

**A MODEL TO ENSURE THE INTEGRATION OF TUBERCULOSIS AND HUMAN
IMMUNODEFICIENCY VIRUS SERVICES IN THE PRIMARY HEALTH CARE
FACILITIES OF LIMPOPO PROVINCE**

by

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DECLARATION

I, **Mphele Agnes Maake** declare that the thesis, “**A model to ensure the integration of Tuberculosis and Human Immunodeficiency Virus services in the Primary Health Care facilities of Limpopo Province**” hereby submitted for the degree Doctor of Philosophy in Nursing Science in the University of Limpopo has not previously been submitted by me for a degree at this or any other university, that it is my own work in design and in execution, and that all material contained herein has been duly acknowledged.

Mphele Agnes Maake:

Date signed :

DEDICATION

The study is dedicated to my husband, Masilo Jeremia Maake, and my children Popolo, Matapa and Bochilu. My brothers, Andrew and Dipolelo; and my younger sister Bakgopisie Mumcy for their great continuous support, abundance of love and understanding during my studies. I also dedicate this study to my mother Josephine Mphogo and my mother in law Mabotse Elizabeth Maake for their love, prayers and always being there for me when I need them. TB/HIV co-infected patients in the five districts of Limpopo Province for participating in the focus group discussions. May God shower them with lots of blessings.

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ABSTRACT

The aim of this study was to develop a model to ensure the integration of Tuberculosis (TB) and Human Immune Deficiency Virus (HIV) services in the Primary Health Care (PHC) facilities of Limpopo Province. An explanatory sequential mixed method was used in this study to develop a model for ensuring the integration of TB and HIV services in the PHC facilities of the Limpopo Province. The researcher collected quantitative data followed by qualitative data. Quantitative data was collected through administration of questionnaires to 450 PHC nurses in the five districts of Limpopo Province. The qualitative data was collected by conducting focus group discussions to five groups of Community Home Based Carers (CHBCs) and five groups of TB/HIV co-infected patients in the five districts of Limpopo Province. Audiotape and field notes were used to capture verbal and non-verbal cues. The Statistical Package for Social Sciences (SPSS) computer programme version 22.0 was used for capturing and analysis of the quantitative data. Content analysis was used to analyse the qualitative data from the CHBCs and the TB and HIV co-infected patients' focus group discussions.

The study revealed lack of knowledge and skills on TB and HIV management due to insufficient training of PHC nurses about TB and HIV management. Staff shortage of PHC nurses in the facilities was also indicated by PHC nurses. Furthermore, TB and HIV co-infected patients are faced with challenges in the PHC facilities and in the community. Challenges that are faced by CHBCs and the TB and HIV co-infected patients include negative attitudes of some clinic staff members towards them. The patients' families also have some negative attitudes towards the CHBCs as they leave the patients to them without assisting them in the caring duties. The community members also has negative attitudes as they do not accept the CHBCs in their homes to support the patients.

Based on the results, a model was developed to ensure the integration of TB and HIV services. The model was validated by PHC nurses and the experts in research and model development. The validation results showed that the model was clear and simple to be used in the PHC facilities for integration of TB and HIV services.

The study recommends that the model should be used by PHC facilities for integration of TB and HIV services. The PHC nurses should attend TB and HIV capacity-building courses.

Key words: Tuberculosis, Human immune Virus, Primary Health Care nurses, Primary Health Care facilities, Model, Integration, TB/HIV co-infection.

LIST OF ABBREVIATIONS

ACSM	Advocacy Communication and Social Mobilization
AIDS	Acquired Immunodeficiency Syndrome
ARV	Anti Retro Viral
ART	Antiretroviral treatment
BTBC	Bureau of Tuberculosis Control
CBO	Community Based Organization
CHBC	Community Home Based Carers
CPT	Cotrimoxazole Preventive Therapy
DOH	Department of Health
DOTS	Direct Observed Treatment Short Course
HAST	HIV and AIDS, STIs and TB
HCT	HIV counseling and testing
HIV	Human Immunodeficiency Virus
IPT	Isoniazid Preventive Therapy
MDGs	Millennium Development Goals
MDR-TB	Multidrug Resistant-Tuberculosis
NGO	Non-Governmental Organization
NTCP	National TB Control Programmes
PCP	Pneumocystis Pneumonia
PHC	Primary Healthcare
PLWHA	People Living with HIV/AIDS
PMTCT	Prevention of Mother to Child Transmission
STIs	Sexually Transmitted Infections
SDGs	Sustainable Development Goals
TB	Tuberculosis
WHO	World Health Organization
XDR-TB	Extreme Drug Resistant- Tuberculosis

DEFINITION OF CONCEPTS

- **Adherence**

According to Kagee (2004), adherence means taking drugs exactly as they are prescribed. In this study adherence refers to TB/HIV co-infected patients taking treatment as prescribed at the correct time for the correct period.

- **Professional nurse**

According to the Nursing Act No 33 of 2005, Section 30(1), a professional nurse is a person who is qualified and competent to independently practice comprehensive nursing in the manner and to the level prescribed and who is capable of assuming responsibility and accountability for such practice. In this study a professional nurse is a person employed in the Primary Health Care facilities who takes care of people who are infected with TB and HIV.

- **Integration**

According to Dorland's Medical Dictionary (2007), integration is the state of combination or the process of combining into completeness and harmony. In this study integration refers to diagnosis and treatment of TB and HIV in the same consulting room by the same Primary Health Care nurse. According to WHO (2016), integration is "The organization and management of health services so that people get the care they need, when they need it, in ways that are user friendly, achieve the desired results and provide value for money".

- **Primary Health Care (PHC)**

Primary healthcare is essential care made universally accessible to individuals and families, through their full participation at an affordable cost so that at the end they become self-reliant and maintain self-determination (Dennil, King & Swanepoel, 2007). In this study primary healthcare is regarded as the first level of care within the community where people with TB and HIV co-infection receive care, treatment and support from their families and community health care workers.

- **Primary Health Care facility**

According to the KwaZulu-Natal Department of Health (2001), a Primary Health Care facility is a facility at and from which a range of Primary Health Care services are provided and that is open eight or more hours a day based on the needs of the community to be served. In this study a Primary Health Care facility is a clinic or Health Care Centre that offers treatment, care and support of the TB/HIV co-infected patients.

- **TB/HIV co-infection**

The Geneva Health Forum (2014) defines TB/HIV co-infection as the existence of two disease entities together in a particular patient at the same time. In this study TB/HIV co-infection refers to the patients who are suffering from both TB and HIV at the same time.

- **Model**

A model is a symbolic depiction of reality which provides a schematic representation of some relationships among phenomena and uses symbols or diagrams to represent an idea (Brink 2012). For the purpose of this study a model refers to a schematic presentation of the integration of TB and HIV service in Limpopo province.

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CHAPTER 1

OVERVIEW OF THE STUDY

1.1 Introduction and background

Limpopo Province reported a high Tuberculosis (TB) and Human immunodeficiency virus (HIV) co-infection rate of 94.9% during 2014/2015 financial year, 13 884 out of 14 623 TB patients had HIV as reported by the District Information System (DHIS) and the Electronic TB register (ETR.net) (Department of Health, 2015). The Primary Health Care (PHC) nurses received the training on diagnosing, treatment, care and management of the TB and HIV. The training included education of patients on self-protection against contracting HIV and TB. Irrespective of strategies put in place, the TB/HIV co-infection rate remains high and was reported to be at 64.3% in the 2015/2016 financial year which is 11 059 out of 17 180 (Department of Health, 2016).

The death rate associated with TB is 64.2% because out of 8 754 TB patients 5 603 died which brought the death rate to 77.0 deaths per 100,000 populations in South Africa (Statistics South Africa, 2008). Statistics South Africa (2008) also reported that TB was the highest reported condition in all the deaths recorded in 2008. According to Statistics South Africa (2008), people living with HIV have an estimated 20 to 30 times greater risk of developing TB than people without HIV infection. HIV is therefore the biggest risk factor for developing TB. Research conducted about HIV and TB co-infection show that the clinical features of the patients are more likely to include extra pulmonary Tuberculosis and Miliary TB. TB is a critical health problem and estimated by the WHO to be among the leading cause of death and disability (Sterling, Pham & Chiasson, 2010).

South Africa experiences challenges regarding TB control and management due to the escalating rates of HIV and AIDS that fuel TB. This could be due to inadequate implementation of the Directly Observed Treatment Short Course (DOTS) strategy, low smear conversion rates, poor referral systems of patients particularly from

hospitals to clinics, and poor compliance with the National Guidelines (Health Systems Trust, 2005).

The HIV and AIDS epidemic has been accompanied by a severe epidemic of TB worldwide. TB is the major medical complication and the cause of death among people with HIV & AIDS in poor countries, particularly the Eastern and Southern African countries such as South Africa and Lesotho. South Africa has a co-infection rate of 71% with the high TB case load in Kwa-Zulu Natal (UNAIDS,2008; WHO, 2008c).

In a survey of TB drug resistance conducted by the Medical Research Council (MRC) in South Africa in 2001 - 2002, it was found that 52.4% of culture positive TB patients in Limpopo Province were also infected with HIV. More than 50% of patients were younger than 35 years, indicating the impact of HIV on TB incidence in the Province Natal (WHO, 2008c).

Responding to the challenges identified, there is a need to implement interventions to reduce HIV- related TB morbidity and mortality through collaborative TB and HIV activities. This involves the creation of joint National TB and HIV coordinating bodies that include TB and HIV patient-support groups, the development and implementation of a joint National Plan, HIV surveillance among TB patients and a system of monitoring and evaluation (Department of Health, 2006).

Strategies such as provision of National TB/HIV Guidelines to facilities and implementation of the DOTS strategy to ensure patients' adherence to treatment were implemented to fight TB and HIV at National level. The Stop TB strategy and the Global Plan to Stop TB were launched in January 2006 at the World Economic Forum in Davos, Switzerland (WHO, 2008b).

Primary Health Care nurses and Community Home Based Carers (CHBC) of Limpopo Province were trained about the treatment, care and support of the TB and HIV infected patients. Isoniazid Preventive Therapy (IPT) initiation to eligible HIV positive patients was included in the trainings. Awareness campaigns are also conducted in communities in the form of radio talks, television talks, door-to-door

campaigns and formal organised events. Health education sessions at facilities to groups of patients, one-to-one education of patients in the patient's consultation rooms were conducted but the TB/HIV co-infection remains high.

1.2 Research problem

South Africa is one of the countries with the highest number of people infected with HIV and also one of the countries with high TB incidence rates worldwide. According to World Health Organization (WHO, 2008a), South Africa ranks third highest in the world in TB burden. An estimated 71% of TB patients are co-infected with HIV in South Africa. Kwa-Zulu Natal Province has the highest number of TB patients who are infected with HIV in South Africa. From 2009, South Africa accelerated the response to HIV epidemic through scaling up of HIV services. TB services were slower because only 26% of TB patients were tested for HIV (WHO, 2009c).

Isoniazid Preventive Therapy appeared to be effective in preventing active TB in people living with HIV. Isoniazid Preventive Therapy is recommended by National Guideline in South Africa for all people living with HIV where TB has been ruled out. In 2010 South Africa reported 760 000 HIV infected people having screened for TB and only 120 000 of these people started on IPT (Department of Health, 2010).

The WHO formulated policies to guide the whole world on how to reduce TB/HIV co-infection (Department of Health, 2010).

- Training of PHC nurses on diagnosis of TB and HIV as well as treatment of TB and HIV positive patients.
- Training of CHBCs on TB and HIV patients care and support.
- Conducting Advocacy Communication and Social Mobilization (ACSM) which is the information strategy to capacitate communities with knowledge of disease prevention, treatment and self-care as well as care of others.
- Prevention strategies such as Isoniazid Preventive Therapy (IPT) to HIV positive patients to prevent development of TB.

Despite the implementation of the WHO policies in Limpopo Province, there are still increasing numbers of TB and HIV co-infection.

1.3 Conceptual framework

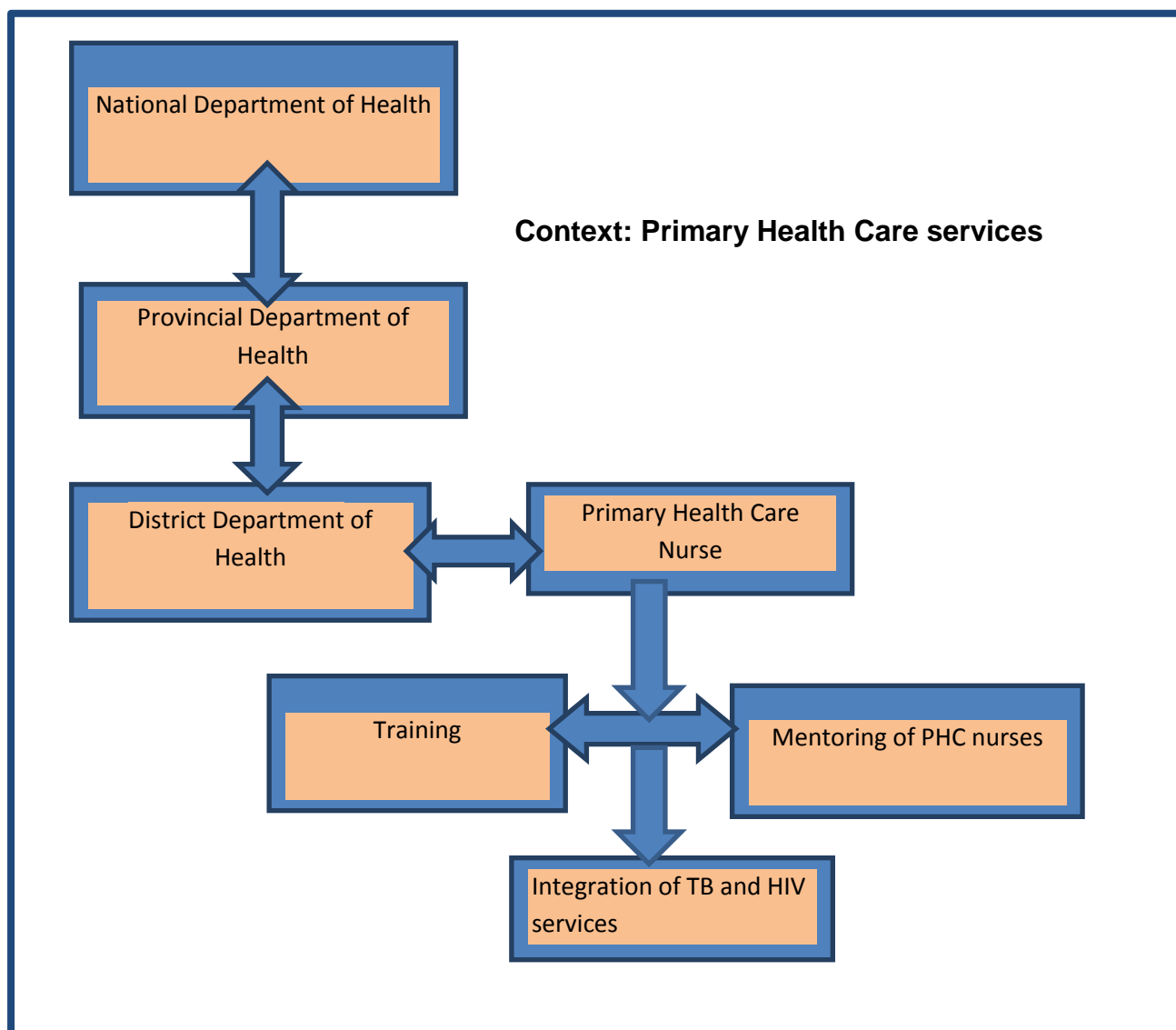


Figure 1.1: Schematic presentation of the field of investigation and focus of this study

Figure 1.1 shows the context of the study and the concepts related to the study. The blocks indicate the hierarchical order of the field of investigation in this study. This is the two-way process of communication in the management, treatment and care of TB/HIV co-infected patients. The top block indicates the National Department of Health which develops policies and guidelines. The policies and guidelines are

adopted by the Provincial Department of Health, and distributed to the district offices. The district offices distribute the guidelines to PHC facilities. Before the implementation, PHC nurses are trained in order to provide them with the knowledge and skills of how to implement the policies and guidelines. Provincial and district managers conduct support visits for Monitoring and Evaluation of TB/HIV services in the PHC facilities. The National Department of Health receives the feedback from the facilities through the Provincial offices which have direct communication with National Department of Health through reports and meetings. Reports are compiled by professional nurses at PHC facilities and submitted to the districts. Thereafter, the districts submit to the Provincial Department of Health which then submits to the National Department of Health.

In this study the core role players are PHC nurses who are expected to implement the strategies set by the National Department of Health and Provincial department on how to integrate TB and HIV services. An example of the Policy guideline set by the National Department of health is the IPT guideline which directs professional nurses on how to prevent TB in HIV positive patients. CHBCs are also involved as they receive training from nurses so that they can in turn give health education to patients and their families in the communities on how to prevent the spread of TB and HIV.

Guidance and onsite in-services are conducted to PHC nurses during the Monitoring and Evaluation visit. The last block indicates integration of TB and HIV services in the PHC facilities. The two-way arrows indicate two-way communication at all levels of service starting from National Department of Health, the Province, the District and the PHC facilities.

1.4 Aim of the study

The aim of the study was to develop a model to ensure integration of TB and HIV services in the PHC facilities of Limpopo Province.

1.5 Research question

What model can be developed to ensure integration of TB and HIV services in the PHC facilities of Limpopo Province?

1.6 Objectives of the study

- To determine the PHC nurses' knowledge and skills on management, care and treatment of TB/HIV co-infected patients in Limpopo Province.
- To identify the challenges faced by CHBCs regarding care and support of the TB/HIV co-infected patients in Limpopo province.
- To explore the experiences of TB/HIV co-infected patients regarding the TB/HIV services in Limpopo province.
- To develop a model to ensure integration of TB and HIV services in Limpopo Province
- To validate the model for TB/HIV services integration.

1.7 Overview of the research methodology

An explanatory sequential mixed method was used in this study to develop a model for ensuring effective integration of TB and HIV services in the PHC facilities of Limpopo Province. The researcher collected quantitative data followed by qualitative data. Quantitative data was collected through administration of questionnaires to 450 PHC nurses in the five districts of Limpopo Province.

The qualitative data was collected by conducting focus group discussions to five groups of CHBCs and five groups of TB/HIV co-infected patients in the five districts of Limpopo Province. Interview guides and the audiotapes were used to collect data. The Statistical Package for Social Sciences (SPSS) computer programme version 22 for Windows was used for management and analysis of quantitative data and content analyses was used for qualitative data analysis. Based on the results, a model was developed and validated. The details of the research methodology are discussed in chapter 3.

1.8 Significance of the study

The study will guide policy makers in the Department of Health in Limpopo Province to review the policies regarding the implementation of TB and HIV management. The research results may serve as a research resource for the different components of TB and HIV integration. It will assist other researchers as a baseline and background information which may form the basis for further research in TB and HIV integration. The TB and HIV services integration model will enable PHC nurses to integrate the

TB and HIV services at the same time in the same consulting room by one PHC nurse. This integration of TB and HIV services will encourage patients' adherence to treatment.

1.9 Conclusion

This chapter introduced the background of the study, the research problem, conceptual framework, aim of the study, purpose of the study, the research question, objectives of the study and the overview of the research methodology. The significance of the study was briefly described. Chapter 2 will discuss the literature reviewed for the study.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter provides the background information about TB and HIV and the overview of the literature reviewed on TB/HIV co-infection, TB and HIV Integration and TB/HIV integration models. A broad review of relevant publications such as the latest article peer-reviewed journal articles extracted from the internet and books from the library about TB and HIV integration and models was conducted. The main objective of this review of literature was to explore how other countries are managing TB and HIV and benchmarking on the good practices that can be implemented in Limpopo Province to improve the TB and HIV integration services.

2.2 Background of tuberculosis (TB)

Tuberculosis (TB) is an infectious disease caused by the bacillus called mycobacterium tuberculosis TB mostly affects the lungs names pulmonary TB, but can affect other parts of the body and named extra-pulmonary TB (Department of Health, 2012). TB is transmitted via the respiratory route, with the most important source of infection being the patient with Pulmonary TB. A person who coughs releases infectious droplet nuclei, which can also be spread into the air through talking, sneezing, spitting and singing, and can remain in the air for long periods, especially in the absence of direct sunlight (WHO, 2009d). The risk of infection for a person depends on two factors: the extent of exposure to the bacilli and the person's susceptibility to infection (WHO, 2009d).

The risk of contracting TB is higher with prolonged and close exposure to an infectious person and in a person with decreased immune function such as the HIV-infected person, diabetic patient and patient on steroids. Of those infected, 90% of people without HIV infection will not develop the TB disease. In general, a small proportion of people infected with Mycobacterium tuberculosis will develop TB disease in their lifetime. If TB is not diagnosed and treated earlier, the mortality rate

will increase. The most common method for diagnosing TB worldwide is sputum smear microscopy in which bacteria are observed in sputum samples examined under a microscope. Following recent developments in TB diagnostics, the use of rapid molecular tests (Expert) for the diagnosis of TB and drug-resistant TB is increasing (Global Tuberculosis report, 2009).

2.3 The background of HIV

The first case of HIV in South Africa was identified in 1981. In the first annual national survey which was conducted in 1990 in pregnant women, it was found that an estimated HIV prevalence was 0.8% among pregnant women. In 1991 the HIV prevalence was 1.5%, this indicated that the country was facing an AIDS epidemic (Fletcher, 2009).

Researchers have identified two types of HIV which is HIV-1 which is the commonest type of HIV in the whole world. Another type is HIV-2 which is common in West Africa. Both have the same routes of transmission, but HIV-2 is more easily transmitted and progression to AIDS might be slower in those infected with HIV-2. Mostly the main route of transmission worldwide is through sexual intercourse although the routes of transmission differ according to the regions. In Sub-Saharan Africa, the routes that play a major role in HIV transmission are sexual intercourse, contaminated blood and mother-to-child transmission. In the Russian federation and the Ukraine, the commonest route of HIV transmission is injecting drug use through the sharing of contaminated injecting needles (WHO, 2008).

HIV infects the CD4 which contains the antigen on their surface that is the helper T-lymphocytes, which are responsible for the body immune system strengthening. The HIV infection attacks the T-lymphocytes and as a result the body immune system becomes weak. This results in progressive immune suppression, which will result in increased susceptibility to opportunistic infections in those infected with HIV (WHO, 2008).

2.4 The dual epidemics of TB and HIV

HIV has profoundly changed the epidemiology of TB, disrupting the balance between TB infection and control in both developing and developed countries. HIV-associated

TB is a public health crisis in developing countries. Active TB disease is the most common opportunistic infection amongst HIV infected individuals. When the immune system is weak due to HIV, the bacteria begins to multiply and this often leads to active TB (WHO, 2008). The lifetime risk of developing TB from an infection with Mycobacterium Tuberculosis is 5-10% in an HIV negative person versus 50% in an HIV positive individual.

HIV infection reduces the immune system of people and this leads to a significantly increased risk of developing active TB disease. HIV leads to progression from latent TB infection to active TB disease (WHO, 2008). HIV is the most important factor in the reactivation of latent TB into active TB disease. It also increases the occurrence of recurrent TB (relapses) due to reactivation. HIV also leads to higher rates of smear negative and extra pulmonary TB which is difficult to diagnose. The risk of death in a patient with HIV who has TB is twice than that of an HIV positive patient without TB. In countries with high HIV prevalence, TB has re-emerged as an epidemic. There has been an increased association between TB and HIV as co-morbid illnesses, an association which has an enormous negative impact on both control and spread of the co-morbid illness (WHO, 2008).

In South Africa, about 70% of TB patients are living with HIV and this causes TB disease difficult to diagnose, but curable whereas HIV is very easy to diagnose yet not curable (Eldred, 2009). TB is harder to diagnose in people living with HIV/AIDS (PLWHA) (WHO, 2008). HIV in Sub-Saharan Africa constitutes some 64% of the global total of 39.5 million people living with HIV. Southern Africa remains the most affected region, and the epidemic in South Africa is interlinked with epidemics occurring in neighbouring countries. South Africa, Swaziland, Lesotho and Botswana reported the highest antenatal HIV prevalence levels in the world in 2006 (WHO, 2008).

TB is a leading cause of death for people living with HIV/AIDS (PLWHA). TB is responsible for an estimated 13 percent of AIDS mortality worldwide and a much higher proportion of AIDS deaths in some regions, particularly in Africa (Department of Health, 2014). A person with TB infection has a 10 percent lifetime chance of developing active TB disease. People living with HIV have the risk of 5 to 15 percent

of developing active TB disease annually (WHO, 2008). TB accelerates the progression of HIV infection (WHO, 2008). Providing TB/HIV co-infected individuals with a complete regimen of TB drugs to treat a standard TB infection can extend life by several years even in the absence of ART (Department of Health, 2011a, Department of Health, 2014; Tuberculosis Virtual Resource centre, 2007).

Following successful treatment for TB and adherence to ART, the lives of PLWHA can be sustained for a prolonged period, and mortality will be reduced. According to the Stop TB Partnership's Global plan to stop TB (2006-2015), the high rates of TB treatment interruption and transfers to other treatment centres are key reasons for the development of drug resistance TB, Multidrug Resistant and Extreme Drug Resistant-Tuberculosis in Africa. Drug resistant TB in Africa is increasing and disrupting the progress made in both TB and HIV/AIDS control. Drug resistance is entirely human made which arises in the context of inadequate TB control. The only way to prevent drug resistance is to ensure that all TB cases are identified and that patients complete the entire standard treatment regimen (Gandhi, Moll & Sturm, 2006). TB kills more women living with HIV globally than any other single infectious disease, and more women die annually of TB than of all causes of maternal mortality combined (WHO, 2014).

2.5 Global burden of TB and HIV

Worldwide, about 11.1 million adults are estimated to be infected with TB and HIV. Seventy percent of these live in Sub-Saharan Africa, 20% in South East Asia and 4% in Latin America and the Caribbean over the past decade. It is also estimated that, in Sub-Saharan Africa, one third or more of HIV infected persons may develop TB (WHO, 2008). In 2004 some areas of this region, 60%-70% of patients were co-infected with HIV and TB.

There were 9.2 million new cases of TB and 1.7 million deaths occurred globally in 2006, of which 0.7 million deaths were HIV positive people. The factors influencing TB trends remain the traditional ones such as poverty, failures in the treatment system and immigration. In others areas the HIV epidemic is playing a major role in death of patients with TB. The 22 high burden countries account for approximately 80% of the estimated number of new TB cases worldwide each year, mostly in the

developing countries. Without the implementation of proper control measures, TB comprises 25% of all avoidable adult deaths. WHO estimates that between the year 2000 and 2020, nearly one billion people will be newly infected by TB disease, 200 million will get sick and 35 million will die from TB. Tuberculosis affects 75% of the economically productive group of between 15-54 years of age (WHO, 2008).

TB patients who are also HIV infected are much more likely to develop TB disease than those who are HIV-negative. Since from the 1980s, the HIV epidemic led to a major burden in TB cases and TB mortality in many countries, which persisted throughout the 1990s and up to around 2004, especially in Southern and East Africa. In 2011, 1.1 million (13%) of the 8.7 million people who developed TB worldwide were HIV-positive; 79% of these HIV-positive TB cases were in the African Region. Globally, there were an estimated 0.4 million HIV-associated TB deaths in 2011, death rate among men and women were equal. WHO, UNAIDS and the Stop TB Partnership have set a target of halving TB mortality rates among people who are HIV-positive by 2015 compared with 2004, the year in which TB mortality among HIV positive people is estimated to have peaked. WHO recommended interventions such as: prevention, diagnoses and treatment of TB in people living with HIV, since the year 2004 (Global Tuberculosis report, 2007).

These strategies are known as collaborative TB/HIV activities. They include testing TB patients for HIV, providing antiretroviral therapy (ART) and co-trimoxazole preventive therapy (CPT) to TB patients living with HIV. The 'Three IS' for TB/HIV activities should be provided to TB patients, these are: intensifying TB case-finding among people living with HIV, offering Isoniazid preventive therapy (IPT) to people living with HIV who do not have active TB and infection control in congregate settings and in the Health care facilities. This will prevent the spread of TB in the community. (Global Tuberculosis report, 2007).

Antiretroviral therapy reduces TB mortality rates. ART reduces the risk of TB disease development by 65% to patients irrespective of their CD4 cell-count levels (Department of Health, 2014). Administration of IPT and ART together can have an additive effect of reducing the risk of developing active TB disease among people

living with HIV. All TB patients living with HIV are supposed to be put on ART irrespective of their CD4 cell-count level (Global Tuberculosis report, 2007).

2.6 The socio-economic impact of TB and HIV co-infection

Co-infection of TB and HIV exacerbates the social and economic effects of ill health on the poor and vulnerable and places a burden of care of children and unpaid caregivers. Sixteen Million of children are orphaned through parental death from TB/HIV co-infection. The social and economic impact of TB/HIV on individuals and family's needs to be addressed within a comprehensive package of strategies to complement the appropriate integrated health services (WHO, 2008b). Strategies such as payment schemes for home based carers and social protection, such as cash transfers, can alleviate the economic burden on families and result in better long-term health outcomes. Operational research is urgently needed to guide national policy development and scale-up of cash transfer programmes that will reach people impacted by TB/HIV co-infection and their caregivers (WHO, 2008b).

According to Heyer and Ogunbanjo (2006), adolescents infected with TB and HIV are faced with a challenge of peer pressure of being isolated and rejected by their peer group. This result in them rejecting the medications so that they may be able to socialise with their peer group. The study that was conducted in Zambia revealed that limited transport, gravel roads to the health facilities and lack of transport fees to the health facilities resulted in poor adherence to treatment. The area is poverty stricken because there is a limited chance of employment for both men and women. The poor social background leads to failure to access treatment (Heyer & Ogunbanjo 2006).

2.7 Diagnosis of TB in an HIV positive patient

Diagnosing TB in an HIV positive patient is difficult as in most cases the sputum smear microscopy test is negative and patients suffer from extra-pulmonary TB which is difficult to diagnose. The Xpert is therefore used to diagnose TB in HIV positive patients. Xpert is a molecular diagnostic test with tremendous potential to greatly improve detection and diagnosis of TB and MDR-TB. In less than two hours, it can detect *Mycobacterium tuberculosis* DNA and changes in the DNA that are

associated with Rifampicin resistance directly from the sputum, while traditional culture techniques to confirm drug resistance TB take several weeks. The Xpert is more sensitive for detecting TB than the standard sputum-smear microscopy. Xpert is faster in detecting TB and MDR-TB than standard tests which involves bacterial growth in laboratory cultures (Department of Health, 2014). The ability of the Xpert to detect TB rapidly in patients in whom bacteria cannot be detected with a microscope such as persons co-infected with HIV provides an advantage over the microscopy. When used optimally, Xpert is expected to result in earlier diagnosis of TB (especially among those who are HIV infected) and MDR-TB. This allows earlier initiation of TB treatment, which will reduce the time of patient's infectiousness and decrease transmission of the infection to other people. The Xpert has an advantage because it facilitates direct testing of sputum samples with minimal staff effort and bio- safety risk as there is minimal handling of sputum by hand as it is being processed technologically (Department of Health, 2014).

Limpopo province has the Xpert machines in all its hospitals which improves the sputum turnaround Time (TAT) for early diagnosis of TB and Drug resistant TB. This facilitates treatment initiation and prevention of spread of the disease to other people through early initiation of treatment (Department of Health, 2014). In 2014, WHO indicated that earlier and faster diagnosis of all forms of TB is important as it improves the chances of people getting the right treatment and being cured, and it helps stop spread of drug-resistant TB (Chattu, 2014).

2.8 TB infection control

Mycobacterium tuberculosis transmission can take place where people living with HIV come into contact with infectious TB patients at home, in the community, in congregate settings and in health facilities (Department of Health, 2007). The incidence of latent TB infection and TB disease among health workers in health-care facilities exceeds the incidence among the general population. The incidence of latent TB infection and TB disease among individuals in congregate settings and in household settings also exceeds the clinics, emergency rooms, inpatient wards and laboratories. A study of TB transmission measured by fingerprinting M. tuberculosis strains transmitted from hospitalized HIV-infected TB patients to guinea pigs breathing ward air found that Multidrug resistant (MDR) TB patients who received

suboptimal drug therapy accounted for 90% of TB transmission. Sound infection control methods are therefore essential to prevent *M. tuberculosis* transmission among people living with HIV (Bekker, 2008). The WHO policy on TB infection control includes managerial activities at the National, Provincial, district and facility level measures, including:

- Administrative controls – triage, separation of infectious cases, cough etiquette and reduced hospital and clinic stay of patients.
- Environmental controls – natural or mechanical ventilation systems and upper room ultraviolet germicidal irradiation.
- Personal protective interventions – respirators and prevention and care packages for HIV infected health workers (Department of Health, 2007).

The implementation of comprehensive infection control measures reduces transmission of *M. tuberculosis* in health-care facilities. All health care facilities, public and private, caring for patients with infectious TB, or suspected of having infectious TB, should immediately implement administrative infection control measures (Department of Health, 2010b; Francis, 2007).

2.9 HIV testing of TB patients

Central TB Division (CTD) and the National AIDS Control Organization (NACO) have adopted the policy of routinely offering of voluntary HIV counselling and testing (HCT) to all TB patients as part of an intensified TB/HIV package of services for states with the highest HIV disease burden (Department of Health, 2011). This policy will facilitate early detection of HIV infection in TB patients, and lead to early access to HIV care, treatment and support. These interventions are expected to reduce death rate among HIV-infected TB patients. Health care providers should routinely offer voluntary counselling and testing to all TB patients, except those with already known HIV status. “Known” HIV status means those patients with a history of positive HIV test or those with a negative HIV test within the past 6 months (Department of Health, 2008a).

TB patients with unknown HIV status are to be counselled and tested for HIV. The HIV counselling and testing may be made any time after TB diagnosis, during or after initiation on TB treatment preferably at the earliest stage. Health care providers

should explain the need and importance of HIV testing for patients to know their HIV status and also that HIV testing is voluntary and not mandatory. The counsellor should spend adequate time with the TB patient during the counselling session to explain the importance of sharing their HIV test result with the treating physician, for better care (Department of Health, 2008a).

2.10 TB preventative therapy in HIV positive people

The dramatic spread of the HIV epidemic through Sub-Saharan Africa in the past decades has been accompanied by the increased TB cases registered by National TB programmes. It is estimated that 70% of new adult cases of Tuberculosis in South Africa are co-infected with HIV. Tuberculosis is the commonest cause of death among co-infected persons in South Africa and TB accelerates HIV disease progression. Preventing TB among HIV-infected persons will reduce the incidence of TB in the community (Department of Health, 2010). TB preventive therapy is the administration of one anti - TB drug to HIV positive persons who are not infected with TB disease. In HIV persons who received IPT, the risk of developing TB is reduced by approximately 60% and their survival is also prolonged (Churchyard, 2009). The preventive therapy is an intervention that should be part of the package of care for people living with HIV/AIDS. TB preventive therapy should only be offered if the following prerequisites have been met:

- Patients are screened for TB disease before initiation of TB preventive therapy.
- Health care providers follow up and monitor patients monthly to encourage adherence, address side-effects and exclude active TB.
- The HIV/AIDS programme takes responsibility for implementing TB preventive therapy.
- Data is collected on the number of people who are started on IPT
- Data is collected on the number of people who complete 6 months of IPT
- Data is collected on the number of people who develop TB when taking IPT (Dept. of Health, 2010).

It is essential to exclude active TB in every patient before starting preventive therapy. This is done to avoid giving one anti tuberculosis drug to patients who

require a full treatment regimen. Patients should be screened for the following signs and symptoms of active TB disease before initiation of TB preventive therapy
Current coughs for 24 hours or longer

- Fever
- Loss of weight
- Drenching night sweats (Day, Charalambous, Fielding, Hayes, Churchyard and Grant, 2006).

Patients with one or more signs and symptoms are considered TB suspects and must be further investigated for active TB as per national TB guidelines. These patients are not eligible for preventive therapy until active TB disease has been excluded based on sputum smear microscopy and mycobacterium culture (Department of Health, 2010).

The standard regimen for TB preventive therapy is Isoniazid (INH) 5mg /kg daily, with the maximum of 300mg per day in adults and Isoniazid (INH) 10mg/kg daily with the maximum of 300mg per day in children. Vitamin B6 (pyridoxine) 25mg per day should be given same time with Isoniazid to prevent the occurrence of peripheral neuropathy. The recommended duration of the preventive therapy is 6 months of continuous treatment. The patient should be given continuous counselling about the importance of adherence to therapy to prevent resistance to Isoniazid (Department of Health, 2010).

