB), which guided the assessment and description of KAP related to IPT of PLWHA. This theory consists of three main constructs: attitude, subjective norms and perceived behavioural control (Ajzen, Joyce, Sheikh, & Cole, 2011). 'Attitude' refers to the positive or negative evaluation of a particular behaviour. 'Subjective norms' refer to the perceived pressure from important others to perform or not to perform behaviour. 'Perceived behavioural control' refers to the perceived ease or difficulty of performing behaviour. These three main constructs of the theory are further determined by different beliefs. Attitudes are determined by behavioural beliefs, which are the individual beliefs about the advantages or disadvantages of a specific behaviour. Subjective norms are influenced by normative beliefs. Normative beliefs reflect the person's beliefs about whether important others would support or not support his or her behaviour. Perceived behavioural control is determined by control beliefs, which are beliefs about specific barriers that may occur to stop people from performing behaviour (Ajzen, Joyce, Sheikh, & Cole, 2011).

Figure 1 illustrates the TPB and its application to this KAP study. Knowledge, as described in this KAP study, does not reflect information on what is known by PLWHA in relation to IPT use as it is usually presented in KAP studies. Knowledge, depicted as the informational foundation, consists of the following constructs: behavioural and

normative beliefs, subjective norms as well as control beliefs and perceived behavioural control towards IPT use.

According to the TPB, one can expect PLWHA attitudes towards IPT to influence their IPT uptake. The practice component of this KAP study does not also reflect information on what is done in relation to IPT use as in the normal KAP studies but rather the intention of PLWHA towards IPT use, their actual behavioural control towards IPT use, and their behaviour towards IPT. The three constructs (intention, actual behavioural control and behaviour) relate to the practice component of the study.

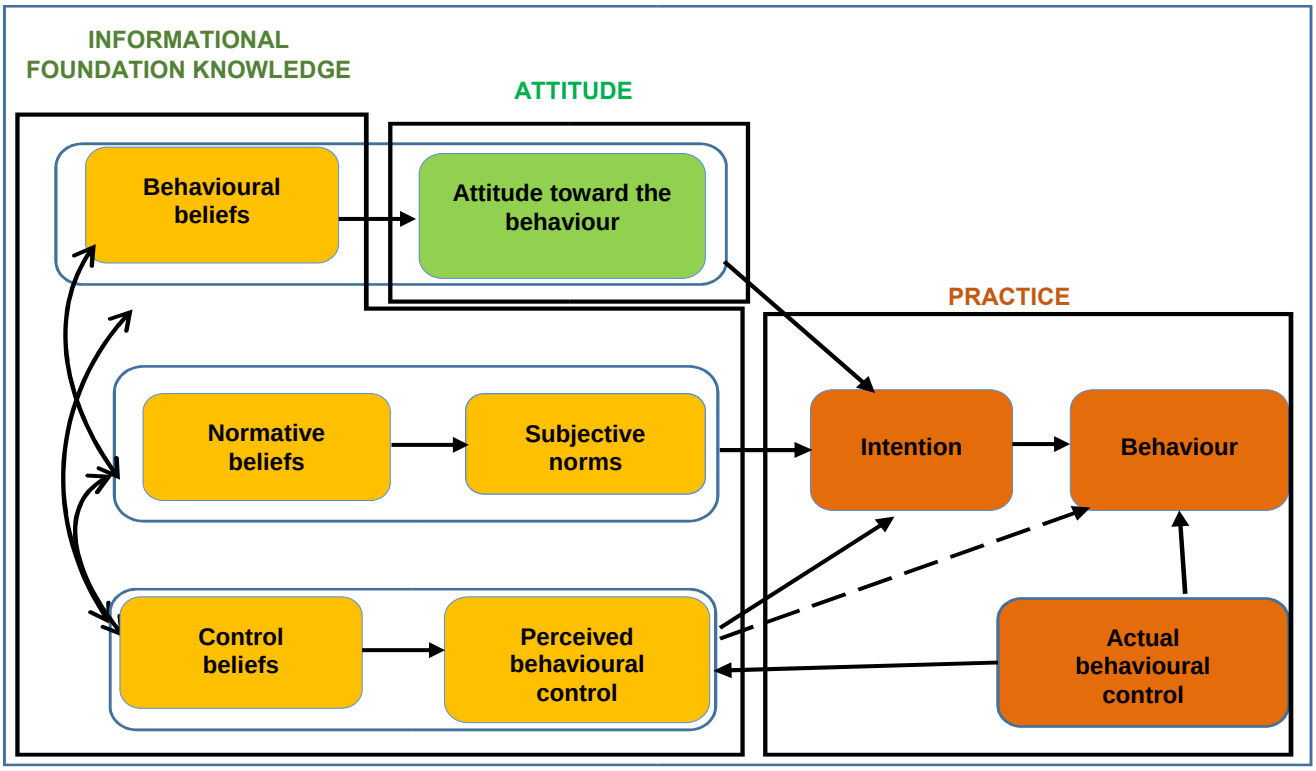

FIGURE 1: Application of the theory of planned behaviour to KAP study (Reid, 2016)

Methodology

Design

A quantitative descriptive design using a structured questionnaire was deployed to assess and describe the KAP related to IPT of adults PLWHA in Berea district, Lesotho.

Ethics

Ethical clearance for this study was granted by the relevant authorities (the Health Research Ethics Committee, reference number: ECUFS NR 99/2015 and the Health Research and Ethics Committee of Lesotho, reference number ID63/2015). Permission was also sought from the authorities of both hospitals before the pilot study as well as the main study could take place. Participants signed written consent before their participation in the study and were told that they might discontinue their participation at any time they felt so without consequences.

Population

The population for the study in 2015 consisted of PLWHA attending HIV care clinics in Berea district. There are 22 health centers and two hospitals: Maluti Hospital and Berea Hospital in the district. These two hospitals reported the highest number of PLWHA: 10,000 and 15,000 respectively. Berea Hospital offered HIV services to an average of 1,500 PLWHA each month, 75 PLWHA per day, while Maluti Hospital offered these services to 1 000 PLWHA per month, on average 50 PLWHA per day.

Sampling

Purposefull selection of the two hospitals in Berea district, followed by convenient selection of PLWHA attending HIV Care clinics at the two hospitals was done; Maluti hospital (n=140) and Berea hospital (n=210). The selected PLWHA were males and females aged 18 or above, proficient in English or Sesotho, and who had signed the consent form to participate in the study. Only those who were intellectually disabled,

physically ill or could not speak either English or Sesotho were excluded from the study.

Data collection

A structured literature-based questionnaire was developed and was aligned to the TPB constructs. The questionnaire had to collect information on KAP related to IPT of PLWHA as seen in Figure 1. The quantitative data was obtained from closed- and open-ended questions. Prior to the actual data collection, a pilot study was first conducted among a sample of eight PLWHA; (Berea Hospital, n=5; and Maluti Hospital, n=3). That data was not included in the main study.

Data collection for the main study took place from December 2015 to January 2016. Five trained fieldworkers together with the researcher administered the questionnaire to the participants who met the inclusion criteria and who had agreed to participate in the study. The questionnaire was completed in Sesotho for all the participants. Responses were entered in an Excel spreadsheet for purposes of analysis.

Data analysis

Descriptive statistics, such as frequencies, and percentages for categorical data and medians and percentiles for continuous data were calculated. The analysis was done by the Department of Biostatistics at the University of the Free State.

The KAP of PLWHA were analysed in terms of the TPB constructs enhancing the uptake of IPT. Categories depicting high, average and low scores were calculated, with ‘high’ indicating scores above 70%, ‘average’ ranging from 50% to 69% and ‘low’ ranging from 0% to 49%.

Results

The results are presented based on demographic and biographic characteristics and TPB constructs.

Demographic and biographic characteristics

The characteristics of PLWHA who participated in the study are presented in Table 1. There were more females (67.1%) than males (32.9%). The median age was 39 years (range 18-77 years). PLWHA were Sesotho-speaking and their educational level was generally secondary level although they had not completed it. The median level of education was completion of secondary school. Very few (3.1%) of the PLWHA did not attend school at all.

TABLE 1: Demographic and biographic characteristics

Characteristics	Attribute	Frequency	Percentage (%)
Demographic characteristics			
Gender	Male	115	32.9
	Female	235	67.1
Language	Sesotho	350	100
Education	No Schooling	11	3.1
	Some Primary School(<7years)	83	23.7
	Some Secondary School(<3years)	95	27.1
	Completed Secondary School(=3years)	47	13.4
	Diploma/Degree	21	6.0
	Other(Specify) *e.g. ABET*	1	0.3
Biographic characteristics			
Time HIV diagnosis	> 1 year	28	8.0
	1–5	202	57.7
	6–10	97	27.7
	11–15	19	5.4
	16–21	4	1.2
Antiretroviral (ART) status	Already on ART	328	93.7
	Not on ART	22	6.3
TB screening	Monthly (positive response)	153	43.7

Biographical information

The median period of knowing their HIV status among PLWHA was four years (range < 1 year to 21 years), and the majority (93.7%) was on ART for a median period of three years (range < 0.08 years to 21years). Only 43.7% reported being screened for TB monthly.

Knowledge regarding IPT

The constructs of the TPB were used to assess PLWHA knowledge regarding IPT. These were behavioural beliefs, normative beliefs, control beliefs, subjective norms and perceived behavioural control. Table 2 presents positive scores under each construct.

TABLE 2: Participants' knowledge enhancing IPT uptake reflected as behavioural, normative and control beliefs, as well as subjective norms and perceived behavioural control (n=350)

Item	Frequency	Percentages (%)
Behavioural beliefs		
HIV increases the risk of TB among HIV-positive people	288	82.3
HIV-positive people are at risk of developing TB **than those** who are HIV negative	299	85.4
HIV positive people should be screened for TB regularly to exclude TB	328	93.7
IPT reduces chances of developing TB among PLWHA	322	92.0
IPT improves PLWHA health by reducing morbidity and mortality associated with TB	318	90.9
Side-effects associated with IPT are preventable and manageable	260	74.3
IPT increases life expectancy among PLWHA	313	89.4
Normative beliefs		
When the immune system drops, the higher chances to developing TB	320	91.4

Examination for TB in order to exclude it among HIV-positive people	303	86.6
IPT is given to HIV-positive people who do not have signs (cough, weight loss, fever & night sweat) of TB	266	76.0
IPT reduces chances of developing TB	326	93.1
The more adherent I am on IPT, the more likely it would be to prevent TB	340	97.1
IPT has side-effects	236	67.4
Immune boosters prevent TB among HIV-positive people	87	24.9
Subjective norms		
HIV destroys the immune system, putting PLWHA at risk of developing TB	330	94.3
IPT prevents TB among HIV-positive people	309	88.3
IPT is given to PLWHA who do not have TB	293	83.7
Screening for TB excludes TB in people living with HIV	310	88.6
PLWHA who are on IPT experiences side-effects	245	70.0
PLWHA will have too many pills to take if they have to take IPT with all other medication	196	56.0
Immune boosters make PLWHA healthy by preventing TB	284	81.1
Control beliefs		
Which Illnesses are associated with TB preventive medication	1	0.3
Perceived behavioural control (preventable illnesses associated with TB)		
Which illnesses are associated with TB preventable medication which are not preventable	0	0

Table 3 reflects a summary of those positive scores enhancing IPT uptake under each knowledge construct.

TABLE 3: Summary of TPB knowledge-related constructs enhancing IPT uptake (n=350)

Constructs	Range (min–max)	Median	Percentage %
Behavioural Beliefs	0–100	100	88.9
Normative Beliefs	0–100	85.7	82.9
Control Beliefs	0–75	0	0.3
Subjective Norms	0–100	71.4	69.4
Perceived behavioural control	0–66.7	0	0

Behavioural beliefs (88.9%) and normative beliefs (82.9%) scored high. Since beliefs lay the informational foundation determining ultimate behaviour, one can expect participants' behavioural and normative beliefs to strengthen IPT uptake. Subjective norms (69.4%) had an average score. It is interesting to note that unlike what is expected according to the TPB, expectations of others (normative beliefs) did not have such a strong effect on the participants' subjective norms. Control beliefs (0.3%) and perceived behavioural control (0%) scored low. The fact that participants could seemingly not identify potential facilitating or inhibiting factors (control beliefs) had – as could be expected according to the TPB – also a negative effect on participants' perceived behaviour control.

Attitude regarding IPT

Table 4 depicts attitudes from participants that could strengthen IPT uptake. In summary, the positive attitude scores depicted a median of 76.2% (range 9.5-100) and 78.6% of the items enhancing IPT uptake.

TABLE 4: Attitude enhancing IPT uptake (n=350)

Item	Frequency	Percentage %
All PLWHA are at risk of developing TB	318	90.9
It is important to screen all PLWHA in order to exclude TB	340	97.1
It is important that IPT is given to all PLWHA who do not have signs of TB	323	92.3
I can reduce my chances of developing TB by taking IPT	340	97.1
Other people may know my HIV status just by taking IPT	216	61.7
TB can be prevented by African traditional medications	294	84.0
I cannot talk openly about my taking of IPT	188	53.7
I cannot take IPT because I am not sick	228	65.1
IPT reduces illnesses and deaths caused by TB among PLWHA	295	84.3
Use of IPT makes PLWHA live longer	322	92.0
For me to be healthy I will look for information about IPT	324	92.6
IPT can make a person feel bad or sick, making it difficult to take IPT medication	197	56.3
Increased availability of IPT makes PLWHA stop using other measures to prevent TB	267	76.3
I can recommend IPT to a friend	333	95.1
TB is more of a spiritual problem and prevention lies on the African spiritual methods	276	78.9
TB can be controlled and prevented among PLWHA through use of IPT	332	94.9
Every PLWHA should take responsibility to prevent TB by taking IPT	341	97.4
The endless process of IPT makes me feel bad and tired	184	52.6
IPT increases the number of medication the PLWHA is taking especially those already on ART	183	52.3
I will educate my friends and family members about IPT as a method of preventing TB among PLWHA	343	98.0
I feel happy if the clinic makes sure that I do not have TB every month	349	99.7

Practices regarding IPT

The TPB constructs used to assess participants' practices related to IPT were intention, actual behavioural and behaviour.

TABLE 5: Practices enhancing IPT uptake reflected as intention, actual behaviour and behaviour (n=350)

Constructs	Item	Frequency	Percentage %
Intention			
	Ask the nurse/doctor about TB medications for prevention of TB (IPT)	330	94.3
	Be examined for TB every month	335	95.7
	Take TB preventive medication per nurse/doctor's prescription	346	98.9
	Report if feeling bad or sick while on IPT	346	98.9
	To reduce alcohol intake while on IPT	338	96.6
	Report any sign of TB when experiencing it while on IPT	347	99.1
	Disclose my HIV status to people important to me	344	98.3
Actual behavioural control			
	Asked the nurse/doctor about IPT	340	97.1
	Be examined for TB monthly	339	96.9
	Take TB preventive medication per nurse/doctor's prescription	347	99.1
	Report if feeling bad or sick while on IPT	344	98.3
	To reduce alcohol intake should be on IPT	340	97.1
	Report any sign of TB when experiencing it while on IPT	345	98.6
	Disclose my HIV status to people important to me	343	98.0
Behaviour			
	Asked the nurse/doctor about IPT	285	81.4
	Be examined for TB monthly	298	85.1
	Take TB preventive medication per nurse/doctor's prescription	315	90.0
	Report if feeling bad or sick while on IPT	260	74.3
	To reduce alcohol intake should be on IPT	296	84.6
	Report any sign of TB when experiencing it while on IPT	260	74.3
	Disclose my HIV status to people important to me	341	97.4

In Table 5, the total practice scores predicting positive practice towards IPT for each item under each TPB construct are presented. Table 6 provides a summary of practice constructs enhancing IPT uptake. Intention (99.4%), actual behaviour (98.0%) and practice (89%) all scored high. The high scores of the practice constructs strongly suggest participants' intention to use IPT.

TABLE 6: Summary of practice constructs enhancing IPT uptake (n=350)

Constructs	Range (min–max)	Median	Percentage %
Intention	28.6–100	100	99.4
Actual behavioural control	0–100	100	98.0
Behaviour	14.3–100	100	82.9

Discussion

Participants' profile

In this study, there were more females than male participants, supporting the evidence that women have greater access to HIV care services including ART than men (Lesotho Ministry of Health [LMOH], 2014). This is further supported by the Lesotho national HIV programme data (2017), which showed that there were 61.857 men and 118.172 women accessing ART services in the country in the period 2004-2017. This finding could be influenced by the high HIV prevalence in women (30%) compared to men (19%) (Lesotho Ministry of Health [LMOH], 2014). It has also been proved that women consult a doctor more readily for all symptoms or conditions, and that men are more reluctant or would delay consulting (Wang, Hunt, Nazareth, Freemantle & Peterson, 2013). The median age (39 years) of the study reflects the reproductive age group (15-49 years), which determined the national HIV prevalence of 25% in Lesotho (LMOH, 2014).

For the entire period of the study, communication between participants and data collectors was in Sesotho. This is in line with the fact that in Lesotho, between 85% and 90% of the population speaks Sesotho as a first language (Gary & Fennig, 2017).

The level of education is an important factor that could possibly influence knowledge about a disease positively (Bhutto & Nisar, 2016). Study participants were able to read and write, aligning it to the 79.4% the national literacy rate according to World Factbook of the Central Intelligence Agency (2017). This creates a healthy platform for knowledge.

In this study, it was found that less than half of the participants were screened for TB on monthly basis. This finding falls short of the Lesotho National IPT guidelines, which state that all PLWHA should be screened for TB every month (LMOH, 2011).

Knowledge

Knowledge will be discussed based on the constructs of TPB, in which knowledge is depicted as the informational foundation consisting of the behavioural, normative and control beliefs, subjective norms as well as perceived behavioural control towards IPT use.

*Behavioural beliefs e*xpress the link about what participants believed the consequences would be between HIV and TB and IPT use respectively. The study revealed that PLWHA were knowledgeable and aware that HIV increases the risk of TB in people with HIV. The study findings correspond with a TB KAP study by Hibstu and Bago (2016), in which the majority of the participants in Southern Ethiopia agreed that HIV-infected patients were at a greater risk of getting TB than those HIV-negative. In the present study, participants were also aware that IPT reduces chances of developing TB; hence, reduces morbidity and mortality among people living with HIV, even though they associated IPT with side-effects. This result is consistent with study findings on the effect of IPT on TB incidence in Ethiopia, which found that IPT brought about a significant reduction in TB incidence among HIV-infected individuals (Assebe, Reda, Wubeneh, Lerebo & Lambert, 2015). In a study on adverse drug reaction in TB patients conducted in India, Shaheda, Ali Baig, Syed and Anasari (2016) concluded that counselling of patients for timely prevention, detection and management of side-effects associated with anti-TB drugs would help in minimising further occurrence of side-effects.

In the current research, *normative beliefs* and *subjective norms e*xpressed the link to what participants believed their families and people important to them believed about IPT in relation to TB prevention and eligibility to IPT. Participants in this study reported that their families believed that IPT is given to people who do not have TB. This finding is in line with results by Briggs, Emerson, Modi, Taylor and Date (2015) from a study on the use of IPT among PLWHA conducted in low- and middle-income countries. Briggs *et al.* concluded that IPT should be provided to all PLWHA without TB, regardless of CD4 count or ART status. It was also found that participants believed that their families believed IPT would lead to pill burden among those already on ART and other medications. However, despite the increase in pill burden, Lim, Wong, Pereirasamu, Aug, Leong and Chow (2016) in a study on the outcome of IPT in PLWHA in Malaysia found that IPT was well tolerated with concurrent ART and with a high completion rate. There was a misconception among participants that immune boosters make people healthy by preventing TB. In a study conducted in South Africa on African traditional immune boosters and infectious diseases, Ngcobo and Gqaleni (2015) emphasised that it is important to avoid the temptation of claiming the effectiveness of immune boosters based on their antimicrobial activities for prevention and treatment of infectious diseases, such as TB and HIV.

Social influences, connection and support, such as family and friends, are primary factors in the adoption of health behaviours and depend on having contact with friends and family who also engage in these behaviours (Murphy, Vernon, Diamond & Tiro, 2014). However, in a study conducted by Berhe, Demissie and Tesfaye (2014) in Ethiopia on IPT adherence and associated factors among PLWHA, it was found that the importance of patients making their own decision to start and to adhere to IPT rather than the influence of friends was more successful in influencing IPT uptake.