Counselling to be offered to the patient about the drug side effects such as nausea and vomiting, dark urine, jaundice, severe psychosis and peripheral neuropathy. They should be advised to stop the therapy immediately and seek medical care if they develop side effects of Isoniazid. Patients starting TB preventive therapy should complete the 6 months of therapy within a period of 9 months. Follow up of patients should be done every month and TB screening to be done on every follow up visit to the clinic (Department of Health, 2010).

2.11 Co-trimoxazole Prophylaxis Therapy

Co-trimoxazole is a fixed dose combination of Sulfamethoxazole and Trimethoprim; it is a broad-spectrum antibiotic that targets a range of gram-positive and gram-negative organisms, fungi, and protozoa. Co-trimoxazole can also be given routinely for the prevention of opportunistic infections in HIV-infected persons; this strategy is called Cotrimoxazole prophylaxis therapy (CPT). Co-trimoxazole reduces morbidity and mortality of HIV-infected patients. All HIV-infected TB patients registered are eligible for CPT, irrespective of their CD4 counts. All adults above 14-years who are HIV positive with tuberculosis disease on treatment are to be prescribed CPT. Patients who report being HIV-infected should have their HIV status confirmed before CPT can be prescribed. Pregnant patients are also eligible for CPT regardless of foetus gestational age. Patients with a history of a serious drug allergy to sulpha drugs or known glucose-6 phosphate dehydrogenase (G6PD) deficiency should be excluded from CPT (Department of Health, 2008a).

No baseline laboratory investigations are required before initiation of CPT. A dosage of CPT prophylaxis for adults above 14 years and body weight of above 30kg is 960 mg daily. CPT is provided to patients in monthly packets and it is taken with anti-tuberculosis treatment and ART. CPT is self-administered by the patient daily. Co-trimoxazole is to be given for the entire duration of TB treatment. After TB treatment, CPT should be continued at the ART centre. Patients who do not take CPT do not get the prophylactic benefits which mean they will be affected by opportunistic infections such as *Pneumocystis carina* (Department of Health, 2008b).

Patients should be counselled to adhere to CPT as it has several healthy benefits. (Iroezindu,Ofondu,Hausler & Van Wyk, 2013). If patients are noted to have interrupted CPT, counselling by the health staff should be strengthened to promote adherence. Patients who have interrupted CPT may choose to re-start and continue later. HIV-infected children are recommended to be provided with lifelong CPT. Paediatric formula of Cotrimoxazole is available at ART centres (Department of Health, 2008b). Paediatric HIV patients are to be immediately referred to the most convenient Antiretroviral treatment (ART) centre for CPT and ART evaluation and initiation. Drug-related side effects to Cotrimoxazole are uncommon and usually occur within the first 2 weeks of starting treatment. When initiating treatment, patients should be asked to report side effects as soon as they are recognized

(Malangu, 2008). Clinical monitoring should be carried out regularly, at least once every three months. During clinical monitoring visits, adherence should be encouraged. No specific laboratory monitoring is required among children or adults receiving CPT (Department of Health, 2008b).

Major side effects of CPT are uncommon, but may occasionally occur. Anaemia, skin rashes and yellowing of skin and eyes are the major side effects for which the patients need to consult the health care facilities. Loss of appetite, joint pains, nausea and vomiting are other minor side effects. Severe adverse reactions to Cotrimoxazole are rare, but include exfoliative dermatitis, erythema multiforme (Stevens Johnson Syndrome) and severe anaemia. Patients with serious side effects should be referred to a higher level centre for evaluation and treatment by the medical practitioners. In case of serious side effects CPT should be discontinued (Department of Health, 2008b). The PHC nurses must record the prescription of CPT on the patient's treatment card and should ask these clients to report to the PHC facility in case of any adverse drug reaction. The PHC nurses must counsel the patient on the importance of regular follow-up examination and advise the client to come for monthly examination to monitor the progress of treatment (Department of Health, 2008b).

2.12 Directly Observed Treatment

Community based directly observed therapy (CB-DOTS) was introduced in Cambodia in 2002 in an effort to bring TB services closer to patients. Cambodia is divided into 24 provinces, which are further divided into 77 operational districts for the organization of public sector health care services (Department of Health 2014). In 2003, USAID began its involvement in CB-DOTS through the implementation of a pilot activity in five operational districts. Since then, CB-DOTS have been scaled up and it is now implemented in 68 high-burden districts, significantly increasing access to TB services. Treatment for TB patients in their communities, include monitoring for side effects and recording and reporting dosages. Additionally, volunteers play an important role in increasing awareness about TB and promoting earlier case detection by identifying and referring TB suspects to health care facilities (Department of Health, 2014).

USAID support has also helped increase community involvement in TB programs, especially by working with local organizations and encouraging country ownership and sustainability. Community volunteers, called “DOTS watchers,” are trained to directly observe when patients are taking their treatment for TB in their communities, including monitoring for side effects and recording and reporting. Additionally, volunteers play an important role in increasing awareness about TB and promoting earlier case detection by identifying and referring TB suspects to health facilities (Department of Health, 2014).

DOT is an important element in the World Health Organization that recommended a policy package for TB control. DOT means that an observer watches the patient swallowing the tablets in the way that is sensitive and supportive to the patients’ needs. This ensures that a TB patient takes the right drug, in the right doses, at the right intervals. The DOT supporter should be acceptable to the patients to enable them to complete treatment. The supporter may be a health worker or a trained and supervised community member (Home community based carer) (Department of Health, 2014). Directly Observed Treatment is required to ensure treatment adherence to both TB and HIV infected patients (Nachega, Knowlton, Deluca, Schoeman, Watkinson, Efron, & Maartens,2006). It reinforces the patients’ motivation to continue treatment to prevent interrupting treatment. This prevents the emergence of Multiple Drug Resistance TB (MDR-TB) as well as resistance to Anti-retroviral (ARVs) in case of the co-infected patients. For the patient who is working, DOT can be offered in the workplace provided there is a trained health care worker or colleague who can support the patient throughout the treatment period and ensure that the patient reports to the clinic on the date schedules for follow up (Department of Health, 2014).

In DOTS programmes, almost twice as many patients successfully complete their TB treatment as compared with those in non-DOTS programmes. The TB cure rates for DOTS are consistently high, even in countries which vary considerably in terms of culture, geography and socio-economic conditions. DOTS have shown a high TB cure rate across the world. Since DOTS programmes started cure rates have doubled to over 95%. Under DOTS most patients can avoid costly hospital-based treatment and can be treated whilst staying at home. A key principle to DOTS is that

every dose of treatment is observed and recorded by a health worker or trained person from the community for at least the first two months of TB treatment (Department of Health, 2014). This is a way of supporting patients and their families, and of ensuring that they become cured. When patients take their drugs irregularly or stop altogether before the end of the time, they will not be cured and remain infectious to other people, and of the biggest concern, they may develop drug resistant tuberculosis (WHO, 2014b).

2.13 The international context of TB/HIV co-infection

This section will focus on TB and HIV co-infections in developed and developing countries.

2.13.1 Developed countries

The TB and HIV co-infections of North America and Australia will be analysed in this section.

- **TB/HIV Co- infection in New York (North America)**

According to the study conducted by Munsiff (2005), in New York concerning TB and HIV co-infection, the TB epidemic case rates reached about 52 per 100,000 at the height of the epidemic, at which time at least a third of all patients with TB were HIV-infected. The Bureau of Tuberculosis Control (BTBC) is trying to increase counselling and testing of co-infected patients by offering rapid and conventional HIV testing at all its TB chest centres.

Data from the Bureau of HIV/AIDS Prevention and Control indicate that in the year 2000, TB was second to Pneumocystis Pneumonia (PCP) as the most common opportunistic infection in HIV/AIDS patients in New York City. In New York City, the prevalence of HIV infection among TB patients is higher in men than women. Over

the past 5 years, 18% of all male TB cases were HIV-infected, compared to 11% of all female TB cases. A demographic review of the past six years of TB cases in New York City by HIV status shows that 97% of HIV-infected TB cases are between 19 and 65 years of age. The research indicated that HIV-infected TB patients are more likely to be homeless people who stay in the homeless shelters and have a history of substance abuse.

Munsiff (2005) indicated that the homeless people are very hard to reach and they are not receiving enough health care services. They come to health facilities after the latent stage of TB which adds more TB cases in the country and this results in development of other opportunistic infections. The strategy that was developed in New York City is that the BTBC is working on development of the programme for TB screening and contact investigations of infectious TB cases in the Department of Homeless Services (DHS) shelters. They provide more Directly Observed Therapy (DOT) for TB patients. They also offer TB education to medical providers working in the DHS shelters (Gabaix & Laibson, 2015). The study conducted in New York concentrated only on capacitating health care professionals only, and not on patients.

- **TB/HIV integration in Australia**

Australia as one of the developed countries has achieved and maintained the lowest rates of TB in the world. Despite this, TB continues to pose a health challenge. (Australian Bureau of Statistics, 2011). These challenges include an increasing incidence of Multi-Drug-Resistant TB (MDR-TB), the development of Extensively Drug-Resistant TB (XDR-TB), the Human Immunodeficiency Virus (HIV) pandemic, due to immigrations from high burden countries which include students and healthcare worker arrivals. It is predicted that by 2056 Australia's population will have risen from 22 to 35 million largely due to new arrivals. The burden of TB in Australia will depend on future immigration policy and the control of TB in new arrivals. There should be a continuing high standard of diagnosis and treatment in order to maintain TB control in Australia. Australia's vision is to eliminate TB within the continent (Australian Bureau of Statistics, 2011).

In 2008, information on HIV testing status at the time of TB diagnosis was reported in only 83% of TB notifications nationally and of these, less than 1% (11 cases) was

identified as being HIV positive. The results of HIV testing to all TB cases are still not available in Australia and this need to be addressed. There are some groups who are at high risk of developing TB in Australia such as the homeless, prison residents, nursing home residents and the ageing population. Health care workers have been identified as another group at risk. In 2001 there were 17 cases of TB amongst health care workers and in 2008 the number increased to 83 (WHO, 2009a).

The Australian literature did not indicate any intervention strategy to prevent TB and HIV amongst the high-risk groups such as immigrant health care workers, nursing home residents as well as the elderly.

2.14 TB/HIV integration in the developing countries

2.14.1 Integration of TB/HIV services in Lesotho

According to the study conducted by Saranhuck (2008) in Lesotho, it was found that TB killed two million people and nine million are infected every year and those numbers are rising. Lesotho has the third highest HIV prevalence in the world after Swaziland and Botswana and is the poorest of these countries. In addition to its HIV/AIDS epidemic, Lesotho has the fourth highest TB incidence in the world of 635 per 1000,000 people per year. According to estimates from the Lesotho National Tuberculosis Programme, up to 90% of TB patients are also infected with HIV. Health care delivery has been severely limited by shortage of professional health workers mostly medical practitioners.

Lesotho Department of Health developed the Decentralized model of care in Scott catchment area which has one hospital with 102 beds and 14 rural health centres, each staffed only by nurses. These nurses are responsible for providing all primary health care services and for integrating HIV, AIDS and TB services. At the beginning of the programme approximately 30, 000 people were infected with HIV in Scott catchment area. Knowledge of clinical management of HIV was limited and few drugs to treat opportunistic infections were available. ART was not available at all.

Nurses were provided with intensive in-service, theoretical and practical training on management of HIV related conditions and ART to equip them to deal with these new responsibilities. The training was adapted from the WHO training, and included drug management, laboratory investigations, monitoring and evaluation, diagnosis of smear negative patients, drug resistance TB, infection control, IPT, paediatric ART and Prevention of mother to child (PMTCT). Clinical support tools were developed such as nurse-oriented guideline for HIV management, algorithm for diagnosis of smear negative TB and standardised protocols and flow charts for basic clinic procedures (Saranhuck, 2008).

Clinics had shortage of nurses; only two nurses were allocated per clinic. Assistant nurses who underwent the two years training provide all primary health care services. They were supported by clinical nurses and doctors who only visited weekly or bi-weekly to provide clinical mentorship on issues such as diagnosis and management of complicated HIV-related conditions. Nurses' workload was high. In August 2006, an assessment found that nurses were taking care of 45 patients per day which was above the WHO recommendation of the maximum of 30 consultations per day.

Due to the increasing HIV infection, the Government of Lesotho developed the strategy of involvement of lay counsellors through the Non-Governmental Organisations in the health care service. They trained them through training them to deliver HIV and TB services, counselling and testing and treatment as well as adherence education to patients.

In the study, nothing was said about community involvement in the care and support of the TB and HIV positive patients as there is a high shortage of health care professionals. Only lay counsellors are trained and involved in the TB and HIV care and support programme. The lay counsellor programme is assisting in reduction of workload to nurses and benefits the patients as it reduces their waiting period and congestion in the health facilities.

2.14.2 TB/HIV integration in Malawi

The challenges faced by Malawi are like those of Lesotho due to shortage of staff to provide the health care services. Malawi is one of the poorest countries such as Lesotho, with poor health care services. Life expectancy is 43 years for men and 45 for women. The infant mortality rate of Malawi is 86 per 1000. This is due to nutritional deficiencies, pneumonia, anaemia, malaria, TB and AIDS. There is a high rate of mother-to-child HIV transmission in Malawi. There is a high HIV prevalence in women than in men in Malawi (WHO, 2009b).

In the study conducted by Shull, Banda and Kathyola (2011), it was found that only about one-third of the eligible HIV/AIDS patients receive ART in Malawi, due to shortage of trained professional health care workers to offer the service. Decentralising treatment to PHC facilities is crucial to be accessible to all communities, but the key obstacle is a shortage of trained health care workers (HCW) and integrating HIV/AIDS care with other primary health care. As a result of this staff shortage, the strategy of training of nurses on site was developed “on the job training” the guideline and a training programme called Practical Approach to Lung Health and HIV/AIDS (PALSA PLUS) was then developed. PALSA PLUS which is on-site training of nurses utilises a Train- the-Trainer model. This strategy equips nurses and middle managers with facilitation skills to train other primary health care workers at a facility during short sessions over several months so that they may be able to give comprehensive treatment care and support to the TB/HIV co-infected patients. The training is grounded in adult education principles where a series of case scenarios is depicted by a waiting room scene. Guidelines content for TB/HIV are utilised for in-service trainings. This system seeks to optimize the clinical effectiveness of frontline healthcare workers in rural health centres in addressing HIV/AIDS and TB (Shull, Banda and Kathyola, 2011).

Adherence to PALSA PLUS system of staff training benefitted both nurses and patients. Nurses gained the knowledge and skill of giving comprehensive treatment, care and support to patients without going away from the facility to attend the training as they receive on the job training through this strategy.

2.14.3 TB/HIV integration services in Rwanda

Rwanda is one of the African countries that face challenges due to its growing TB epidemic. WHO reported that, in 2002, 37 % of new TB patients were also HIV-positive (WHO, 2006). By 2005, this had increased from 37% to 12% however, more recent data from the Rwandan National TB Program from the first quarter of 2006 report indicated that among the TB patients registered, over 30 percent were found to be HIV-positive. The Rwandan government has begun taking concrete steps to address its TB and HIV co-epidemic. In October 2005, the Rwandan Ministry of Health put forward the following priority areas for addressing TB/HIV co infection.

A. Establishment of mechanisms for collaboration through:

- A coordinating body for TB/HIV activities
- Surveillance of HIV prevalence among TB patients
- Joint TB-HIV planning and
- Monitoring and Evaluation of TB-HIV activities.

B. Focus on decreasing the burden of TB in people living with HIV/AIDS through:

- Intensified TB case-finding and
- Effective TB infection control.

C. Focus on decreasing the burden of HIV in TB patients through:

- Routine HIV testing and counselling
- Introduction of HIV prevention activities
- Introduction of CPT
- HIV/AIDS care and support and PEPFAR provided Rwanda a total of US\$57 million in 2005 and \$72 million in 2006.

Funding for TB/HIV specific activities represented 1.3 percent of the country's program budget in the year 2005 and 2.7 percent in 2006. Part of this funding supported the TB/HIV centres in the Gisenyi District, located northwest of the capital of Kigali. Activities conducted in the Gisenyi District, primarily at the Gisenyi District Hospital, are aimed at developing best practices for TB/HIV integrated care, evaluating methods for identifying HIV in TB patients as well as effective methods of screening HIV infected people for TB. They also develop, implement and assess

innovative programmes for the care, treatment and management of TB/HIV co-infected people. These activities produced the following results:

- Resulting from the dedicated efforts of conducting HIV testing among TB patients, the proportion of registered TB patients with known HIV status rose from 61 percent in 2004 to 92 percent in 2005.
- During the last half of 2005 and the first quarter of 2006, out of 206 newly registered TB patients, 99 patients were found to be HIV positive and 71 starting CPT and 46 were initiated on ART (WHO, 2006).
- Through pilot-testing using simple TB screening questionnaire, 113 (25.5 percent) of 443 patients were found to be HIV-positive, of which 38 (33.6 percent) also had TB disease. The hospital demonstrated that the integration of TB and HIV activities was feasible in a rural setting, using existing infrastructure (WHO, 2007a).

2.14.4 Integration of TB/HIV services in Kenya

Kenya's TB epidemic is primarily driven by HIV/AIDS; making TB/HIV co-infection a significant health concern. WHO estimated that 28% of TB patients in the country are HIV-positive (WHO, 2007a). With such a high rate of TB/HIV co-infection in Kenya, the increase in TB incidence due to HIV reverses the decline of TB resulting from effective DOTS implementation. To address this growing problem of TB/HIV co-infection, the government of Kenya established a national TB/HIV coordinating body in 2003. A primary task of this body is the ongoing development of a system for monitoring and evaluating coordinated TB/HIV activities (WHO, 2007).

Kenya has made significant progress in TB/HIV program coordination in the last few years. Guidelines for HIV testing in Clinical settings were developed in 2004, which created a standard policy to carry out routine HIV diagnostic testing and counselling (DTC) of all TB patients in order to increase the detection rate of HIV positive patients and refer them for care and management. In 2005, tools to collect TB data

were revised and disseminated. The new TB/HIV guidelines were adopted locally; a new TB/HIV curriculum was developed and completed in 2006. TB/HIV steering committees were established at provincial and district levels. The NLTP conducted two sessions of train-the-trainers on TB/HIV in 2005 and 2006 (WHO, 2007).

Kenya received about US\$92.5 million, \$143 million and \$208 million in the years 2004, 2005 and 2006, to support a package of HIV/AIDS prevention, treatment and care activities from PEPFAR funding. In the year 2005, 3.1 percent of the total country program budget was allocated for TB /HIV activities; in 2006, the amount increased to 3.5 percent. PEPFAR is working with WHO to support Kenya's national plan for TB/HIV collaborative activities, which was put forward by the NLTP in March 2006.

Kenya is proceeding with a strategy, supported by WHO technical assistance that aims to offer DTC to all TB patients, followed by a package of HIV prevention, care and management services. To supplement this effort, TB case finding and treatment among PLWHA was intensified. The country plan allowed Kenya to gain new ground in the fight against TB/HIV as it addresses the following key challenges:-

- Increasing the budget line for collaborative TB/HIV activities
- Promoting TB/HIV collaboration at the local and regional levels, as ART centres have encountered difficulty in working with the decentralized NLTP
- Coordinating the distribution of TB and HIV supplies (WHO, 2007a).

All these efforts brought the promising results in the TB and HIV services. In the second quarter of 2006, 59 percent of TB patients have been tested for HIV which increased from 41 percent at the end of 2005, and over 80 percent of HIV positive TB patients were placed on CPT to prevent the opportunistic infections. 80 percent of eligible HIV positive TB patients were put on ART.

These efforts could substantially expand access to ART for HIV positive TB patients if replicated country-wide. PEPFAR established the TB/HIV collaboration project. This project which was headed by the Eastern Deanery AIDS Relief Program (EDARP) has experienced a great deal of success since it began coordinating TB

and HIV services and care in 2001. Since its initiation, the project has evolved from a modest effort among seven clinics to a sophisticated TB/HIV coordination program informing the national policy in this area. The program has developed from a system of routine referrals of TB patients for off-site HIV testing and counselling to integrated care through DTC at the time of TB diagnosis. With support from PEPFAR, in April 2004, the service was broadened to include routine nurse-initiated DTC for all those suspected of having TB (WHO, 2007a).

PEPFAR sponsored another programme in Kenya that program scaled up DTC at TB clinics in Nyanza Province in western Kenya, where HIV prevalence is more than double the national average. This partnership project between the NLTP and CDC began with a DTC pilot program at Nyanza General Hospital in 2004, which registered 1,001 TB patients and tested 56 percent of those patients for HIV. Of those tested patients, 81 percent were HIV positive. Based on the success of this project in providing HIV testing and counselling to TB patients and in detecting new HIV cases, the project began scaling up in 2005. In that year, the DTC sites tested 6,478 TB patients for HIV and detected nearly 5,000 HIV positive patients. This showed that Kenya has a very high TB/HIV co-infection rate. Kenya's successes with TB/HIV coordination have been strongly boosted by PEPFAR's support to the TB and HIV programmes. These projects demonstrate the need for routine DTC for TB patients and routine TB screening for HIV positive patients (WHO, 2007a).

2.14.5 Integration of TB/HIV services in Tanzania

In 2005, 29 percent of new TB cases in Tanzania were co-infected with HIV (WHO, 2007a). Acknowledging the links between TB and HIV/AIDS, the Tanzanian government, with the support of PEPFAR has developed a joint TB/HIV training manual (Watt, Maman, Earp, Eng, Setel, Golin, Jacobson, 2009). They managed to train 40 health care service providers and 22 TB coordinators from three regions in HIV testing and ART. They then began TB/HIV pilot projects in three districts (WHO, 2006; Rwechungura & Frank, 2006). In the year 2004, PEPFAR offered the budget of US\$71 million to Tanzania, increasing to \$109 million in 2005 and \$130 million in 2006. Funding for TB/HIV activities in the year 2005 stood at 1.1 percent of the total prevention, care and treatment budget from PEPFAR and increased to 1.8 percent in 2006. This money was offered to facilitate the TB/HIV activities. PEPFAR had some

success in Tanzanian TB and HIV services, per an early evaluation of HIV testing and counselling in TB programmes, out of 526 new TB patients registered in three supported sites, 462 (88%) accepted HIV testing, of which 231 (50%) were found to be HIV infected and only 62 (27%) received CPT and 6 (3%) were placed on ART. PEPFAR's experience in Tanzania has shown that DTC in TB clinical settings is acceptable to patients and health care providers (WHO, 2007a).

2.14.6 TB/HIV integration in Zambia

The Treatment Action Campaign (TAC) conducted a case study on the quality health care system to provide equal access to HIV prevention and treatment services for everybody. They realized that the main barrier to TB/HIV programme intervention in Zambia has previously been the lack of integration between TB and HIV services. This lack of integration of services meant that people spend long hours at the health care facility if they wanted to access both TB and HIV services. Many clients were lost to follow up as they were discouraged by the long queues and the poor service delivery. This has changed as they have now integrated TB and HIV services. However, lack of resources for civil society organizations to implement TB/HIV interventions over the past years has adversely affected service delivery and hospices that have been providing services, such as palliative care and ART for clients, are now closing down. As a result, the clients that they cater for will have to be cared for in the public sector, which will add more pressure on the already understaffed health sector (WHO, 2007a).

The Community Initiative for TB, AIDS and HIV transmission programme provides an opportunity to screen HIV-infected pregnant women for TB. The study was conducted where 370 HIV infected pregnant women were screened for symptoms of active TB by lay counsellors at the post-test counselling session. If symptomatic, they were referred to nurses who investigated them further. Eight women were found to have previously undiagnosed, smear-negative, culture confirmed TB. It concluded that rates of TB in HIV-infected pregnant women are high, and screening for TB during routine antenatal care should be implemented (WHO, 2010a).

2.15 Integration of TB/HIV services in South Africa

The Department of Health South Africa released the TB Guideline to be used by health care providers in 2009 and Tuberculosis Preventive Therapy among people living with HIV in 2010 to mandate that they be screened for TB, and recommend that those with no active TB be started on IPT. South Africa adopted WHO policy on collaborative activities, including the Three I's which is Intensive case finding, Infection control and Isoniazid preventive therapy, early initiation of ART and speeding up the expansion of ART through decentralization and Nurse Initiation on ART (NIMART) (WHO, 2013a). The HIV co-infection is a risk factor for acquisition of drug-resistant TB (DR-TB). HIV positive people who acquire extensively drug resistant (X-DR -TB) have a high risk of mortality (approaches 100%) despite viral suppression with ART (Foundation for Professional Development, 2007). In South Africa, TB is the leading cause of mortality in HIV infected persons (Gandhi, Moll & Sturm, 2006; Abdool Karim, Churchyard & Lawn, 2009).

This section will focus on three provinces only, namely, Kwazulu-Natal, Western Cape and Limpopo Provinces.

2.16 TB/HIV integration in Kwazulu- Natal Province

KwaZulu-Natal (KZN) is the Province with the highest HIV incidence as well as highest TB/HIV co-infection rate in South Africa. The number of TB cases diagnosed each year is increasing. Mortality due to TB is also high in KZN because more than 70% of TB patients are co-infected with HIV. TB/HIV integration has started to be implemented in the health facilities as TB screening is conducted on HIV positive patients. The main challenge is that IPT uptake is low and the incident of TB has continued to grow since early 1990s to 1131/100,000 in 2011 (Chehab, Vilakazi-Nhlapo, Vranken, Peters, Klausner & Nshuti, 2013).

Chehab et al. (2013) conducted a study on how TB and HIV services are delivered in Kwa-Zulu Natal Province. The province was selected for the study because it has the highest HIV prevalence in South Africa and 49 facilities were sampled. Hospitals, clinics and community health centres were represented. About three quarters of the

newly diagnosed HIV infected patients were screened for TB symptoms in February 2011. Co-trimoxazole (CPT) initiation was lower than the national target of 74% in February. Newly registered TB patient diagnosed with HIV initiated on ART were below 30%. Further, less than half of eligible patients of sampled sites were initiated on IPT in February 2011 which is below the national target of 60%. The study revealed that South Africa is shifting from the vertical programmatic approach with separate staff and service model in the early 2000 to a decentralized integrated approach with a strengthening of primary health care service. The primary health care clinics are empowered through official policies to become the main mode of health care delivery including TB and HIV services (Chehab et al., 2013). KZN DoH placed more focus on treatment, care and support of the TB and HIV infected people, with no prevention efforts. Prevention is more cost effective than treatment, care and support (Department of Health, 2010).

2.17 Integration of TB/HIV services at Ubuntu clinic in Khayelitsha district (Western Cape Province)

Khayelitsha is one of the over populated districts in the Western Cape Province with the highest incidence of TB in South Africa. The study conducted by Pilheu (1998) indicated that population migration contributed to the large TB epidemic in the province, including migration from the rural to the urban areas. Health care workers were issuing incorrect treatment to patients due to lack of knowledge. The HIV epidemic contributes to the increased TB burden in the province.

The study of TB and HIV integration services was conducted for one year at Ubuntu clinic in Khayelitsha from January to September 2003. TB entry point was used as a study point. It was found that 64% of TB patients were tested HIV positive. There was a challenge of failure to identify the extra-pulmonary TB and as such patients with negative smears were repeatedly referred between HIV and TB services and this resulted in delay of treatment commencement. IPT is rarely given to adult HIV positive patients after TB screening in the Khayelitsha district (WHO, 2009a).

A report was compiled to explore the progress that was made in the integration of TB and HIV services. The baseline information on HIV Counselling and Testing (HCT) uptake and TB cure rate was collected. TB and HIV integration is still a challenge

because approaches to TB and HIV treatment still differs as TB is diagnosed and treated by PHC nurses, while HIV treatment is being prescribed by medical practitioners. Nurses still lack knowledge of prescribing ARVs to patients; they only have knowledge and skill on diagnosis and treatment of TB. This causes difficulties in integration of TB and HIV services in Khayelitsha (WHO, 2009a).

The weakness of the TB and HIV services in Khayelitsha is lack of integration of TB and HIV services. The gap should be closed through implementation of the integration model where the two services (TB and HIV) are integrated creating a “one stop” service and patients will receive comprehensive care, treatment and support (WHO, 2009a).

2.18 Global and National measures to control TB and HIV

WHO declared TB a global emergency in 1993, as a reflection of the magnitude of the problem internationally. Different targets for TB control programme were set to facilitate performance in the TB control. The World Health Assembly set the following, 70% case detection rate of new smear positive cases in DOTS programmes and 85% treatment success rate in the cases detected. As TB was recognized as a major global public health problem, The Millennium Development Goals (MDG) also set a target for TB control. The MDG number 6 Target is to ‘halt and reverse the TB incidence by 2015’. Two additional targets were also set by the Stop TB Partnership, which are to half prevalence and death rates by 2015. TB control strategies have been set to fight against TB and to meet the above-mentioned targets. The first strategy is the Directly Observed Treatment Short Course (DOTS) strategy, which was launched in 1994 by WHO (Global Tuberculosis report, 2009).

The expansion of DOTS strategy brought major progress in the TB control programme, which also helped national TB control programmes, although the targets for TB control have not yet been met in world wide. DOTs will also assist to detect early treatment interruption and find out the reason for interruption. It can also assist in early detection of and management of side effects of drugs (Global Tuberculosis report, 2009).

Another important measure to control TB and HIV is The Stop TB Strategy which was launched in 2006. It aims to achieve universal access to high-quality care for all people with TB; to reduce the human suffering and socioeconomic burden associated with TB; to protect vulnerable populations from TB, TB/HIV and drug-resistant TB; support development of new tools and enable their timely and effective use; protect and promote human rights in TB prevention, care and control (Goulding, 2012).

The Stop TB partnership also aims to reduce the prevalence of TB and deaths due to TB by 50% in 2015 as well as elimination of TB as a public health problem by 2050. WHO's policy on TB/HIV collaborative activities should be followed in order to address TB and HIV. This policy recommends twelve collaborative activities between TB and HIV/AIDS control programmes, classified in three broad categories which are:

- establishing the mechanisms for collaboration;
- reducing the burden of TB in people living with HIV;
- reducing the burden of HIV in people living with TB.

TB and HIV collaboration is important because the two diseases commonly occur together and impact each other; both TB and HIV patients will benefit from collaborative activities and it would allow efficient use of resources, especially due to the fact that health systems are overburdened by the high rates of TB and HIV related infections (Department of Health, 2014)

2.19 Non-adherence to anti-TB drugs

According to WHO (2007b), non-adherence to TB treatment remains a major obstacle to efficient tuberculosis control in developing countries. The dual infection of Tuberculosis and HIV presents further adherence problems because of high pill burden and adverse effects of both TB drugs and ARVs. This poses a risk of increased multi-drug resistant TB. The study was conducted to determine the prevalence and factors associated with non-adherence to anti-TB drugs among TB/HIV co-infected patients in Mbarara Hospital in Uganda (WHO, 2007b).

A cross-sectional study with qualitative and quantitative data collection methods was conducted among TB/HIV co-infected adults in Mbarara hospital from January to March 2008; 140 participants were selected to participate in the study. Adherence was assessed over a 5-day period prior to the interview using patients' self-reports. Data was collected using an interviewer administered questionnaire. Qualitative data was collected through key informant interviews using a topic guide and was analysed manually. Quantitative data was analysed using STATA version 8. Logistic regression was used to determine factors associated with non-adherence to TB treatment and ARVs.

The finding was that the prevalence of non-adherence was 25%. TB patients defaulted treatment during the continuation phase of the TB treatment regimen. Smoking and alcohol consumption by patients on antiretroviral therapy was found to be the leading cause of non-adherence to treatment. As the prevalence of non-adherence was high, patients that are on continuation phase of TB treatment should be supported so that they continue taking their drugs in order to be cured.

In countries that offer disability grant to TB and HIV infected patients, non-adherence may result so as to remain on the state grant. Long waiting periods, poor infrastructure and the shortage of health care workers in facilities may also contribute towards non-adherence (Antonio & Carmen, 2008; Braithwaite & Bryant, 2010; Medicines Sans Frontiers, 2007).

Intensive support of patients who smoke and drink alcohol may improve adherence (WHO, 2008c; Schneider, Chersich, Neuman & Parry, 2012,). Other strategies that improve adherence are Directly Observed Treatment for patients on TB treatment and antiretroviral therapy, continuous education and counselling, multidisciplinary and peer support, home visits conducted by health care workers, couple counselling and the use of mobile phones (Amico & Orrell, 2013; Cocohobs, 2011; Sahay, Reddy & Dhayarkar, 2011).

Non-adherence to TB and HIV drugs can be due to fear of side-effects, being occupied by other duties and forgetfulness. Poverty can lead to non-adherence as the patient cannot afford to reach the health facility. Depression can also lead to non-

adherence to treatment. It was also discovered that the use of illegal drugs also contributed to non-adherence to treatment (Hansana, Sanchaisuriya, Sychareun, Chaleunvong & Boonyaleepun, 2013).

The study conducted in Vietnam revealed that family members who stop supporting the patient can lead the patient stop adhering to treatment (Tam, Pharris, Thorson, Alfven & Larsson, 2011).

Poor access to social security grants to people living HIV and AIDs may lead to non-adherence to treatment because, as soon as the CD 4 cell count improves and the viral load becomes undetectable, the social security grant is stopped. Therefore, non-adherence may result so that they remain on the state grant.

Some people living with HIV and AIDS do not want it to be known that they are on treatment and they often skip their treatment so that they may not be seen taking it. They do that in order to be accepted as they cannot disclose their HIV status.

Lack of transport money is a challenge for women with regard to TB and ART access and adherence, because they sometimes fail to assess facilities for treatment. Some women choose not to adhere to their treatment than risk their husbands know that they are HIV positive (Human Rights Watch, 2007; Neyrolles, 2009). Women who are married or in stable relationships find it difficult to adhere to their treatment, as they have to cope with multiple roles in the family (Bonolo, Ceccato, Rocha, Acurcio, Campos & Guimaraes, 2013).

Alcohol consumption has negative influence on antiretroviral adherence in women. Negative effects of alcohol abuse are more in women than men, because there tends to be stigma attached to women who drink alcohol compared to men. These women drink alcohol privately and hide the fact that they drink alcohol Drinking alcohol lead them to forget to take their TB treatment and ARVs (Grant, 2005).

2.20 Drug-resistant TB and HIV

Multidrug-resistant TB (MDR-TB) is defined as TB that is resistant to at least two TB drugs including Rifampicin and Isoniazid (INH). HIV co-infection is significant challenge for the prevention, diagnosis and treatment of MDR and XDR-TB.

Provider-initiated HIV counselling and testing should be offered routinely to all TB patients. HIV is a huge risk factor for the development of all types of TB including the DR-TB (Department of Health, 2011b). The DR-TB is always associated with higher mortality rates in HIV infected patients as compared to those who are not infected with HIV. Diagnosis of DR-TB in HIV positive persons is difficult; all HIV positive patients should be screened for drug resistance TB through culture sputum examination (Nadu, 2011.)

Many outbreaks of MDR-TB have been reported among people living with HIV. These people are at high risk to become infected with mycobacterium tuberculosis and develop active TB disease (Gandhi, Moll & Sturm, 2006). The treatment of MDR-TB is very difficult as it currently takes 18-24 months while treatment of the uncomplicated TB takes only 6-8months. This involves more toxic and expensive medications. MDR-TB complicates the treatment of HIV due to potential drug interactions and increased pill burden (Gandhi, Moll and Sturm, 2006). (Hansana, Sanchaisuriya, Sychareun, Chaleunvong, Boonyaleepun and Schelp (2013), indicated that the development of DR-TB is due to non-adherence to treatment. They indicated that non-adherence can be due to the distance to the clinic, having to take many drugs, difficulty in maintaining the medication regimen and self-stigma due to lack of knowledge about the danger of non-adherence to treatment. The ultimate goal of Drug resistant TB prevention is to treat TB correctly at the first time. This can be attained if patients take their medications correctly and under direct observation (Nadu, 2011).

2.21 Management and treatment of MDR-TB/HIV co-infected patients

Drug resistant-TB treatment is the same for HIV- positive and HIV-negative patients. MDR-TB and Extensively Drug-Resistant (XDR) TB treatment is much more difficult and more common in HIV-positive patients. Mortality is high during treatment particularly in the advanced stage of immunodeficiency mainly due to advanced MDR or XDR-TB disease and other HIV-related opportunistic infections. If the patient can develop MDR or XDR-TB being already on ART, they should immediately be started on the appropriate treatment. If the patient can develop DR-TB while on ART, DR-TB treatment should be started immediately and ART continue throughout DR-TB treatment (Nadu, 2011). If the patient is HIV positive but not on ART during

DR-TB diagnosis, they should be started on ART irrespective of CD4 cell count level once the DR-TB treatment is tolerated preferably within the first month of treatment.

First line Antiretroviral therapy for patients on DR-TB treatment is:

- Zidovudine 300mg orally twice daily or Stavudine 30mg orally twice daily and
- Lamivodine 300mg orally daily and Efavirenz 600mg at night or
- Nevirapine 200mg every 12 hours.

Cotrimoxazole prophylaxis therapy should be offered to HIV co-infected individuals and this will result in a decreased opportunistic infection, hospitalization as well as mortality rate. It should preferably be offered before ART initiation. The dosage of Cotrimoxazole is 960mg (two tablets) daily (Nadu, 2011).

2.22 The epidemiology of HIV and AIDS in Limpopo Province.

Approximately 80% of the population in Limpopo province is rural based. This situation greatly impacts on the population's capacity to acquire education particularly tertiary education which in turn influences the potential for employment in the formal economic sector. Available information shows that one in three people (33.4%) aged 20 and older has had no formal education. The highest percentage of people in this category (39%) is found in Vhembe District, while Capricorn District has the lowest percentage (9%). At least two thirds (67.6%) of the population aged 20 and older with no formal education are women. Statistics South Africa (2007) shows a significant decrease in the percentage of the population aged 20 and older with no schooling, nationally. It is reported that the percentage of people aged 20 and older with no schooling dropped from 17.9% in 2001 to 10.3% in 2007. In 2007, 9.1% of the people aged 20 years and older had completed higher education, as compared with 8.4% in 2001. While these are national figures and, variations are invariably expected at provincial level, the expectation is that the changes reflected at national level are mirrored at provincial level; Limpopo Province included (Statistics South Africa, 2007).

The rate of unemployment plays a key role in depicting the employment status of the labour force in South Africa and, to a fair extent, the functioning of the economy at

large. Statistics South Africa conducts labour force surveys on a quarterly basis in the attempt to track employment and unemployment patterns in the country. The results of the 2010 second quarter Labour force survey put the national unemployment rate at 25.3%. From a provincial perspective, the rate of unemployment in Limpopo province was estimated at 22.6% during the same reference period. This portrays Limpopo Province as one of the provinces in the country with highest unemployment rate following Western Cape 21.8% and Kwa-Zulu Natal 20.8% (Statistic SA, 2007).

The rural nature, unemployment, gender inequality and illiteracy are some of the major factors that affect the Limpopo Province. Approximately 80% of the Limpopo Province is rural with a 19% unemployment rate. This situation greatly impacts on the population's capacity to acquire education – particularly tertiary education which in turn influences the potential for employment in the formal economic sector, making individuals more vulnerable to HIV, STI&TB infections. Available information shows that one in three people 33.4% aged 20 years and older has had no formal education.

2.23 TB/HIV Service models

The models reviewed in this study are the United States President's Emergency Plan for AIDS Relief (PEPFAR) models of TB/HIV integration, as well as models of TB/HIV integration in South Africa. The United States President's Emergency Plan for AIDS Relief (PEPFAR) was initially a five-year (2003-2008), 15 billion Dollars commitment, by the US government to tackle the global HIV and AIDS epidemic. In July 2008, PEPFAR was renewed and intended to spend 48 billion dollars between 2009 and 2013 on programmes globally to combat HIV and AIDS epidemic, tuberculosis and malaria. PEPFAR is the largest healthcare initiative to be launched by the country to address TB, HIV and malaria diseases (WHO, 2010a).

2.23.1 The PEPFAR models for TB/HIV integration

Various types of PEPFAR models, namely, a Catholic AIDS Relief Project of Rwanda, Partial Integration Model of Zambia, Referral or Separate Model of Mozambique and Tanzania, the One Stop Service' for TB and HIV patients of Kenya,

TB/HIV integration model of Malawi and Mentorship model were reviewed in this study.

- **An Integrated HIV/TB Service Model: A Catholic AIDS Relief Project in Rwanda**

Catholic AIDS Relief (CRS's) project is a five-member consortium of NGOs that works through a network of local partner treatment facilities to provide HIV care and medications in nine countries (WHO, 2007a). In Rwanda, AIDS Relief relies on a capacity-building model to improve the quality of care through integration of TB and HIV services. The capacity-building model includes using group learning about TB and HIV illness and treatment that aims to educate the community about how TB and HIV diseases are spreading as well as about the symptoms and treatment of both diseases. It is also aimed to improve demand for services and effective treatment. Each health facility develops a plan in collaboration with local government for community mobilization activities. The AIDS Relief program also conducts on-site mentoring in program performance for all staff, which aims to support quality of services (WHO, 2007a).

People living with HIV are screened for TB on the first time of registration into an HIV care and treatment program. The TB screening is conducted every six months using the screening tool of the National Integrated Program for the Fight against Tuberculosis. All facility health care providers are trained in TB diagnoses treatment and patient management. Community health volunteers are also trained on the use of TB screening tool and provided with basic TB education; they work in their home areas to identify and refer possible TB cases to the local health facilities (WHO, 2007a).

For Catholic AIDS Relief project managers, there were several advantages of community-based TB/HIV integration training sessions, namely;

- They learnt the National standards, protocols and reporting mechanisms for TB and HIV. HIV counselling and testing presents an opportunity for TB screening.
- Quality training equipped community health volunteers to address TB, HIV and other health issues.

- Regular home visits by community volunteers addressing HIV offered extensive community penetration in the effort to detect possible cases of TB which is Active TB case finding.
- Comprehensive training of local-facility staff improves identification of active TB disease.
- The mentoring model was an appropriate tool to address the complexity of successful HIV/TB treatment.

Nurse-based models of care allow services to reach far into remote areas.

- In an era of extensively drug resistant TB (XDR-TB), strong adherence programs are needed for patients to be cured. AIDS Relief's successful model for antiretroviral therapy (ART) adherence can be used as a model for TB adherence.
- Adequate resources for TB programme management are needed to ensure quality treatment and management of TB patients (WHO, 2007a).

The strengths of this model is training of community health volunteers and involving them in the TB screening of community members, this ensures early detection of TB. This will enable them to refer those clients to the health facilities for PHC nurses to conduct further management and treatment and do HIV testing for integration of care. Integration of TB and HIV services is improved as TB screening is done in the HIV counselling and testing site.

Mentoring is conducted to strengthen PHC nurses in the integration of the TB and HIV services (WHO, 2007a).

The Weakness of this model is that it relies only on capacity building of both Health professionals and Community health volunteers for TB and HIV integration. There is a need to include resources provision to ensure easy integration of TB and HIV services.

- **Referral or separate model**

This is the TB/HIV Model used in Mozambique and Tanzania. In this Model TB and HIV services are separate and TB patients seek HIV testing services, HIV care and treatment support outside of the TB clinic. TB/HIV services are linked by a referral system. In this model the patient might be from either TB or HIV entry point. When

the patient is being diagnosed with TB, he/she is then referred to the HIV Counselling and Testing (HCT) service point for HIV counselling, testing and treatment. On the other side, when the patient comes through the HIV entry point, after tested HIV positive, he/she is referred to TB service point for TB screening and treatment (WHO, 2007a).

The weakness of this model is that the movement can make the patients tired and lose confidence in the staff members. The patient can be lost during the movement from one service point to another and not reach their destination thus disrupting the integration of TB and HIV services.

- **Partial integration model**

The partial integration model is practiced in Zambia. In this model ART is provided in the TB clinics while DOT is provided in the HIV/AIDS services. Partial integration is achieved by deliberate effort by health professionals to ensure that some components of TB/HIV services can be delivered on the same day, within the same facility (WHO, 2007a). The weakness of this model is that the patients stay for a long time in the facility moving from one service point to another. This can disrupt adherence to treatment and patients can default coming to the services.

- **'One-Stop Service' for TB and HIV patients**

This is the TB/HIV service integration model practiced in Kenya. In this model TB and HIV services namely counselling and testing for HIV, provision of ART, TB screening and treatment are provided in the same room by one professional nurse. The mobile units go to the rural areas to treat TB and HIV infected people in the same unit by the same nurse (WHO, 2007a).

The strength of this model is that it ensures the easy access of services by people including the rural people who have no means of travelling to the health services. This model is also cost-effective to the patients as they receive two services at the same time without travelling to the health facility two times for different services. The weakness of this model is that people do not take responsibility of seeking health

services. This can result in some complications if the service fails to go to them in some of the days due to unforeseen circumstances such as transport constraints.

2.23.2 TB/HIV service delivery model in Malawi

With the TB/HIV integration model practised in Malawi, the HIV program used DOT strategies. There is no integration of TB and HIV care. Each service is provided separately. Malawi has a challenge of poor infrastructure for provision of TB and HIV services in the same room (Chifundo, 2010; Malawi ministry of Health, 2004). Another challenge is shortage of physicians as there is a large population who need to be started on ART. The number of patients needing Highly Active Anti-Retroviral Treatment (HAART) is 170, 0000 and yet 1 million are infected with HIV (WHO, 2007a).

The weakness of this model is that the patients are not receiving complete care and treatment. TB and HIV are treated separately. HIV patients can end up being infected with TB due to inadequate care in the prevention of TB.

2.23.3 Mentorship of PHC nurses on TB/HIV service delivery

The mentorship model focuses on the mentorship of newly employed Professional nurses in the PHC facilities of Limpopo Province regarding integration of TB and HIV services. Lekhuleni, Khosa and Amusa (2012), discussed about the process of model development which will assist PHC nurses to integrate the TB and HIV services in Limpopo Province. The process of model development involves concept analysis, related concepts, critical attributes, antecedents and consequences. Concept analysis refers to a process that allows the examination of the attributes or characteristics of the concept (Lekhuleni et al., 2012). Furthermore, concept analysis involves the identification and clarification of the variables and concepts around which the model will be developed, including the clarification of statements and their organization. Analysis of concepts brought to light related concepts. The method of concept analysis includes the definition of the concept adherence, critical attributes and consequences (Lekhuleni et al., 2012).

In this study the mentorship model will contribute towards the integration model about the mentoring of PHC nurses by supervisors on the use of the TB and HIV

integration model. The PHC nurses will be supported wherever they experience challenges with regard to the implementation of TB and HIV integration services.

2.23.4 TB/HIV integration model in Khayelitsha (South Africa)

A TB and integration study was also conducted in South Africa. Khayelitsha was implementing TB and HIV services as two vertical services conducted separately. HIV service points were opened next to TB clinics in the public services in the year 2000 and in the year 2001 the first HIV positive patient was initiated on HAART. Voluntary Counselling and Testing (VCT) was re-enforced in the TB services and this was done to enable the TB patients to access HAART. Towards the end of 2003 the buildings of TB and HIV were merged and as such the integration of TB and HIV services were started in Khayelitsha in Ubuntu clinic.

Ubuntu clinic has a common reception area and folders have both the TB and HIV records to make TB and HIV services integration simple. Dually infected patients started to be treated for both TB and HIV simultaneously and this reduced the cost of travelling and waiting time.

The strength of this model is that it is cost-effective to the patients as they receive two services at the same time without travelling to the health facility two times for different services. The challenge of shortage of staff is also reduced because one PHC nurse conducts the two services at the same time. Adherence to treatment is also improved because patients develop confidence in the nurse who offers two services to them.

In this study a model was developed based on involvement of TB/HIV co-infected patients CHBCs in data collection through focus group discussions. PHC nurses were also involved in the quantitative data collection and in validation of the model. Research experts from the University of Limpopo were also involved in the model validation to make sure that it is user-friendly in the PHC facilities.

2.24 TB and HIV co-infection in Limpopo Province

Limpopo Province had challenges in the TB and HIV control programme. There were inadequate human resources for carrying out the medium-term development plan

activities which aimed at the reduction and prevention of new TB and HIV infections. The staff establishment of Limpopo Province Department of Health had only one TB coordinator at the Province in the year 2000 and one TB coordinator in each district for the five districts in Limpopo Province. Currently DOT was discovered to be inadequately implemented in Limpopo Province as most of the patients were self-supported when taking treatment. Limpopo Province is implementing the DOT strategy using trained Community Home-Based Carers (CHBCs) who supervise TB and HIV patient's treatment in the community. Some of these CHBCs are integrated into NGOs and provide comprehensive home-based care services (Gafar, Nyazema & Dambisya, 2014). The CHBCs receive a stipend from the Limpopo Provincial Government Department of Health.

HIV and AIDS and Multidrug Resistant-Tuberculosis (MDR-TB) cause a great challenge in controlling the TB disease. TB and HIV programs are currently managed into the PHC system even though they are still running separately in most facilities. TB and HIV control is ensured by involving communities in the DOT programme. The use of combination drugs is employed in TB and HIV management in Limpopo province under DOT which is conducted by CHBCs (WHO, 2008).

Both facility and Community based DOT are practiced within the province. The TB programme in Limpopo Province has been receiving some reviews from the International Union for TB and Lung diseases (IUATLD) and World Health Organization (WHO). The 2002 review results highlighted that the TB programme in the Province was still below the WHO targets, but there were strengths that could assist the programmes to improve. Health care providers showed commitment to the TB and HIV services; staff members at health facilities, district and provincial managers are also committed to the programmes to assist the patients. The challenge identified within the Limpopo TB and HIV control programmes was that the two programmes are running vertically and some patients were lost to follow up when referred from one service point to another, such as the TB co-infected patients were referred from the hospital to receive ARVs at PHC facilities (WHO, 2008).

ART initiation in the PHC facilities started in Limpopo Province simultaneously with other provinces in 2004 after the facilities were assessed and awarded the authority

to provide ARVs to patients. According to the 2006 Sero-prevalence Survey, Limpopo Province has an HIV prevalence rate of 20.7%, and according to the MRC survey of 2001-2002, Limpopo had a high TB and HIV co-infection rate of 52.4% (Department of Health,2006). The findings of the MRC survey indicated a high rate of MDR-TB in Limpopo at 2.4% for new cases and 6.8% for retreatment MDR-TB cases. Limpopo is approaching the “hot spot” threshold. An MDR-TB hot spot is defined by WHO as a geographical setting where the prevalence of MDR-TB among new patients exceeds 3%. The report from the Electronic TB Register (ETR) indicated that Limpopo province is currently having the TB/HIV co-infection rate of 64% (Limpopo Provincial Strategic Plan on HIV, STIs and TB, 2012-2016).

The weakness of the TB and HIV service provision system is lack of integration as the co-infected patients are not treated in the same room by one PHC nurse. This leads to loss to follow up of patients when they are referred from one point to another. They only come back when they are very sick. Integration of services is needed as it is cost-effective to the patients because they will be treated for both conditions at the same time without travelling to facilities on different days.

2.25 Collaboration of TB and HIV services in Limpopo Province

Collaboration of TB and HIV services entails interaction with multidisciplinary teams and involvement of community stakeholders, working with Non-Governmental Organizations (NGOs), referring clients to social workers, doctors and MDR-TB units, involving traditional health practitioners to dispel myths and misconceptions. Involvement of community stakeholder's entails involving them when planning and conducting the Advocacy Communication and Social Mobilization (ACSM) activities. Traditional leaders and the clinic committees should also be involved in the planning and conducting the ACSM activities (Limpopo Provincial Strategic Plan on HIV, STIs and TB: 2012-2016).

Community involvement and participation forms an integral part of primary health care services; TB and HIV activities in the community should be designed to generate public-will by securing broad consensus and social commitment among civil society to fight the stigma and using iconic members of the community and

respected community leaders can assist in TB and HIV prevention and de-stigmatization of these diseases (WHO, 2013b).

In Limpopo Province, there are NGOs in the community who are assisting in the fight against TB and HIV. It is important to work with NGOs as most of the CHBCs are coming from them and they also assist during campaigns and in tracing of defaulted patients. It is indicated in the National Tuberculosis Control Programme (NTCP) Guidelines (2009) that there should be collaboration with other agencies and NGOs in the fight against TB and HIV. According to the National HIV and AIDS, TB and STI Strategic Plan for South Africa, 2012-2016, NGOs providing care to TB and HIV patients should be involved in the planning and management of the TB and HIV patients. Patients are referred to social workers, medical practitioners and MDR-TB units if need be.

Tuberculosis remains the major opportunistic infection in patients with HIV infection globally, nationally as well as in Limpopo Province (WHO,2008). The model for complete integration of the TB and HIV services need to be developed and practiced to reduce the TB/HIV co-infection rate.

2.26 Stigma and discrimination relating to TB and HIV infections

Daftary (2012), defines stigma as “the shame or disgrace attached to something regarded as socially unacceptable”. The author indicated that individuals who have both TB and HIV experience “a unique and overlapping double” stigma because people perceive that if a person has TB, she/he is also HIV positive. USAID (2008) defines TB and HIV stigma and discrimination as “a process of devaluation of people living with or associated with TB and HIV and AIDS”. Stigma causes people to be shunned, discriminated against and even persecuted for perceived moral, ethical, gender, health, economic, physical, religious class or social impropriety. Stigma can affect the family, where TB and HIV infected people need support (Ware,Wyatt, Tugenberg, 2006). Stigma also affects adherence, as people living with HIV and AIDS and TB are reluctant to take their drugs at a time or at places where people can see them (Panos, 2006; Monger, 2011). Families also need to be educated about TB and support from PHC nurses and CHBCs (Panos, 2006).

Dhingra and Khan (2009) indicated that social stigma associated to TB and HIV reduces the individual status in the society. Stigma can occur at work place where an individual can be discriminated and isolated by co-workers. They can also be discriminated by family members and neighbours (Twehaze, 2009). They can stop participating in the social functions due to the fear of being stigmatised. Stigma and discrimination can cause non-adherence to treatment. The consequences of stigma can affect disclosure, health care seeking behaviours, stigma and discrimination interfere with treatment and prevention measures as people are not free to present themselves to health facilities for treatment and care as well as to participate in prevention activities (Dhingra & Khan, 2009; Law, Gogolishvili, Globerman & Rueda, 2013,). Karim and Karim (2010) indicated that stigma and discrimination are some of the most critical reasons for the failure of prevention programmes. Stigma and discrimination have negative effects on diagnosis and treatment options because an individual may delay to access HIV counselling and testing which delay commencement of antiretroviral therapy and there will be no motivation for the individual to change their risky sexual behaviours (Karim & Karim, 2010).

The tendency to delay seeking health assistance after the onset of the disease results in increased morbidity and mortality as well as the ongoing spread of TB and HIV to other people. Fear of infection had been identified as the main reason for the stigmatization attitudes and behaviour of both health professionals through the use of isolation wards in most hospitals. Some Doctors and nurses use masks and gloves when dealing with TB and HIV infected patients, this can lead to stigmatization of these patients by of community members (Dhingra & Khan, 2009).

2.27 Addressing stigma attached to TB and HIV

Stigma is a barrier presenting a serious obstacle to successful TB and HIV control. Health seeking behaviour includes a balancing of costs and benefits to the patient. The benefit of getting well may out-weigh the cost of social and family rejections, loss of dignity, discrimination at the work place and in the entire community (Tomaszewski, 2012).

A direct approach to address stigma and discrimination involves the following:

- Intensification of education on TB and HIV and regular organisation of refresher courses and retraining of health care professionals in TB and HIV

control, treatment and management. The perception of society about TB and HIV can be changed when health professionals are seen to be treating the TB and HIV patients as normal individuals.

- Conducting the Health-related meetings with communities.
- Teaching and talking to communities about TB and HIV through the media and direct health education sessions at health facilities.
- Encouraging patient to disclose their HIV status and advocating for people living with TB and HIV/AIDS in order to reduce stigma and discrimination.
- Counselling and taking care of the sick by offering them compassion and care and educating them about the importance of disclosure.
- Promoting and encouraging treatment for HIV/AIDS-related illnesses.
- Promoting family involvement in the care of the TB and HIV infected patients.
- Family education and support about TB and HIV conditions and how to take care of their infected family members.

Communities should be encouraged to support TB/HIV co-infected patients and give them continuous counselling so that they may adhere to treatment. Directly Observed Treatment strategy should be implemented in the care and support of TB and HIV through the involvement of Community Home Based Carers (Dhingra & Khan, 2009; Greeff, Phetlhu & Makoae, 2008).

Karim and Karim (2010), state that to combat stigma CBOs, NGOs, health service providers, community health workers and social services need to work toward sensitizing local communities to the needs of those infected with HIV and affected by HIV and AIDS. Responsible people who are on ARVs choose to disclose their HIV status to their sexual partners so that they may practice safer sex to prevent reinfections which can lead to complications. Empowerment of people on antiretroviral therapy is critical as it enables them to act responsibly (Karim & Karim, 2010).

2.28 Support systems for the TB/HIV co-infected patients.

Support to the TB and HIV infected patient is important as the patient who receives the TB and HIV diagnosis is facing a challenge to deal with these life-threatening

diseases. The patient is faced with issues such as death and TB and HIV related symptoms, change in body image, and decisions about disclosure, stigma, rejection and social isolation. Patient's support is vital as most people with TB and living with HIV are concerned about the well-being of their families, and themselves.

Patients should be encouraged to disclose their HIV status to their families in order to gain support from their families (Maman, Van Rooyen & Grooves, 2013). Patients who enjoyed family support were more likely to adhere compared to those who did not enjoy such support (Harris, Pillinger, Fromstein, Gomez, Garris, Kanetsky & Gross, 2011; Oluwagbemiga, 2007). Some patients are worried about how community members will relate with their children once they realize that they are infected with HIV (Adebola, Adedimeji & Aluwole, 2010).

Patient counselling as well as joining support groups has proven to be effective and resulted in positive health behaviour (Gaede, Majeke, Modeste, Naidoo, Titus & Uys, 2006). It was shown that belonging to a support group of people with TB and HIV was proven to promote adherence to treatment and those who experienced side effects were likely to be non-adherent. HIV and AIDS services need to be extended to accommodate health care providers so that they can be empowered to care for the patients (Tapp, Milloy, Kerr, Zhang, Guillemi, Hogg, Montaner & Wood, 2011).

2.29 Sustainable development goals for TB and HIV

The international community made a commitment to eradicate the TB disease, AIDS and Malaria epidemic as a public health threat by 2030. This is an ambitious target of the 2030 Agenda for Sustainable Development adopted by the United Nations General Assembly in September 2015. The Global fund was introduced to sustain and support TB through funding of activities such as Xpert sputum analysis for TB and DR-TB diagnosis and purchasing of TB treatment. Funding for HIV services such as purchasing of ARVs, purchasing of HCT test kits for diagnosing HIV. Purchasing of condoms to prevent the transmission of HIV, care and support of orphans well as Malaria Prevention services such as provision and distribution of insecticides and treatment of malaria cases. Cross-cutting services such as community outreach prevention services, as well as training of health and community

workers are also funded through the Global fund. The following interim targets have been established for 2015 in the Millennium Development Goals as indicated in WHO (2015):

- **To halt by 2015 and begin to reverse the spread of HIV and AIDS.**

Progress has been made in reducing new HIV infections among children aged 0–14 years, with a 79% decline from an estimated 78 000 infections in 2004 to 16 000 in 2013. HIV prevalence declined from 3.7% in 2008 to 1.7% in 2012 among children aged 0-4years and the decline from 5.6% in 2002 to 2.4% in 2012 among children aged 2–14 years. This is attributable to the accelerated prevention of mother-to-child transmission (PMTCT) programme.

- **To achieve by 2010 universal access to treatment for HIV and AIDS for all those who need it**

South Africa had made a progress in achieving universal access to treatment for HIV/AIDS for all those who need it by 2010. The proportion of eligible adults and children receiving antiretroviral therapy (ART) increased from 58.3% in 2010 to 75.2% in 2011, and ART coverage for HIV-positive pregnant women also increased from 87.3% to 99%. In 2013, 2.3 million South Africans were on antiretroviral treatment, making it the largest programme in the world.

- **To halt by 2015 and begin to reverse the incidence of malaria and TB**

The year 2015 was targeted as the deadline for global TB targets set in the context of the Millennium Development Goals (MDGs). It was a year of transitions from the MDGs to a new era of Sustainable Development Goals (SDGs), and from the Stop TB Strategy. The use of the rapid test Xpert was initiated to diagnose the Multiple Drug Resistant TB and Rifampicin Resistant TB since 2010, when WHO first recommended its use (WHO, 2014a).

The Sustainable Development Goals strategy which was approved in September 2015 calls for an integrated approach to address today's development challenges of TB, HIV and Malaria. Water management and sanitation to be implemented to eliminate malaria in the country. Strong and resilient systems for health must be built

to achieve the Sustainable Development Goal targets for HIV, TB and malaria (WHO, 2014a).

As the Sustainable Development Goals lay the groundwork on how to address the challenges of the next 15 years, the achievements in global health in the 15 years since the Millennium Development Goals can serve as a model for what can be done when communities, civil society, governments, international organizations and the private sector come together in pursuit of a common goal (WHO, 2015).

It was discovered that TB was the leading cause of death for women globally; that there was an urgent need to direct efforts and resources. The Global Fund to Fight AIDS, Tuberculosis and Malaria and the Stop TB Partnership called for greater attention to gender, HIV, TB and malaria. Moreover, through the Sustainable Development Goals (SDGs), governments have committed to goals related to gender equality and health (WHO, 2014b).

2.30 Conclusion

This chapter provided an overview of the literature reviewed on models of TB and HIV services integration. National and international literature sources on models of TB and HIV services integration were explored. TB and HIV integration models of PEPFAR and South Africa as well as the collaboration of TB and HIV services in South Africa were reviewed. The literature reviewed revealed how the models of TB and HIV services are implemented globally in the developed countries such as USA and Australia and in the developing countries such as Lesotho, Malawi and South Africa.

The review of the literature revealed that there is a high rate of TB and HIV co-infection globally. It also revealed that integration of TB and HIV services is not well implemented in both developed and developing countries. Lack of integration was discovered to be due to insufficient knowledge of some nurses working in the PHC facilities, lack of policies, resources such as adequate structures for the provision of the integrated TB and HIV services. This shows the need to strengthen knowledge of PHC nurses and CHBCs who assist in caring for TB and HIV infected patients in the communities. Patient education is also important to gain their cooperation on

prevention of TB and HIV infections. The next chapter will focus on research methodology used in the study.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

In this chapter the site where the study was conducted and research methodology included the research design and methods are described. The population, sampling, data analysis, measures to ensure trustworthiness and the ethical considerations that guided the researcher throughout the investigation are also described.

Research question

What model can be developed to ensure integration of TB and HIV services in the PHC facilities of Limpopo Province?

Objectives of the study

- To determine the PHC nurses' knowledge and skills on management, care and treatment of TB/HIV co-infected patients in Limpopo Province.
- To identify the challenges faced by CHBCs regarding care and support of the TB/HIV co-infected patients in Limpopo province.
- To explore the experiences of patients regarding the TB/HIV services in Limpopo province.
- To develop a model to ensure integration of TB and HIV services in Limpopo Province
- To validate the model for TB/HIV service's integration.

3.2 Research site

The study was conducted in Limpopo Province which is situated in the North-Eastern corner of South Africa and shares borders with Botswana, Zimbabwe and Mozambique (Figure 3.1) Limpopo Province is named after the Limpopo river(Pauw,2005). Limpopo Province has an estimated population of 5 592518 people and accounts for 11% of the total population in the Republic of South Africa which is estimated at 51 million people (Statistic South Africa, 2007). Limpopo Province is the fourth most populated province in South Africa after Gauteng, KwaZulu-Natal, and Eastern Cape respectively and it is considered to be the poor province with approximately 87% of its people living in rural areas (Pauw, 2005).

Limpopo Province has an influx of immigrants from Botswana, Zimbabwe and Mozambique and this creates the overpopulation in squatter camps which contribute to increased numbers of unemployed people and infectious diseases such as TB and HIV (Vearey & Nunez, 2010).

Limpopo Province consists of five districts namely: Capricorn, Mopani, Sekhukhune, Vhembe and Waterberg (Pauw, 2005). There are 25 municipalities in the province and, 519 health facilities which include 34 hospitals, 24 health centres and 461 clinics. Capricorn district has 5 municipalities, 8 hospitals, 4 health centres and 100 clinics. Mopani district has 5 municipalities, 7 hospitals, 3 health centres and 93 clinics. Sekhukhune district has 5 municipalities, 7 hospitals, 3 health centres and 87 clinics. Vhembe district has 4 municipalities, 6 hospitals, 8 health centres and 113 clinics and Waterberg district with 6 municipalities, 68 clinics, 7 hospitals, one MDR-TB hospital and 2 health centres.

There is a high concentration of agricultural activities which is the main economic activity followed by mining in Limpopo Province. Limpopo province is mostly rural and second poorest province in South Africa. Approximately 77% of the population lives below the poverty income line (Mopani District Municipality Annual Report, 2011). The rural nature, high levels of unemployment and high levels of illiteracy are some of the major factors that affect Limpopo Province (Census, 2011). The challenge of immigrants has greatly negative impact on the Province's economic capacity. Trucks transporting mining minerals from the mines to other countries have the negative impact on health of Limpopo people because truck drivers have common areas where they park and attract sex workers by giving them money for sex practices. This contributes to increased numbers of sexually transmitted infections (STIs), HIV and TB.



Figure 3.1: The Map of Limpopo Province where the study was conducted

3.3 Research method

The concept research method refers to a model to conduct a research within the context of a particular paradigm (Wahyuni, 2012). It comprises of the underlying sets of beliefs that guide a researcher to choose one set of research methods over another. Methodology enables a researcher to reach a valid and reliable perception of phenomena, events, processes or issues at many different levels (Kothari, 2006). Creswell (2009) defines research methodology as a system of methods used in a particular field to reach a valid and reliable perception of phenomena, events, processes or issues at many different levels.

An explanatory sequential mixed method was used in this study to develop a model for ensuring effective integration of TB and HIV services in the PHC facilities of Limpopo Province. Mixed method research entails the collection and analysis of both quantitative and qualitative data and this was done sequentially (Creswell, 2009). In an explanatory sequential mixed method, the researcher gathers qualitative data to

discuss the findings found in the quantitative data (Creswell & Plano Clark, 2011). The researcher collected quantitative data followed by qualitative data. Quantitative data was collected through administration of questionnaires to 450 PHC nurses in the five districts of Limpopo Province. The qualitative data was collected by conducting focus group discussions with five groups of CHBCs and five groups of TB/HIV patients in the five districts of Limpopo Province.

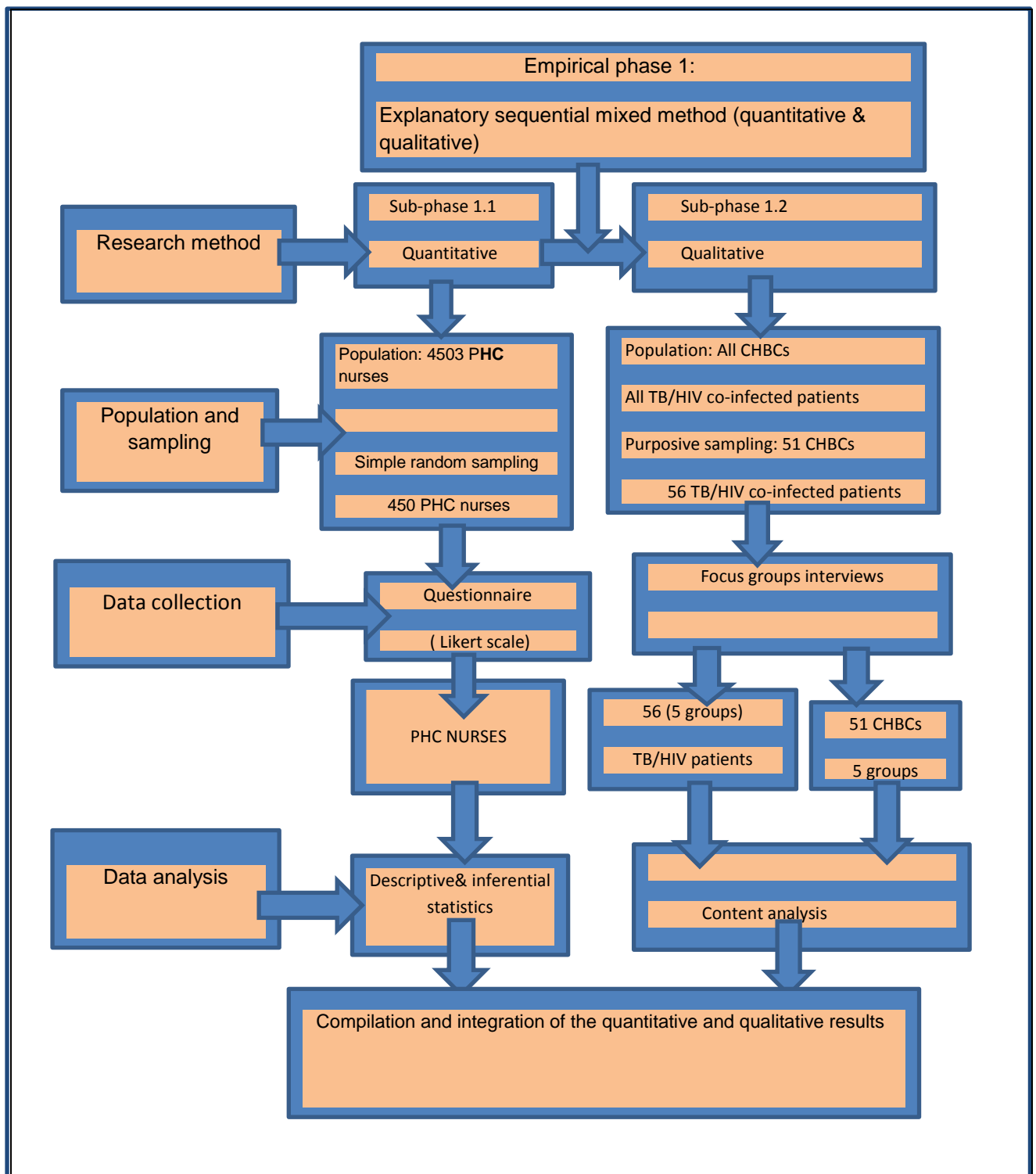


Figure 3.2: The schematic presentation of sequential mixed research method

In the explanatory sequential mixed research method, the researcher conducted the quantitative component of the research first through questionnaires in order to derive secondary research questions for the qualitative through focus group interviews. The

focus interviews assisted the researcher to obtain in-depth and descriptive data of the participants' experiences of the issues and, in terms of this the solutions arising from a discussion which explored the problems mentioned. This provided a further understanding of the experiences of the TB/HIV co-infected patients (Creswell, 2012).

The quantitative data aided in the identification of items and scales that led to the development of a qualitative instrument. The use of explanatory sequential mixed method, which combines quantitative and qualitative methods, was preferred in this study because both approaches allowed a more complete investigation. An important advantage of mixed method studies is that they can show the results and explain why they were obtained (Creswell, 2012). The study adopted three phases namely, empirical, model development and model validation (Figure 3.2).

3.3.1 Sub-phase 1.1: Quantitative

The objective of the quantitative sub-phase was to determine the PHC nurses' knowledge and skills on management of TB/HIV co-infection in Limpopo Province. The quantitative sub-phase used an objective measurements and numerical analysis of data collected. Quantitative research focuses on gathering numerical data and generalizing it across groups of people (Babbie & Mouton, 2009). In quantitative research the goal is to explore the relationship between variables in the population.

3.3.2 Research Design

Research design is a logical and systematic plan prepared for use in conducting a study (Kumar 2008). It provides the overall structure of the procedure to be followed, sampling methods, data collection tools and the related methods of analysis. Burns and Grove (2005), describe descriptive designs as designs that aim to gain more information about characteristics within a field of study. Descriptive designs are aimed to accurately portray the characteristics of people, situations or groups (Polit and Beck, 2006; Shuttleworth, 2008). In this study the researcher used the explanatory sequential mixed research design where data was collected, analysed and results compiled from the PHC nurses, then the focus group discussions of CHBCs followed by TB/HIV co-infected patients focus group discussions.

3.3.3 Population

Polit and Beck (2010), described the population as a group of individuals who have the same characteristics. The population was 4 503 professional nurses who are working in the primary healthcare facilities in the five districts of Limpopo Province, 8 968 CHBCs in the five districts and 7 853 TB/HIV co-infected patients in the five districts of Limpopo province.

3.3.4 Sampling

Sampling refers to the process of selecting a portion of the population to represent the entire population (Brink, Van der Walt & Van Rensburg, 2012). Sampling enables the researcher to obtain the required information in a reliable manner without involving the whole population systematic sampling was used to select 450 PHC nurses from the data base of the Department of health in Limpopo Province to participate in the study. A random sample is one in which every element in the population has an equal and independent chance of being selected for sample. The systematic sampling was conducted by selecting every tenth PHC nurse from the data base according to the number of PHC nurses in the Province.