Control beliefs and perceived behavioural control express the link to what participants believed their control would be in IPT use. It was found that participants believed that they do not have control over IPT-related issues. This finding is supported by the study findings by Hagger, Hardcastle, Strickland, Pang and Watss (2016) in Australia, which predicted intentions to engage in self-management behaviours in familial hypercholesterolemia patients using a multi-theory perspective on beliefs about illness and self-management behaviours. In Hagger *et al.*'s study, it was found that many

familial hypercholesterolemia sufferers failed to engage in self-care behaviours leaving them at increased risk because they perceived no control over this disease.

Attitude

According to the results of the current study, 78.6% of the participants had a positive attitude enhancing IPT uptake. This finding is aligned with the TPB, which predicts that a positive attitude results in a favourable behaviour (Ajzen *et al.*, 2011). In a study conducted in Uganda on cotrimoxazole use among HIV-infected people, Okwera, Mafigiri, Guwatudde, Whalen and Joloba (2015) found that participants who had a positive attitude about cotrimoxazole were also quite positive about encouraging its use.

Despite the overall wide positive attitude towards IPT, there were cultural beliefs and misconceptions which did not support IPT use. Some participants perceived IPT use as a measure of disclosing their HIV status. A similar misconception was found in a study conducted by Makanjuolo, Taddese and Booth (2014) on factors associated with IPT adherence, in which it was found that participants reported that IPT use was linked to HIV; hence, disclosure of their HIV status. Other participants from Makanjuolo *et al.*'s study believed that IPT should not be taken because people are not sick. Makanjuolo *et al.* (2014) also found that people were more inclined to take treatment when they were symptomatic than when asymptomatic. The participants from Berea district had mixed feelings about IPT side-effects. Some felt IPT causes illnesses to people, while others did not. This finding was confirmed by the results from a study on TB incidence and all causes of mortality among PLWHA on IPT conducted in Tanzania by Shayo, Mashiro, Aboud, Bakari and Mugusi (2016) where it was clearly revealed that IPT was associated with side-effects that led to PLWHA stopping taking it against physicians' advice.

Such unfavourable attitude could create a challenge for TB prevention practices (intentions and behaviour towards IPT). In a study conducted by Nolna, Kammogne, Ndzing, Afanda, Ntone and Nolna (2016) in Cameroon on community KAP, it was found that negative attitudes and poor practices regarding TB were obstacles in eliminating and controlling it.

Practice

Practices based on the construct of TPB, in which practice reflects PLWHA intention towards IPT use, PLWHA actual behavioural control and their behaviour will be discussed.

Intention expressed participants' desire to carry out IPT-related activities. Almost all of the participants in this study (99.4%) had intentions to carry out IPT-related activities such as discussing preventive medication with health care workers and reporting TB symptoms to them as well. In Australia, Akbar, Anderson and Gallegos (2015) reviewed the TPB studies predicting self-care intentions and behaviour among people at risk of diabetes, and found that intention was the most predictive construct for all diabetes-related behaviours. On the other hand, in a study conducted in Ohio assessing KAP on latent TB treatment acceptance, Beidenham (2015) found that a lack of intention might hamper successful treatment rates and might increase participants' chances of going into active tuberculosis disease.

Actual behavioural control expressed participants' control and ability to carry out IPT-related activities. The high score (98%) for actual behavioural control indicated that participants had means to implement IPT-related activities, such as being screened for TB and taking IPT as prescribed. This result is supported by study findings on the relationship between intention to purchase pro-environmental products and pro-environmental consumer behaviour and the effect of actual behavioural control. In a study conducted in Australia, Grimmer and Miles (2017) found that higher actual behavioural control strengthened the relationship between intentions and pro-environmental consumer behaviour. The consumers they studied with a high level of control over their behaviour were likely to translate intentions into actual purchase behaviour.

Behaviour expresses participants' ability to perform actual IPT-related activities. The high percentage behaviour in this study (82.9%) implies that participants have performed IPT-related activities even though there were lower scores in some behaviour items, for example reporting when feeling bad or sick and when experiencing signs of TB. In a study reviewing delay in TB diagnosis and treatment in Ethiopia, Storla, Yimer and Bjune (2008) found that the reasons for reluctance in health-seeking for TB-related symptoms are due to both patient and provider factors, such as fear of social isolation, economic constraints, distance to the health facility, inadequate staff, attitudes and poor quality of health services.

Limitations

Some limitations have been identified in this study. The sample consisted of PLWHA who have been initiated on IPT as well as those who have not been initiated on IPT. Differentiating between the KAP of PLWHA who have been on IPT and those who have not been initiated on IPT, could prove valuable results. However, the researcher still managed to collect valuable information from participants.

The questionnaire used has not been validated. The study was further limited to one district of the country, preventing the generalisation of the results to the rest of the districts experiencing a low uptake of IPT.

Conclusion

This KAP study explored IPT-related uptake of people living with HIV/AIDS in Berea district and found a low uptake of IPT among people living with HIV/AIDS in Berea district. The study was guided by the TPB, which predicts intention to perform a behaviour. The low uptake of IPT seemingly did not lie with the PLWHA in Berea district. These participants were apparently knowledgeable about IPT, had a positive attitude towards IPT use, and did not have a problem to use IPT. The researcher can therefore only propose further research in establishing the cause for the low uptake of IPT in this Lesotho sub-district. It is possible that the reason for the low uptake of IPT in this specific district could lie within the larger health system.

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CHAPTER 5

Summary of the findings, recommendations and limitations of the study

5.1 INTRODUCTION

The main purpose of this study was to assess the knowledge, attitudes and practices regarding IPT among HIV-positive adults (PLWHA) in Berea district, Lesotho. The previous chapter (Chapter 4), which was presented as an article, reported on the findings of the study. In this chapter, a brief description of the study findings, recommendations, value of the study and overview of the possible limitations as well study conclusion will be presented.

5.2 SUMMARY OF STUDY RESEARCH FINDINGS

The study findings will be discussed according to the objectives of the study as indicated in Chapter 1 (see section 1.5) and are aligned to the theory of planned behaviour, which was the theoretical framework for this study.

5.2.1 Participants' knowledge regarding IPT

The findings showed that participants had high behavioural beliefs and normative beliefs, enhancing IPT uptake, while control beliefs and perceived behavioural control were very low, not reinforcing IPT uptake at all. Subjective norms were average, implying that the significant others of the participants in this study did not support IPT uptake. Overall, the participants were knowledgeable about other aspects of IPT as well as TB/HIV.

5.2.2 Participants' attitude regarding IPT

The findings of this study revealed that participants had a positive attitude towards IPT, which is believed to enhance its uptake among PLWHA. However, there were still some cultural beliefs, which affected IPT use negatively.

5.2.3 Participants' practices regarding IPT

The findings showed that all the participants had high intentions, actual behavioural control and actual behaviour to carry out IPT-related activities which would enhance its uptake. In general, participants had good practices towards IPT use.

5.3 RECOMMENDATIONS

Based on the study findings, recommendations are made to enhance the uptake of IPT in Berea district, are discussed based on the KAP of the study, and are linked to the theory of planned behaviour where necessary. Although various structures support IPT implementation, the suggested recommendations would benefit TB and HIV/AIDS programmes if they could be incorporated in the monitoring and evaluation system of the Ministry of Health. Table 5.1 depicts the recommendations and the responsible person or party who should be responsible for implementing the recommendation:

5.3.1 Recommendations related to knowledge

The recommendations for knowledge are reflected in Table 5.1 below and are discussed under the following headings: health promotion and education, training, guidelines and service delivery.

TABLE 5.1: Knowledge recommendations related to IPT (to be continued)

Recommendations	Responsible person/party	Link to the theory of planned behaviour
Health promotion & education of patients Health education related to IPT should be reinforced at every visit to the patients at HIV care clinic that is daily. It can be done on a one-to-one basis or as a group. This education needs be sensitive towards beliefs PLWHA have.	HIV care clinic staff	Informational foundation of patients is influenced by their beliefs; hence, it is important to know them.
Training of health Dedicated health care workers responsible for health education should be trained in terms of health education aspects, which are effective communication and feed-back, clear appealing messaging, communication channels as well as behaviour change theories, e.g. TPB. These will assist those health care workers to be able to give precise, comprehensive and correct information about IPT using a two-sided message (presenting both advantage and disadvantage of taking action). Health care workers should be trained at least once a year on how to identify health educational needs of their clients as well as com-munities by using health education and promotion guidelines.	HIV care clinic managers, dedicated health care workers Health Education Unit from Ministry of Health	Health care workers who have received targeted training in understanding the TPB and therefore the importance of taking PLWHA beliefs and norms into consideration will strengthen positive IPT-related behaviour.
Health educators should be deployed and offered formal in-stitutionalised training every year and deployment of the available ones at district level as well as facility level every year.	Human Resource Unit from Ministry of Health	
Guidelines Develop health education guide-lines, which would guide health care workers on what to include and what to exclude while giving health education.	Health education Unit, National TB/HIV programme	

TABLE 5.1: Knowledge recommendations related to IPT

Recommendations	Responsible person/party	Link to the theory of planned behaviour
Service delivery IPT information should be integrated into community education packages and should be widely and constantly disseminated to commu-nities through community structures such as VHWs or community-based organisations. These should be disseminated during public gathe-rings, which should be conducted on a monthly basis at village level, as well as during home visits.	HIV care clinic manager, VHWs, community-based organisations.	Community/society plays a role in influencing individuals' intention to perform or not to perform a behaviour; hence, the need to strengthen their beliefs and norms to assist in positive IPT-related behaviour.

5.3.2 Recommendations regarding attitude and practice

The recommendations for attitude and practice are reflected in Table 5.2 bellow. The discussion focuses more on community engagement such as community dialogues or community discussion groups

TABLE 5.2: Recommendations regarding attitude and practice

Recommendations	Responsible person/party	Link to the theory of planned behaviour
Community dialogues or group discussions (patients included) should be organised on a quarterly basis so that communities would be able to share their opinions, experiences and beliefs or judgement of what is important in their health or not important. These would familiarise health care workers with patients' norms, values and cultural practices so that the negative ones can be targeted and addressed through effective communication, resulting in high community participation in positive health behaviours.	HIV care clinic staff, health centre committee members (including village chief, teacher VHW, community representative, health centre representative).	Positive attitude and practice could be strengthened by community involvement, which will enhance PLWHA intentions towards IPT use.

5.4 LIMITATIONS OF STUDY

The study had some limitations. The sample consisted of PLWHA who had been initiated on IPT and those who have not been initiated on IPT. Differentiating between the KAP of PLWHA already on IPT and those who have not been initiated on IPT could provide valuable findings. However, the researcher still managed to collect valuable information from participants.