Table 3.1: The number of professional nurses and sample size per district

District	Number of PHC nurses	Sample size
Capricorn	978	98
Mopani	1 293	129
Sekhukhune	864	86
Vhembe	1 050	105
Waterberg	318	32
Total	4 503	450

PHC nurses were selected from both rural area clinics and urban area clinics. Therefore, a sample size of 450 was required for the study. The sample size was calculated using Slovin's formula:

Slovin's formula was used to select the sample size and the sample was calculated follows:

$$n = N / (1 + Ne^2)$$

Sample size of PHC nurses in Limpopo Province:

n= Number of sample= unknown?

N= Total number of PHC nurses in Limpopo Province is 4503

e= Error tolerance which is = 0.05

$$n = N / (1 + NE^2)$$

$$= 4503 / (1 + 4503 \times 0.05^2)$$

$$= 450,3$$

Four hundred and fifty (450,3) is the sample size but it was rounded off to 450.

- **Inclusion criteria:**

Both male and female PHC nurses were included in the study and included PHC nurses who are trained on TB and HIV management at primary health care setting. PHC nurses should have 3 or more years of experience employed in the primary health care facilities. The experience in the PHC facilities and the knowledge they obtained in the TB and HIV management training will make it easy for PHC nurses to integrate the TB and HIV services, hence their inclusion in the study.

- **Exclusion criteria**

PHC nurses with less than 3 years experience employed in the Primary health care facilities were excluded in the study. PHC nurses who were not trained on TB and HIV management were included to participate in the study. PHC nurses who participated in the pilot study were not included in the main study.

Development of the questionnaire:

A self-developed questionnaire was used for data collection. According to de Vos, Strydom, Fouche and Delport (2012), a questionnaire is a set of questions on a form which is completed by the respondents in respect of a research project. Respondents were invited to a central venue per district. The researcher distributed the questionnaires and collected them after completion.

Description of the questionnaire:

The questionnaire is divided into the following 13 sections (Appendix 8)

- Section A: Biographic data

This section consists of 4 items that addresses gender, qualification, years of experience in the PHC facilities and the districts in which PHC nurses are working.

- Section B: Courses attended

This section consists of 26 items that address the information about the TB and HIV courses attended by respondents in order to determine their knowledge and skills as well as their competency on diagnosis of TB, HIV and STI's.

- Section C: Availability of guidelines

This section consists of 7 items that address availability of guidelines for management of TB, HIV, STI, and MDR –TB as well as TB infection control and IPT.

- Section D: Clients/patients education and information (ACSM)

This section consists of 17 items that inquire about the information and education that PHC nurses provide to patients and their families about TB and HIV diseases, treatment and the side effects of drugs.

- Section E: TB and HIV service provision

This section consists 4 items that enquire about the manner in which TB and HIV services are provided in the PHC facilities.

- Section F: Human resources and development

This section consists of 9 items that enquire about the trained staff on TB and HIV management, and availability of a training plan.

- Section G: Professional nurses' competency on HIV control and management.

This section consists of 5 items that determine the level of participants' competency on HIV counselling and testing, Prevention of Mother to Child HIV Transmission (PMTCT), couple counselling as well as HIV treatment adherence counselling.

- Section H: Professional nurses' competency TB control and management.

This section consists of 5 items that establish the participants' level of competency on TB screening, diagnosis, and treatment as well as prevention of TB and MDR-TB.

- Section I: Integration of TB and HIV services

This section consists of 7 items that establish the manner of TB and HIV management in PHC facilities, whether TB and HIV services are integrated or managed separately.

- Section J: TB and HIV programme support

This section consists of 14 items that intended to establish the support system for the TB and HIV patients in the health care facilities and in the community.

- Section K: Availability of TB and HIV drugs and commodities

This section consists of 7 items that aimed at establishing the availability of TB and HIV drugs, TB sputum collection bottles, HIV testing kits and their storage to maintain their functionality.

- Section L: Prevention of the spread of TB

This section consists of 12 items that establish the practice of PHC nurses on the prevention of the spread of TB.

- Section M: Prevention of the spread of HIV

This section consists of 10 items to establish the mechanisms for the prevention of HIV transmission. Respondents were invited to a central venue per district. The researcher distributed the questionnaires and collected them after completion.

3.3.5 Pilot study

A pilot study is the process whereby the research design for a prospective survey is tested (de Vos et al., 2012). A pilot study is regarded as a small scale trial run of all the aspects planned for a use in the main study and It helps the researcher to refine the study for the main enquiry. Polit and Beck (2010), describe a pilot study as a small trial run that is conducted to prepare for major research study.

A pilot study was conducted in one of the Community Health Centres in Capricorn district for testing of the questionnaire. To access participants, the researcher made an appointment with operational manager of the facility for a briefing meeting. The information about the study was given to the Manager and to PHC nurses who were involved in the study. The researcher then secured appointments with PHC nurses who volunteered to participate in the study.

The researcher developed the questionnaire for the study based on the information from the literature review on the variables for the study and also guided by the objectives of the study. The venue that was comfortable and free from distractions was organised. Participants were given the pamphlets on the details of the study to read before they can sign the consent form to participate in the study. Participants were also given consent forms to sign to indicate that they accept to participate in the study. The questionnaire was tested through its administration to ten (10) participants from the Community Health Centre in Capricorn district for them to complete in the presence of the researcher. Thereafter, the researcher collected the questionnaires.

The flaws that were identified in the questionnaire were that there were questions that were asked twice such as competent in diagnosing TB, competency in diagnosing HIV and competency in diagnosing STIs. PHC nurses who participated in the pilot study and the CHC used were excluded from the main study.

3.3.6 Data Collection

- **Preparation for data collection**

The researcher wrote the letter to the Provincial Head of Department (HOD) requesting to collect data in Limpopo Province. Requisition letters were also written to the District Executive Managers (DEMs) to request the permission to collect data from PHC nurses in the five districts through questionnaires administration. Written permission was granted by the HOD and DEMS (Appendix 2-7).

The researcher then made an appointment with PHC managers of the five districts to brief them about the study in order to access participants. The researcher then secured appointments with participants per district. Participants were PHC nurses working in PHC facilities in the five districts of Limpopo Province. They were PHC

nurses who have three years' experience and above in the PHC facilities. The schedule for appointments was made for participants according to the districts to meet at a venue that was comfortable and free from distractions. Participants were transported to the central venue to complete the questionnaires.

- **Procedure for data collection**

PHC nurses were invited to one central venue per district. The quiet venue was prepared to avoid noise and disturbance. The venue was labelled "Silence" to prevent disturbances. The researcher greeted and welcomed respondents and introduced herself in order to create the conducive environment. Respondents were appreciated for accepting to participate in the study. Respondents were given the opportunity to introduce themselves.

Respondents were given consent forms to sign to indicate that they accepted to participate in the study after reading the pamphlets that described what the study is about. Questionnaires were distributed to PHC nurses for them to complete in the presence of the researcher for clarity in case of questions that are not clear to them. The researcher then collected the completed questionnaires after completion and thanked participants for participating in the study. Lunch was served to participants before transporting them back to their different facilities.

3.3.7 Data analysis

In every study the data collected need to be analysed before they can be interpreted. Creswell (2009), define data analysis as a process of examining and interpreting data to derive meaning, gain understanding and develop empirical knowledge. According to Sonko, McCoy, Mahlalela, Oteba, Kamau, Berhanu, and Shamu (2010), data analysis is a process of inspecting, cleaning, transforming and modelling data with the goal of highlighting useful information, suggesting conclusions, and supporting decision making.

Once data collection had been completed, the researcher began the process of data analysis and interpretation. The purpose of data analysis was to describe the data clearly, identify what is typical and atypical of the data, bring to light differences,

relationships and other consistent patterns existing in the data and ultimately answer research question.

The Statistical Package for Social Sciences (SPSS) computer programme was used for capturing and analysis of the data of this study. The programme version 22.0 for windows was used for data analysis. The descriptive statistics assisted the researcher to understand the frequency distributions as well as the central tendency in the quantitative data collected. According to de Vos et al. (2012), descriptive statistics are numbers that are used to summarize and describe data. Descriptive statistics are used to get a feel for the data, for use in the statistical test and to indicate error associated with results. According to Brink (2007), descriptive statistics describe, organize and present data. Frequencies, percentages, the mean and standard deviations were calculated.

Inferential statistics such as the T-test was used to determine the significance of differences between the means of responses of PHC nurses in the two sets of data of data pertaining the true and false reponses. ANOVA test was used for comparing three or more independently drawn samples with ordinary scaled data. ANOVA test was used to test competency of PHC nurses and less competent was 1.

3.4 Validity and reliability

- **Validity**

According to Polit and Beck (2010), validity refers to the extent to which an empirical measure accurately reflects the concept it is intended to measure. Validity of a measurement procedure is the degree to which the measurement process measures the variable it claims to measure. Validity refers broadly to the degree to which an instrument is doing what it is intended to do (Burns & Grove, 2005). The term validity generally refers to the process of ensuring that the survey accurately measures what it is intended to measure (Rolfe, 2006). In this study the questionnaire was tested in the pilot study to check if it measures the knowledge of PHC nurses as well as availability of commodities which can improve integration of TB and HIV services in the PHC facilities of Limpopo province. The researcher applied content and face validity.

Content validity

According to Burns and Grove (2005), content validity is concerned with the representativeness or sampling adequacy of the content or topic. To determine content validity, the instrument should be checked if it really measures the concept it is supposed to measure. Content validity was ensured by involving quantitative research experts who are professors and have quantitative research and HIV/AIDS and Tuberculosis publications; to check the questionnaire for clarity. Corrections and adjustments were made before the questionnaire can be distributed to PHC nurses for collection of data.

Face validity

Face validity refers to the relevance of the instrument to those who will complete or administer it. Face validity is a desirable characteristic of a measuring instrument. In this study the instrument was structured to accurately measure the attributes and to be the relevant measure of those attributes (Burns and Grove, 2005). Experts in quantitative research who are professors and have quantitative research and HIV/AIDS and Tuberculosis publications; were consulted to view the questionnaire at face value before distribution for data collection.

- **Reliability**

According to Polit and Beck (2010), reliability is when an instrument consistently measures the target attribute. The less variation an instrument produces in repeated measurements, the higher its reliability. Reliability can be equated with a measure's stability, consistency or dependability.

Reliability was ensured through pre-testing the questionnaire during the pilot study. Reliability was ensured if the PHC nurses in different districts of Limpopo Province scores the same level of competency using the same questionnaire. Cronbach's alpha coefficient was used to confirm reliability of the questionnaire. Alpha provides a measure of the internal consistency of a test or scale it is expressed as a number between 0 and 1.

Internal consistency describes the extent to which all the items in a test measure the same concept or construct. If alpha is too high it may suggest that some items are

redundant as they are testing the same question but in a different guise (Polit and Beck, 2010).

3.5 Phase 2: Qualitative Phase

The objectives of the qualitative phase were to:

- identify the challenges faced by CHBCs regarding care and support of TB/HIV co-infected patients in Limpopo province.
- examine the experiences of patients regarding the TB/HIV co-infection in Limpopo province.

Polit and Beck (2010), describes qualitative research methods as methods that are used to investigate phenomena in a holistic and in-depth fashion. According De Vos et; al (2012), a qualitative design is non-experimental and conducted in a naturalistic environment. Qualitative studies aim to develop an understanding of a phenomenon as it exists in the real world. Qualitative research is naturalistic and it attempts to study the everyday life of different groups of people and communities in their natural setting. Qualitative research involves an interpretive, naturalistic approach to its subject matter; it attempts to make sense of, as well as interpreting phenomena in terms of the meaning people bring to them. Qualitative research aims to explore and to discover issues about the problem on hand, because very little is known about the problem (De Vos et; al, 2012).

- There is usually uncertainty about dimensions and characteristics of the problem. Qualitative research is designed to help researchers understand people, and the social and cultural contexts within which they live. In qualitative research, different knowledge claims, enquiry strategies, and data collection methods and analysis are employed. The qualitative research elicits participant accounts of meaning, experience or perceptions. It produces descriptive data in the participant's own written or spoken words (Creswell, 2007). Phenomenological explorative research design was conducted to identify the challenges

experienced by CHBCs regarding care and support of TB/HIV co-infected patients and examine the experiences of patients regarding the TB/HIV co-infection in Limpopo province.

- **Phenomenological research design**

According to De Vos et al. (2012), phenomenology is the approach that aims to understand and interpret the meaning that subjects give to their everyday lives. A phenomenological study is a study that describes the meaning of experiences of a phenomenon, topic or concept for various individuals. The researcher who utilizes the Phenomenological approach reduces the experiences to a central meaning. Phenomenology deals with the lived experiences of participants.

According to (Creswell, 2007) the purpose of the phenomenological approach is to illuminate the specific, to identify phenomena through how they are perceived by the actors in a situation. In the human sphere this normally translates into gathering 'deep' information and perceptions through inductive, qualitative methods such as interviews, discussions and participant observation.

A phenomenological study describes the meaning of lived experiences regarding a particular event for several individuals (Creswell, 2007). The researcher interacted with participants through focus group discussions. Participants were given an opportunity to share their personal experiences of being diagnosed with TB and HIV. Even though they were asked similar questions, they responded in different ways, each person related their own experiences about TB and HIV.

The researcher obtained the narratives from the TB and HIV infected patients regarding their lived experiences, learned about the emotions and experiences of patients during focus group discussions as well as knowledge about their condition and challenges they encounter. Before collecting data, the population of the study was identified. This study used a phenomenological design to study TB and HIV patients' lived experience.

- **Exploratory qualitative research design**

According to Polit & Beck (2010), exploratory designs begin with a phenomenon the researcher is interested not simply observing and describing. In the exploratory design the full nature of the phenomenon is investigated, the manner in which it is manifested and other related factors. Uys and Basson (2005), describes exploratory as designs that explore a relatively unknown field with the purpose of gaining new insights into the domain phenomenon. According to Burns and Grove (2005), exploratory research designs aim at increasing the knowledge in the field of study but not aim at generalization of results to the large population. Exploratory designs were utilized in this study to determine the challenges with regard to the integration of TB and HIV services in the PHC facilities of Limpopo Province.

3.5.1 Population

The target population of the qualitative aim of this study included 8 968 Community Home Based Carers and 10 083 co-infected patients for 2013/2014 in Limpopo Province.

3.5.2 Sampling and sample size

According to Neelankavil (2007), sampling is a procedure used to identify, choose and gain access to relevant units of a given population as a basis for drawing generalizable conclusions. Purposive sampling was used to select 51 CHBCs' and 56 TB/HIV co-infected patients from the five districts of Limpopo Province to participate in the focus group discussions. Purposive sampling is selecting cases for study because they have deep understanding of and illuminate the phenomenon of interest Neuman (2006) states that purposive sampling may be used to select members of a difficult-to-reach, specialized population and is appropriate to select unique cases that are especially informative such as TB/HIV co-infected patients. Such sampling is aimed at insight about the phenomenon and not at empirical generalization from a sample to a population. One focus group discussion was conducted per district until data saturation was reached. The number of CHBCs was as follows per districts: Capricorn district 9. Mopani district 12, Sekhukhune district 10. Vhembe district 10 and Waterberg district 10. Number of TB/HIV co-infected patients who were selected for focus group was 56 as determined by data saturation. The number of participants was as follows per district: Capricorn 11, Mopani 15, Sekhukhune 10, Vhembe 8 and Waterberg 12.

Inclusion criteria of CHBC's

- Both males and females CHBCs' were included in the study.
- The inclusion criteria were CHBC's who are trained on TB and HIV management at primary health care setting.
- Those CHBC's who had 3 or more years of experience working in the primary health care facilities.
- They had to be willing to participate in the study and signed the consent form to participate.

Exclusion criteria of CHBC's

- CHBC's with less than 3 years' experience working in the Primary health care facilities were excluded from the study.
- CHBC's who are not trained on TB and HIV management were not included to participate in the study as they are not allowed to take care of patients without knowledge and experience.

Inclusion criteria of TB/HIV co-infected patients

- TB/HIV co- infected patients who accepted their condition and disclosed their status to their families and also belong to the support group were included in the study as they were able to participate openly and freely in the discussion. They accepted to be included and signed the consent form to participate freely in the study.

Exclusion criteria of TB/HIV co-infected patients

- TB/HIV co-infected who did not disclose their statuses to their families were excluded from the study because they could not be comfortable to talk about their condition freely.

3.5.3 Qualitative data collection

Focus group discussions of CHBCs' and TB/HIV co-infected patients were conducted for 40-50 minutes. Participants were assured about confidentiality of their responses. One focus group discussion was conducted per district. Each focus group had 10-15 participants from the districts; only Vhembe district which had 8

participants. This resulted in 5 focus group discussions for patients and 5 focus group discussions for CHBC's. When conducting the focus group discussion, the second person was involved to compile the field notes and recorded non-verbal cues. The researcher asked questions and operated the audio tape to record the discussions, after obtaining permission from the participants.

3.5.4 Focus group discussions

- **Focus group discussions for CHBCs**

Focus group discussion is one of the major research tool to understand people's thoughts and feelings (Kumar, 2008). Focus group discussion is usually conducted by inviting six to ten people to gather for a few hours with a researcher to talk about a service, a topic or organization. The meeting is held in a pleasant place, and refreshments are served to create a relaxed environment.

The researcher started with encouraging open and easy discussion to bring out true feelings and thoughts. The comments of the focus group discussion were recorded through notes taking or videotaped and studied later to understand the main issues that were raised.

The focus groups were conducted after the results of the quantitative phase conducted with PHC nurses in phase 1. The focus groups were conducted after the analysis of phase 1 data in order to obtain in-depth information on the findings that needed to be further explored. The questions were formulated for CHBC's and were brought for discussion in the focus group. Ten CHBC participants were included per district. The researcher organized the transport for participants to one central point per district to form the group. The central questions asked during the focus group discussions included questions about what motivated them to become CHBCs, knowledge of CHBCs about TB and HIV diseases, attitude of the PHC nurses, TB/HIV co-infected and their families and the attitudes of the community towards CHBCs.

- **Focus group discussions for TB/HIV co-infected patients**

The focus group discussions were conducted in the five districts of Limpopo Province. Participants were invited to the central area per district and the transport was organised for them to be transported to the central areas per district. The discussions took place in a quiet area with minimum disruptions. The sitting arrangement was in semi-circular and the audio tape was put on the middle table in front to be able to capture the voices of participants. Pamphlets with the details of the study were given to participants as they were all able to read and write; there after the consent forms were also given for them to sign. Participants were told that participation is voluntary; they can withdraw to participant if they do not want to continue. They were assured that the information which will be discussed will be confidential. They were labelled and addressed by numbers not names to ensure confidentiality of the information. The discussions were conducted for 40-50 minutes. Central questions asked to TB/HIV co- infected patients were: what did they know about TB and HIV diseases, what were their feelings and reactions after being diagnosed with TB and HIV, the attitudes of PHC nurses and CHBCs towards them and what support are they receiving from the PHC nurses, CHBCs and their families.

- **Member checking**

Member checking means assessing the intentionality of the participants. It entails both the data and its interpretation with the source of information. The findings of the study are taken back to participants for the interpretation of the data as well as to check for adequacy to be discussed and confirmed (Babbie & Mouton, 2009). In this study member checks were done in the afternoon of the same day as participants remained at the venue the rest of the day. This was done to ensure that the information was well captured in the tape recorder and in the field notes.

3.5.5 Qualitative data analysis

Analysis of qualitative data is an interactive process of fitting data together and making the invisible to become visible and obvious (Burns & Grove, 2005). The first step in analysing focus group data is to have the entire interview transcribed. Transcription facilitates further analysis and establishes a permanent written record of the group discussion that can be shared with other interested parties. In this study,

content analysis was used to analyse the data. Content analysis involves gathering and analysing the textual material, where content refers to words, meanings, pictures, symbols, ideas, themes or any message that can be communicated.

Content analysis method was used as follows:

- The full transcribed material was read to get the sense in the whole text.
- The researcher listened to the recorded information from the tape recorder.
- Coding of the information as well as summarising of the content of each of the coded groups was done.
- Identified units that have the same meaning and then code those units.
- Synthesizing and integrating the insight from the condensed meaning unit into generalized description of concepts concerning the increasing rate of TB/HIV co-infection in Limpopo Province.
- Any text that could not be categorised with the initial coding scheme was given a new code (Hsieh and Shannon, 2005).
- To achieve neutral and unbiased results an independent coder who is an expert in qualitative research was requested to verify themes and sub-themes.

3.6 Measures to ensure trustworthiness

There are different criteria used by researchers in evaluating the quality of a study. Researchers discuss methods enhancing the trustworthiness of data and findings of the study. The researcher used the following dimensions to ensure trustworthiness in all phases of the study: credibility, conformability, dependability and transferability (Polit and Beck, 2010).

3.6.1 Credibility

According to Polit and Beck (2010), credibility refers to the steps taken by the researcher to improve and evaluate data; this involves a prolonged engagement in data collection activities in order to have an in-depth understanding of the views of the group under study. Credibility was achieved when confidence in the truth of the data and interpretation was attained (Mouton, 2012). The following procedures were followed to achieve credibility in this study:

- **Prolonged engagement** - the researcher stayed in the field for two weeks collecting data until data saturation was reached.
- **Referential agency** – for good record keeping, the researcher used audiotapes and field notes.

In this study, credibility was ensured by accurate identification and description of the participants. Credibility of qualitative data addresses the question whether the research has established confidence in the findings at the end of the study (de Vos et al., 2012). To ensure credibility in this study, the independent coder who is a professor and have HIV/AIDS and Tuberculosis publications; was involved to verify the credibility of the data. Credibility was also ensured through prolonged engagement of two weeks during the preparations for data collection. Member checking was also done after data collection. Furthermore, audit trail was done whereby the supervisors listened to the audio tape used during the focus group discussions.

- **Confirmability**

This refers to the potential for congruency of data in terms of meaning, relevancy and accuracy. It needed be established whether the data represented the information given by participants not imaginations and perceptions of the researcher which could be biased (Brink et al., 2012).

Confirmability also refers to the objectivity or neutrality of the data where two or more independent people agree on the meaning of the data (Polit and Hunger, 2001). In this study, the researcher obtained valuable information through prolonged contact with participants during focus group discussions, observing participants during data collection and without allowing bias or her own perspectives to influence the discussions. The results of the focus group discussions, tape recorded and field notes were confirmed by the supervisor and the co-supervisor.

- **Dependability**

Dependability refers to measures that are focused on the stability of the information that is gathered from the same people if they give the same information on repeated

occasions (Jooste, 2010). The dependability of a study means that the data is to be trusted (Brink et al., 2012). Dependability refers to the stability of data over time. In this study audio, taped data was compared with the field notes compiled during the focus group discussions. The study findings, interpretation and recommendations were examined to ensure that the investigation is supported by data and were internally coherent and this established conformity (Brink et al., 2012). Field notes collected during interviews were given to the independent coder for scrutiny and confirmation. An agreement was reached during the meeting between the researcher and the co-coder.

- **Transferability.** Transferability is the ability to transfer findings to other similar situations or problems (Polit & Beck, 2012). It is the ability to apply findings to other participants. The researcher is interested in generalizing the findings statistically, and in defining observations within the context in which they occur during the focus group discussions. Strategies to enhance transferability are thick description of data, purposive sampling and data saturation. Transferability to ensure the dependability has the following strategies:
 - **Thick description-** This entails the collection and provision of sufficient detailed description of data within a given context and report on it. In this study the researcher collected sufficient information about the experiences of CHBCs and TB/HIV co-infected patients by conducting ten focus group discussions with them in the five districts of Limpopo province.
 - **Purposive sampling** – This is the extent to which qualitative findings can be transferred to other groups or settings, analogous to generalizability. This was ensured through selection of participants from five districts of Limpopo Province in order to maximize the range of information collected (Brink et al., 2012).

- To accomplish thick description of data, the researcher collected sufficient detailed descriptions of data in context and then reported on them with detailed precision (Babbie & Mouton, 2009).

- **Prolonged engagement**

This entails staying in the field with the participants until data is saturated. In this manner the researcher gains an in-depth understanding of the phenomenon as well as specific aspects of participants such as their views, cultures and experiences. This assisted in building trust and rapport between the researcher and participants which is needed in the gathering of rich data (Brink et al., 2012). In this study the researcher remained in the field for two weeks until data saturation occurs through focus group discussions.

- **Triangulation**

Triangulation refers to the use of multiple referents to draw conclusions about what constitutes the truth (Brink et al., 2012; de Vos et al., 2012). It assists in capturing a complete and contextualized portrait of the phenomenon under study (Polit & Beck, 2010). In this study triangulation was done through Theory triangulation involves using multiple perspectives to interpret a set of data (Polit & Beck, 2010). In this study the researcher applied the triangulation method through the in-depth interviews with CHBCs and TB/HIV co-infected patients for two weeks to gain more insights about the their experiences of having TB and living with HIV and CHBC on taking care of the co-infected patients.

3.6.2 Authenticity

This is another criterion for trustworthiness. Authenticity refers to the extent to which the researcher indicates a range of realities in a fair and faithful manner where the report conveys the experiences and feelings of the participants. The reader should be able to understand the lives being portrayed in the report with the sense of feeling emotions and experiences of participants (Brink et al., 2012). In this study the researcher stayed with participants and collect data through engagement with them in the focus group discussions in the five districts of Limpopo province.

3.6.3 Bias

According to Brink et al (2012), bias is the tendency to err in one direction which gives results or values that have a tendency to be consistently on one side of the true value. Any influence that produces a distortion in the results of study or that strongly favours the outcome of a particular finding of a research study. Therefore, a biased sample is a sample which does not accurately represent the population from which it is selected. In this study bias was avoided because the sample represented the population because PHC nurses, CHBCs and TB/HIV co-infected patients from the 5 district were included in the sample. Participants were not given the content of the questionnaire before data collection in the quantitative study. The researcher did not use her own knowledge during the focus group interviews but gave participants chance to share the information freely.

3.7 Ethical considerations

Ethics is a system of moral values that is concerned with the degree to which research procedures adhere to professional, legal and social obligations to the study participants (Polit & Beck, 2010).

3.7.1 Ethical clearance and permission to conduct the study

Ethical clearance was obtained through the written permission from the Head of Department in the Department of Health as well as permission from the District Executive managers of PHC facilities where professional nurses are working. Ethical clearance was also obtained from Sefako Makgato University Research Ethics Committee (SMUREC) (Appendix1). Written consent was obtained from participants. Consent was also requested from the professional nurses, CHBCs and patients who were involved in the study.

- **Respect of persons**

Participants were treated with respect as they were capable of making their own decisions and persons with limited autonomy or were not capable of making their own decisions were protected (Houser, 2012). Confidentiality was ensured and participants were requested to sign informed consent forms. They were informed that participation in the study was voluntary which meant they could withdraw from the study at any time if they did not want to continue. Participants' decisions were

respected and protected from harm (Houser, 2012). Participants were given counselling and support during the focus group discussion sessions so that they could be at ease.

- **Principle of justice**

Participants were treated with fairness (Houser, 2012). They were informed that they were allowed to withdraw at any time when they did not want to continue with the study.

- **Respect for Human dignity**

This principle entails the right to self-determination and the right to full disclosure (Polit & Beck, 2010). Participants' real names were not used in the study and information leaflets about the research including consent forms were given to participants before the interview so that they may read and sign if they agreed to participate in the study. Right to privacy was maintained and the researcher ensured that the research was not more intrusive than it needed to be. Participants' privacy was maintained at all times (Polit & Beck, 2010). Focus group discussions were conducted in a quiet, private place in order to maintain privacy.

- **Informed consent**

The principle of informed consent come from the subject's right to freedom and self-determination and competence to make correct decisions voluntarily after being provided with full information. This includes the right to discontinue participation in the study at any time without prejudice (Cohen, Manion and Morrison, 2008). The potential participants were informed that they would not be receiving any form of remuneration for participating in the study. The researcher obtained informed consent from all the participants. No participant was forced to participate (Brink et al., 2012). They were made aware that they may withdraw from the study at any given time (de Vos et al., 2009; Brink et al., 2012). In the case of this study, the consent was obtained in a written format that was available in English for PHC nurses and CHBCs' and in the local languages for the patients to understand.

- **Confidentiality**

Participants were made aware that their opinions will be anonymous as they would only be identified with numbers not names. They were informed that any information that may result in identifying them would be removed. Only patients who have disclosed their status were included in the study. The researcher informed co-infected patients about the oath of secrecy of her profession to ensure that their discussions will not be disclosed. All data collected will remain private and confidential. The data will be locked in a safe at the researcher's home and no unauthorized people will have access to the key.

3.8 Overview of model development methodology

The strategies used in the model development are: analysis, synthesis and derivation. In analysis, the model development process was informed by the results that are derived from analysis of quantitative and qualitative data. In synthesis, the information was derived from quantitative and qualitative data to obtain the central challenges such as lack of knowledge of PHC nurses about TB and HIV due to insufficient training. Deductive and inductive reasoning were used in derivation reasoning.

Concept analysis was also applied in the identification of the central concept, related concepts, critical attributes, antecedents, consequences and theoretical relationships. Dickoff, James and Wieldenbach (1968) used six steps in model development namely: the agent, the recipient, the context, the dynamics, the process and the terminus. Details of model development will be discussed in chapter 6 of this thesis.

3.9 Conclusion

This chapter outlined the research methodologies, study site, research design, population, pilot study, data collection and data analysis methods used in the study. The explanatory sequential mixed method was described. Data analysis of the quantitative data was described using descriptive and inferential statistics. Content analysis was used for qualitative data. Furthermore, the chapter described the process involved in the design of the model. Ethical considerations followed in the study were also outlined. The following chapter will discuss the quantitative results.

CHAPTER 4

DISCUSSION OF QUANTITATIVE RESULTS

4.1 Introduction

The previous chapter focused on methodology used in quantitative and qualitative data collection and analysis. This chapter discusses the quantitative results.

4.2 Section A: Biographic data

Section E focuses on biographic data and includes gender of the respondents, professional qualifications of PHC nurses, their years of working experience and the district of employment.

4.2.1 Gender of respondents

The gender of respondents is shown in table 4.1.

Table 4.1: Gender of the participants

Gender	F	%
Male	64	14
Female	386	86
TOTAL	450	100

Table 4.1 shows that out of 450 PHC nurses, 386 (86%) were females and 64 (14%) were males employed in the PHC facilities of Limpopo Province. The PHC facilities of Limpopo Province are dominated by females. Globally despite the equal opportunity legislations throughout the world, nursing has continued to be a female dominated profession (Chung, 2008; Vere-Jones, 2008). The female-to-male ratio of the nurses in Canada and the United States is 1:9. In Europe in countries such as Spain and Portugal, over 20% of nurses are males (O'Lynn & Tranbarger, 2013; Aiken, 2012).

Notable exceptions include Francophone Africa, which includes countries such as Benin, Burkina Faso, Cameroon, Chad, Congo, Cote d'Voire and Gabon, which all have more male than female nurses (O'Lynn & Tranbarger, 2013). The 2013 American Community Survey Highlight Report revealed that there were 3.5 million employed nurses in the United States and about 3.2 million (91%) of whom were female and 330 000 were male (9%) (O'Lynn & Tranbarger, 2013; Buchan & Calman, 2008).

4.2.2 Professional Qualifications of PHC nurses

The professional qualifications of PHC nurses is shown in table 4.2.

Table 4.2: Professional qualifications of PHC nurses and their districts of employment

Item	Capricorn		Mopani		Sekhukhune		Vhembe		Waterberg		Total	
	f	%	f	%	f	%	F	%	F	%	No	%
Four-year degree comprehensive course (R425)	12	12.2	9	7.0	11	12.8	10	9.5	3	9.4	45	10.0
Four-year diploma comprehensive course (R425)	25	25.5	49	38.3	33	38.4	35	33.3	11	34.1	153	34.1
Integrated general nursing and midwifery	20	20.4	21	16.4	15	17.4	16	15.2	3	9.4	75	16.7

General nursing (3years)	7	7.1	11	8.6	2	2.3	12	11.4	2	6.3	34	7.6
Bridging course	34	34.7	38	29.7	25	29.1	32	30.5	13	40.6	142	31.6
Total	98	100	129	100	86	100	105	100	32	100	450	100

Table 4.2 shows the qualifications of PHC nurses and the district of employment. The Capricorn district has 12 (12,2%) nurses with 4-year degree Comprehensive course (R425) and a large number of those qualified in Bridging course 34 (34%). The bridging course qualified nurses will need coaching and mentoring and it will be difficult for TB and HIV integration to be implemented in the district as only few nurses qualified comprehensively. In Mopani district, 49 (38.3%) of the nurses have a Four-year diploma comprehensive course (R425) which will enable TB and HIV integration services to be implemented through the skilled nurses. In the Sekhukhune district, 11 (12.8%) of the nurses have a comprehensive Degree (R425); 33 (38.4%) have a comprehensive Diploma (R425) and this ensure that there are enough skilled PHC nurses that will implement TB and HIV integration services in the district. In the Vhembe district, 10 (9.5%) of nurses have a 4-year comprehensive degree (R425) in Nursing; 35 (33.3%) of the nurses have a 4 year Comprehensive diploma in Nursing and this also revealed that Sekhukhune is staffed with knowledgeable and skilled PHC nurses to implement TB and HIV integration as well as mentoring other colleagues. Furthermore, 15 (17.4%) of the nurses have integrated nursing qualification; 2 (2, 3%) of the nurses have a 3-year General nursing qualification and 25 (29.1%) of the nurses have a bridging course nursing qualification. In Vhembe district 10 (9.5%) nurses have 4-year Comprehensive degree (R425), while 35 (33.3%) have 4-year comprehensive diploma in nursing and these highly skilled nurses will mentor and guide other nursing cadres on the integration of TB and HIV services in the district. In the Waterberg District, 3 (9.4%) of the nurses have a 4-year comprehensive degree in nursing; 11 (34.1%) of the nurses have a 4-year comprehensive diploma (R425); 3 (9.4%) of the nurses have an integrated nursing qualification; 2 (6.3%) of the nurses have General nursing 3 years nursing qualification and 13 (40, 6%) of the nurses have a bridging qualification in nursing. The 40.6% PHC nurses in Waterberg District

that have bridging course nursing qualifications need to upgrade their qualifications, mentoring and guidance in implementation of TB and HIV services in the district.

The findings of the study reveal that this is a relatively well qualified group of PHC nurses. All PHC nurses in this study have recognised nursing qualifications, which qualifies them as professionals and to work as nurses in PHC facilities. It is generally accepted that quality patient care relies on having a well-educated nursing workforce (Greiner & Knebel, 2004). The study conducted by Rosseter (2015), revealed that baccalaureate-prepared nurses on hospital units were associated with lowering patients' mortality by 10.9%.

4.2.3 Experience of Primary Health Care nurse

The working experience of PHC nurses and their district of employment is displayed in table 4.3.

Table 4.3: Experience of PHC nurses

Period	Capricorn		Mopani		Sekhukhune		Vhembe		Waterberg		Total	
	f	%	f	%	f	%	f	%	F	%	f	%
3-5yrs	37	37.8	58	40.5	48	56.5	29	27.6	10	31.3	182	40.5
6-7yrs	7	7.1	5	3.9	8	9.4	4	3.8	4	12.5	28	6.2
8-9yrs	9	9.2	7	5.4	12	14.1	8	7.6	2	6.3	38	8.5
10-12yrs	15	15.3	21	16.3	5	4.7	12	11.4	6	18.8	59	12.9
13+yrs	30	27.6	38	29.5	13	15.3	52	49.5	10	31.3	143	31.8
Total	98	100	129	100	86	100	105	100	32	100	450	100

Table 4.3 shows that 182 (40.5%) of the participants have 3-5 years nursing experience, 28 (6.2%) of the respondents have 6-7 years nursing experience, 38 (8.5%) of the respondents have 8-9 years nursing experience, 59 (12.9%) of the respondents have 10-12 years nursing experience, 143 (31.8%) of the respondents have 13 years and above nursing experience. The findings revealed that Limpopo province has a high number of less experienced PHC nurses who only have 3-5 years' experience. This implies that most of the PHC nurses need mentoring in the treatment, management and care of TB and HIV patients, which could be provided by nurses with at least 13 years' experience. Capricorn district has 15 (15.3%) nurses who are more experienced with 10-12 years of experience; the number is low to implement integration of TB and HIV services in the district. In Mopani district 58 (45.5%) are less experienced with 3-5 years of experience, 21 (16.3%) have 10-12 years of experience while 38 (29.5%) have 13 years and more of experience which is too low to can manage to mentor the 45.5% less experienced PHC nurses in Mopani district. Sekhukhune district have only 13 (15.3%) PHC nurses with 13 years and more to mentor and guide the implementation of TB and HIV services as 48 (56.5%) PHC nurses still need coaching and mentoring as they are less experienced with 3-5 years of nursing experience. In Vhembe district 52 (49.5%) of PHC nurses have 13 years and more experience to mentor other nurses or implement TB and HIV services in the district. Waterberg district has the lowest number of experienced PHC nurses to implement TB and HIV services and they need training on TB and HIV Management.

These findings align with Rosseter (2015), who indicated that there are several reasons why experienced workers can help maintain a reliable, dedicated work force and provide a significant cost savings in both short term and long term. Experienced workers are usually dedicated to their work, efficient and confident, have organizational skills, are proud of their work, always punctual, honest, focused, detail oriented and attentive, good listeners, mature, exemplary, with good communication skills. However, Rosseter (2015), says that experience can be both an advantage and may also have negative consequences for professionals, such as resistance to implementation of policies.

4.3 Section B: Course attendance

Table 4.4: Courses attended

Item	Capricorn		Mopani		Sekhukhune		Vhembe		Waterberg	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
	f (%)	f (%)	f (%)	f (%)	f (%)	f (%)	f (%)	f (%)	f (%)	f (%)
1.Human immune virus management	68 (69.4)	28 (28.6)	86 (66.7)	43 (33.3)	54 (62.8)	31 (36)	80 (76.2)	20 (19)	17 (53.1)	15 (46.9)
	77 (78.6)	21 (21.4)	105 (81.4)	24 (18.6)	55 (64)	27 (31.4)	91 (86.7)	13 (12.4)	19 (59.4)	13 (40.6)
3.Mode of transmission of HIV	78 (79.6)	20 (20.4)	107 (82.9)	20 (15.5)	57 (66.3)	28 (32.6)	94 (89.5)	11 (10.5)	18 (56.3)	14 (43.8)
4. Prevention of HIV	75 (76.5)	23 (23.5)	105 (81.4)	20 (15.5)	59 (68.6)	27 (31.4)	93 (88.6)	11 (10.5)	20 (62.5)	12 (37.5)
5.Prevention of Mother to Child transmission (PMTCT)	66 (67.3)	30 (30.6)	95 (73.6)	34 (26.4)	54 (62.8)	32 (37.2)	87 (82.9)	16 (15.2)	17 (53.1)	15 (46.9)
6. Adherence counselling	57 (58.2)	39 (39.8)	64 (49.6)	59 (45.7)	39 (45.3)	45 (52.3)	55 (52.4)	47 (44.8)	8 (25)	24 (75)
7.Tuberculosis(TB) management	71 (72.4)	27 (27.6)	95 (73.6)	34 (26.4)	61 (70.9)	24 (27.9)	79 (75.2)	26 (24.8)	15 (46.9)	17 (53.1)
8.TB screening to patients	71 (72.4)	26 (26.5)	97 (75.2)	32 (24.8)	58 (67.4)	26 (30.2)	81 (77.1)	24 (22.9)	14 (43.8)	18 (56.3)
9. TB diagnosing	71 (72.4)	25 (25.5)	97 (75.2)	32 (24.8)	61 (70.9)	25 (29.1)	82 (78.1)	23 (21.9)	14 (43.8)	18 (56.3)
10.Mode of TB transmission	70 (71.4)	27 (27.6)	99 (76.7)	30 (23.3)	63 (73.3)	23 (26.7)	83 (79)	22 (21)	16 (50)	16 (50)
11. Prevention of TB	71 (72.4)	26 (26.5)	99 (76.7)	30 (23.3)	63 (73.3)	23 (26.7)	83 (79)	22 (21)	15 (46.9)	17 (53.1)
12. TB treatment	71 (72.4)	27 (27.6)	99 (76.7)	30 (23.3)	61 (70.9)	24 (27.9)	78 (74.3)	26 (24.8)	15 (46.9)	17 (53.1)
13. TB/HIV integrations courses	61 (62.2)	36 (36.7)	79 (61.2)	48 (37.2)	57 (66.3)	28 (32.6)	70 (66.7)	32 (30.5)	13 (40.6)	19 (59.4)
14. HIV treatment to TB	62	35	74	54	49	35	67	38	13	19

patients	(63.3)	(35.7)	(57.4)	(41.9)	(57)	(40.7)	(63.8)	(36.2)	(40.6)	(59.4)
15. TB screening to HIV positive patients	69	29	91	37	54	31	74	31	15	17
	(70.4)	(29.6)	(70.5)	(28.7)	(62.8)	(36)	(70.5)	(29.5)	(46.9)	(53.1)
16. Diagnosing TB to the HIV positive clients	68	29	92	37	52	33	75	30	12	19
	(69.4)	(29.6)	(71.3)	(28.7)	(60.5)	(38.4)	(71.4)	(28.6)	(37.5)	(59.4)
17. TB treatment to HIV positive patients	71	27	89	39	49	35	74	31	11	21
	(72.4)	(27.6)	(69)	(30.2)	(57)	(40.7)	(70.5)	(29.5)	(34.4)	(65.6)
18. Sexually transmitted infections (STI) management	69	28	51	78	31	55	61	43	14	18
	(70.4)	(28.6)	(39.5)	(60.5)	(36)	(64)	(58.1)	(41)	(43.8)	(56.3)
19.Types of STIs	71	27	59	70	29	57	62	43	15	17
	(72.4)	(27.6)	(45.7)	(54.3)	(33.7)	(66.3)	(59)	(41)	(46.9)	(53.1)
20. Mode of transmission of STIs	73	25	61	68	31	55	63	42	15	17
	(74.5)	(25.5)	(47.3)	(52.7)	(36)	(64)	(60)	(40)	(46.9)	(53.1)
21. Examination of patients for STIs	69	29	56	72	31	55	61	44	15	17
	(70.4)	(29.6)	(43.4)	(55.8)	(36)	(64)	(58.1)	(41.9)	(46.9)	(53.1)
22. Diagnosing of STIs	69	29	61	68	33	53	62	43	15	17
	(70.4)	(29.6)	(47.3)	(52.7)	(38.4)	(61.6)	(59)	(41)	(46.9)	(53.1)
23. Treatment of patients with STIs	68	30	61	65	35	50	63	42	14	18
	(69.4)	(30.6)	(47.3)	(50.4)	(40.7)	(58.1)	(60)	(40)	(43.8)	(56.3)
24. Multiple Drug Resistant (MDR) TB management	22	76	44	85	19	66	34	70	5	27
	(22.4)	(77.6)	(34.1)	(65.9)	(22.1)	(76.7)	(32.4)	(66.7)	(15.6)	(84.4)
25. Diagnosing MDR TB	23	75	53	75	25	61	40	65	7	25
	(23.5)	(76.5)	(41.1)	(58.1)	(29.1)	(70.9)	(38.1)	(61.9)	(21.9)	(78.1)
26. Treatment supervision to MDR TB patients	18	79	50	79	19	67	36	69	5	27
	(18.4)	(80.6)	(38.8)	(61.2)	(22.1)	(77.9)	(34.3)	(65.7)	(15.6)	(84.4)

The results presented in table 4.4 will be discussed in sub-headings 4.3.1 to 4.3.27 as follows:

4.3.1 Human immune virus management training

Vhembe district has the highest number of participants at 80 (76.2%) who attended the Human Immune Virus (HIV) management courses, followed by Capricorn district at 68 (69.4%), Mopani district at 86 (66.7%), Sekhukhune district at 54 (62.8%) and Waterberg district at 17 (53.1%) with the lowest number of participants who attended HIV courses (Table 4.4). Attending HIV courses is part of professional development for the PHC nurses. Dall' Alba (2006), describes professional development as formal courses and programmes in professional education, and the formal and informal development of professional skill that occurs in the workplace. The formal professional development courses may be directed either towards the people who are inexperienced and seeking to gain entry to a particular profession or towards experienced professionals who seek some form of continuing education outside their usual place of work.

The development of maturity and professionalism in a professional group as a whole implies that the group sets high standards of professional quality, a professional association exists, and professionals are properly educated. The primary aim of continuing professional development in nursing is the improvement of patient care. Continuing professional development in nursing enables professional nurse practitioners to provide quality nursing care and service delivery to their patients. Continuing professional development have three main roles, namely; the maintenance role that fosters the notion of lifelong learning, the survival role that requires the nurse practitioner to demonstrate the on-going competence and the mobility role that aims to increase the professional's employability (Swihart, 2009). The researcher believes that the provision of an in-service education programme in the workplace will equip the professional nurse practitioner with the knowledge and skills to execute the job-related performance in the workplace and that it will contribute to the continuing, professional and personal development of the PHC nurses.

4.3.2 HIV counselling and testing training

In Vhembe district a high number of PHC nurses at 91 (87.6%) attended HIV counselling and testing courses, followed by Mopani district at 105 (81.4%), Capricorn district at 77 (78.6%), Sekhukhune district at 55 (64.0%) and Waterberg

district at 19 (59.4%). According to the WHO (2008), HIV testing and counselling form the gateway to care, treatment and support for persons in need.

HIV counselling and testing is an important part of a continuum of HIV prevention and treatment services. It should also be offered whenever this will aid their clinical diagnosis and management.

4.3.3 Mode of transmission of HIV training

The participants attended the programme or course of modes of transmission in high proportion. In Vhembe district 94 (89.5%) participants attended the course, 129 (84.5%) participants of Mopani district, 98 (79.6%) participants from Capricorn district, 107 (82.9%) participants of Sekhukhune district, 57 (66.3%) participants from Waterberg district attended the course. The good attendance of the courses by the participants indicates that courses are highly valued in the Limpopo Province.

The mode of transmission of HIV refers to the three major routes of transmission of HIV. HIV is transmitted in human body fluids by three major routes namely; sexual intercourse through vaginal, rectal or penile tissues, direct injection with HIV contaminated drugs, needles, syringes, blood or blood products and from HIV infected mother to foetus in utero, through intrapartum inoculation from mother to infant or during breast-feeding (WHO, 2010c).

4.3.4 Prevention of HIV training.

The following proportion of participants indicated that they attended the course on Prevention of HIV; Vhembe district at 93 (88.6%), Mopani district at 105 (81.4%) Capricorn district at 75 (76.5%), Sekhukhune district at 59 (68.6%) and Waterberg district at 20 (62.5%). The statistics indicate that Vhembe had the highest proportion of PHC nurses attending courses on HIV prevention. Prevention of HIV course is a very important course because this course equips the PHC nurses with the necessary skills to deal with HIV/AIDS in different care, counselling and educational situations in the multicultural South African contexts (University of South Africa, 2015). The course offers participants the opportunity to disseminate correct and relevant information on HIV/AIDS (University of South Africa, 2015).

4.3.5 Prevention of Mother to Child Transmission of HIV/AIDS (PMTCT) training.

Vhembe district had the highest number of participants who had attended prevention of mother to child HIV/AIDS training at 87 (82.9), followed by Mopani district at 95 (73.6%), Capricorn district at 66 (67.3%) Sekhukhune district with 54 (62.8%) and Waterberg district at 17 (53.1%). Mother to child transmission of HIV refers to the passing on of the virus from the infected mother to her child and may occur during pregnancy, labour and during breastfeeding. Courses for the prevention of mother to child transmission of HIV/AIDS include antenatal HIV testing and counselling, provision of appropriate antiretroviral (ARV) regimen for mothers and new-borns and support for safer infant feeding options and practices (WHO, 2010c).

Prevention of mother to child transmission training includes HIV testing during pregnancy, best practice in obstetrics, and infant nutrition. To qualify for the certificate of completion for this course, participants have to fully attend the workshop and successfully complete the assessment process (Foundation for professional development, 2009).

4.3.6 Adherence counselling training.

Capricorn district had the highest proportion of nurses who had attended adherence counselling training (58.2%), followed by Mopani district at 64 (49.6%) Sekhukhune district at 39 (45.3%) while Waterberg district is the least at 8 (25.0%) in attending the adherence counselling courses.

4.3.7 Tuberculosis (TB) management training.

Vhembe district had the highest number of participants who had attended Tuberculosis management training at 75.2%, followed by Mopani district at 95 (73.6%), Capricorn district at 71(72.4%), Sekhukhune district at 61 (70.9%) while Waterberg district is the least at 15 (46.9%). The four districts did well in TB management training because above 70% of PHC nurses attended the TB management training.

4.3.8 TB screening training.

Vhembe district had the highest proportion of nurses who had attended TB screening training at (77.1%), followed by professional nurses from Mopani district at 75.2%, Capricorn district at 73.5%, Sekhukhune district at 69.8% while Waterberg district is the least at 56.3% in attending TB screening training.

4.3.9 TB diagnosing training.

Vhembe District had the highest number of PHC nurses who attended the TB diagnosis training at 82 (78.1%) followed by Mopani District at 97 (75.2%), Capricorn at 71 (72.4%), Sekhukhune district at 61 (70.9%) and the least being Waterberg district at 14 (43.8%) in attending the TB diagnosing training.

4.3.10 Mode of TB transmission training.

Vhembe district had the highest number of participants who had attended training Mode of TB transmission training at 79.0%, followed by Mopani district, at 99 (76.7%), Sekhukhune district at 63 (73.3%) Capricorn district at 71 (71.4%) and the least being Waterberg district at 16 (50%), in attending mode TB transmission course.

Mode of transmission refers to the manner in which Tuberculosis germs are transmitted from one person to another. When a person with active Tuberculosis (TB) sneezes or coughs, he or she releases aerosols with thousands of particles into the air (Department of Health, 2008b). This is very important because the knowledge gained in these courses contributes to the prevention of TB to other people.

4.3.11 Prevention of TB training.

The following proportion of participants indicated that they attended the course on Prevention of TB; Vhembe at 79% (Table 4.4), followed by Mopani district at 76.7%, Capricorn district at 72.4%, Sekhukhune district at 67.3% and Waterberg district at 46.9%. Vhembe district is the highest at 79%, while the least in prevention of TB training is Waterberg district at 46.9%. The findings also revealed that there is a balance in attendance in all the districts of the Limpopo Province as the respondents who attended in the four districts are between 73.3% and 79%.

4.3.12 TB treatment training.

Professional development programmes in the PHC facilities of Limpopo Province is aimed at training the professional nurses about the treatment of TB because TB it is one of the major diseases in the Limpopo Province. Mopani district at 76.7% is the highest in PHC nurses who attended TB treatment courses, followed by Vhembe district at 78 (74.3%), Capricorn district at 71 (72.4%), Sekhukhune district at 61 (70.9%) and the district with the least in PHC nurses who attended TB treatment course is Waterberg District at 15 (46.9%).

4.3.13 TB/HIV integration courses.

Vhembe district had the highest number of participants who had attended training on TB/HIV integration at 66.7%, followed by Sekhukhune district at 57 (66.3%), Capricorn district at 61 (62.2%), Mopani district at 79 (61.2%), while Waterberg district is the least at 13 (40.6%) of participants who attended the TB/HIV integration courses.

4.3.14 HIV counselling and testing to TB patients training.

HIV counselling and testing are very critical in the provision of health services. HIV counselling and testing to TB patients refers to counselling and then testing of TB patients in order to find out if they have HIV. The results revealed that Capricorn district had the highest of participants who attended the HIV counselling and testing training at 62 (64,3%, followed by Vhembe district at 67 (63.8%), Sekhukhune district at 49 (57%), Mopani district at 74 (57.4%) while Waterberg district is the least at 13 (40.6%) of participants who attended the HIV counselling and testing to TB patients training.

4.3.15 HIV treatment in TB patient s'training.

Waterberg district has the lowest propotion of PHC nurses who attended the training on HIV treatment to TB patients at 40.6%. The findings revealed that Vhembe district with is the highest at the propotion of 63.8% of PHC nurses taining in the HIV treatment to TB patients in the Limpopo Province, followed by the Mopani district at 74 (57.4%), Capricorn district at 62 (63.3%) and Sekhukhune district at 49 (57.5%).

4.3.16 TB screening in HIV positive patients training.

TB screening is done to people who are at high risk for TB development, such as the people with diseases or conditions that weaken the immune system such as HIV/AIDS, which makes them more vulnerable to TB infection (American Association for Clinical Chemistry, 2016). Professional nurses are expected to attend the TB screening to HIV positive patient's courses in order to gain more knowledge about the screening methods of TB to HIV positive patients. Mopani district had the highest number of participants who had attended training on TB screening to HIV positive patients at 70.5%, followed by Vhembe district at 74 (70.5%), Capricorn district with 69 (70.4%), Sekhukhune district at 54 (62.8%) while Waterberg district is the least at 15 (46.9%) participants who attended the TB screening to HIV positive patients training.

4.3.17 Diagnosing TB in HIV positive clients training.

Diagnosing is the identification of the nature of an illness or other problem by examination of the symptoms (Oxford Advanced English Dictionary, 2007). Vhembe district had the highest number of participants who had attended training on diagnosing TB in HIV positive clients at 71.4%, followed by Mopani district at 92 (71.3%), Capricorn district at 68 (69.4%), Sekhukhune district at 52 (60.5%) while Waterberg district is the least 12 (37.5%) participants who attended the training of diagnosing TB in HIV positive clients.

4.3.18 Treatment of TB in HIV positive clients training.

The following proportion of participants indicated that they attended the training on treatment of TB in HIV positive clients; Capricorn district at 72.4% (Table 4.4), followed by Vhembe district at 74 (70.5%), Mopani district at 89 (69%), Sekhukhune district at 47 (57%) and Waterberg district at 12 (34.4%).

HIV associated Tuberculosis remains a major global public health challenge, with an estimated 1.4 million patients world-wide (Padmapriyadarsini, Narendan & Swaminathan, 2011). Co-infection with HIV leads to challenges in both the diagnosis and treatment of Tuberculosis. There has been an increase in rates of drug resistant Tuberculosis, including multi-drug and extensively resistant TB which is difficult to treat and contribute to increased mortality (Padmapriyadarsini, Narendan &

Swaminathan, 2011). It is therefore very important that PHC nurses should attend professional development programmes in order to be empowered about the methods of treating the co-infections of TB and HIV.

4.3.19 Sexually-transmitted infections (STIs) management training.

Sexually transmitted infections (STIs) management refers to the planning and control of sexually transmitted infections. Capricorn district had the highest number of participants who had attended the training on sexually-transmitted infections (STIs) at 70.4%, followed by Vhembe district at 61 (58.1%), Waterberg district at 14 (43.8%), Mopani district at 51 (39.5%) and Sekhukhune district at 31 (36%).

4.3.20 Types of STIs training.

The term sexually transmitted disease (STI) is used to refer to a variety of clinical syndromes caused by pathogens that can be acquired and transmitted through sexual activity (Workowski, & Berman, 2010). Capricorn district had the highest number of participants who attended types of STIs training at 72.4%, followed by the PHC nurses from Vhembe district at 62 (59.0%), Waterberg district at 15 (46.9%), Mopani district at 59 (45.7%) while the least is Sekhukhune district at 29 (33.7%). The findings revealed that there are more participants who did not attend the courses than those who attended.

4.3.21 Mode of transmission of STIs training.

Capricorn district had the highest number of participants who attended mode of transmission of STI training at 74.5%, followed by Vhembe district at 63 (60.0%), Mopani district at 61 (47.3%) Waterberg district at 15 (46.9%) and Sekhukhune district at 31 (30%).

4.3.22 Examination of patients for Sexually Transmitted Diseases training.

Examination of patients for Sexually Transmitted Diseases involves blood tests and swabs taken from the genitals or urine testing. Professional nurses are expected to attend courses on examination of patients for Sexually Transmitted Diseases in order to improve health care (Options for sexual health, 2016; Workowski, 2010). Capricorn district had the highest number of respondents who attended the training on examination of patients for Sexually Transmitted Diseases at (70.4%, followed by

Vhembe with at 61 (58.1%), Mopani district at 56 (43.4%), Waterberg district at 15 (46.9%) while Sekhukhune is the least at 31 (36%).

4.3.23 Diagnosing of STIs training.

Diagnosis refers to the identification of the nature of an illness or other problems by examination of the symptoms. Capricorn district had the highest number of respondents who attended the training on diagnosing of STIs at 70.4%, followed by Vhembe district at 62 (59%), Mopani district at 61 (47.3%), Waterberg at 15 (46.9%) and Sekhukhune at 33 (38.3%). The findings revealed that PHC nurses from Capricorn district are the highest in attending the diagnosing of STIs training.

4.3.24 Treatment of patients with STIs training.

The following percentage of participants indicated that they attended the training on treatment of patients with STIs; Capricorn district at 69.4%, followed by professional nurses from Vhembe district at 63 (60%), Mopani district at 61 (47.3%), Waterberg district at 14 (43.8%) and Sekhukhune district at 35 (40.7%).

It is essential for PHC nurses to attend professional development programmes because the changes and improvements that professional nurses undergo during professional development stimulate them to grow and help them to develop in their profession.

4.3.25 Multiple Drug Resistant (MDR) TB management training.

MDR-TB refers to multidrug-resistant TB, which is defined as resistance to at least isoniazid and rifampicin (Nadu, 2011). In this case nurses are required to attend multidrug-resistant TB management courses in order to be able to manage multidrug-resistant TB patients. The following proportion of participants indicated that they attended the multidrug-resistant TB management courses; Mopani district at 34.1%, followed by Vhembe district at 34 (32.4%), Capricorn district at 22 (22.4%), Sekhukhune district at 19 (22.1%), and Waterberg at 5 (15.6%).

4.3.26 Diagnosing MDR TB training.

The results revealed that few professional nurses attended the diagnosing MDR-TB training in the Limpopo Province. The following proportion of participants indicated

that they attended the training on diagnosing MDR-TB; Mopani district at 41.1% followed by Vhembe district at 40 (38.1%), Sekhukhune district at 25 (29.1%), Capricorn district at 23 (23.5%) and Waterberg district at 7 (21.9%).

4.3.27 Treatment supervision to MDR TB patients training.

Treatment supervision to MDR-TB patients is the action or process of watching and directing what someone does or how something is done (Merriam Webster Dictionary, 2015). The results revealed that few professional nurses attended the treatment supervision to MDR-TB patients' courses in the Limpopo Province.

The following proportion of participants indicated that they attended the training on treatment supervision to MDR TB patients; Mopani district at 38.8% (Table 4.4), followed by Vhembe district at 36 (34.3%), Sekhukhune district at 19 (22.1%), Capricorn district at 18 (18.4%) and Waterberg district at 5 (15.6%).

4.4 Section C: Availability of HIV and TB guidelines.

Table 4.5 Availability of guidelines.

Guidelines		Capricorn		Mopani		Sekhukhune		Vhembe		Waterberg	
		f	%	f	%	f	%	f	%	F	%
1.Tuberculosis management guidelines	Never available	2	2	8	6.2	4	4.7	3	2.9	3	9.4
	Rarely available	6	6.1	13	10.1	5	5.8	6	5.7	3	9.4
	Often available	9	9.2	14	10.9	5	5.8	10	9.5	5	15.6
	Always available	81	82.7	94	72.9	72	83.7	85	81	21	65.6

2.Human Immune management guidelines	Never available	2	2	7	5.4	2	2.3	2	1.9	6	18.8
	Rarely available	7	7.1	11	8.5	8	9.3	3	2.9	1	3.1
	Often available	7	7.1	13	10.1	4	4.7	7	6.7	6	18.8
	Always available	81 82.7		97	75.2	71	82.6	89	84.8	19	59.4
3.Isoniazid Preventive Therapy (IPT) management guidelines	Never available	1	1	17	13.2	6	7	3	2.9	7	21.9
	Rarely available	7	7.1	11	8.5	8	9.3	4	3.8	4	12.5
	Often available	10	10.2	21	16.3	6	7	13	12.4	3	9.4
	Always available	78	79.6	78	60.5	66	76.7	84	80	17	53.1
4.Sexually transmitted infections management guidelines	Never available	3	3.1	12	9.3	6	7	6	5.7	6	18.8
	Rarely available	8	8.2	14	10.9	8	9.3	7	6.7	3	9.4
	Often available	6	6.1	7	5.4	6	7	11	10.5	4	12.5
	Always available	80	81.6	94	72.9	66	76.7	80	76.2	18	56.3
5.Tuberculosis infection control guidelines	Never available	5	5.1	15	11.6	8	9.3	5	4.8	5	15.6
	Rarely available	9	9.2	19	14.7	7	8.1	7	6.7	3	9.4
	Often available	7	7.1	19	14.7	5	5.8	13	12.4	4	12.5
	Always available	77	78.6	75	58.1	66	76.7	76	72.4	20	62.5
6.Multiple Drug Resistant TB guidelines	Never available	15	15.3	38	29.5	21	24.4	21	20	10	31.3
	Rarely available	12	12.2	26	20.2	14	16.3	14	13.3	5	15.6
	Often available	14	14.3	13	10.1	10	11.6	14	13.3	8	25
	Always available	57	58.2	51	39.5	41	47.7	55	52.4	9	28.1
7.TB/HIV integration guidelines	Never available	4	4.1	22	17.1	8	9.3	9	8.6	7	21.9
	Rarely available	5	5.1	22	17.1	13	15.1	10	9.5	2	6.3
	Often available	13	13.3	19	14.7	7	8.1	10	9.5	9	28.1
	Always available	76	77.6	66	51.2	56	65.1	74	70.5	14	43.8

- **Availability of Tuberculosis management guidelines.**

The following proportion of participants indicated that Sekhukhune district at 83.7% always had the most Tuberculosis management guidelines, followed by Capricorn district at 81 (82.7%), Vhembe district at 85 (81%), Mopani district at 94 (72.9%) and Waterberg district at 21 (65.6%). The findings also revealed that in each district, there are few PHC facilities where the TB Management Guidelines are completely not available. The guidelines are meant to provide guidance to PHC nurses on the management of people with Tuberculosis as well as those co-infected with TB and HIV (Department of Health, 2014).

- **Availability of Human Immune Virus management guidelines.**

Vhembe district had the highest number of participants who indicated that Human Immuno Virus management guidelines are available in the PHC facilities; at 89 (84.8%), followed by Capricorn district at 81(82.7%), Sekhukhune district at 71 (82.6%) Mopani district at 97 (75.2%) and Waterberg district at 19 (59.4%).

- **Availability of Isoniazid Preventive Therapy (IPT) guidelines.**

Isoniazid is an antibiotic used as a first-line agent for the prevention and treatment of both latent and active tuberculosis (The American Society of Health System Pharmacists, 2016). The guidelines for using Isoniazid are very crucial because they guide PHC nurses on how to manage side-effects, such as eye pain, numbness in hands and feet, skin rash, fever, swollen glands, sore throat, unusual bleeding and stomach pains (The American Society of Health System Pharmacists, 2016). It is therefore very important that PHC facilities should always possess guidelines of using Isoniazid, for constant referral. The results indicated that the guidelines for Isoniazid Preventive therapy (IPT) management are always available in the various districts of the Limpopo Province but in varying degrees. Vhembe district had the highest number of participants who indicated that Isoniazid Preventive Therapy (IPT) guidelines are always available at 84 (80%), followed by Capricorn district at 78 (79.6%), Sekhukhune district at 66 (76.7%), Mopani district at 78 (60.5%) and Waterberg district with 17 (53.1%).

- **Availability of Sexually transmitted infections management guidelines.**

Capricorn district had the highest number of participants who indicated that guidelines for sexually transmitted infections are always available in the PHC facilities at 80 (81.6%), followed by Sekhukhune district at 66 (76.7%), Vhembe district at 80 (76.2%), Mopani district at 94 (72.9%) and Waterberg district with 18 (56.3%). Management of sexually transmitted diseases guidelines are more than 80% available in the various districts of Limpopo Province.

- **Availability of Tuberculosis infection control guidelines.**

The following proportion of participants indicated that tuberculosis infection control guidelines are available in the PHC facilities of Limpopo Province; Capricorn district

at 77 (78.6%) participants who said they are available, followed by Sekhukhune district at 66 (76.7%), Vhembe district at 76 (72.4%) and Waterberg district at 20 (62.5%) (Table 4.5). People who work in the PHC facilities and those that receive care in health-care settings are at risk of being infected with Tuberculosis because they are in direct contact with the infectious TB patients. Therefore, it is necessary to have a TB infection control guideline as part of a general infection control programme designed to ensure prevention of TB in the health care settings (Department of Health, 2009).

- **Availability of Multiple Drug Resistant TB guidelines.**

The multiple drug resistance TB refers to TB that does not respond to at least isoniazid and rifampicin, the two most effective anti-TB drugs (World Health Organization, 2015). The results revealed that average of 81 (18.1%), respondents indicated that there are no multiple drug resistance TB guidelines in the PHC facilities of Limpopo Province while an average of 202 (45.2%) participants indicated that the multiple drug resistance TB guidelines are always available in the PHC facilities of the Limpopo Province.

- **Availability of TB/HIV integration guidelines.**

The TB/HIV integration guidelines are aimed at guiding the PHC nurses to conduct two services at the same time. Capricorn district had the highest number of participants who indicated that TB/HIV integration guidelines are available in the PHC facilities at 76 (77.6%), followed by the Vhembe district 74 (70.5%), Sekhukhune district at 56 (65.1%), Mopani district at 66 (51.2%) and Waterberg district at 14 (43.8%) participants who indicated that TB/HIV integration guidelines are available in the PHC facilities.

4.5 Section D: Modes of TB and HIV services provision.

- **TB and HIV services are offered in the same building.**

The following proportion of participants indicated that TB and HIV services are offered in the same building; Capricorn district at 87.8% (Table 4.5), followed by Waterberg district at 87.5%, Sekhukhune district at 86%, Vhembe district at 77.1% and Mopani district at 76%.

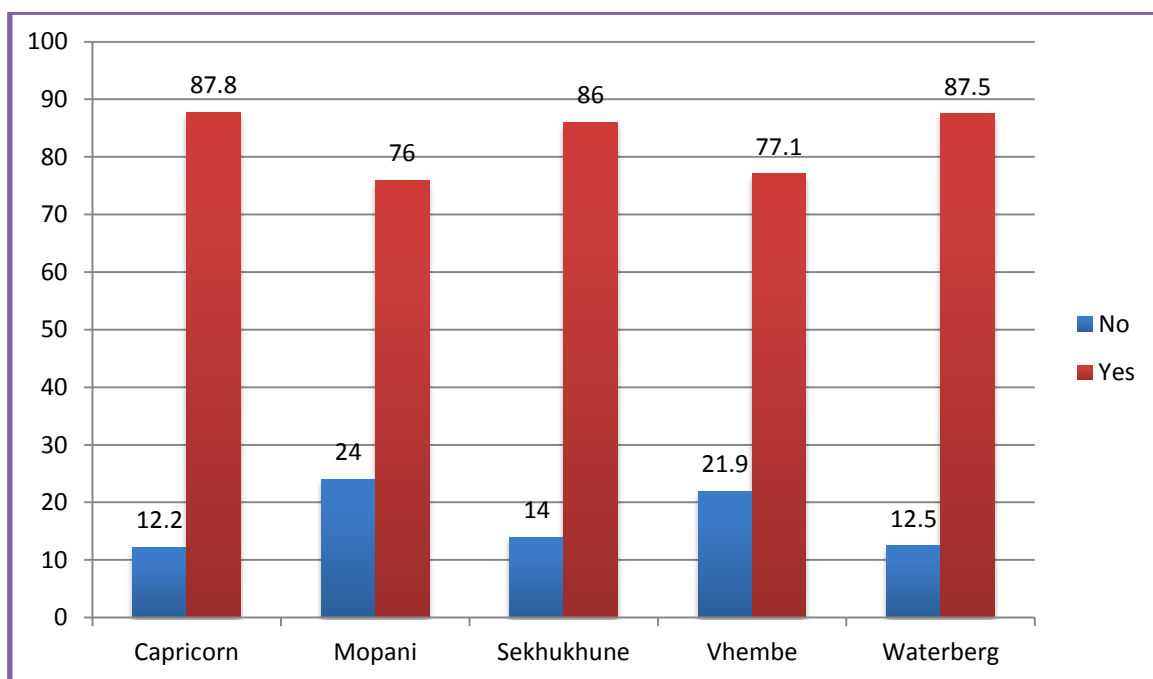


Figure 4.1:Facilities offering TB and HIV services in the same building.

A Chi-square test was used to calculate if there is any statistical difference between those who said yes and those who said no in each district regarding TB and HIV services offered in the same building.

Table 4.6: Significance regarding facilities offering TB and HIV services in the same building.

District	Category	Observed	Expected	Chi-Square	P-value
Capricorn	Yes	86	49 (50%)	34.798	<0.0001
	No	12	49 (50%)		
Mopani	Yes	98	64.5(50%)	34.798	<0.0001

	No	31	64.5(50%)		
Sekhukhune	Yes	74	43 (50%)	44.698	<0.0001
	No	12	43(50%)		
Vhembe	81	52			
	23	52	32.346		<0.0001
Waterberg	28	16	18.00		<0.0001
	4	16			

According to Table 4.6, difference between the participants who said “yes” and those who said “no” in all the districts, is extremely statistically significant with p-value of <0.0001.

- **TB and HIV services offered in the same rooms at different times.**

The following participants indicated that TB/HIV services are offered in the same rooms at different times Sekhukhune at 53.5%, followed by Waterberg district at 46.9%, Capricorn district at 45.9%, Mopani district at 44.2% and Vhembe district at 32.4%. In Waterberg and Sekhukhune districts there is significant difference between the participants who said “yes” and those who said “no”.

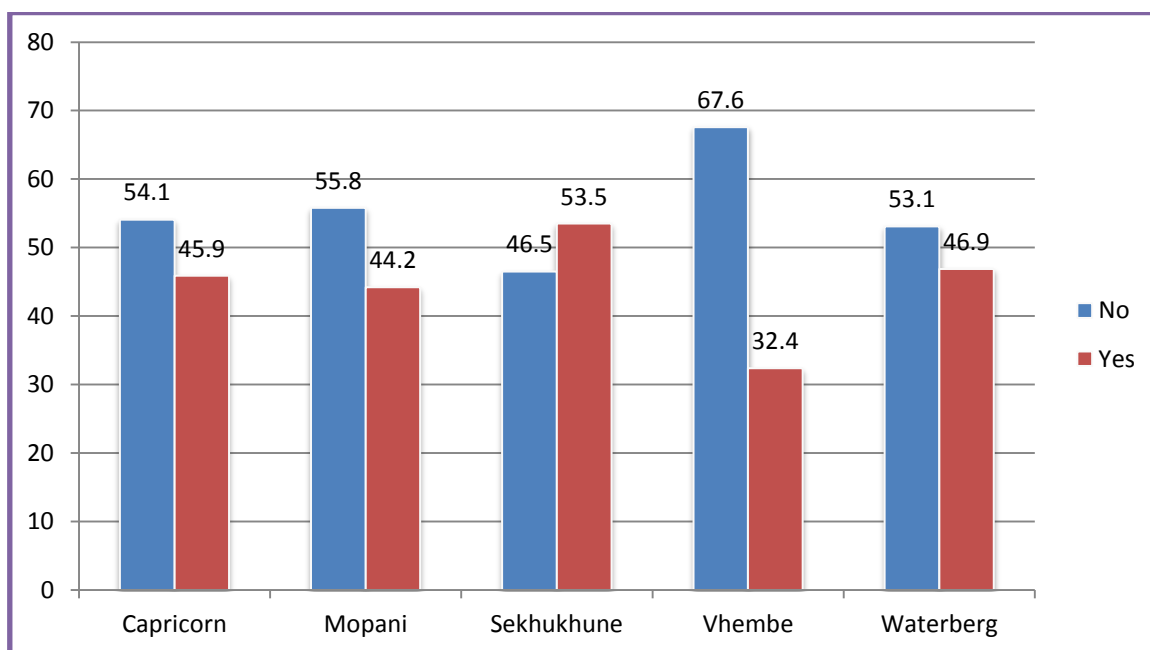


Figure 4.2: Facilities offering TB and HIV services in the same room at different times.

Based on the results in Figure 4.2 the following Chi-square values were revealed as in table 4.7:

Table 4.7: Significance regarding facilities offering TB and HIV services in the same room at different times.

District	Category	Observed	Expected	Chi-Square	P-value
Capricorn	Yes	45	49 (50%)	0.653	<0.4190
	No	53	49 (50%)		
Mopani	Yes	57	64.5(50%)	1.744	<0.1866
	No	72	64.5(50%)		
Sekhukhune	Yes	46	43 (50%)	0.419	<0.5176
	No	40	43(50%)		
Vhembe	Yes	33	52	13.855	<0.0002
	No	71	52		
Waterberg	Yes	15	16	0.125	<0.7237
	No	17	16		

Table 4.7, shows that the in the Vhembe district there is statistical significance regarding services offered in the same room at different times with p-value <0.0002.