Due to limited resources and a short time frame, the study was conducted in one district at two health facilities. This limited the extent to which the findings of the study could be generalised to the other health facilities, which were not included in the study.

The questionnaire used has not been validated; therefore, this can be seen as a limitation of the study.

5.5 VALUE OF THE STUDY

The findings from the study would benefit the national TB/HIV programme as well as TB/HIV implementing partners in planning and strengthening behaviour change activities supporting IPT.

Future studies should investigate whether other health system factors could possibly play a role in the low uptake of IPT other than patient factors.

The current study forms a baseline for studies which will be conducted following this one.

5.6 CONCLUSION

The present study assessed PLWHA knowledge, attitude and practices regarding IPT in Berea district, Lesotho. The first chapter of the study comprised an introduction to the overall research contents (research problem, aim, objectives, design and methods, and the ethical considerations during the study). This was followed by an in-depth discussion of the background to the study. The methodology included a description of the research design, the population, sampling methods, research instrument, data collection, data analysis and ethical considerations. A description of the findings obtained from the analysed data was presented in an article format in Chapter 4.

This last chapter presented the recommendations which are believed would strengthen IPT uptake among people living with HIV in Berea district as well as from other districts of the country

Knowledge is power (Francis Bacon).

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APPENDIX A1

Participant information sheet

PARTICIPANT INFORMATION SHEET

Study Title: Knowledge, Attitude and Practices related to IPT of HIV positive adults in Berea district, Lesotho.

Introduction: My name is Anna Masheane - Moseneke, Masters Student at University of the Free State. I am conducting research onknowledge, attitudes and practices related to Isoniazid Preventive Therapy of People Living with HIV in Lesotho

Purpose of the Research: Is to assess what PLWHAs know, think and do about IPT in Berea Hospital/ Maluti hospital, Lesotho. This study will help the Ministry of Health through TB/HIV programs to develop behavioural change interventions which will address the PLWHA needs related to IPT knowledge, Attitude and practices resulting in increased demand and uptake of the service.

Invitation to participant: You are therefore invited to participate in this study. Participation is voluntary and refusal will not lead to participant being denied benefits to which the subject is entitled.

Remuneration: There is no individual benefit such as payment awarded to the respondents for participation in the study.

Costs: No cost will be incurred by participating in this study.

Beneficiaries and Benefits of the study: This will help increase demand and uptake of IPT among PLWHA in the country in order to reduce high co-infection rates and TB as well.

Risks: There is minimal risk to the respondents participating in the study.

Results: The findings of the study will be shared through meetings, public gatherings and report copies will be distributed to relevant stakeholders.

Confidentiality: Your name will not be linked to the questionnaire. Questionnaires will be coded.

Time: The interviews will take approximately 30 minutes.

Researcher conduct details: 00266 22323253 (W) 00266 59591066/62591066 (Mobile)
E-mail:annahmasetsoto@gmail.com
Contact details of the study supervisor: Mrs. M Jacobs (0514017072)

APPENDIX A2

Tokomane ea tlhahiso leseling ka pilisi e theolang sekhahla sa lefuba ho bakuli ba phelang le kokoana-hloko ea HIV

SEHLOHO SA LIPHUPUTSO

TSEBO, MAIKUTLO, LIKETSAHALO KA PELISI E THEOLANG SEKHAHLA SA LEFUBA BATHONG BA BAHOLO BA PHELANG LE KOKOANA-HLOKO EA HIV SETEREKENG SA BEREA, LESOTHO.

Lumela

Lebitso la kake Anna Masheane-Moseneke.Ke etsa liphuputso ka tsebo, maikutlo le liketsahalo tsa batho ba phelang le kokoana-hlokoea HIV malebana le pilisi e theolang sekhahla sa lefuba ho bona. Boithutong bona re batla ho ithuta hore na batho ba phelang le tsoaetso ea HIV ba tseba eng, maikutlo a bona ke a feng le hore na ba nka mehato e feng malebana le pelisi ena e theolang sekhahla sa lefuba ho bona kahar'a Lesotho. Sephetho sa boithuto bona se tla tsebisoa batho ba etsang liqeto ka se etsahalang ele hore ba etse meralo e tla etsa hore tšebeletso ea mofuta ona e ntlafela.

Memo bakengsa ho nkakarolo: Re u kopa/ mema ho nka karolo boithutong bona.

Se kenyelelitsoeng ka hara boithuto- u tla botsoa lipotso ke mofuputsi ka uena, seo use tsebang, kamoo u ikutloang le seo u se etsang ka pilisi e theolang sekhahla sa lefuba. Lipotso li tla nka metsotso e mashome a mararo (30)

Likotsi: Ho kaba le ho ameha (moeeng) ha nyane hoa motho ea nkang karolo boithutong bona.

Melemo ea ho nkakarolo boithutong bona: ke hore maikutlo a hao ha kopana le a ba bang a tla fana ka thlaiso leseling e tla sebelisoa ho etsa meralo e tla ntlafatsa tsebeliso ea pelisi ena ele hore maphelo a batho baphelang le kokoana-hloko ena ea HIV a ntlafale.

Ho nka karolo ke boithaopo, ho hana ho nka karolo ha hona kenyeletsa kotlo kapa ho lahleheloa ke melemo eo thuto ee kenyeletsang; motho aka khaotsa ho nka karolo nako e ‘ngoe le e ‘ngoe kantle ho kotlo kapa ho lahleheloa ke melemo eo thuto e kabeng e ekenyelelitse. Ha hona litjeo tse tla batloa ho uena ha u nka karolo hape u keke ua patalloa ho nka karolo liphuputsong tsena.

Lekunutu: Ho tla etsoa matsapa ohle ho boloka tlhahiso-leseling ea motho emong le emong ele lekunutu. Liphetho li tla phatlalatsoa libokeng le likopanong.Tlhahiso leseling ea motho e ka phatlalatsoa ha ho hlokahala ke lekhotla la molao.

Lintlha ka botlalo ka mofuputsi – bakeng sa tlhahiso-leseling kapa lipotso:
Anna Masheane-Moseneke: +266 59591066/6259196

Lintlha ka botlalo ka motataisi oa mofuputsi: ‘M’eMandie Jacobs (0514017072)

APPENDIX B1

Consent form to participate in research

CONSENT FORM TO PARTICIPATE IN RESEARCH

I have been asked to participate in a research study titled: knowledge, attitudes and practices related to IPT of PLWHA in Lesotho.

I have been informed about the study by ……

My participation in this research is voluntary, and I will not be penalized or lose benefits if I refuse to participate or decide to terminate participation. If I agree to participate, I will be given the participant information sheet, which is a written summary of the research.Iunderstand that I will not receive remuneration for participation in this study and it will not cost me anything.

The research study, including the above information has been verbally described to me. I understand what my involvement in the study means and I voluntarily agree to participate. I have received the Information sheet and understand the content.

_____ _____

Signature of Participant **Date**

APPENDIX B2

Tumello ea ho nka karolo liphuputsong

TUMELLO EA HO NKA KAROLO LIPHUPUTSONG

Ke kopuoe ho nka karolo liphuputsong ka sehloho sena: TSEBO, MAIKUTLO, LIKETSAHOLO KA PILISI E FANOANG HO FOKOTSA SEKHATLA SA LEFUBA BATHONG BA BAHOLO BA PHELANG LE KOKOANA-HLOKO EA HIV SEREREKENG SA BEREA, LESOTHO

Ke tsebisitsoe ka boithuto ke……..

Ho nka karolo hoaka liphuputsong tsena ke boithaopo, ha kena ho fumana kotlo kapa ho amohuoa melemo ha ke hana ho nka karolo le ha ke khetha ho khaotsa ho nkakarolo. Haeba ke lumela ho nka karolo, ke tla fuoa pampiri ea tlhahiso-leseling eaba nkang karolo.Kea utloisisa hore hakena patalloa ho nka karolo boithutong bona. le hore ha kena patala letho.

Boithuto ba liphuputso ho kenyeletsa le tlhahiso-leseling li hlakikisitsoe ka puisano ho ‘na. Ke utloisisa seo ho kena hoaka boithutong bona ho se bolelang hape ke lumela ka boithaopo ho nka karolo. Ke fumane pampiri ea tlhahiso-leseling ebile ke ea utloisisa se boleloang. .

_____ _____

Tekeno ea motho ea nkang karolo **Letsatsi**

APPENDIX C

Letter from UFS Health Research Ethics Committee

UNIVERSITY OF THE FREE STATE
UNIVERSITEIT VAN DIE VRYSTAAT
YUNIVESITHI YA FREISTATA
UFS·UV
HEALTH SCIENCES
GESONDHEIDSWETENSKAPPE

IRB nr 00006240
REC Reference nr ZA0408-011
IORG0005187
FWA00013784

16 September 2015

MS AM MASHEANE-MOSENEKE
DEPARTMENT OF NURSING
FACULTY OF HEALTH SCIENCES
UFS

Dear Ms Masheane-Moseneke

ECUFS NR 99/2015
MS AM MASHEANE-MOSENEKE
DEPARTMENT OF NURSING
PROJECT TITLE: KNOWLEDGE, ATTITUDES AND PRACTICES RELATED TO ISONIAZID PREVENTIVE THERAPY OF ADULTS LIVING WITH HIV AND AIDS IN LESOTHO.

1. You are hereby kindly informed that, at the meeting held on 15 September 2015, the Ethics Committee approved the above project after all conditions were met.

2. Any amendment, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

3. A progress report should be submitted within one year of approval of long term studies and a final report at completion of both short term and long term studies.

4. Kindly use the ECUFS NR as reference in correspondence to the Ethics Committee Secretariat.

5. The Ethics Committee functions in compliance with, but not limited to, the following documents and guidelines: The SA National Health Act. No. 61 of 2003; Ethics in Health Research: Principles, Structures and Processes (2015); SA GCP(2006); Declaration of Helsinki; The Belmont Report; The US Office of Human Research Protections 45 CFR 461 (for non-exempt research with human participants conducted or supported by the US Department of Health and Human Services- (HHS), 21 CFR 50, 21 CFR 56; CIOMS; ICH-GCP-E6 Sections 1-4; The International Conference on Harmonization and Technical Requirements for Registration of Pharmaceuticals for Human Use (ICH Tripartite), Guidelines of the SA Medicines Control Council as well as Laws and Regulations with regard to the Control of Medicines, Constitution of the Ethics Committee of the Faculty of Health Sciences.