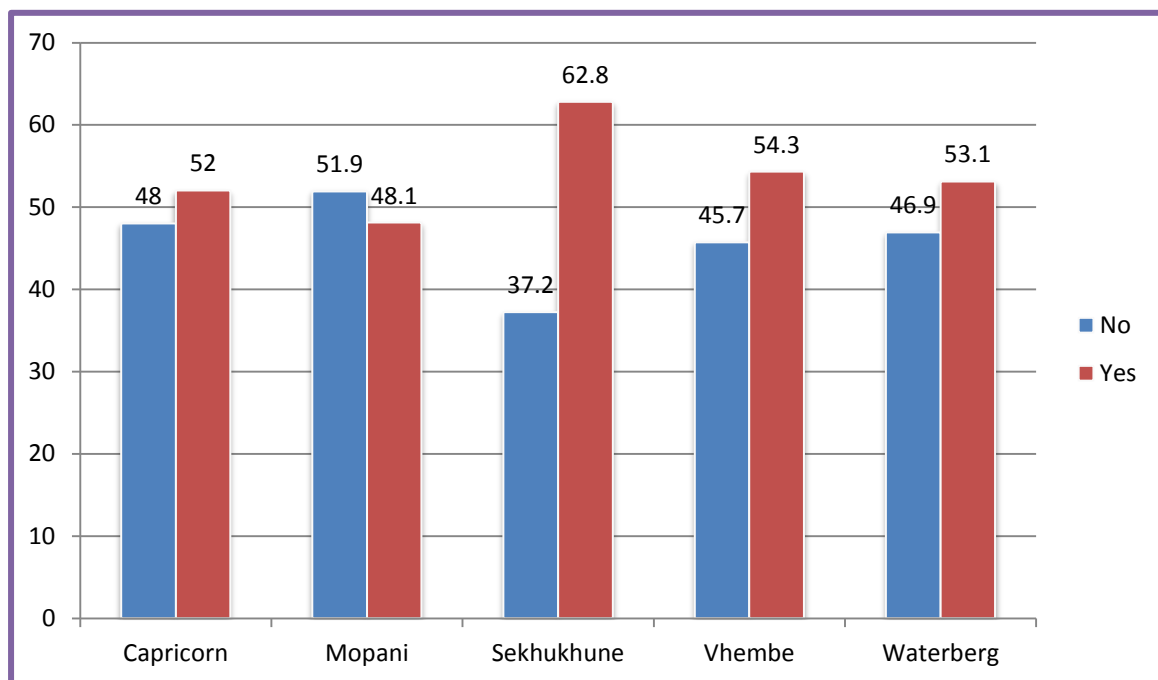


Figure 4.3: Facilities offering TB and HIV services in the same room at the same time by one professional nurse

- **TB and HIV services are offered in the same rooms at the same time by one professional nurse**

The percentages shown in figure 4.3 revealed the participants' responses about the offering of TB and HIV services in the same room at the same time by one professional nurse; Sekhukhune district at 62.8%, followed by Vhembe district at 54.3%, Waterberg district at 53.1%, Capricorn district with 52% and Mopani district with 49.1%.

Table 4.8: Significance regarding facilities offering TB and HIV services in the same room at the same time by one professional nurse

District	Category	Observed	Expected	Chi-Square	p-value
Capricorn	Yes	51	49 (50%)	0.163	0.6862
	No	47	49 (50%)		
Mopani	Yes	62	64.5(50%)	1.194	0.6598
	No	67	64.5(50%)		
Sekhukhune	Yes	54	43 (50%)	5.628	0.5176
	No	32	43 (50%)		
Vhembe	Yes	56	52	0.615	0.4328
	No	48	52		
Waterberg	Yes	17	16	0.125	Less than 0.7237
	No	15	16		

Table 4.8 shows that there was no significant difference among the districts as shown by a p-value of >0.05.

4.6 Section E: Human Resources and Development.

The items in table 4.9 regarding human resources development will be discussed in sub-heading 4.6.1 to 4.6.9.

Table 4.9: Human Resources and Development.

Item		Capricorn		Mopani		Sekhukhune		Vhembe		Waterberg	
		f	%	f	%	f	%	f	%	f	%
1. There is adequate staff allocated in the facility at all times	Strongly agree	7	7.1	12	9.3	8	9.3	11	10.5	3	9.4
	Agree	12	12.2	21	16.3	17	19.8	15	14.3	8	25
	Disagree	41	41.8	47	36.4	29	33.7	49	46.7	13	40.6
	Strongly disagree	37	37.8	49	38	32	37.2	28	26.7	8	25
2. The training plan for TB is available in the facility	Strongly agree	6	6.1	13	10.1	11	12.8	10	9.5	4	12.5
	Agree	36	36.7	33	25.6	31	36	26	24.8	8	25
	Disagree	29	29.6	36	27.9	26	30.2	37	35.2	9	28.1
	Strongly disagree	25	25.5	45	34.9	17	19.8	29	27.6	11	34.4
3. The training plan for HIV is available in the facility	Strongly agree	11	11.2	20	15.5	12	14	17	16.2	6	18.8
	Agree	32	32.7	41	31.8	31	36	28	26.7	10	31.3
	Disagree	34	34.7	30	23.3	23	26.7	35	33.3	8	25
	Strongly disagree	21	21.4	35	27.1	20	23.3	23	21.9	7	21.9
4. The training plan for TB/HIV integration is available in the facility	Strongly agree	10	10.2	14	10.9	8	9.3	11	10.5	4	12.5
	Agree	31	31.6	34	26.4	32	37.2	26	24.8	9	28.1
	Disagree	34	34.7	42	32.6	25	29.1	39	37.1	10	31.3
	Strongly disagree	21	21.4	38	29.5	20	23.3	26	24.8	8	25
5. There are adequate trained staff on TB management at all times	Strongly agree	15	15.3	21	16.3	14	16.3	13	12.4	4	12.5
	Agree	32	32.7	49	38	33	38.4	31	29.5	6	18.8
	Disagree	31	31.6	32	24.8	23	26.7	46	43.8	14	43.8
	Strongly disagree	20	20.4	27	20.9	16	18.6	13	12.4	7	21.9
6. There are adequately trained staff on HIV management at all times	Strongly agree	22	22.4	44	34.1	25	29.1	26	24.8	6	18.8
	Agree	30	30.6	45	34.9	34	39.5	34	32.4	13	40.6
	Disagree	33	33.7	18	14	19	22.1	36	34.3	8	25
	Strongly disagree	13	13.3	21	16.3	8	9.3	7	6.7	4	12.5
7. The skills audit of HIV training is available and updated regularly	Strongly agree	25	25.5	41	31.8	23	26.7	32	30.5	7	21.9
	Agree	46	46.9	44	34.1	36	41.9	43	41	10	31.3
	Disagree	15	15.3	31	24	19	22.1	20	19	10	31.3
	Strongly disagree	12	12.2	12	9.3	7	8.1	8	7.6	4	12.5
8. The skills audit of TB training is available and updated regularly	Strongly agree	23	23.5	34	26.4	23	26.7	27	25.7	8	25
	Agree	48	49	42	32.6	39	45.3	41	39	10	31.3
	Disagree	15	15.3	36	27.9	14	16.3	27	25.7	8	25
	Strongly disagree	12	12.2	17	13.2	9	10.5	8	7.6	5	15.6
9. The skills audit of	Strongly agree	22	22.4	33	25.6	25	29.1	25	23.8	6	18.8
	Agree	46	46.9	31	24	34	39.5	43	41	9	28.1

TB/HIV integration training is available and updated regularly	Disagree	19	19.4	47	36.4	18	20.9	27	25.7	11	34.4
	Strongly disagree	11	11.2	18	14	9	10.5	9	8.6	5	15.6

4.6.1 Availability of staff allocated to PHC facility.

The average of 117 (26%), participants indicated that PHC facilities of Limpopo Province have adequate staff allocated to the facilities at all times, while 333 (74%) participants indicated that PHC facilities do not have adequate staff at all times. The district with the most shortage of staff is Capricorn district at 39.8% PHC facilities with enough staff.

4.6.2 Availability of TB training plans in PHC facility.

The following proportion of participants agreed that TB training plans are available in the PHC facilities; Capricorn district at 42.8%, followed by Sekhukhune district at 24.4%, Waterberg district at 18.8%, Mopani district at 17.9%, and Vhembe district at 17.2%. The whole Limpopo Province, 186 (41.3%) participants agreed that there are TB training plans in their PHC facilities, while 264 (58.7%) participants disagreed that there are TB training plans.

4.6.3 Availability of the training plan for HIV in PHC facility.

The following proportion of participants agreed that the HIV training plans are available in the PHC facilities; Capricorn district at 43.9%, Mopani district at 57.3%, Sekhukhune district at 50%, Vhembe district at 42.9% and Waterberg district at 50.1%, a total of 214 (47.6%), agree that HIV training plans are available in their PHC facilities, while 56.1% of Capricorn district, 50.4% of Mopani district, 50% of Sekhukhune district, 55.2% of Vhembe district and 46.9% respondents of Waterberg district, a total of 236 (52.4%) disagreed that there are HIV training plans in their PHC facilities.

4.6.4 Availability of training plan for TB/HIV integration in the facility.

The following proportion of participants agreed that the TB/HIV training plans are available in the PHC facilities; Sekhukhune district at 46.5%, followed by Capricorn district at 41.8%, Waterberg district at 40.6%, Mopani district at 37.3%, and Vhembe

district at 35.3%. This indicates that 179 (39.8%) respondents agree that TB/HIV integration training plans are available, while 56.1% of Capricorn district, 62.1% of Mopani district, 52,4% of Sekhukhune district and 56,3% of Waterberg district which is 271 (60.2%) of Limpopo facilities disagreed that training plans for TB/HIV integration are available.

4.6.5 Availability of trained staff on TB management at all times.

The following proportion of participants agreed that staff trained on TB management are available at all times in the PHC facilities; Sekhukhune district at 54.7%, Mopani district at 54%, Capricorn district at 48%, Vhembe district at 41.9% and Waterberg district at 31.3% which is 218 (48.4%) of the participants in Limpopo Province agree that their PHC facilities have adequate trained staff on TB management at all times; while 52% of Capricorn, 45,7% of Mopani, 45,3% of Sekhukhune, 56.2% of Vhembe and 65.7% of Waterberg district which is 232 (51.6%), participants of Limpopo Province disagreed to be having adequate staff trained on TB management.

4.6.6 Availability of trained staff on HIV management.

The following proportion of participants agreed that staff trained on HIV management are available at all times in the PHC facilities of Limpopo Province; Mopani district at 69%, Sekhukhune district at 68.6%, Vhembe district at 57.5% and Waterberg district at 59.4% which is 279 (62%) participants of Limpopo Province, agreed that they have adequate trained staff on HIV management at all times, while 47% of Capricorn district, 30.3% of Mopani district, 31.4% of Sekhukhune district, 41% of Vhembe district and 37.5% of Waterberg district which is 171 (38%) participants of Limpopo Province disagreed in having adequate staff trained on HIV management. Mopani District has more trained staff on HIV management at all times than any other district in the Limpopo Province.

4.6.7 Availability of HIV training skills audit.

The following proportion of participants agreed that HIV training skills audits are available at all times in the PHC facilities of Limpopo Province; Capricorn district at 72.4%, Vhembe district at 71.5%, Sekhukhune district at 68.6%, Mopani district at 65.9%, and Waterberg district at 53.2% which is 307 (68.2%) respondents of Limpopo Province agreed that they have skills audit of HIV training and it is updated

regularly, while 27.5% of Capricorn district, 33.3% of Mopani district, 30.2% of Sekhukhune district, 26.6% and 43.8% of Waterberg district which is 143 (31.8%) participants disagreed to be having skills audit of HIV training. Capricorn district have more skills audit of HIV training than any other district in the Limpopo Province.

4.6.8 Availability TB training skills audit.

The following proportion of participants agreed that TB training skills audits are available at all times in the PHC facilities of Limpopo Province; Capricorn district at 72.5% Sekhukhune district at 72%, Vhembe district at 64.7%, Mopani district at 59%, and Waterberg district at 56.3%, a total of 295 (65.6%) respondent of Limpopo Province; agreed that they have skills audit of TB training and it is updated regularly, while 40.6% of Waterberg district, 31.1% of Mopani district 27.5% of Capricorn district, 26.8% of Sekhukhune district, 33.3% of Vhembe district a total of 155 (34.4%) participants disagreed that TB training skills audits are available. The findings also reveal that Capricorn district has more skills audit of TB training than any other district in the Limpopo Province.

4.6.9 Availability of TB/HIV integration training skills Audit.

The following proportion of participants agreed that TB/HIV integration training skills audits are available at all times in the PHC facilities of Limpopo Province; Capricorn district at 69.3%, Mopani district at 49.6%, Sekhukhune district at 68.6%, Vhembe district at 64.8% and Waterberg district at 49.6%, a total of 274 (60.9%) participants of Limpopo Province, agreed that they have skills audit of TB/HIV integration training, while 30.6% of Capricorn district, 50.4% of Mopani district, 31.4% of Sekhukhune district, 34.3% of Vhembe district and 50% of Waterberg district a total of 176 (39.1%) participants of Limpopo Province disagree. The findings also reveal that Capricorn district with 69.3% and Sekhukhune district with 68.6% have more skills audit of TB/HIV integration training than any other district in the Limpopo Province.

4.7 Section F: Clients/Patients educational information. Advocacy Communication and Social Mobilization (ACSM).

Table 4.10 Clients/Patients educational information

Item		Capricorn		Mopani		Sekhukhune		Vhembe		Waterberg	
		f	%	f	%	f	%	f	%	f	%
1.Educational health talks on TB in patient waiting area	Never available	1	1	8	6.2	2	2.3	4	3.8	5	15.6
	Hardly available	4	4.1	5	3.9	3	3.5	1	1	5	15.6
	Sometimes available	10	10.2	22	17.1	14	16.3	23	21.9	0	0
	Often available	26	26.5	36	27.9	34	39.5	29	27.6	9	28.1
	Always available	57	58.2	58	45	33	38.4	46	43.8	13	40.6
2.Educational health talks on HIV in patient waiting area	Never available	1	1	5	3.9	2	2.3	1	1	4	12.5
	Hardly available	4	4.1	3	2.3	4	4.7	0	0	3	9.4
	Sometimes available	6	6.1	14	10.9	10	11.6	14	13.3	1	3.1
	Often available	24	24.5	34	26.4	32	37.2	28	26.7	11	34.4
	Always available	63	64.3	73	56.6	38	44.2	59	56.2	11	40.6
3.Distribution of educational material on TB	Never available	13	13.3	19	14.7	13	15.1	15	14.3	8	25
	Hardly available	15	15.3	26	20.2	17	19.8	15	14.3	5	15.6
	Sometimes available	34	34.7	44	34.1	29	33.7	35	33.3	6	18.8
	Often available	19	19.4	13	10.1	10	11.6	19	18.1	8	25
	Always available	16	16.3	24	18.6	15	17.4	18	17.1	8	15.6
4.Distribution of educational material on HIV	Never available	9	9.2	17	13.2	9	10.5	8	7.6	4	12.5
	Hardly available	15	15.3	22	17.1	17	19.8	15	14.3	8	25
	Sometimes available	36	36.7	44	34.1	31	36	34	32.4	8	25
	Often available	21	21.4	22	17.1	14	16.3	23	21.9	6	18.8
	Always available	16	16.3	24	18.6	15	17.4	23	21.9	6	18.8

5. Distribution of education material on TB/HIV co-infection	Never available	13	13.3	24	18.6	12	14	15	14.3	8	25
	Hardly available	20	20.4	29	22.5	20	23.3	21	20	1	31.3
	Sometime available	35	35.7	42	32.6	31	36	35	33.3	0	9.4
		18	18.4	17	13.2	3	15.1	14	3.3	3	12.5
	Often available	12	12.2	16	12.4	9	10.5	17	16.2	4	18.8
Always available									6		
6. Distribution of educational material in the appropriate language	Never available	23	23.5	29	22.5	21	24.4	14	13.3	7	21.9
	Hardly available	28	28.6	27	20.9	23	26.7	17	16.2	8	25
	Sometimes available	24	24.5	38	29.5	21	24.4	34	32.4	8	25
	Often available	16	16.3	10	.8	8	9.3	3	12.4	4	12.5
	Always available	7	7.1	24	18.6	13	15.1	25	23.8	5	15.6
7. Intensive education on the disease to patients diagnosed with TB	Never available	4	4.1	10	7.8	4	4.7	3	2.9	4	12.5
	Hardly available	3	3.1	7	5.4	6	7	5	4.8	3	9.4
	Sometimes available	16	16	28	21.7	11	12.8	22	21	6	18.8
	Often available	7	17.3	33	25.6	9	22.1	25	23.8	4	12.5
	Always available	58	59.2	50	38.8	45	52.3	48	45.7	1	46.9
									5		
8. Intensive education on treatment to patients diagnosed with HIV	Never available	0	0	5	3.9	2	2.3	0	0	4	12.5
	Hardly available	3	3.1	2	1.6	5	5.8	4	3.8	1	3.1
	Sometimes available	10	10.2	18	14	7	8.1	10	9.5	5	15.6
	Often available	21	1.4	36	27.9	19	22.1	29	27.6	5	15.6
	Always available	64	65.3	68	52.7	52	60.5	59	56.2	1	53.1
9. Intensive education on disease to patients diagnosed with TB and HIV	Never available	1	1	7	5.4	2	2.3	2	1.9	3	9.4
	Hardly available	1	1	3	2.3	3	3.5	4	3.8	1	3.1
	Sometimes available	11	11.2	19	14.7	13	15.1	13	12.4	2	6.3
	Often available	19	19.4	29	22.5	17	19.8	29	27.6	7	21.9
	Always available	66	67.3	71	55	51	59.3	55	52.4	9	59.4
10. Information to patients about side	Never available	0	0	2	1.6	2	2.3	0	0	3	9.4
		4	4.1	9	7	3	3.5	5	4.8	4	12.5

effects of TB drugs	Hardly available	5	5.1	18	14	4	4.7	11	10.5	2	6.3
	Sometimes available	19	19.4	24	18.6	20	23.3	26	24.8	6	18.8
	Often available	70	71.4	75	58.1	57	66.3	61	58.1	1	53.1
	Always available									7	
11. Information to patients about side effects of Anti Retro Virus (ARVs)	Never available	0	0	5	3.9	3	3.5	0	0	4	12.5
	Hardly available	2	2	7	5.4	2	2.3	2	1.9	2	6.3
	Sometimes available	6	6.1	11	8.5	4	4.7	9	8.6	1	3.1
	Often available	21	21.4	17	13.2	17	19.8	24	22.9	6	18.8
	Always available	69	70.4	89	69	59	68.6	68	64.8	1	59.4
										9	
12. Adherence counselling offered to patients	Never available	1	1	4	3.1	1	1.2	0	0	4	12.5
	Hardly available	2	2	2	1.6	1	1.2	2	1.9	1	3.1
	Sometimes available	3	3.1	7	5.4	5	5.8	6	5.7	2	6.3
	Often available	12	12.2	19	14.7	17	19.8	16	15.2	4	12.5
	Always available	79	80.6	97	75.2	62	72.1	79	75.2	1	65.6
13. Education to patients about the duration of the treatment of TB and HIV	Never available	1	1	1	0.8	1	1.2	0	0	3	9.4
	Hardly available	1	1	3	2.3	1	1.2	2	1.9	2	6.3
	Sometimes available	2	2	6	4.7	4	4.7	9	8.6	2	6.3
	Often available	9	9.2	18	14	14	16.3	17	16.2	5	5.6
	Always available	85	86.7	101	78.3	66	76.7	75	71.4	2	62.5
										0	
14. Family education about TB	Never available	4	4.1	5	3.9	3	3.5	5	4.8	7	21.9
	Hardly available	9	9.2	15	11.6	4	4.7	3	2.9	0	0
	Sometimes available	25	25.5	33	25.6	20	23.3	22	21	7	21.9
	Often available	27	27.6	27	20.9	23	26.7	33	31.4	1	31.3
	Always available	33	33.7	49	38	36	41.9	40	38.1	0	25
										8	
15. Family education	Never available	4	4.1	6	4.7	5	5.8	5	4.8	5	15.6

about HIV	Hardly available	10	10.2	13	10.1	5	5.8	5	4.8	2	6.3
	Sometimes available	27	27.6	39	30.2	18	20.9	21	20	5	15.6
	Often available	28	28.6	21	16.3	23	26.7	34	32.4	1	40.6
	Always available	29	29.6	49	38	35	40.7	38	36.2	3	21.9
										7	
16. Family education about care of patient with TB and HIV co-infection	Never available	5	5.1	8	6.2	3	3.5	6	5.7	6	18.8
	Hardly available	7	7.1	14	10.9	5	5.8	6	5.7	1	3.1
	Sometimes available	22	22.4	31	24	20	23.3	18	17.1	4	12.5
	Often available	28	28.6	26	20.2	21	24.4	33	1.4	1	31.3
	Always available	36	36.7	49	38	37	43	40	38.1	0	34.4

The items in table 4.10 regarding clients/patients educational information will be discussed from sub-heading 4.7.1 to 4.7.16.

4.7.1 Educational health talks on TB in patient waiting area.

Education sessions are related to professional development of health care workers. Dall'Alba and Sandberg (2006), describe professional development as formal courses in professional education and the informal development of professional skills that occurs in the workplace. The formal professional development courses may be directed either towards the people who are inexperienced and seeking to gain entry to a particular profession or toward experienced professionals who seek some form of continuing education outside their usual place of work. The results indicated that 341 (75.8%), participants said that they often and always participate in health talks on TB in patient waiting area in the various PHC facilities of the Limpopo Province; and also indicated that 109 (24.2%) participants do not participate in health talks on TB in patient waiting area in the various PHC facilities. The findings also revealed that Capricorn district with 83 (84.7%) had the highest numbers of participants who indicated that they often and always participate in health talks on TB in patient waiting area in the various PHC facilities of the Limpopo Province.

4.7.2 Educational health talks on HIV in patient waiting area.

The results revealed that 375 (83.3%), participants indicated that they often and always participate in health talks on HIV in patient waiting area in the various PHC facilities of the Limpopo Province; 75 (16.6%) participants indicated that they do not participate in health talks on HIV in patient waiting area in the various PHC facilities in Limpopo Province. The results indicated that Capricorn district is the highest in HIV educational health talks with 87 (88.8%).

4.7.3 Distribution of educational materials on TB.

The following proportion of participants agree that educational materials on TB are distributed in the PHC facilities of Limpopo Province; Capricorn district at 6.3%, Mopani at 18.6%, Sekhukhune at 17.4%, Vhembe district at 17.1% and Waterberg district at 15.6% participants who indicated that they always distributed educational materials on TB; while 14.7% of Capricorn district, 15.3 of Mopani district, 15.1% of Sekhukhune district, 14.3% Vhembe districts and 25% participants of Waterberg district indicated that they never distributed educational materials on TB.

4.7.4 Distribution of educational material on HIV.

The following proportion of participants of Limpopo Province, 47 (53%), indicated that they never distributed HIV educational materials. Capricorn district at 36.7%, Mopani district at 34.1%, Sekhukhune district at 36%, Vhembe district at 32.4% and Waterberg district at 25% indicated that they sometimes distribute educational materials on HIV while 48 (10.6%) of respondents indicate that they never distributed educational materials on HIV, 77 (17.1%) of the participants indicate that they rarely distribute educational materials on HIV, 86 (19.1%) participants indicated that they sometimes distribute educational materials on HIV, 21.4% participants indicated that they often distribute educational materials on HIV and 84 (18.6%) participants indicated that they always distribute educational materials on HIV.

4.7.5 Distribution of education material on TB/HIV co-infection.

The following proportion of participants indicated that often distribute education material on TB and HIV co-infection; Capricorn district at 18.4%, Mopani district at 1.2%, 15.1% Sekhukhune district at 15.1%, 13.3% Vhembe district at 13.3% and Waterberg district at 12.5%. The results also indicate that 35.7% from Capricorn

district, 32.6% from Mopani district, 36% from Sekhukhune district, 33.3% from Vhembe district and 9.4% participants from Waterberg district indicated that they sometimes distribute education material on TB and HIV co-infection.

4.7.6 Distribution of educational material in the appropriate language.

The following proportion of participants indicated that educational materials are always distributed in the appropriate language; Capricorn district at 7.1%, Mopani district at 18.6%, Sekhukhune district at 15.1%, Vhembe district at 23.8% and Waterberg district at 15.6%. The results also revealed that 23.5% respondents from Capricorn district, 22.5% from Mopani district, 24.4% from Sekhukhune district, 13.3% from Vhembe and 21.9% participants from Waterberg district indicated that they never distributed educational materials in the appropriate language.

4.7.7 Intensive education on the disease to patients diagnosed with TB.

The following proportion of participants indicated that they offer intensive education to patients diagnosed with TB; Capricorn district at 59.2%, Mopani district at 38.8%, Sekhukhune district at 52.3%, Vhembe district at 45.7% and Waterberg district at 46.9% indicated that they always give intensive education to TB patients. However there are 25 (5.6%) respondents from the PHC facilities of the Limpopo Province who indicated that patients never receive TB intensive education in their facilities.

4.7.8 Intensive education on treatment to patients diagnosed with HIV.

The following proportion of participants indicated that they offer intensive education to patients diagnosed with HIV; Capricorn district at 65.3%, Mopani district at 52.7%, Sekhukhune district at 60.5%, Vhembe district at 56.2% and Waterberg district at 53.1% indicated that patients diagnosed with HIV always receive intensive education on HIV disease in the PHC facilities.

4.7.9 Intensive education on disease to patients diagnosed with TB/HIV.

The following proportion of participants indicated that they offer intensive education to patients diagnosed with HIV; Capricorn district at 67.3%, followed by Mopani district at 55%, Sekhukhune district at 59.3%, Vhembe district at 52.4% and Waterberg district at 59.4% indicated that the patients diagnosed with TB and HIV always receive intensive education on both diseases. However 15 (3.3%) participants who

indicate that in their PHC facilities patients diagnosed with TB and HIV never receives intensive education.

4.7.10 Information to patients about side effects of TB drugs.

The following proportion of participants indicated that they provide information to TB patients about side effects of TB drugs; Capricorn district at 90.8%, followed by Mopani district at 76.7%, Sekhukhune district at 89.6%, Vhembe district at 82.9% and Waterberg district at 71.9%. The results indicate that 0% of participants from Capricorn district, 1.6% from Mopani district, 2.3% from Sekhukhune district, and 0% from Vhembe district and 9.4% of the respondents from Waterberg district indicated that they never provide information to patients about the side effects of TB drugs.

4.7.11 Information to patients about side effects of Anti Retro Virus (ARVs).

The following proportion of participants indicated that they provide information to TB patients about side effects of Anti Retro Virus (ARVs); Capricorn district at 91.8%, Mopani district at 82.2%, Sekhukhune district at 88.4%, Vhembe district at 87.7% and Waterberg district at 78.2% often and always provide information to patients about the side effects of Anti Retro Virus (ARVs). The results also revealed that only 12 (2,7%) participants from all the districts of Limpopo Province never provide information to patients about the side effects of Anti Retro Virus (ARVs).

4.7.12 Adherence counselling offered to patients.

The following proportion of participants indicated that they offer adherence counselling to patients; Capricorn district at 92.8%, Mopani district at 89.9%, Sekhukhune district at 91.9%, Vhembe district at 90.4% and 78.1% and Waterberg district at 78.1% often and always provide adherence counselling to patients.

Adherence counselling will improve patient's adherence to treatment and prevent the development of MDR-TB.

4.7.13 Education to patients about the duration of the treatment of TB and HIV.

The following proportion of participants indicated that they provide education to patients about the duration of TB and HIV treatment; total of 410 (91.1%), from all the districts of Limpopo Province, often and always provide education to patients about the duration of the treatment for TB and HIV and 32 (7.1%) of participants, rarely and sometimes provide education to patients about the duration of TB and HIV treatment, while 8 (1.8%) participants, never provide education to patients about the duration of the treatment of TB and HIV.

4.7.14 Family education about TB.

The results on indicated that 286 (63.6%), participants from all the districts of Limpopo Province, often and always provide family education about TB, the total of 138 (30.7%) participants from all the districts of Limpopo Province rarely and sometimes provide family education about TB to the patients' families, while a 24 (5.3%) respondents, never provide family education about TB. The results also revealed that Sekhukhune district at 68.6% is the highest district in the provision of family education about TB in the Limpopo Province, while Waterberg district with 2 (0.4%) is the least in providing family education about TB.

4.7.15 Family education about HIV.

The results indicates that 261 (58%), participants from all the districts of Limpopo Province, often and always provide family education about HIV. A total of 35 (7.7%) of the participants from all the districts of Limpopo Province indicated that they rarely and sometimes provide family education about HIV to the patients, and 25 (5.6%) of respondents indicated that they never provide family education about HIV. The results also revealed that Vhembe district with 72 (16%) is the highest in the provision of family education about TB to in the Limpopo Province, while Capricorn district is the least at 57 (12.7%) in providing family education about HIV.

4.7.16 Family education about care of patient with TB and HIV co-infection.

Mopani district had the highest number of participants who indicated that they provide family education about care of patients with TB and HIV co-infection at 75 (16.7%), followed by Vhembe district at 73 (16.2%), Capricorn district at 64 (14.2%),

Sekhukhune district at 58 (12.9%) and Waterberg district being the least at 21 (4.7%).

The results also revealed that 5 (5.1%) participants from Capricorn, 8 (6.2%) from Mopani district, 3(3.5%) from Sekhukhune, 6 (5.7%) from Vhembe district and 6 (18.8%) from Waterberg district never provide family education about care of patient with TB and HIV co-infection. The lack of family education can result in the danger of them being infected by TB and HIV as they may not know about the measures to themselves.

4.8 Section G: Competency of PHC nurses.

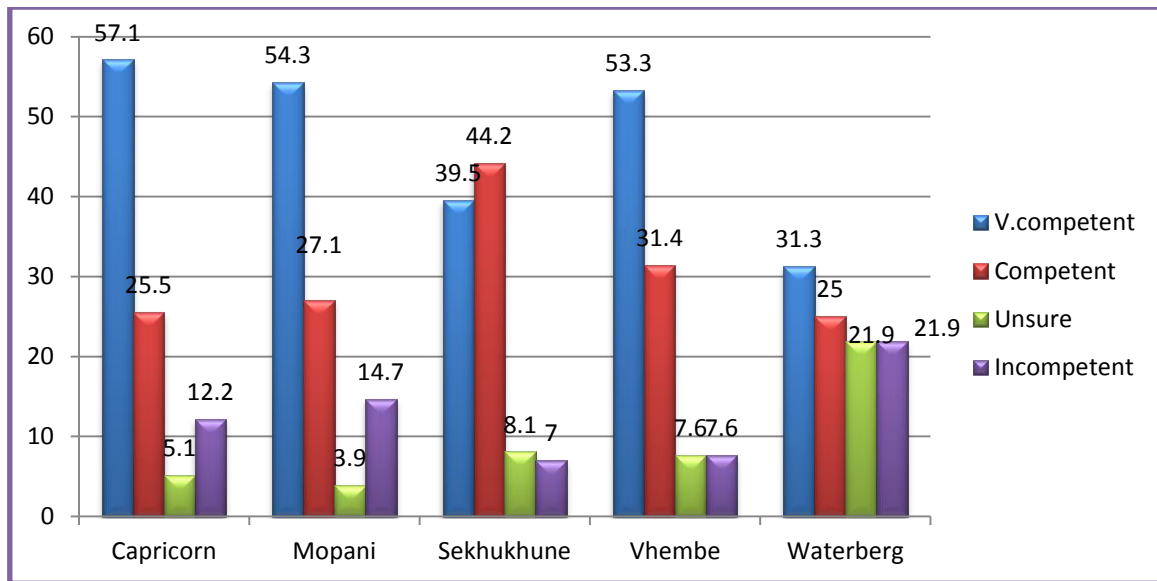


Figure 4.4: Competency in HIV Counselling and testing.

4.8.1 HIV Counselling and testing (HCT).

With regard to figure 4.4, the following proportion of participants indicated that they are competent in HIV counselling and testing (HCT); Capricorn district at 57.1%, Mopani district at 54.3%, Sekhukhune district at 39.5%, Vhembe district at 53.3% and Waterberg district at 31.3% indicated that they are very competent in HIV counselling and testing. The results indicated that 12.2% in Capricorn district, 14.7% in Mopani district, 7% in Sekhukhune district, 7.6% in Vhembe district and 21.9% participants in Waterberg are incompetent in HIV counselling and testing, while Capricorn district at 5.1%, Mopani district at 3.9%, Sekhukhune district at 8.1%, Vhembe district at 7.6% and Waterberg district at 21.9% are unsure about their competency in HIV counselling and testing.

4.8.2 Competency in HIV treatment.

The following proportion of participants agreed that they are very competent in HIV treatment as shown in figure 4.5: Capricorn district at 78.6% (Figure 4.5), agree that they are very competent and competent, 9.2% are unsure, while 12.2% are incompetent, participants from Mopani district at 67.4% strongly agreed that they are very competent and competent, 14.7% are unsure, while 17.8 are incompetent, 83.7% of the respondents from Sekhukhune district agree and strongly agreed that they are very competent and competent, 11.6% are unsure, while 4.7% are incompetent, 77.1% participants from Vhembe District agreed and strongly agreed that they are competent in HIV treatment. While 4.3% are unsure, while 8.6% are

incompetent, 53.2% of the participants from Waterberg district agreed and strongly agreed that they are very competent and competent, 18.8% are unsure, while 28.8% are incompetent in HIV treatment.

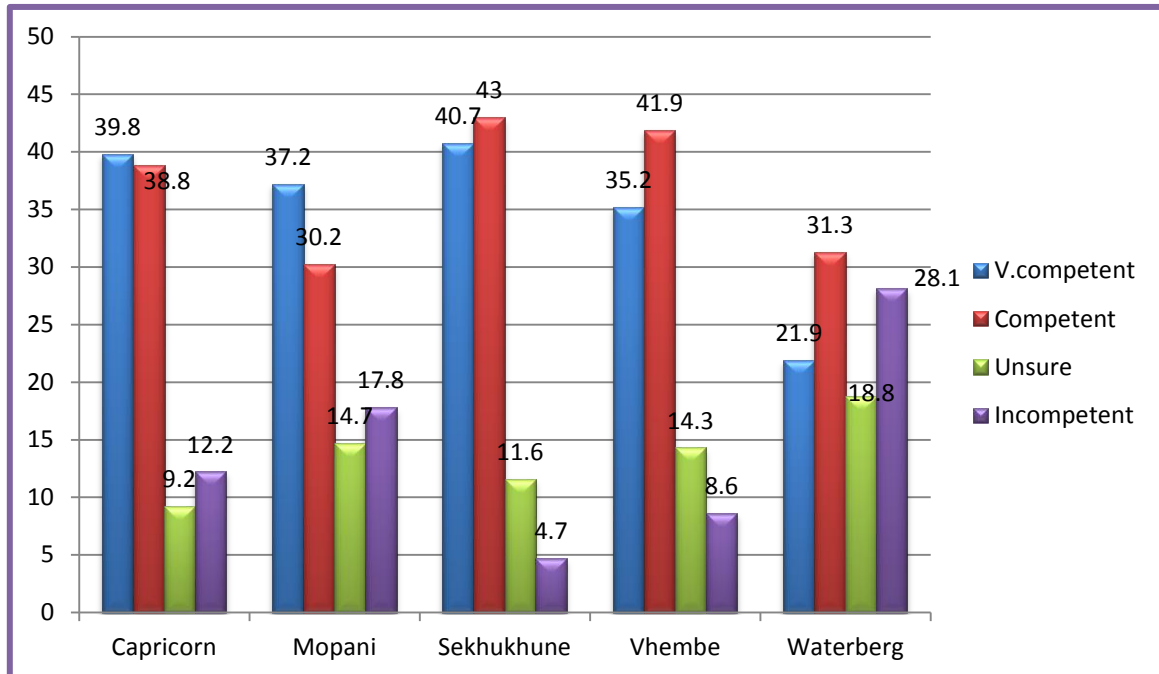


Figure 4.5: Competency in HIV treatment.

4.8.3 Prevention of Mother-to-Child HIV Transmission (PMTCT).

The following proportion of participants agreed and strongly agreed that they are able to prevent Mother-to-child HIV transmission as shown in figure 4.6: Capricorn district at 76.6%, Mopani district at 75.2%, Sekhukhune district at 82.5%, Vhembe district at 79% and Waterberg district at 53.1%. The responses of the respondents also reveal that 12.2% from Capricorn district, 10.9% from Mopani district, 8.1% from Sekhukhune district, 12.4% from Vhembe district and 21.9% of the participants from Waterberg district indicated that they are unsure about their competence in the prevention of HIV transmission from mother to child.