Yours faithfully

DR SM LE GRANGE
CHAIR: ETHICS COMMITTEE

APPENDIX D

Letter from National Health Research Ethics Committee

LESOTHO

Ministry of Health
P.O. Box 514
Maseru 100

31st August, 2015

Mrs. Anna Masheane-Moseneke
P.O. Box 14383
Maseru 100

Dear **Mrs. Anna Masheane-Moseneke**

Re: Knowledge, Attitudes and Practices Related to Isoniazid Preventive Therapy of HIV positive Adults in Berea District Hospitals, Lesotho (ID63-2015)

Thank you for resubmitting the above mentioned proposal. The Ministry of Health, Research and Ethics Committee having reviewed your protocol hereby authorizes you to conduct this study among the specified population. The study is authorized with the understanding that the protocol will be followed as stated. Departure from the stipulated protocol will constitute a breach of the permission.

We are looking forward to have a progress report and final report at the end of your study.

Sincerely,

Dr. Nyane Letsie
Director General Health Services

Mrs. Veronica Lehana
Co- Chairperson
National Health Institutional Review Board

APPENDIX E

Letter to hospitals

P.O Box 14383
Maseru 100
15th October 2015

The District Health Manager
Berea DHMT
Berea

Dear Sir/Madam

Re: REQUEST TO CONDUCT STUDY AT YOUR HOSPITAL

The aim of the study is to describe Knowledge, attitudes and practices related to Isoniazid Preventive Therapy of HIV positive adults (PLWHA) in Berea Hospital, Lesotho. The objectives of the study are:

- To compile a demographic profile and biographical information of adults PLWHA on IPT in Berea district hospitals.
- To assess and describe knowledge of adults PLWHA on IPT in Berea district Lesotho
- To assess and describe attitudes of adults PLWHA on IPT in Berea district, Lesotho.
- To assess and describe practices of adults PLWHA on IPT in Berea district, Lesotho.

The study findings will be submitted to the University of Free State, Faculty of Health Sciences as a requirement for my Masters of Social Science, the Ministry of Health, Lesotho and your institution to inform the policy, strategic and annual plans.

Cc: Nursing Manager

Yours sincerely

Anna Masheane-Moseneke

Contacts: 59591066/ 62591066

annahmasetsoto@gmail.com

APPENDIX F

Letter from Maluti Hospital

Maluti Adventist Hospital

A SEVENTH-DAY ADVENTIST INSTITUTION
LESOTHO

Private Bag X019
Ficksburg OFS
9730

Tel: (00266) 22540203
Fax: (00266) 22540230

P O Box 11
Mapoteng 250
Lesotho

29th October, 2015

Mrs Anna Masheane-Moseneke

P.O. Box 14383

Maseru-100

Lesotho

Dear Ms Moseneke,

This serves to inform you that the Administration Committee of Maluti (ADCOM) which sat on the 22nd October, 2015 approved that you conduct your study on 'Knowledge, Attitudes and Practices related to Isoniazid Preventive Therapy of HIV positive Adults in Maluti Adventist Hospital. The following conditions apply:

1. You will maintain confidentiality
2. You will share relevant findings with the facility.

We wish you all the best as you continue with your studies.

Sincerely

Mrs. Tlelima

Nursing Services Manager – on behalf of ADCOM

APPENDIX G1

English questionnaire

KAP RELATED TO ISONIAZID PREVENTIVE THERAPY (IPT) OF ADULT PLWHA IN LESOTHO:QUESTIONNAIRE
For 18 years and older

Only interview patients: **Consent document signed by older than 18 years PLWHA**

For Office Use

Instructions – Tick the appropriate number or write your answer in the space provided.

☐☐☐ 1-3 Interview number

1.1 **Name of facility** ..... ☐☐ 4-5

1.2 **Date questionnaire is completed ...../...../..... (dd/mm/yy)** ☐☐☐☐☐☐ 6-11
d d m m y y

PART I: RESPONDENT PROFILE

DEMOGRAPHIC INFORMATION

In the following section I will be asking you some general information about yourself

1.3 **Note respondent's gender**

1	Male	
2	Female	☐ 12

1.4 **How old are you in years?** ..... ☐☐ 13-14

1.5 **What is your home language?**

1	English	
2	Sotho	☐ 15

1.6 **What is your highest level of education?**

0	No schooling	
1	Some primary school	
2	Completed secondary school	
3	Some secondary school	
4	Completed secondary school	
5	Diploma/Degree	
6	Other (Specify)	☐ 16

BIOGRAPHICAL INFORMATION

In the following section I want to ask about your GENERAL state of health.

1.7 **How long ago were you diagnosed with HIV?**
..... Years ☐☐ 17-18

1.8 **Are you already on ART:**

1	Yes	
2	No	☐ 19

1.9 **If yes, how long were you on ART?**
..... Years ☐☐ 20-21

1.10 **When last were you screened for TB using 4 question screening tool (cough, weight loss, fever and night sweat?**

1	A month ago	
2	2 months ago	
3	Longer than 3 months ago	
4	Never screened for TB	☐ 22

1.11 **During the following questions, I will be asking you about TB preventive medication (IPT) which is a pill given to PLWHA to reduce their chances of developing TB. Have you ever/are you been on IPT?**

1	Yes	
2	No	23

1.12 **If yes, how long did you take it?**

..... Months 24

1.13 **If no, explain why?**

..... 25
..... 26
..... 27

PART II: KNOWLEDGE REGARDING IPT

2.1 **Indicate if the following statements are true, false or if you are unsure:**

	1	2	3		
1	T	F	U	HIV increases the risk of TB among HIV positive people	28
2	T	F	U	All HIV positive people are at risk of developing TB than those HIV negative	29
3	T	F	U	HIV positive people should be screened for TB regularly to exclude TB	30
4	T	F	U	IPT reduces changes of developing TB amongh PLWHA	31
5	T	F	U	IPT improves PLWHA health by reducing morbidity and mortality associated with TB	32
6	T	F	U	Side effects associated with IPT are preventable and manageable	33
7	T	F	U	IPT increases life expectancy among PLWHA	34

Normative beliefs

*The following questions are about what **you** believe **other people** believe about IPT:*

2.2 **Say if the statement is true, false or you are not sure:**

	1	2	3		
1	T	F	U	When immune system drops, the higher the chances to develop TB	35
2	T	F	U	Examination for TB in order to exclude amongh HIV positive people	36
3	T	F	U	IPT is given to HIV positive people who do not have signs (cough, weight loss, fever and night sweat) of TB	37
4	T	F	U	IPT reduces chances of developing TB	38
5	T	F	U	The more adherent I am on IPT, the more likely it would be to prevent TB	39
6	T	F	U	IPT has side effects	40
7	T	F	U	Immune boosters prevent TB among HIV positive people	41

Subjective norms

2.3 **The following questions are about what your family believes about IPT. Say if the following statements are tru, false or if you are unsure. In our family we believe that:**

	1	2	3		
1	T	F	U	HIV destroys immune system, putting PLWHA at risk of developing tB	42
2	T	F	U	IPT prevents TB among HIV positive people	43
3	T	F	U	IPT is given to PLWHA who do not have TB	44
4	T	F	U	Screening for TB excludes TB in people living with HIV	45
5	T	F	U	PLWHA who are on IPT experience side effects	46
6	T	F	U	PLWHA will have too many pills to take if they have to take IPT with all their other medication	47
7	T	F	U	Immune boosters make PLWHA healthy by preventing	48

Control beliefs

2.4 **Which illnesses are associated with TB preventive medication?**

..... ☐ 49
..... ☐ 50
..... ☐ 51
..... ☐ 52
..... ☐ 53

Perceived behaviour control

2.5 **Which illnesses are associated with TB preventive medication which can be prevent?**

..... ☐ 54
..... ☐ 55
..... ☐ 56
..... ☐ 57
..... ☐ 58

2.6 **Which illnesses are associated with TB preventive medication which cannot be prevented?**

..... ☐ 59
..... ☐ 60
..... ☐ 61
..... ☐ 62
..... ☐ 63

Attitude towards IPT

3.1 **Please indicated if the following statements are true, false or unsure:**

	1	2	3		
1	T	F	U	All PLWHA are at risk of developing TB	☐ 64
2	T	F	U	It is important to screen all PLWHA in order to exclude TB	☐ 65
3	T	F	U	It is important that IPT is given to all PLWHA who do not have signs of TB	☐ 66
4	T	F	U	I can reduce my chances of developing TB by taking IPT	☐ 67
5	T	F	U	Other people may know my HIV status just by taking IPT	☐ 68
6	T	F	U	TB can be prevented by African traditional medications	☐ 69
7	T	F	U	I cannot talk openly about my taking of IPT	☐ 70
8	T	F	U	I cannot take IPT because I am not sick	☐ 71
9	T	F	U	IPT reduces illnesses and deaths caused by TB among PLWHA	☐ 72
10	T	F	U	Use of IPT makes PLWHA live longer	☐ 73
11	T	F	U	For me to be healthy I will look for information about IPT	☐ 74
12	T	F	U	IPT can make a person feel bad or sick, making it difficult to take IPT medication	☐ 75
13	T	F	U	Increased availability of IPT makes PLWHA stop using other measures to prevent TB	☐ 76
14	T	F	U	I can recommend IPT to a friend	☐ 77
15	T	F	U	TB is more of a spiritual problem and prevention lies on the African spiritual methods	☐ 78
16	T	F	U	TB can be controlled and prevented among PLWHA through use of IPT	☐ 79
17	T	F	U	Every PLWHA should take responsibility to prevent TB by taking IPT	☐ 80
18	T	F	U	The endless process of IPT makes me feel bad and tired	☐ 81
19	T	F	U	IPT increases number of medication the PLWHA is taking especially those already on ART	☐ 82
20	T	F	U	I will educate my friends and family members about IPT as a method of preventing TB among PLWHA	☐ 83
21	T	F	U	I feel happy if the clinic makes sure that I do not have TB every month	☐ 84

Practices towards IPT

Intension

4.1 **Please indicated if you think the following sentences are true, false or unsure:**

	1	2	3		
1	T	F	U	Ask the nurse/doctor about TB medications for prevention of TB	85
2	T	F	U	Be examined for TB every month	86
3	T	F	U	Take TB preventive medication per nurse/doctors prescription	87
4	T	F	U	Report if feeling bad or sick while on IPT	88
5	T	F	U	Reduce alcohol intake while on IPT	89
6	T	F	U	Report any sign of TB when experiencing it while on IPT	90
7	T	F	U	Disclose my HIV status to people important to me	91