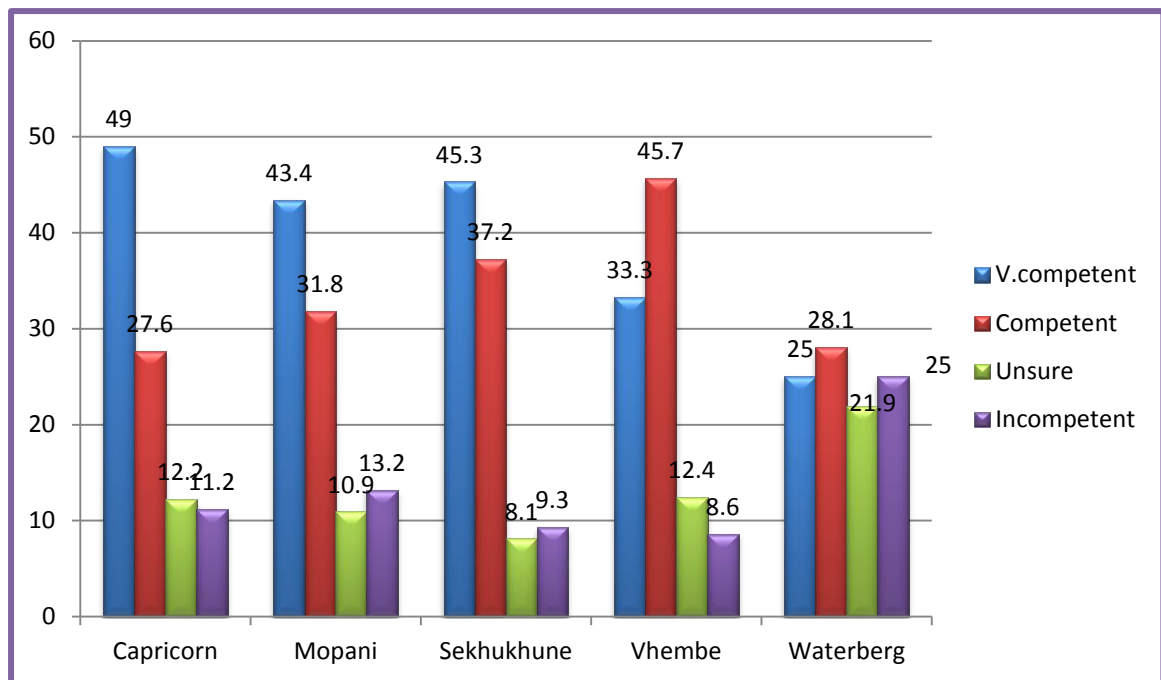


Figure 4.6: competency in the prevention of mother to child HIV transmission.

The results indicated that 11.2% participants from Capricorn district, 13.2% from Mopani district, 9.3% from Sekhukhune district, 8.6% from Vhembe district and 25% of the participants from Waterberg district are incompetent in the prevention of mother to Child HIV transmission. This is a challenge because pregnant women who are HIV positive will deliver HIV infected children if PHC nurses are not able to offer a preventive care to them.

4.8.4 Competency in Couple counselling for HIV.

The following proportion of participants indicated that they are very competent in conducting couple counselling for HIV as presented in figure 4.7; Capricorn district at 36.7%, followed by Mopani district at 27.9%, Vhembe district at 26.7%, Sekhukhune district at 17.3%, and Waterberg district at 12.5%. The responses of 21.4% participants from Capricorn district, 14.7% from Mopani district, 22.1% from Sekhukhune district, 12.4% from Vhembe district and 21.9% from Waterberg district indicated that they are unsure about their competence in conducting couple counselling for HIV.

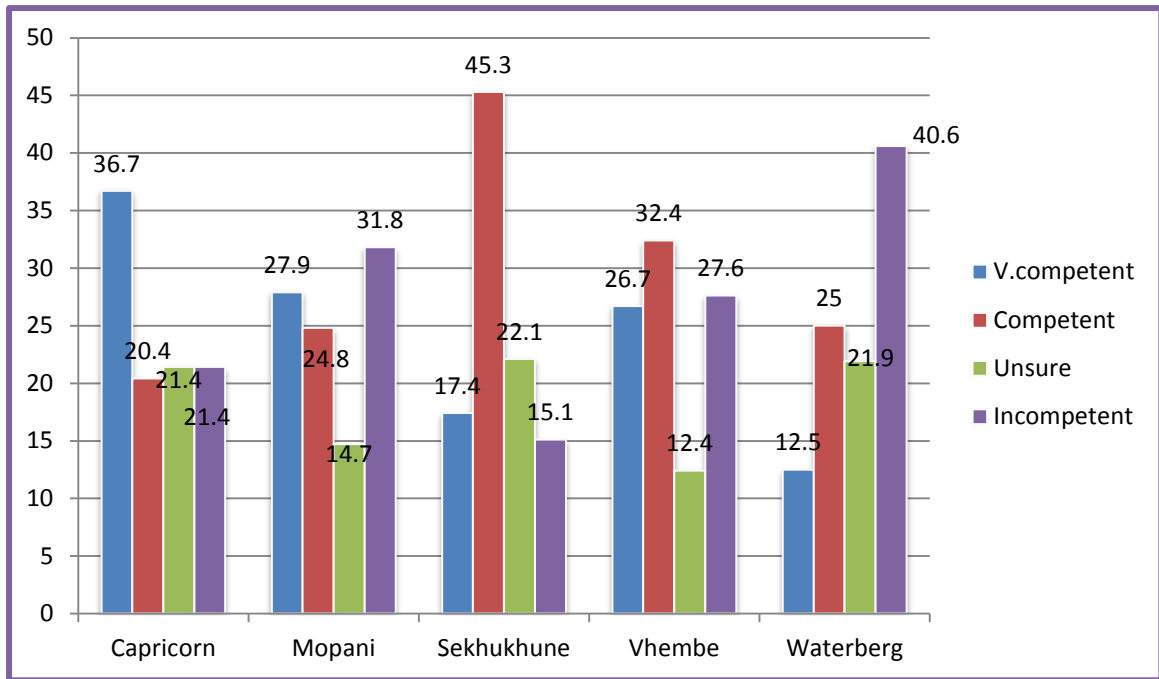


Figure 4.7: Competency in couple counselling for HIV.

The results indicated that 21.4% participants from Capricorn district, 31.8% from Mopani district, 15.1% from Sekhukhune district, 27.6% from Vhembe district and 40.6% of the participants from Waterberg district indicated that they are incompetent in conducting couple counselling for HIV.

4.8.5 Competency in Treatment adherence counselling.

The following proportion of participants indicated that they are competent in conducting adherence counselling as in figure 4.8; Capricorn district at 64.3% (Figure 4.8), followed by Mopani district at 65.9%, Sekhukhune district at 81.4%, Vhembe district at 71.4% and Waterberg district at 46.9%.

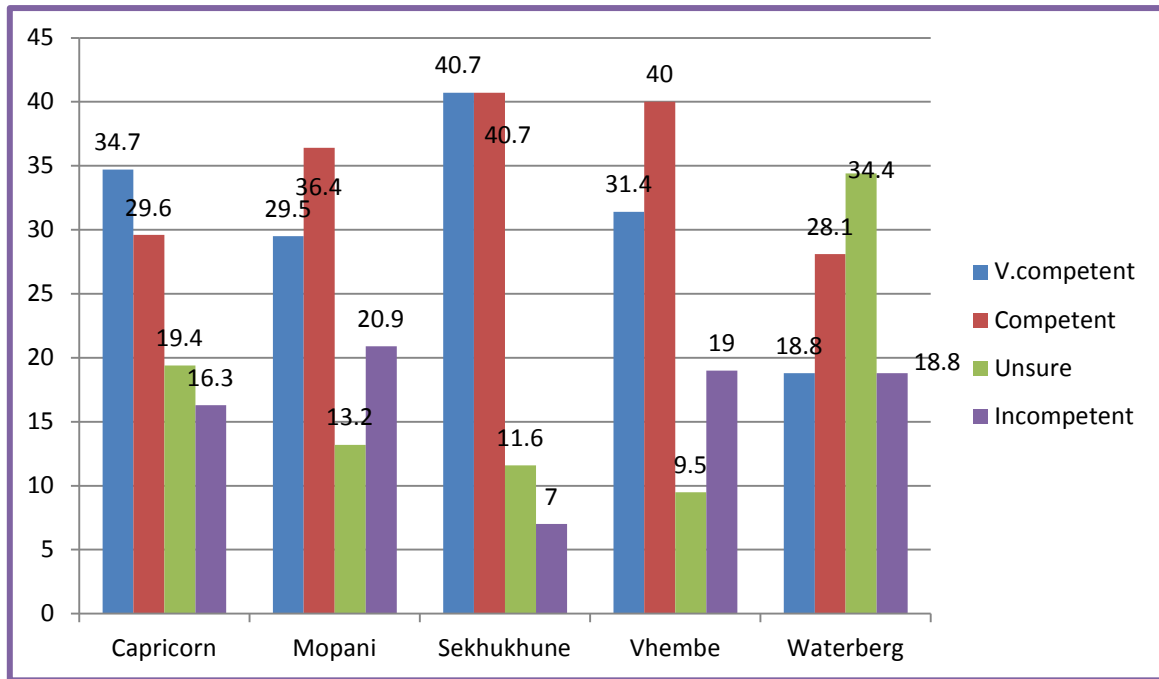


Figure 4.8: Competency in treatment adherence counselling.

The results in table 4.8 revealed that 19.4% of Capricorn district, 13.2% of Mopani district, 11.6% of Sekhukhune district, 9.5% of Vhembe district and 34.4% from Waterberg district are not sure about their competence in treatment adherence counselling, while 16.3% of Capricorn district, 20.9% of Mopani district, 7%, of Sekhukhune district, 19% of Vhembe district and 18.8% participants from Waterberg district are incompetent in treatment adherence counselling. Treatment adherence counselling refers to the advice given to the patients to strictly adhere to all the instructions of the treatment that they are getting for the treatment to be effective.

4.8.6 Competency in diagnosing TB.

The following proportion of participants in figure 4.9 indicated that they are competent in diagnosing TB: Vhembe district at 90.5% followed by Capricorn district at 89.8%, Sekhukhune district at 89.6%, Mopani district at 85.2%, and Waterberg district at 65.5%.

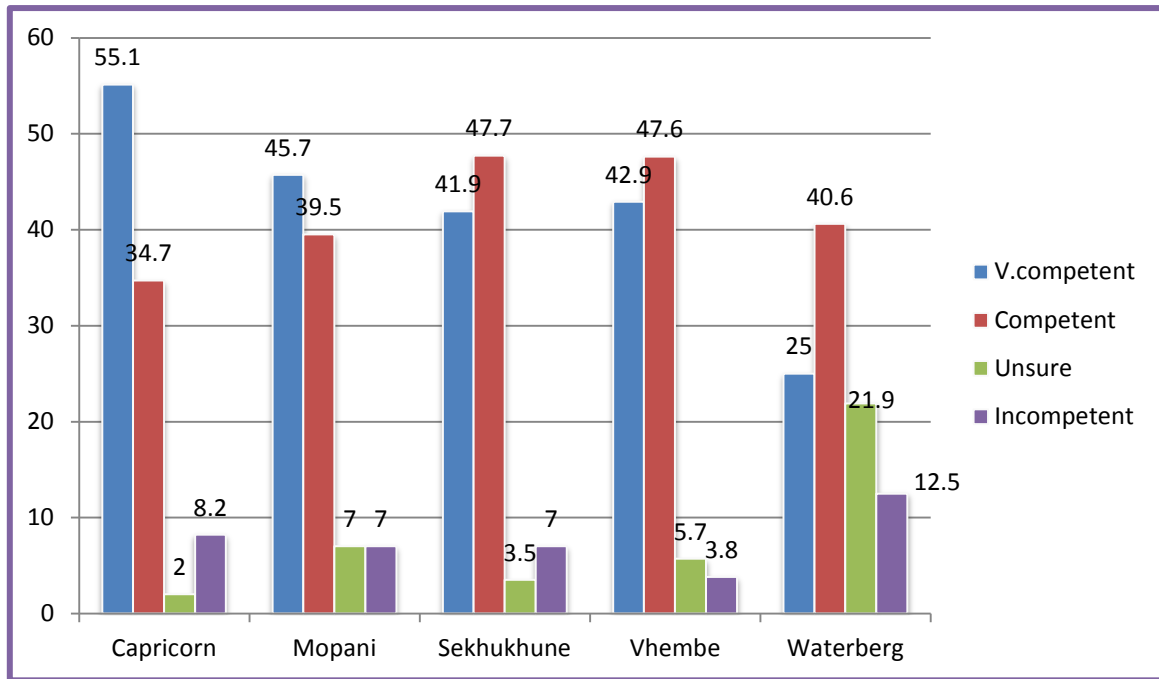


Figure 4.9: Competency in diagnosing TB.

The results in figure 4.9 indicated that Capricorn district at 2%, Mopani district at 7%, Sekhukhune district at 3.5%, Vhembe district at 5.7% and Waterberg District at 21.9% of participants who are unsure about their competence in the diagnosis of TB. Furthermore, the results revealed that 8.2% from Capricorn district, 7% from Mopani district, 7% from Sekhukhune district, 3.8% from Vhembe district and 12.5% of the participants from Waterberg district indicated that they are incompetent in diagnosing TB.

4.8.7 Competency in diagnosing HIV.

The following proportion of participants indicated that they are competent in diagnosing HIV; Sekhukhune district at 95.3% (Figure 4.10), followed by Vhembe district at 91.5%, Capricorn district at 87.7%, Mopani district at 85.3% and Waterberg district at 75%. The results also reveal that many participants from Sekhukhune districts with 91.5% is higher than other districts with competency in diagnosing of HIV.

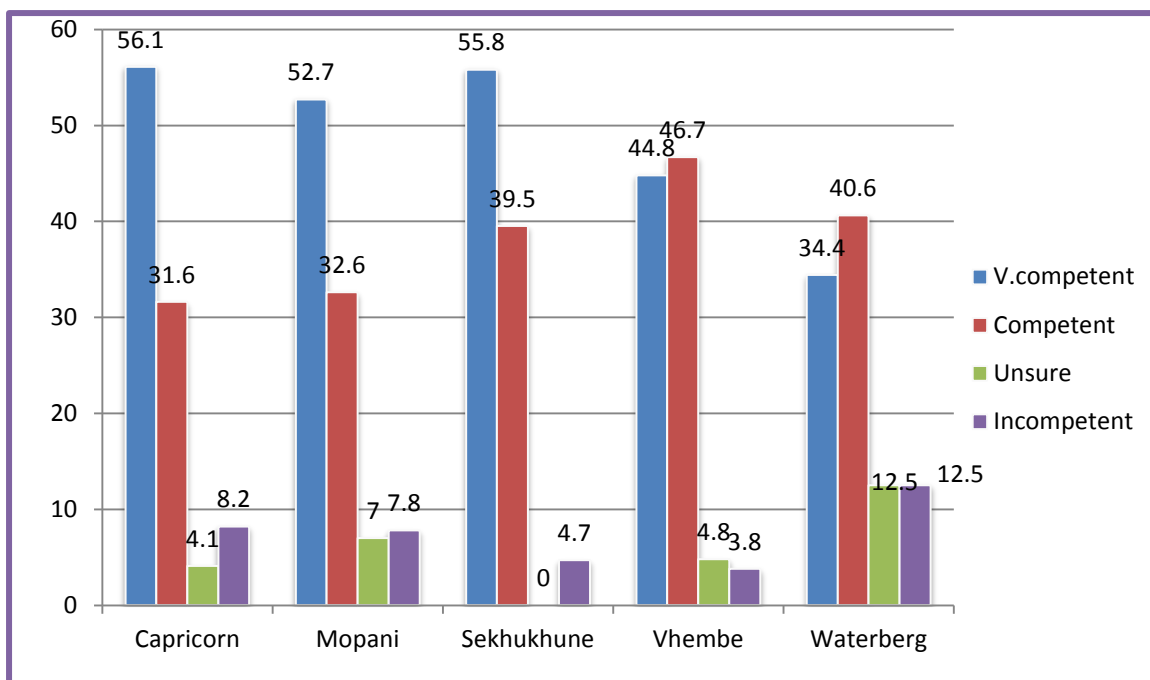


Figure 4.10: Competency in diagnosing HIV.

In figure 4.10 there are 4.1% participants from Capricorn district, 7% from Mopani district, 4.8% from Vhembe and 12.5% of the participants from Waterberg district who are unsure about their competence in the diagnosis of HIV, while 8.2% from Capricorn district, 7.8% from Mopani district, 4.7% from Sekhukhune district, 3.8% from Vhembe district and 12.5% of the respondents from Waterberg district who are incompetent in diagnosing HIV.

4.8.8 Competency in diagnosing STIs.

The following proportion of participants as shown in figure 4.11 indicated that they are very competent in diagnosing STIs; Sekhukhune district at 87.2%, followed by Capricorn district at 84.7%, Vhembe district at 84.7%, Mopani district at 81.4%, Waterberg district at 75.1%; while 7.1% from Capricorn district, 9.3% from Mopani district, 7% from Sekhukhune district, 11.4% from Vhembe district and 15.6% of the participants from Waterberg district indicated that they are unsure about their competence in the diagnosis of sexually transmitted diseases.

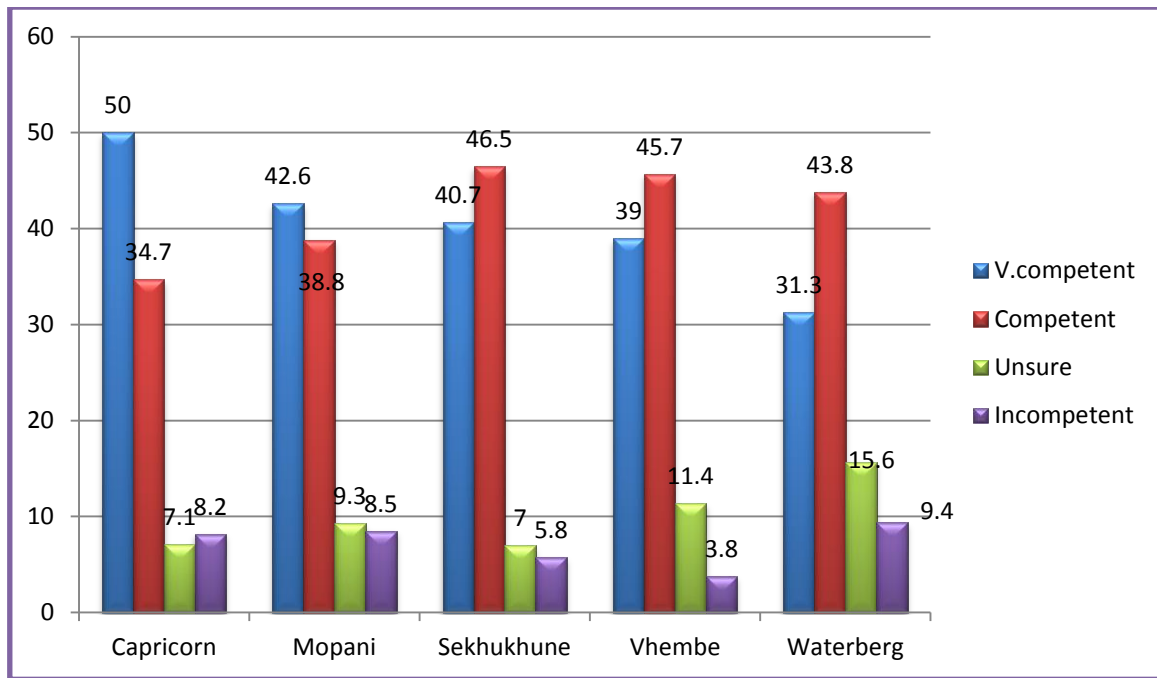


Figure 4.11: Competency in diagnosing STI.

The results in figure 4.11 indicate that 3.8% of the participants from Vhembe District are the least competent of all the districts of the Limpopo Province, while 8.2% respondents from Capricorn, 8.5% from Mopani district, 5.8% from Sekhukhune 3.8% from Vhembe and 9.4% of the participants from Waterberg district are incompetent.

4.9 Section H: Competency in TB Screening, treatment and prevention.

4.9.1 TB screening.

The results revealed that 412 (91.6%) participants of Limpopo Province indicated that they are competent in TB screening, while 37 (8.2%) participants from all districts of Limpopo Province indicated that they are incompetent in TB screening. The results also revealed that Capricorn district is the highest at 97.9%, followed by Vhembe district at 92.3%, Sekhukhune district at 90.7%, Mopani district at 89.2%, Waterberg district at 81.2% are very competent and competent in TB screening; while 2% from Capricorn district, 3.9% from Mopani district, 5.8% from Sekhukhune district 5.7% from Vhembe district 9.4% from Waterberg district are incompetent.

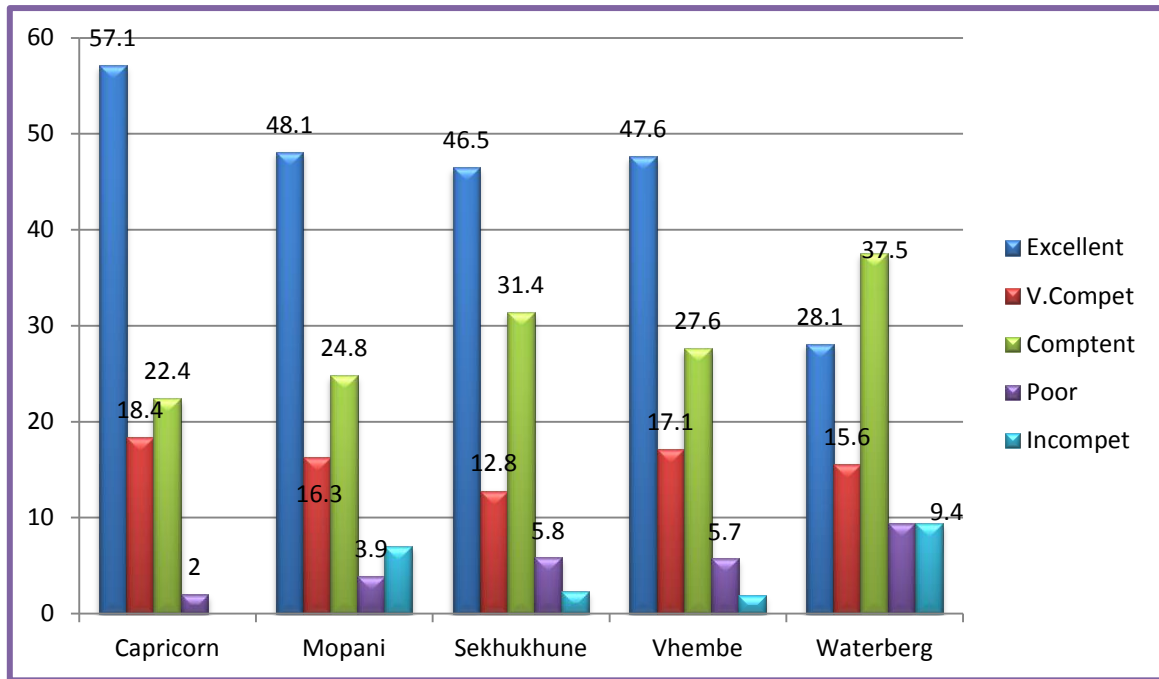


Figure 4.12: Competency in TB screening.

It is also very important to determine if there is any significant difference between the participants who are competent and the participants who are incompetent.

A T-test was conducted to determine if there is any significant difference between the two groups in TB screening competency. The following table illustrates the competency levels of the various districts of the Limpopo Province.

Category	Group 1	Group 2
Capricorn	96	2
Mopani	115	14
Sekhukhune	78	8
Vhembe	97	8
Waterberg	26	6

Findings:

Group	Group 1	Group 2
Mean	82.40	7.60
SD	34.14	4.34
SEM	15.27	1.94
N	5	5

Two-Tailed p-value:	0.0013
The mean of Group One Minus Group Two:	74.80
95% confidence interval:	From 39.31 to 110.29
t=	4.8606
df=	8
Standard error of difference:	15.389

Conclusion:

By conventional criteria, the difference between the competent and incompetent participants of the five districts in TB screening is very statistically significant.

4.9.2 Treatment of TB patients.

The results revealed that 385 (85.6%) (Figure 4.13) of participants in the five districts of Limpopo Province are competent in the treatment of patients with TB while 65 (14.4%) participants are incompetent.

A T-test was also conducted to ascertain whether there is any significant difference between the competent and incompetent participants in the five districts of Limpopo Province. The following table illustrates the competency levels of the various districts of the Limpopo Province.

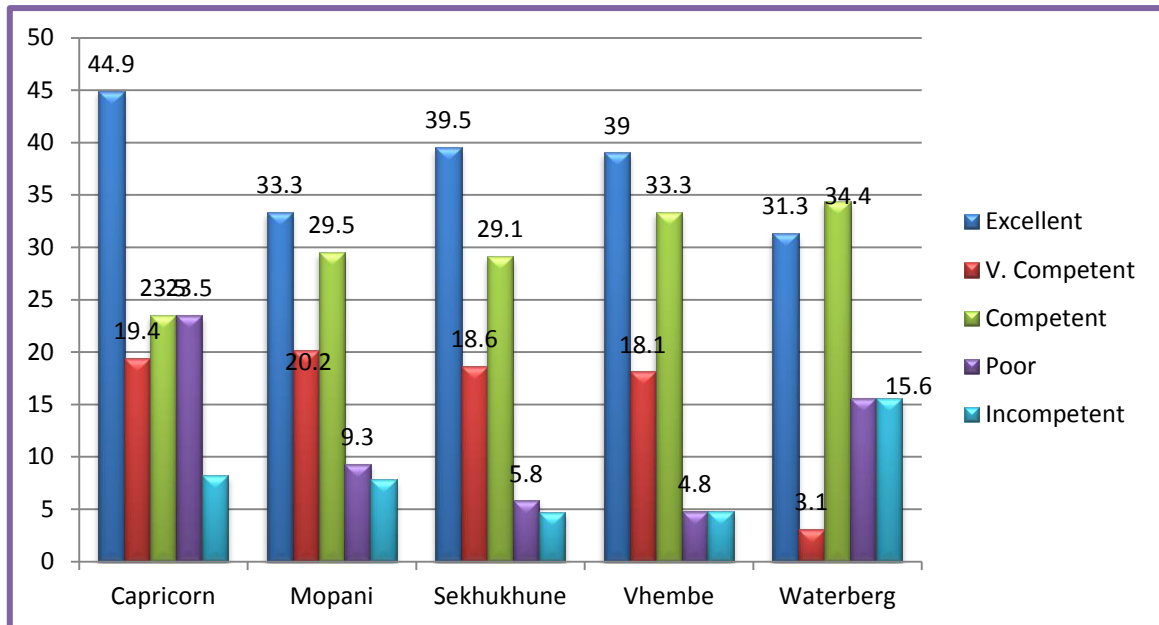


Figure 4.13: Competency in Treatment of patients with TB

Category	Group 1	Group 2
Capricorn	86	12
Mopani	107	22
Sekhukhune	75	11
Vhembe	95	10
Waterberg	22	10

Findings:

Group	Group 1	Group 2
Mean	77.00	13.00
SD	32.92	5.10
SEM	14.72	2.28
N	5	5

Two-Tailed p-value: 0.0026

The mean of Group One Minus Group Two: 64.00

95% confidence interval:	From 29.65 to 98.35
t=	4.2964
df=	8
Standard error of difference:	14.896

Conclusion: By conventional criteria, the difference between the competent and incompetent participants of the five districts in the treatment of patients with TB is very statistically significant.

4.9.3 Competency in Prevention of TB.

The following proportion of participants agreed that they are competent in prevention of TB; Mopani district at 69.6% (Figure 4.14), followed by Sekhukhune district at 68,6%, Waterberg district 59,4%, Vhembe district at 57.5% and Capricorn district at 53%. The responses also indicated that in the whole Province, 412 (91.6%) participants are competent in prevention of TB; while 38 (8.4%) are incompetent in the prevention of TB.

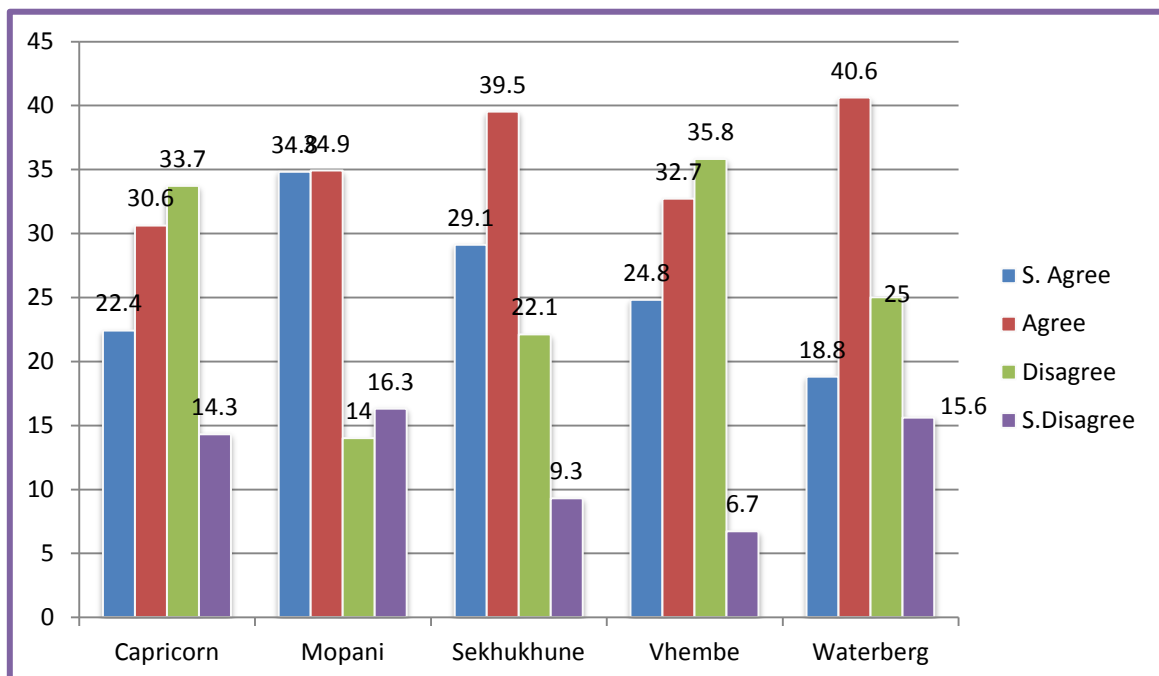


Figure 4.14: Competency in Prevention of TB

The study established whether there is any significant difference between the participants who are competent and those who are incompetent in prevention of TB in the Limpopo Province. A T-test was therefore used to verify the level of significance between the two groups.

Category	Group 1	Group 2
Capricorn	92	6
Mopani	115	14
Sekhukhune	81	5
Vhembe	99	6
Waterberg	25	7

Findings:

Group	Group 1	Group 2
Mean	77.00	13.00
SD	32.92	5.10
SEM	14.72	2.28
N	5	5

Two-Tailed p-value: 0.0026
 The mean of Group One Minus Group Two: 64.00
 95% confidence interval: From 29.65 to 98.35
 t= 4.2964
 df= 8
 Standard error of difference: 14.896

Conclusion: By conventional criteria, the difference between the competent and incompetent participants of the five districts in the prevention of TB is very statistically significant.

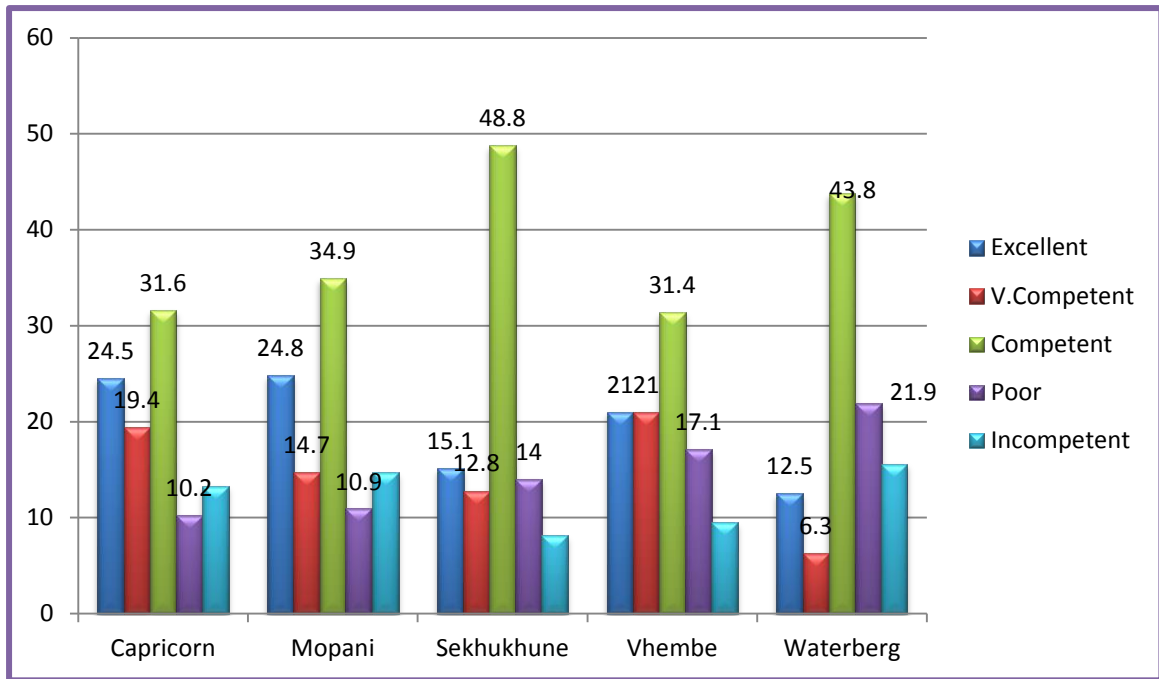


Figure 4.15: Competency in Prevention of Multiple Drug Resistant (MDR) TB

4.9.4 Competency in Prevention of Multiple Drug Resistant TB (MDR-TB)

The following proportion of participants indicated that they are competent in prevention of Multiple Drug Resistant TB (MDR-TB); Sekhukhune district at 76.7% (Figure 4.15), followed by Capricorn district at 75.5%, Mopani district at 74.4%, Vhembe district at 73.4% and Waterberg district at 62.6%, while 20.2% respondents of Capricorn district, 20.9% of Mopani district, 22% of Sekhukhune district, 26.1% of Vhembe district and 35.9% of Waterberg district indicated that they are incompetent in prevention of MDR-TB. Most participants in Waterberg district are incompetent in MDR-TB prevention. These statistics reveal that there is balance in the prevention of multiple drug resistant TB competency levels.

A T-test was therefore used to verify the level of significance between the two groups.

Category	Group 1	Group 2
Capricorn	75	23
Mopani	96	33
Sekhukhune	67	19
Vhembe	77	28
Waterberg	20	12

Findings:

Group	Group 1	Group 2
Mean	67.00	23.00
SD	28.35	8.09
SEM	12.68	3.62
N	5	5

Two-Tailed P value: 0.0103
 The mean of Group One Minus Group Two: 44.00
 95% confidence interval: From 13.60 to 74.40
 t= 3.3376
 df= 8
 Standard error of difference: 13.183

Conclusion: By conventional criteria, this difference between the competent and incompetent participants of the five districts in the prevention of MDR-TB is considered to be statistically significant.

4.10 Section I: Integration of TB and HIV services

The findings in table 4.11 regarding integration of TB and HIV services will be discussed in sub-heading 4.10.1 to 4.10.7.