Actual behavioural control

4.2 **I have the practice means to:**

	1	2	3		
1	T	F	U	Ask the nurse/doctor about TB	92
2	T	F	U	Be examined for TB monthly	93
3	T	F	U	Take TB preventive medication per nurse/doctors prescription	94
4	T	F	U	Report if feeling bad or sick while on IPT	95
5	T	F	U	Reduce alcohol intake while on IPT	96
6	T	F	U	Report any sign of TB when experiencing it while on IPT	97
7	T	F	U	Disclose my HIV status to people important to me	98

Actual behavioural

4.3 **I have been able to:**

	1	2	3		
1	T	F	U	Ask the nurse/doctor about TB	99
2	T	F	U	Be examined for TB every month	100
3	T	F	U	Take TB preventive medication per nurse/doctors prescription	101
4	T	F	U	Report if feeling bad or sick while on IPT	102
5	T	F	U	Reduce alcohol intake while on IPT	103
6	T	F	U	Report any sign of TB when experiencing it while on IPT	104
7	T	F	U	Disclose my HIV status to people important to me	105

APPENDIX G2

Sesotho Questionnaire

LIPOTSO TSA BATHO BA PHELANG LE TSOAETSO EA HIV LE AIDS
Ba lilemo li 18 ho ea holimo

O botse feela batho ba: **Faneng ka tumello, ba lilemo li 18 ho ea holimo, ba phelang le tsoaetso ea HIV**

For Office Use

Litaelo – Etsa selikalikoe nomorong e fanoeng ele karabo kappa ngola karabo sebakeng se fanong

☐☐☐ 1-3 Interview number

1.1 **Lebitso la setsi** ..... ☐☐ 4-5

1.2 **Letsatsi leo lipotso li tlatsitsoeng ka lona ...../...../..... (dd/mm/yy)**

☐☐☐☐☐☐ 6-11
d d m m y y

LITABA TSA BOTHO BA HAO KA KAKARETSO

Karolo ena e tlo botsa lipotsa ka uena:

1.3 **Hlokemela boleng ba botho**

1	Botona
2	Botsehali

☐ 12

1.4 **u lilemo li kae?** ..... ☐☐ 13-14

1.5 **U bua puo ea leleme lefe?**

1	Sekhooa
2	Sesotho

☐ 15

1.6 **Boemo ba hao ba thuto ke bofeng?**

0	Ha ua ea sekolong ho hang
1	Ha ua qeta sekolo South Africa mathomo
2	U qetile sekolo South Africa mathomo
3	Ha ua qeta sekolo se phahameng
4	U qetile sekolo se phahameng
5	Lipoloma/Likharata
6	Seseng (hlalosa) .....

☐ 16

BOLENG BA BOPHELO BA HAO

Lipotso tse latelang li tlo bots aka bophelo ba hao ka kakaretso

1.7 **Ke nako e kae u phela le kokoana hloko ea HIV?**
..... Lilemo ☐☐ 17-18

1.8 **Na o noa litlhare (ARV):**

1	Ee
2	Che

☐ 19

1.9 **Haeba karebo ke ee, ke nako e kae u li noa?**
..... Lilemo ☐☐ 20-21

1.10 **Ke neng lekhetlo la ho qetela ho u ne u hlahlobeloa lefuba ho sebelisitsoe lipotso ka mats'oao a lona lefuba (ho khohlela, ho theoha boimeng, mocheso, ho fufuleloa bosiu)?**

1	Khoeli e fetileng
2	Khoeli tse 2 tse fetileng
3	Ho feta khoeli tse 3 tse fetileng
4	Ha ke eso hlahlobele lefuba

☐ 22

1.11 **Lipotso tse latelang li tlo bots aka litlhare tse thibelang lefuba bathing ba phelang le tsoaetso ea HIV. Na o kile oa noa lithlhare tse thibelang lefuba?**

1	Ee	
2	Che	23

1.12 **Haeba karabo ke ee, u li noele nako e kae?**
.....Likhoeli 24

1.13 **Haeba karabo ke che, hlalosa hore na hobanerng o sa li noa?**
..... 25
..... 26
..... 27

Mona ke tlo botsa lipotso mabapi le kutloisiso ea hae ka litlhare tse thibelang lefuba. Ha ho karabo efosahetseng kappa e nepahetseng, kutloisiso ea hau ke eona karabo.

LITHUMELO TSA HAU

2.1 **Bont'sa na lintlha tse latelang li nepahetse, fosahetse kappa ha u tsebe hantle:**

	1	2	3		
1	N	F	H	HIV e eketsa kotsi ea ho ba le lefuba ho batho ba phelang le tsoaetso ea eona	28
2	N	F	H	Batho bohle ba phelang le tsoaetso ea HIV ba kotsing ea ho ba le lefuba ho feta batho ba senang eona	29
3	N	F	H	Batho bohle ba phelang le tsoaetso ea HIV ba lokela ho hlahlobela lefuba khafetsa ele mokhoa oa ho le fumana kapele	30
4	N	F	H	Litlhare tse thibelang lefuba li fokotsa menyetla ea ho tsoaroa ke lefuba ho batho ba phelang le tsoaetso ea HIV	31
5	N	F	H	Litlhare tse thibelang lefuba li ntlafatsa maphelo a batho ba phelang le tsoaetso ea HIV ka ho fokotsa bokoli le mafu a amahangoang le lefuba	32
6	N	F	H	Litlamorao tsa litlhare tsea thibelang lefuba li ka thibeloa le ho laoloa	33
7	N	F	H	Litlhare tse thibelang lefuba li ekelitse litsiu tsa bophelo ho batho ba phelang le kokoana hloko ea HIV	34

Litumelo tsa setso sa hau

Lipotso tse latelang li bots aka tumelo ea hau le seo batho ba se lumelang ka litlhare tse thibelang lefung:

2.2 **Bots'a na lintlha tse latelang li nepahetse, fosahetse kappa ha u tsebe hantle:**

	1	2	3		
1	N	F	H	Ha sesole sa mmele se theoha, monyetla oa ho tsoaroa ke lefuba oa eketseha	35
2	N	F	H	Ho hlahlobela lefuba ho bontsa lefuba haeba le le teng ho batho ba phelang le tsoaetso ea HIV	36
3	N	F	H	Litlhare tse thibelang lefuba li fuoa batho ba phelang le tsoaetso ea HIV ba senang matsoao a lefuba	37
4	N	F	H	Litlhare tse thibelang lefuba li fokotsa monyetla ea ho ts'oaro ke lefuba	38
5	N	F	H	Ha ke noa litlhare tse thibelang lefube hantle, ke monyetleng oa ho thibela lefuba	39
6	N	F	H	Litlhare tse thibelang lefuba lina le litlamorao	40
7	N	F	H	Lintho tse nyollang sesole sa mmele li thibela lefuba ho batho ba phelang le tsoaetso ea lefuba	41

Litumelo tsa hau

2.3 **Bonts'a na lintlha tse latelang li nepahetse, fosahetse, kappa ha u tsebe hantle. Ke lumela hore:**

	1	2	3		
1	N	F	H	HIV e bolaea sesole sa mmele, ebe motho ea phelang le tsoaetso ea HIV o ba kotsing ea ho ba le lefuba	42
2	N	F	H	Litlhare tse thibelang lefuba li thibela lefuba ho batho ba phelang le tsoaetso ea HIV	43
3	N	F	H	Litlhare tse thibelang lefuba li fuoa batho ba phelang le tsoaetso ea HIV ba senang lefuba	44
4	N	F	H	Tlhatlhobelo ea lefuba ka ho botsa lipotso ka matsoao a lefuba eka bonts'a lefuba ha le le teng ho batho ba phelang le ts'oaetso ea HIV	45
5	N	F	H	Batho ba phelang le tsoaetso ea HIV ba noang litlhare tse thibelang lefuba b aba le litlamorao	46
6	N	F	H	Batho ba phelang le tsoaetso ea HIV ba litlhareng tse ling tsa bona b aka imeloa ke ho noa litlhare tse thibelang lefuba mmoho le tseo tse ling	47
7	N	F	H	Lintho tse nyollang sesole sa mmele li etsa hore batho ba phelang le tsoaetso ea HIV ba phele hantle ka ho thibela lefuba	48

Litumelo taolong ea tsebeliso ea litlhare tse thibelang lefuba

2.4 **Ke bokuli bofeng bo tlisoang ke litlhare tse thibelang lefuba?**

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..... 50
..... 51
..... 52
..... 53

Litumelo taolong ea tsebeliso ea litlhare tse thibelang lefuba

2.5 **Ke bokuli bofeng bo tlisoang ke litlhare tse thibelang lefuba tse ka thibeloang kappa ba laoloa?**

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..... 55
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..... 58

2.6 **Ke bokuli bofeng bo tlisoang ke litlhare tse thibelang lefuba bo ke keng ba thibeloa kappa ba laoloa?**

..... 59
..... 60
..... 61
..... 62
..... 63

Maikutlo

3.1 **Bonts'a na lintlha tse latelang li nepahetse, fosahetse, ha u tsebe hantle:**

	1	2	3		
1	N	F	H	Batho bohle ba phelang le tsoaetso ea HIV ba kotsing ea ho ts'oaroa ke lefuba	64
2	N	F	H	Ho bohlokoa hore batho ba phelang le ts'oaetso ea HIV ba hlahlobeloe lefuba khafetsa	65
3	N	F	H	Ho bohlokoa ho fa batho ba phelang le tsoaetso ea HIV ba senang lefuba litlhare tse thibelang lefuba	66
4	N	F	H	Nka fokotsa sekhahla sa ho ts'oaroa ke lefuba ka ho noa litlhare tse le thibelang	67
5	N	F	H	Batho b aka tseba boemo b aka ba HIV ka baka la ho noa litlhare tse thibelang lefuba	68
6	N	F	H	Lefuba le ka thibeloa ka litlhare tsa setso	69
7	N	F	H	Nkeke ka bua patlalla ka ho noa litlhare hoaka tse thibelang lefuba	70
8	N	F	H	Nkeke ka noa litlhare tse thibelang lefuba hobane ha ke kule	71

9	N	F	H	Ho thibela ho kula le ho lahleheloa ke bophelo ka lebaka la lefuba ho bohlokoa ho batho ba phelang le tsoaetso ea HIV ka hore ba noa litlhare tse le thibelang lefuba		72
10	N	F	H	Litlhare tse thibelang lefuba li etsa hore batho ba phelang le ts'oaetso ea HIV ba phele nako e telele		73
11	N	F	H	Hore ke thibele lefuba ke tla batla tsebo ka litlhare tse thibelang lefuba		74
12	N	F	H	Litlamorao tsa litlhare tse thibelang lefuba li ka etsa hore motho a ikutloe asa phela hantle, a kula, eleng ho etsang hore batho ba sitoe ho li noa		75
13	N	F	H	Ho fumaneha hoa litlhare tse thibelang lefuba ho etsa hore batho ba phelang le tsoaetso ea HIV ba tlohelle ho sebelisa mekhoea e meng ea thibelo ea lefuba		76
14	N	F	H	Nka khothaletsa motsoalle oaka ea phelang le ts'oaetso ea HIV ho noa litlhare tse thibelang lefuba		77
15	N	F	H	Lefuba ke bothata ba tumelo ea semoea mme ho thibeloa hoa lona ho holima mekhoa ea litumelo tsa se Africa		78
16	N	F	H	Lefuba le ka thibeloa le ho laoloa ho batho ba phelang le tsoaetsa ea HIV		79
17	N	F	H	Motho e mong le e mong ea phelang le tsoaetso ea HIV o lokela ho nka boikarabello ba ho thibela lefuba ka ho noa litlhare tse le thibelang		80
18	N	F	H	Methati e sa feleng ea ho noa litlhare tse thibelang lefuba e etsa hore ke ikutloe ke tenehile ebile ke khathetse		81
19	N	F	H	Litlhare tse thibelang lefuba li eketsa boima ba ho noa litlhare haholo ho batho ba se ba ntse ba noa tsa HIV		82
20	N	F	H	Ke tla ruta metsoalle le ba lelapa ka tsebeliso ea litlhare tse thibelang lefuba		83
21	N	F	H	Kea thaba ha setsi sa bophelo se etsa bonnete bah ore ha kena lefuba khoeli engoe le engo		84

Maikemisetso

4.1 **Bonts'a na lintlha tse latelang li nepahetse, fosahetse kappa ha u tsebe hantle. Ker era ho:**

	1	2	3			
1	N	F	H	Botsa mooki kappa ngaka ka litlhare tse thibelang lefuba		85
2	N	F	H	Hlahlobela lefuba nako eohle ha ke tlile litsebeletsong tsa bophelo		86
3	N	F	H	Noa litlhare tse thibelang lefuba ho latela lipehelo tsa mooki/ngaka		87
4	N	F	H	Tlaleha litlamorao tsa litlare tse thibelang lefuba ha ke ba le tsona		88
5	N	F	H	Theola ho noa jola ha ke ntse ke noa litlhare tse thibelang lefuba		89
6	N	F	H	Tlaleha mats'oao a lefuba ha keba le ona ha ke ntse ke noa litlhare tse thibelang lefuba		90
7	N	F	H	Joetsa batho ba bohlokoa ho nna ka boemo b aka ba HIV		91

Maitsoaro a etsahetseng

4.2 **Ke tla khona ho:**

	1	2	3			
1	N	F	H	Botsa mooki/ngaka ka litlhare tse thibelang lefuba		92
2	N	F	H	Hlahlobela lefuba nako eohle ha ke tlile litsebeletsong tsa bophelo		93
3	N	F	H	Noa litlhare tse thibelang lefuba ho latela lipehelo tsa mooki/ngaka		94
4	N	F	H	Tlaleha litlamorao tsa litlare tse thibelang lefuba ha ke ba le tsona		95
5	N	F	H	Theola ho noa jola ha ke ntse ke noa litlhare tse thibelang lefuba		96
6	N	F	H	Tlaleha mats'oao a lefuba ha keba le ona ha ke ntse ke noa litlhare tse thibelang lefuba		97
7	N	F	H	Joetsa batho ba bohlokoa ho nna ka boemo b aka ba HIV		98

Maitsoaro

4.3 **Ke khonne ho:**

	1	2	3			
1	N	F	H	Botsa mooki/ngaka ka litlhare tse thibelang lefuba		99
2	N	F	H	Hlahlobela lefuba nako eohle ha ke tlile litsebeletsong tsa bophelo		100
3	N	F	H	Noa litlhare tse thibelang lefuba ho latela lipehelo tsa mooki/ngaka		101
4	N	F	H	Tlaleha litlamorao tsa litlare tse thibelang lefuba ha ke ba le tsona		102
5	N	F	H	Theola ho noa jola ha ke ntse ke noa litlhare tse thibelang lefuba		103
6	N	F	H	Tlaleha mats'oao a lefuba ha keba le ona ha ke ntse ke noa litlhare tse thibelang lefuba		104
7	N	F	H	Joetsa batho ba bohlokoa ho nna ka boemo b aka ba HIV		105

APPENDIX H

Questionnaire Quideline

KNOWLEDGE, ATTITUDES AND PRACTICES RELATED TO ISONIAZID PREVENTIVE THERAPY OF ADULT LIVING WITH HIV AND HIV IN BEREA DISTRICT, LESOTHO	
1.	Before the interview starts, explain to the participant that the information he or she will be giving will assist in improving the care of people living with HIV and AIDS, and that the questionnaire will take about 25 – 30 minutes to complete.
2.	Make sure that the participant has signed the informed consent form and has received the information document before you start the interview.
3.	Make sure that all questions are answered.
Question - by question guide:	
Instructions: Below are questions found in the IPT related knowledge, attitudes and practices questionnaire.	
The instructions are not supposed to be read to the participants. Be familiar with this question-by-question guide, so you understand what each question is asking.	
Ensure that the questionnaire has an interview number.	
1.1	Write the name of the hospital
1.2	Write the date the questionnaire is completed
PART 1: DEMOGRAPHIC INFORMATION	
1.3	Note the participant's gender: Make a tick in the block indicating male or female.
1.4	How old are you in years? Ask the participant what is his or her current age in years.
1.5	What is your home language? Ask the participant which language they are speaking at home. If they are speaking more than one, tick both.
1.6	What is your highest level of qualification? Ask the participant which class did he or she complete at school. If he or she has completed high school ask whether he or she has any diplomas or degrees. Make a tick in the appropriate box.
Biographical information	
Read the introductory statement aloud and then ask the questions.	
1.7	How long ago were you diagnosed with HIV? We would like to know the period or length of time you have known that you are HIV positive. Write the period in months or years on the space provided.

1.8	Are you on ART? We would like to know if you are taking treatment for HIV and AIDS.
1.9	If yes, how long were you on ART? We would like to know the period the client had been taking treatment for HIV/AIDS. Write the period in months or years on the space provided.
1.10	When last were you screened for TB using 4 question screening tool (cough, weight loss, fever and night sweat)? We would like to know the last time the patient was asked if he/she has one of the following signs of TB: cough, weight loss, fever and night sweat. Tick the appropriate box.
1.11	Have you ever been on IPT? Want to know if the patient had taken medication for TB prevention. Tick yes or no. If he/she proceed to 1.12 and if no skip 1.12 and go to 1.13.
1.12	If yes, how long did you take it? We would like to know the time period in months the patient took TB medication for prevention of TB
1.13	If no, explain why? Want to know the reasons that contributed to the patient for not taking medications for treatment of TB. Write the exact words of the patient as she/he said on the space provided.
PART 11: KNOWLEDGE REGARDING IPT	
Behavioural beliefs	
2.1	Indicate whether the following statements are true, false or if you are unsure. The participant must indicate for each statement if he or she thinks this statement is true or false. If the participant is unsure about the answer, tick unsure. Ask one question at a time and allow the participant to make up his mind before proceeding to the next question. Also ask the participant to stop at any point in the interview if he or she does not understand any question.
1.	HIV increases the risk of TB among HIV positive people. We would like to know the participant's understanding of the relationship between HIV and TB among HIV positive people.
2.	All HIV Positive people are at risk of developing TB than those HIV negative. We would like to know the participant's understanding of the impact of TB among HIV positive people compared to those HIV negative.

	3. HIV positive people should be screened for TB regularly to exclude TB. We would like to know the participant's understanding on the importance of excluding TB through screening.
	4. IPT reduces chances of developing TB among PLWHA. We would like to know if the participant understands that chances of developing TB could be reduced by taking TB preventive medication.
	5. IPT improves PLWHA health by reducing morbidity and mortality associated with TB. Would like to know if the participant understand that TB preventive medication could improve their lives by reducing illness and death due to TB.
	6. Side effects associated with IPT are preventable and manageable. If participant understand that side effect due to TB preventive medication could be prevented and managed.
	7. IPT increases life expectancy among PLWHA. Would like to know if participant understand that TB preventive medication can make them live longer as their lives were improved by preventing TB.
Normative beliefs	
2.2	The following questions are about what you believe other people believe about IPT. Say if the statement is true, false or you are unsure.
	1. When immune system drops, the higher the chances to develop TB. We would like to know whether the participant believes that when a person gets weak he/she will develop TB.
	2. TB screening exclude TB among HIV positive people. We would like to know if the participant believes that being asked if she/he has signs of TB could assist in making a decision about whether the person has TB or not.
	3. IPT is given to HIV positive people who do not have symptoms of TB. We would like to know if the participant believes that IPT is given to PLWHA who do not have TB.
	4. IPT reduces chances of developing TB. Would like to know if the participant believes IPT reduces the chances of developing TB.
	5. The more adherent I am on IPT, the more likely it would be to prevent TB. Would like to know if the participant believes that taking IPT as prescribed would work effectively in preventing TB.

6. IPT has side effects. Would like to know if the participant believes that IPT has side effects
7. Immune boosters prevent TB among HIV positive people. Would like to know if the participant believes that immune boosters prevent TB among HIV positive.
Subjective norms.
2.3 The following questions are about your family's beliefs about oral health. Say if the following statements are true, false or unsure.
In our family we believe that.....
1. HIV destroys immune system, putting PLWHA at risk of developing TB. We would like to know if the participant's family believe that HIV destroys immune system, putting PLWHA at risk of developing TB.
2. IPT prevents TB among HIV positive people. We would like to know if the participant's family believes that IPT or TB preventive medication can prevent TB PLWHA.
3. IPT is given to PLWHA who do not have TB. We would like to know if the participant's family believes that IPT is given to PLWHA who do not have TB.
4. Screening for TB excludes TB in people living with HIV. We would like to know if the participant's family believes that TB screening could exclude TB from PLWHA.
5. PLWHA who are on IPT experience side effects. We would like to know if the participant's family believes that IPT side effects affect PLWHA who take it.
6. PLWHA who are on other medication experience pill burden. We would like to know if the participant's family believes that IPT increases pill burden among PLWHA who are on other medications such as ARVs.
7. Immune boosters make PLWHA healthier by preventing TB making them healthy. We would like to know if the participant's family believes that immune boosters prevent TB by making PLWHA healthy.
Control beliefs
2.4 What side effects can an HIV positive person have when using preventive medication (IPT) for TB? We would want to know the IPT side effects the participant is aware of.

Perceived behavioural control
Indicate if the following statements are true, false or if you are unsure. Here we would like to know if the participant believes he or she can control his/her TB status through use of IPT.
2.5 Which side effects can an HIV positive person who is using preventive medication for TB can prevent? We would want to know if a PLWHA who is taking IPT is aware of the side effects that could be prevented.
2.6 Which side effects can an HIV positive person who is using preventive medication for TB cannot prevent? We would want to know if a PLWHA who is taking IPT is aware of the side effects that he/she cannot prevent.
PART 111: ATTITUDES REGARDING IPT.
3.1 Tell me if you think the sentences I am saying are true, false or if you are unsure. In the following 21 statements the participant must indicate her/his feelings about them.
1. All PLWHA are at risk of developing TB. Here, we would like to know if the participant is aware that HIV is the risk factor for TB.
2. It is important to screen all PLWHA in order to exclude TB. We would like to know if the participant considers TB screening important in excluding TB
3. IPT should be given to all PLWHA who do not have symptoms of TB irrespective of their CD4 count. Would like to know if participant is aware that IPT is given only to people who do not have TB.
4. I can reduce my chances of developing TB by taking IPT. Would like to know if participant feels that he can reduce chances of developing TB by taking IPT
5. Other people may know my HIV status just by taking IPT. Would like to know if participant thinks taking IPT can disclose her/his HIV status.
6. TB can be prevented by African traditional medications. Would like to know if participant thinks TB can be prevented by taking traditional medications.
7. I cannot talk openly about my taking of IPT. Would like to know if participant can disclose that he/she is taking IPT.
8. I cannot take IPT because I am not sick. Would like to know if participant thinks IPT is taken by sick people.

9. Reducing morbidity and mortality due to TB among PLWHA through use IPT is important. Would like to know if participant thinks it is important to reduce illness and death caused by TB among HIV positive people by taking IPT.
10. Increasing PLWHA life expectancy through use of IPT is good. Would like to know if participant thinks it is good to increase life expectancy of PLWHA by taking IPT.
11. For me to be healthy, I will have to look information about IPT. Would like to know if participant thinks there is need to have information about IPT so that he /she can use it to keep himself/herself healthy by preventing TB.
12. IPT side effects make it difficult to take it. Would like to know if participant thinks that IPT is associated with side effects that prevent him/her from taking it.
13. Increased accessibility of IPT makes PLWHA stop using other measures to prevent TB. Would like to know if participant thinks that availability of IPT at points of care can make PLWHA stop using other measures to prevent TB.
14. I can recommend IPT to a friend. Would like to know if a participant can mobilize her/his friend to take IPT.
15. TB is more of the spiritual problem and prevention lies on the African spiritual methods. Would like to know if participant thinks that TB is a spiritual problem which can be prevented by spiritual methods.
16. TB can be controlled and prevented among PLWHA through use of IPT. Would like to know if participant thinks TB can be prevented by sue of IPT.
17. Every PLWHA should take responsibility to prevent TB by taking IPT. Would like to know if participant beliefs that TB prevention is PLWHA responsibility by making sure that they take IPT.
18. The endless process of IPT makes me feel bad and tired. Would like to know if participant can cope with requirements associated with IPT, such as monthly clinic check-ups, daily taking of IPT
19. IPT increases pill burden among PLWHA especially those already on ARVs. Would like to know if participant thinks taking IPT can increase number of pill taken by person each day, resulting in pill burden especially among those who are already on ARVs.

20. I will educate my friend and family members about IPT as a method of preventing TB among PLWHA. Would like to know if a participant can mobilize his/her family to take IPT in order to prevent TB.
21. I feel bad if I am not screened for TB monthly. Would like to know if participant likes to be screened, if not he/she becomes unhappy.
PART IV: PRACTISES REGARDING IPT.
Intention
4.1 Tell me if you think the sentences I am saying are true, false of if you are unsure. Here, we would like to know what the participant intends to do to in order to prevent TB.
I plan to.....
1. Ask the nurse/doctor about TB medications for prevention of TB (IPT).
2. Be screened for TB every month or regularly
3. Take TB preventive medication per nurse/doctor prescription.
4. Report adverse effects of IPT.
5. Reduce alcohol intake while on IPT.
6. Disclose my HIV status to people important to me.
Actual behaviour
4.2. Here we would like to know the definite behaviour that you will put into action. In this question, practical refers to what the participant knows he or she will be able to afford in reality. The participant must answer true, false or unsure.
I have the practical means to:
1. Ask the nurse/doctor about TB medications for prevention of TB.
2. Be screened for TB monthly/regularly.
3. Take IPT per nurses/doctor prescription.
4. Report side effects should I be on IPT.
5. Report any symptom of TB should I be on IPT.
6. Report side effects should I be on IPT.
7. Disclose my HIV status to people important to me for their support should I be on IPT.

Behaviour

4.3 Here we would like to know what you have been able to do in the past. The participant must answer true, false or unsure.
I have in the past been able to:
1. Ask the nurse/doctor about TB medications for prevention of TB.
2. Be screened for TB every month.
3. Report immediately any side effects associated with IPT.
4. Take IPT daily for six months, as per nurse/ doctor prescription.
5. Reduce alcohol intake while on IPT.
6. Report any symptoms of TB when I experience them.
7. Disclose my HIV status to people important to me for their support should I be on IPT.

APPENDIX I

Journal Author Quidelines

AFRICAN JOURNAL OF AIDS RESEARCH

Instructions to Authors

African Journal of AIDS Research (AJAR) publishes papers that make an original contribution to the understanding of the social dimensions of HIV and AIDS in African contexts. AJAR will publish research articles of 5 000 to 7 500 words and short communications of 3 000 words. Review papers will be considered only if they make an original conceptual or theoretical contribution to the field. Invited book reviews are also published.

Editorial policy: Submission of a manuscript implies that the material has not previously been published, nor is it being submitted elsewhere for publication. Contributors are accepted with the understanding that the authors have the authority for publication. Submission will be taken to imply transfer of copyright of the material to the publishers, NISC (Pty) Ltd. Contributions must conform to the principles outlined in Ethical Considerations in Research Publication available on the Journal's Instructions to Authors webpage*.

Papers submitted to AJAR will be reviewed by two appropriately qualified and experienced referees to ensure that all articles accepted for publication are methodologically and conceptually sound and make an original contribution to the field. The journal adheres strictly to a double blind review process. The final decision to accept a manuscript rests with the Editor-in-Chief.

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Submission: Manuscript submissions should be made online at the *African Journal of AIDS Research* ScholarOne Manuscripts site at https://mc.manuscriptcentral.com/tandf. New users should first create an account. Once a user is logged onto the site, submissions should be made via the Author Centre. Manuscripts must adhere to the format criteria described below, and papers failing to do so will be returned to authors to be corrected before being reviewed. Authors can make use of a language editing service to ensure that the presentation of their work is of an appropriate standard for submission (see Journal's Instructions to Authors webpage* for details of suitable editing services).

Manuscript presentation: Submitted manuscripts should contain the following sections, each in separate files:

Title page: The title (max. 20 words) should be a concise description of the article content. Author names must appear only on the title page. This page should also include each author's names (full first name and surname), each author's full institutional affiliation, the e-mail address of the designated corresponding author. Recommended, but not required, are short biographical notes for the authors (highest academic degree, work experience, research interest) and/or any acknowledgements.

Abstract: This should include the title of the paper and an abstract. The abstract is a concise statement of the scope of the work, the principal findings and the conclusions and should not exceed 250 words. It should not contain references. Below the abstract, up-to eight additional keywords or phrases (which are not already given in the title) should be listed in alphabetical order. Short communications also require brief abstracts (max. 150 words).

Main text: All papers should include Introduction and Conclusions sections, but given the diverse range of papers that might be published in AJAR, we do not prescribe a standard format for the middle section.

Format – Manuscripts should be prepared in MSWord. The headings and text should be presented in <b>plain Arial or Calibri font. The text should use 1.5 line spacing, with no extra line spacing, and should not include text columns, creative formatting or additional fonts. Headings should be sentence case and never numbered. There should be no more than three heading levels: (1) bold, (2) bold italics, (3) italics. Endnotes, not footnotes, may be used sparingly. Tables and figures (graphs, photographs or scanned images) should not be part of the text but prepared as separate files.

Editorial style – Manuscripts should be written in clear English (UK spelling). Consult the Oxford English Dictionary for spelling, capitalisation, hyphenation and abbreviation conventions. Consult a copy of the journal for general style conventions. Double quotation marks and regular font should be used to designate material quoted directly from other texts. Direct speech should be italicised. Use single quotation marks to signify a quote embedded within another quotation. Double quote marks and italic font should be used to denote informants' quotes. The period (.) must be used as the decimal indicator, and 'thousands' should be designated by a space rather than a comma (Example: 1 200 000). Conventions on presenting mathematical and statistical data are outlined in Guidelines for the presentation of mathematical and statistical data and available from the Journal's Instructions to Authors webpage*.

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Cockerham, W. C. (2000). The sociology of health behaviour and health lifestyles. In Bird C, Conrad P, & Fremont A. (Eds.), *Handbook of Medical Sociology*. (pp. 159–172). Upper Saddle River, NJ: Prentice-Hall.

Klopper, C., Stellenberg, E., & van der Merwe, A. (2014). Stigma and HIV disclosure in the Cape Metropolitan area, South Africa. *African Journal of AIDS Research*, 13(1), 37–43. http://dx.doi.org/10.2989/16085906.2014.889909

Silaigo, S., Nkambule, R., Peterson, I., Reed, J., Donnell, D., Ginindza, H., ... Justman, J. (2010). Recent patterns in population-based HIV prevalence in Swaziland. *PLoS One*, 8(10), e77151. http://dx.doi.org/10.1371/journal.pone.0077151

World Health Organization. (2014, May). Swaziland: health profile. http://www.who.int/gho/countries/swz.pdf?ua=1 (accessed Jan 17, 2014).

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APPENDIX J

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