Table 4.11 Integration of TB and HIV services

Item		Capricorn		Mopani		Sekhukhune		Vhembe		Waterberg	
		f	%	F	%	f	%	f	%	f	%
1. All PHC nurses are responsible for TB and HIV management	Strongly agree	66	67.3	75	58.1	51	59.3	49	46.7	19	59.4
	Agree	17	17.3	30	23.3	30	34.9	45	42.9	7	21.9
	Disagree	9	9.2	12	9.3	3	3.5	8	7.6	4	12.5
	Strongly disagree	6	6.1	11	8.5	2	2.3	3	2.9	2	6.3
2. Integration of TB and HIV is offered in this facility	Strongly agree	76	77.6	69	53.5	46	53.5	53	50.5	17	53.1
	Agree	17	17.3	43	33.3	33	38.4	44	41.9	10	31.3
	Disagree	2	2	5	.9	3	3.5	6	5.7	4	12.5
	Strongly disagree	2	2	11	8.5	2	2.3	2	1.9	1	3.1
3. TB and HIV statistics is compiled Quarterly in this facility	Strongly agree	62	63.3	62	48.1	34	39.5	50	47.6	17	53.1
	Agree	28	28.6	44	34.1	40	46.5	39	37.1	10	31.3
	Disagree	4	4.1	7	5.4	9	10.5	8	7.6	1	3.1
	Strongly disagree	4	4.1	14	10.9	2	2.3	7	6.7	3	9.4
4. TB/HIV data is used to improve the service in this facility	Strongly agree	54	55.1	62	48.1	34	39.5	46	43.8	17	53.1
	Agree	30	30.6	50	38.8	39	45.3	51	48.6	10	31.3
	Disagree	8	8.2	7	5.4	12	14	6	5.7	3	9.2
	Strongly disagree	3	3.1	8	6.2	0	0	1	1	2	6.3
5. TB/HIV data is used to improve the service in this facility	Strongly agree	52	53.1	57	44.2	48	55.8	47	44.8	15	46.9
	Agree	34	34.7	48	37.2	29	33.7	43	41	10	31.3
	Disagree	8	8.2	13	10.1	9	10.5	13	12.4	6	18.8
	Strongly disagree	4	4.1	11	8.5	0	0	2	1.9	1	3.1
6. Professional nurses know how to prescribe correct treatment of HIV	Strongly agree	49	50	63	48.8	47	54.7	49	46.7	15	46.9
	Agree	39	39.8	43	33.3	35	40.7	43	41	11	34.4
	Disagree	5	5.1	11	8.5	4	4.7	12	11.4	5	15.6
	Strongly disagree										

		5	5.1	11	8.5	0	0	1	1	1	3.1
7. Professional nurses know how to treat side effects of TB treatment and ARVs	Strongly agree	33	33.7	41	31.8	30	34.9	31	29.5	9	28.1
	Agree	42	42.9	61	47.3	43	50	50	47.6	15	46.9
	Disagree	18	18.4	15	11.6	12	14	22	21	7	21.9
	Strongly disagree	5	5.1	12	9.3	1	1.2	2	1.9	1	3.1

4.10.1 Responsibility of PHC nurses in TB and HIV services.

The results revealed that 389 (86.4%) participants in the five districts in Limpopo Province agreed that all PHC nurses are responsible for TB and HIV management. Capricorn district had the highest at 66 (67.3%) of participants who strongly agreed that all nurses are responsible for TB and HIV management. The results reveal that 60 (13.3%) respondents disagreed that PHC nurses are responsible for TB and HIV services.

4.10.2 Integration of TB and HIV services in the facility.

The results indicated that 408 (90.7%), participants in the five district of Limpopo Province agreed that integration of TB and HIV services is offered in their PHC facilities, while 42 (9.3%) participants disagreed that the TB and HIV services are offered in their facilities.

4.10.3 Compilation of TB and HIV statistics.

The results revealed that 225 (50%), participants in Limpopo Province strongly agree that TB/HIV statistics is compiled quarterly in their facilities and 161 (35.8%) participants agreed that TB and HIV statistics is compiled quarterly in their facilities, while 29 (6.4%) participants disagreed that statistics is compiled quarterly and 30 (6.6%) respondents strongly disagreed that statistics is compiled quarterly in their facilities.

4.10.4 TB/HIV data is used to improve the service in the facility.

The results revealed that 393 (87.3%), participants in the five districts of Limpopo province agreed that TB and HIV data is used to improve the service in their facilities, while 57 (12.7%) participants disagreed that TB/HIV data is used to improve the service in their facilities.

4.10.5 Knowledge of TB treatment among Professional nurses.

The results revealed that 383 (85.1%) participants in Limpopo Province agreed that Professional nurses know how to prescribe correct TB treatment, while 67 (14.9%) participants disagreed that professional nurses know how to prescribe correct TB treatment.

4.10.6 Knowledge of HIV treatment among Professional nurses.

The results revealed that 396 (88%), respondents agree that they know how to prescribe correct treatment of HIV; while 54 (12%) participants disagreed that they have knowledge to prescribe treatment for HIV.

4.10.7 Professional nurses know how to treat side effects of TB treatment and ARVs.

The results revealed that 355 (78.9%) respondents of Limpopo Province agreed that professional nurses know how to treat side effects of TB treatment and ARVs, 95 (21.1%) participants disagreed that they know how to treat side effects of TB treatment and ARVs.

4.11 Section J: TB and HIV program support.

The discussion of the findings in table 4.12 will be done in sub-heading 4.11.1 to 4.11.14.

Table 4.12: TB and HIV program support.

Item		Capricorn		Mopani		Sekhukhune		Vhembe		Waterberg	
		f	%	F	%	f	%	f	%	f	%
1. TB/HIV support groups are available in this facility	Strongly agree	21	21.4	21	16.3	24	27.9	24	22.9	5	15.6
	Agree	34	34.7	35	27.1	29	33.7	48	45.7	12	37.5
	Disagree	24	24.5	40	31	21	24.4	18	17.1	8	25
	Strongly disagree	17	17.3	31	24	12	14	14	13.3	7	21.9
2. TB and HIV patients benefit from the support group	Strongly agree	24	24.5	21	16.3	25	29.1	28	26.7	3	9.4
	Agree	32	32.7	41	31.8	31	36	48	45.7	15	46.9
	Disagree	28	28.6	38	29.5	18	20.9	16	15.2	7	21.9
	Strongly disagree	12	12.2	28	21.7	12	14	13	12.4	7	21.9
3. TB and HIV patients understand their condition	Strongly agree	32	32.7	28	21.7	28	32.6	30	28.6	9	28.1
	Agree	51	52	73	56.6	45	52.3	63	60	16	50
	Disagree	9	9.2	18	14	10	11.6	8	7.6	6	18.8
	Strongly disagree	5	5.1	9	7	3	3.5	3	2.9	1	3.1
4. The district/sub-district supervision visit the facility for TB and HIV Services monthly	Strongly agree	20	20.4	23	17.8	18	20.9	14	13.3	7	21.9
	Agree	44	44.9	47	36.4	35	40.7	49	46.7	13	40.6
	Disagree	24	24.5	34	26.4	19	22.1	29	27.6	8	25
	Strongly disagree	8	8.2	23	17.8	14	16.3	11	10.5	4	12.5
5. Written feedback is provided from the supervisor after the visit	Strongly agree	28	28.6	21	16.3	21	24.4	13	12.4	8	25
	Agree	38	38.8	48	37.2	35	40.7	41	39	11	34.4
	Disagree	20	20.4	33	25.6	17	19.8	37	35.2	9	28.1
	Strongly disagree	9	9.2	25	19.4	13	15.1	14	13.3	3	9.4
6. Community Home Based Carers (CHBCs) are trained on TB screening	Strongly agree	36	36.7	45	34.9	25	29.1	24	22.9	10	31.3
	Agree	52	53.1	57	44.2	46	53.5	57	54.3	13	40.6
	Disagree	6	6.1	12	9.3	11	12.8	13	12.4	6	18.8
	Strongly disagree	3	3.1	12	9.3	4	4.7	8	7.6	3	9.4
7. Community Home Based Carers are trained on how TB is spreading	Strongly agree	44	44.9	50	38.8	26	30.2	25	23.8	12	37.5
	Agree	47	48	60	46.5	47	54.7	59	56.2	13	40.6
	Disagree	3	3.1	6	4.7	10	11.6	12	11.4	4	12.5
	Strongly disagree	2	2	12	9.3	3	3.5	7	6.7	3	9.4
8. Community Home Based Carers are trained on prevention of TB	Strongly agree	44	44.9	49	38	23	26.7	27	25.7	11	34.4
	Agree	45	45.9	60	46.5	51	59.3	58	55.2	12	37.5
	Disagree	5	5.1	7	5.4	9	10.5	10	9.5	6	18.8
	Strongly disagree	2	2	2	1.6	3	3.5	7	6.7	3	9.4

9. TB and HIV patients are attached to CHBC for DOT	Strongly agree	45	45.9	46	35.7	26	30.2	25	23.8	10	31.3
	Agree	44	44.9	64	49.6	48	55.8	62	59	11	34.4
	Disagree	6	6.1	9	7	5	5.8	13	12.4	6	18.8
	Strongly disagree	1	1	9	7	6	7	5	4.8	3	9.4
10. TB and HIV patients cooperate with health care professionals and CHBCs	Strongly agree	34	34.7	37	28.7	21	24.4	17	16.2	6	18.8
	Agree	45	45.9	62	48.1	45	52.3	67	63.8	15	46.9
	Disagree	14	14.3	20	15.5	15	17.4	17	16.2	8	25
	Strongly disagree	2	2	9	7	5	5.8	4	3.8	3	9.4
11. TB and HIV patients adhere to their treatment	Strongly agree	19	19.4	24	18.6	22	25.6	17	16.2	7	21.9
	Agree	52	53.1	69	53.5	50	58.1	67	63.8	16	50
	Disagree	22	22.4	25	19.4	12	14	16	15.2	8	25
	Strongly disagree	4	4.1	8	6.2	2	2.3	3	2.9	1	3.1
12. Social grant is always offered to TB and HIV patients	Strongly agree	14	14.3	18	14	7	8.1	10	9.5	4	12.5
	Agree	23	23.5	33	25.6	28	32.6	22	21	7	21.9
	Disagree	41	41.8	41	31.8	35	40.7	41	39	12	37.5
	Strongly disagree	18	18.4	34	26.4	16	18.6	31	29.5	9	28.1
13. Food parcels are always offered to the HIV and TB patients	Strongly agree	14	14.3	12	9.3	7	8.1	7	6.7	7	21.9
	Agree	23	23.5	33	25.6	29	33.7	31	29.5	4	12.5
	Disagree	39	39.8	45	34.9	31	36	39	37.1	12	37.5
	Strongly disagree	20	20.4	35	27.1	19	22.1	26	24.8	9	28.1
14. TB and HIV patients accept their condition	Strongly agree	15	15.3	21	16.3	15	17.4	14	13.3	4	12.5
	Agree	51	52	62	48.1	50	58.1	57	54.3	20	62.5
	Disagree	25	25.5	27	20.9	14	16.3	27	25.7	6	18.8
	Strongly disagree	6	6.1	16	12.4	7	8.1	7	6.7	2	6.3

4.11.1 Availability of support groups in the PHC facilities.

The following proportion of participants indicated that support groups are available in their PHC facilities; Vhembe district at 73 (69.5%), Capricorn District at 55 (56.1%), Mopani District at 56 (43.9%), Sekhukhune district at 53 (61.6%) and Waterberg district at 17 (53.1%) strongly agreed and agreed that TB/HIV support groups are available in their facilities, while 41 (41.8%) participants in Capricorn, 71 (55%) in Mopani 33 (38.4%) in Sekhukhune, 33 (38.4%) Vhembe 32 (30.4%) and Waterberg district at 15 (46.9%), disagreed and strongly disagreed that TB/HIV support groups are available in their facilities.

4.11.2 TB and HIV patients benefit from the support group.

The following proportion of participants agreed and strongly agreed that TB and HIV patients benefit from the support group; Capricorn district at 56 (57.2%), Mopani district at 62 (48.1%), Sekhukhune district at 59 (69.4%), Vhembe district at 76 (72.4%) and Waterberg district at 18 (56.5%), while 40 (40.8%) of Capricorn district, 66 (51.25%) of Mopani district, 30 (34.9%) of Sekhukhune district, 29 (27.6%) of Vhembe and 14 (43.8%) of Waterberg district disagreed and strongly disagreed that TB and HIV patients benefit from the support group. Vhembe district with 72.4% had the highest number of participants who agreed and strongly agreed that TB and HIV patients benefit from the support group.

4.11.3 Understanding of TB and HIV among TB/HIV co-infected patients.

The following proportion of participants agreed and strongly agreed that TB/ HIV co-infected patients understand TB and HIV; Capricorn district at 83 (84.7%) (Table 4.12), Mopani district at 101 (78.3%), Sekhukhune district at 73 (84.9%), Vhembe district at 93 (88.6%) and Waterberg district at 25 (78.1%) agreed and strongly agreed that TB and HIV patients understand their condition. However, 14 (14.3%) participants of Capricorn district, 27 (70.6%) of Mopani district, 55 (63.9%) Sekhukhune district, 71 (67.6%) of Vhembe district and 8 (7.6%) participants of Waterberg district disagreed and strongly disagreed that TB and HIV patients understand their condition. Vhembe District had the highest number of participants 88.6% who agreed and strongly agreed that TB and HIV patients understand their condition.

4.11.4 The district supervision visits to the facility for TB and HIV Services monthly.

The following proportion of participants agreed and strongly agreed that the district visit their facilities monthly for supervision of TB and HIV Services; Capricorn district at 64 (65.3%), Mopani district at 70 (54.2%) Sekhukhune at 53 (61.6%), Vhembe at 63 (60%) and Waterberg district at 20 (62.5%).

However, 32 (34.7%) from Capricorn, 59 (45.7%) from Mopani, 33 (38.4%) from Sekhukhune, 40 (38.1%) from Vhembe and 16 (37.5%) participants from Waterberg

district disagreed and strongly disagreed that the district/sub-district conduct monthly supervision visit to their PHC facilities. Capricorn district had the highest number of participants at 65.3% has more agreed while Mopani district had the highest number of participants at 44.2%, who disagreed and strongly disagreed that supervisory visit is conducted in their facilities monthly.

4.11.5 Written feedback is provided from the supervisors after the visit.

The following proportion of participants agree and strongly agreed that written feedback is provided from the supervisors after the visit; Capricorn district at 66 (67.4%) (Table 4.12), Mopani district at 69 (57.1%), Sekhukhune district at 56 (65.1), Vhembe district at 60 (51.4%), and Waterberg district at 19 (59.4%). However, the results also indicated that 29 (29.6%) from Capricorn district 58 (45%) from Mopani district, 30 (34.5%) from Sekhukhune district, 51 (48.5%) from Vhembe and 12 (37.5%) from Waterberg district strongly disagreed that written feedback is provided from the supervisor after the visit.

4.11.6 Community Home Based Carers (CHBCs) are trained on TB screening.

Capricorn district had the highest numbers of participants who agreed and strongly agreed that CHBCs are trained on TB screening; at 88 (89.8%), followed by Sekhukhune district at 71 (82.6%), Mopani district at 109 (84.4%), Vhembe district at 96 (91.4%), while Waterberg district is the least at 23 (71.9%) participants who agreed and strongly agreed that community home based carers are trained on TB screening. However, 9 (9.2%) participants from Capricorn district, 24 (18.6%) from Mopani district, 21 (20.1%) from Vhembe district and 9 (28.2%) from Waterberg district disagreed and strongly disagreed that Community Home Based Carers are trained on TB screening.

4.11.7 Community Home Based Carers are trained on how TB is spreading.

The following proportion of participants agreed and strongly agreed that CHBCs are trained on how TB is spreading; Capricorn district at 93 (94.8%), followed by Mopani district at 110 (85.3%), Vhembe district at 93 (88.5%), Sekhukhune district at 73 (69.5%) and Waterberg district at 25 (78.1%). However, 5 (5.1%) of Capricorn district, 19 (14.7%) of Mopani district, 13 (15.1%) of Sekhukhune district, 19 (18.1%)

of Waterberg district disagreed and strongly disagreed that Community Home Based Carers are trained on how TB is spreading.

4.11.8 Community Home Based Carers are trained on prevention of TB.

The following proportion of respondents agreed and strongly agreed that CHBCs are trained on the prevention of TB; Capricorn district at 84 (85.7%), followed by Mopani district at 109 (84.5%), Sekhukhune district at 74 (86%), Vhembe district at 96 (91.4%) and Waterberg district at 23 (71.9%). However 7 (9.2%) participants from Capricorn district, 19 (14.7%) from Mopani district, 12 (14%) from Sekhukhune district, 17 (16.2%) from Vhembe district and 9 (28.1%) from Waterberg district, disagreed and strongly disagreed that Community Home Based carers are trained on prevention of TB. The results also indicate that Capricorn district had the highest number of participants at 89 (90.8%), who agreed and strongly agreed that Community Home Based Carers are trained on prevention of TB.

4.11.9 TB and HIV patients are attached to CHBC for DOT.

Capricorn district had the highest number of participants who agreed and strongly agreed that TB and HIV patients are attached to CHBC for DOT; at 89 (90.8%), followed by Mopani district at 110 (85.3%), Sekhukhune district at, 87 (82.8%) Vhembe district at 80 (95.2%) and Waterberg district at 21 (65.7%), while 7 (7.1%) from Capricorn, 18 (14%) from Mopani, 11 (12.8%) from Sekhukhune, 18 (17.1) from Vhembe and 9 (28.2%) from Waterberg district disagreed and strongly disagreed that TB and HIV patients are attached to CHBC for DOT.

4.11.10 TB and HIV patients cooperate with health care professionals and CHBCs.

The following proportion of participants agreed and strongly agreed that TB and HIV patients cooperate with health care professionals; Capricorn district at 79 (80.6%), followed Sekhukhune district at 84 (80%), Mopani district at 99 (76.8%), Vhembe district at 70 (76.7%) and Waterberg district at 21 (65,7%). However, the results also indicated that 16 (16.3%) participants from Capricorn district, 29 (22.5%) from Mopani district, 20 (23.3%) from Sekhukhune district, 21 (20%) from Vhembe district and 11 (34.3%) from Waterberg district disagreed and strongly disagreed that TB

and HIV patients cooperate with health care professionals in their various PHC facilities.

4.11.11 TB and HIV patients adhere to their treatment.

The following proportion of participants agreed and strongly agreed that TB and HIV patients adhere to their treatment; Capricorn district at 71 (72.5%) (Table 4.12), Mopani district at 93 (72.1%), Sekhukhune district at 72 (83.7%), Vhembe district at 84 (80%) Waterberg district at 23 (71.9%). However, 26 (26.5%) participants from Capricorn district, 33 (25.6%) from Mopani district, 14 (16.3%) from Sekhukhune district, 19 (18.1%) from Vhembe district and 9 (28.1%) from Waterberg district disagreed and strongly disagreed that TB and HIV patients adhere to their treatment.

4.11.12 Social grant is always offered to TB and HIV patients.

The following proportion of participants agreed and strongly agreed that social grant is always offered to TB and HIV patients; Capricorn district at 37 (37.8%) Mopani district at 51 (39.6%), Sekhukhune district at 35 (40.7%), Vhembe district at 32 (30.5%) and Waterberg district at 11 (34.4%); while 59 (62.2%) respondents from Capricorn district, 75 (58.2%) from Mopani district 57 (44.5%) from Sekhukhune district 72 (68.5%) from Vhembe and 21 (65.6%) from Waterberg district disagreed and strongly disagreed that social grants are always offered to TB and HIV patients of the various PHC facilities of the Limpopo Province.

Generally, a social grant is money given by the government to an individual or group of people to pay for something that is helpful. Section 24 to 29 of the Bill of Rights in the South African Constitution; recognize the socio-economic rights of citizens, including the right to social security.

4.11.13 Food parcels are always offered to the HIV and TB patients.

The following proportion of participants agreed and strongly agreed that food parcels are always offered to the HIV and TB patients in the PHC facilities of Limpopo Province; Capricorn district at 37 (37.8%) (Table 4.2), Mopani district at 44 (41.8%), Sekhukhune district at 45 (34.9%) Vhembe district at 38 (36.2%) and

Waterberg district at 11 (34.4%), while 59 (60.2%) participants from Capricorn district, 80 (62%) from Mopani district, 50 (58.1%) from Sekhukhune district, 65 (61.9%) from Vhembe district and 21 (65.6%) participants from Waterberg district disagreed and strongly disagreed that food parcels are always offered to the HIV and TB patients of the various PHC facilities in Limpopo Province.

4.11.14 TB and HIV patients accept their condition.

The proportion of responses of participants agreed and strongly agreed that TB and HIV patients accept their condition; Capricorn district at 69 (67.3%), Mopani district at 83 (64.4%), Sekhukhune district at 65 (75.5%), Vhembe district at 71 (67.6%) and Waterberg district at 24 (75%), while 31 (31.6%) participants from Capricorn district, 48 (33.1%) from Mopani district 21 (24.4%) of Sekhukhune district 34 (32.4%) of Vhembe district and 8 (25.1%) participants of Waterberg district, disagreed and strongly disagreed that TB and HIV patients accept their condition.

4.12 Section K: Availability of TB and HIV drugs and commodities

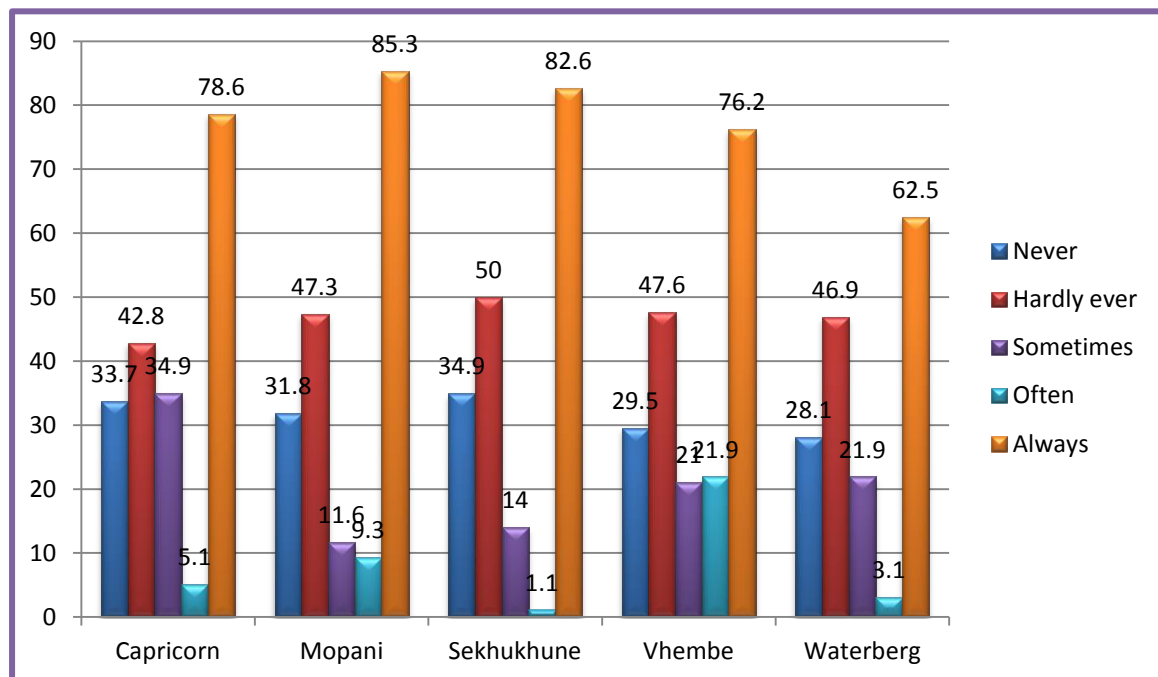


Figure 4.16: Availability of TB drugs.

4.12.1 Availability of TB drugs.

The following proportion of participants in figure 4.16 indicated that TB drugs are always available in their PHC facilities of Limpopo Province: Mopani district at

85.3%, followed by Sekhukhune district at 82.6%, Capricorn district at 78.6%, Vhembe district at 76.2% and Waterberg district at 62.5%, while 9 (2%) of PHC facilities in Limpopo Province which disagreed that TB drugs are available. The findings revealed that 27 (6%) of participants indicated that TB drugs are sometimes available in their facilities.

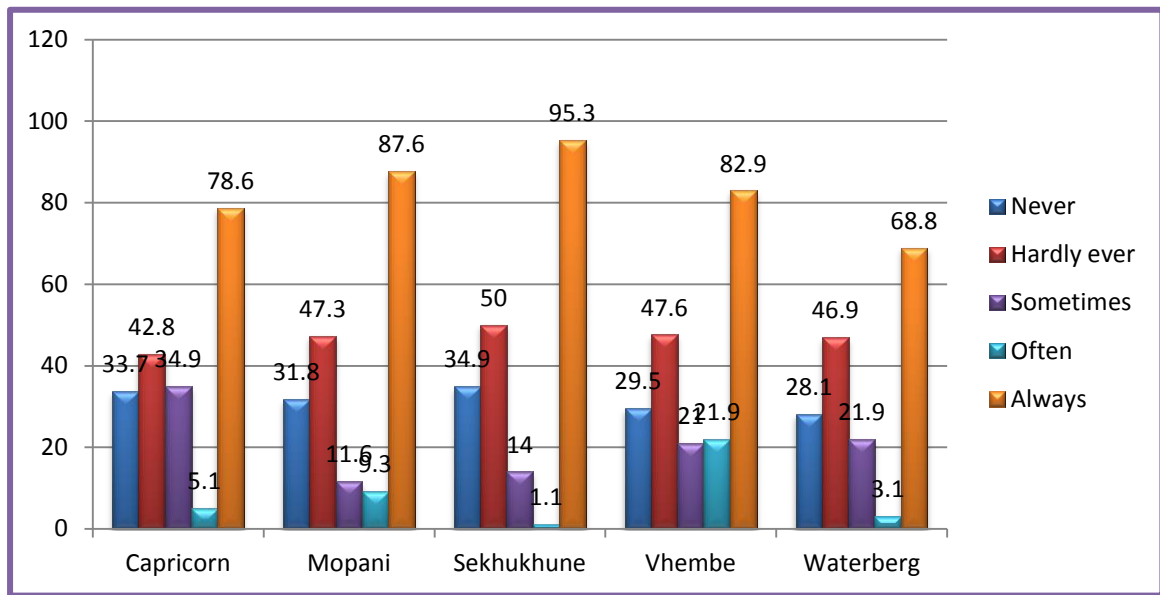


Figure 4.17: Storage of TB drugs

4.12.2 Storage of TB drugs

The following proportion of responses of participants in figure 4.17 indicated that TB drugs are properly stored in a cool room in their PHC facilities; Sekhukhune district at 95.3%, Mopani district at 87.6%, Vhembe district at 82.9%, Capricorn district at 78.6% and Waterberg district at 68.8%, while 19 (4.2%) participants indicated that TB drugs are never properly stored in cool rooms.

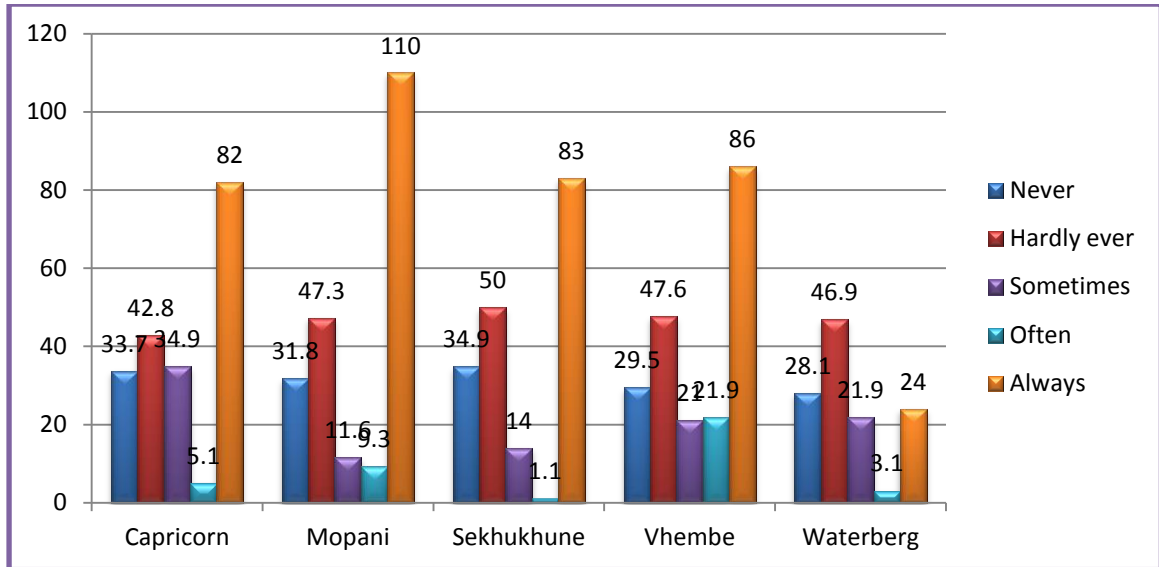


Figure 4.18: Storage of Antiretroviral drugs

4.12.3 Storage of antiretroviral drugs.

The following proportion of responses of participants as in figure 4.18, indicated that antiretroviral drugs are stored in a cool room; at 430 (99.6%), for the entire province, while 20 (4.4%) participants of PHC facilities in the Limpopo Province indicated that they never stored ARV drugs properly in a cool room.

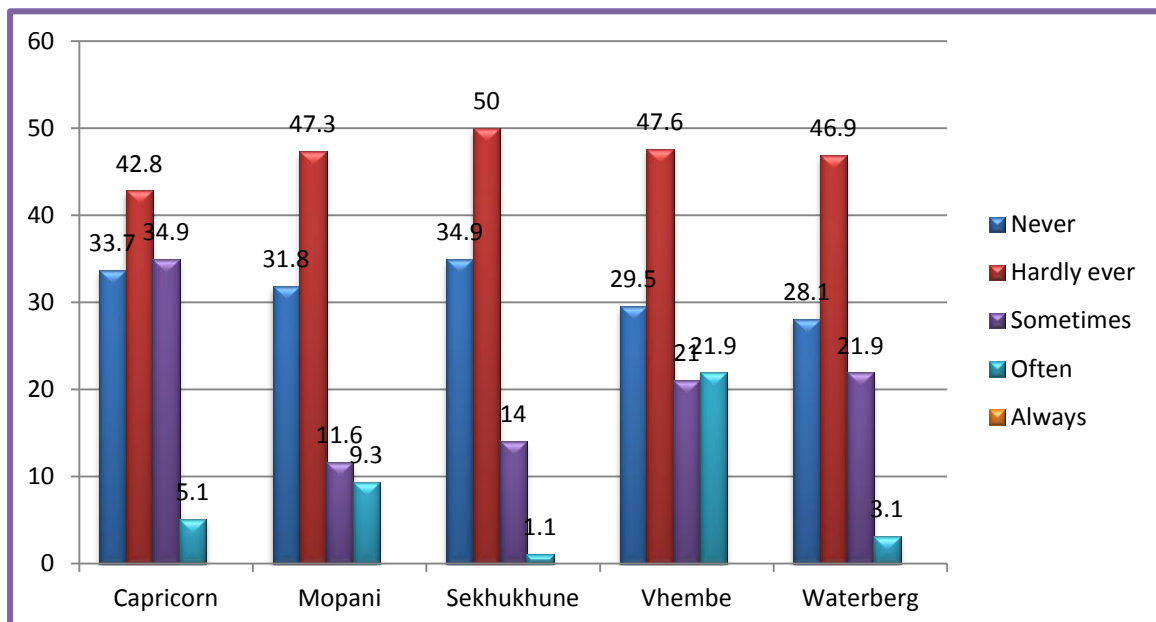


Figure 4.19: Availability of ARV Drugs.

4.12.4 Availability of Antiretroviral drugs in the PHC facilities.

The proportion of responses of participants as shown in figure 4.19 indicated that antiretroviral drugs are not available; 13 (2.9%), participants in Limpopo Province indicated that there are no ARV drugs in their PHC facilities. The findings also revealed that the district with ARV drugs in most of their PHC facilities in Limpopo Province is Mopani district where 120 (93%) participants indicated that they often and always have ARV drugs in their PHC facilities.

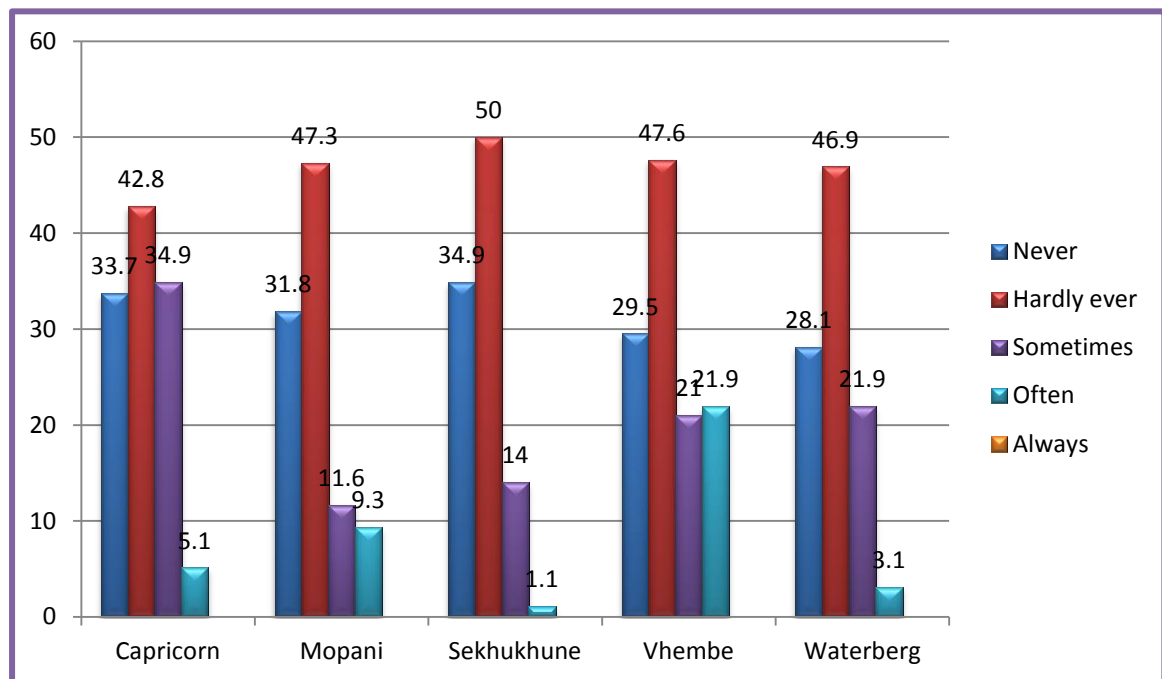


Figure 4.20: Availability of Sputum bottles.

4.12.5 Availability of Sputum bottles in PHC facilities.

Sekhukhune district had the highest number of participants who indicated that sputum bottles are always available in their PHC facilities; at 97.7% as in figure 4.20, followed by Vhembe district at 93.3%, Capricorn district at 93.0%, Mopani district at 86.8% and Waterberg district at 75%; as such they will be able to conduct early diagnosis and treatment of TB.

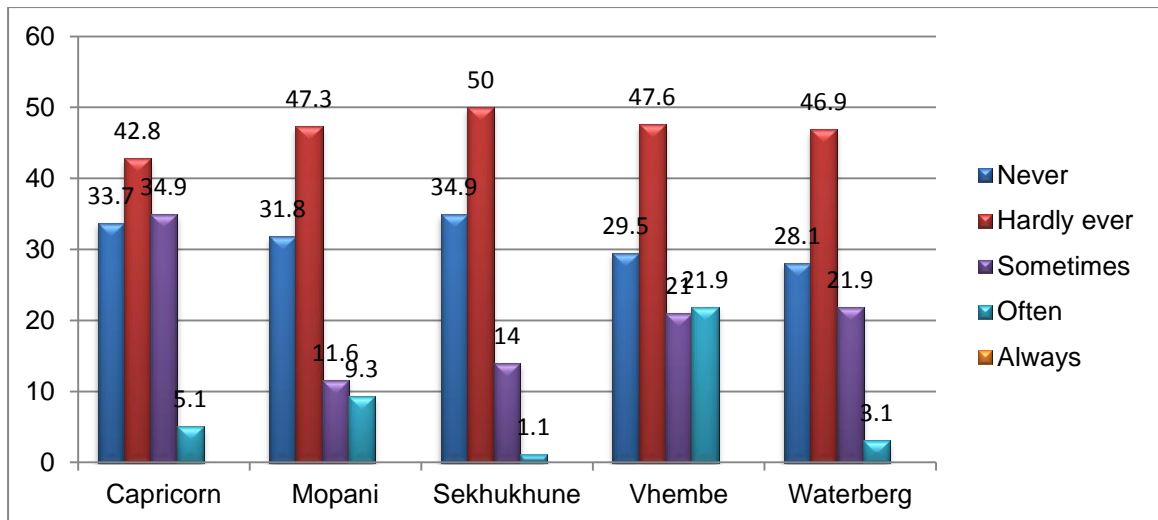


Figure 4.21: Availability of Rapid HIV test kits in PHC facilities

4.12.6 Availability of Rapid HIV test kits in PHC facilities.

The proportion of responses of participants indicated that rapid HIV test kits are available; Capricorn district at 83.7% as in figure 4.21, Mopani district 92.2%, Sekhukhune district at 73.3%, Vhembe district at 85.7% and Waterberg district at 62.5%, while only few participants from the five districts indicated that Rapid HIV tests are never available.

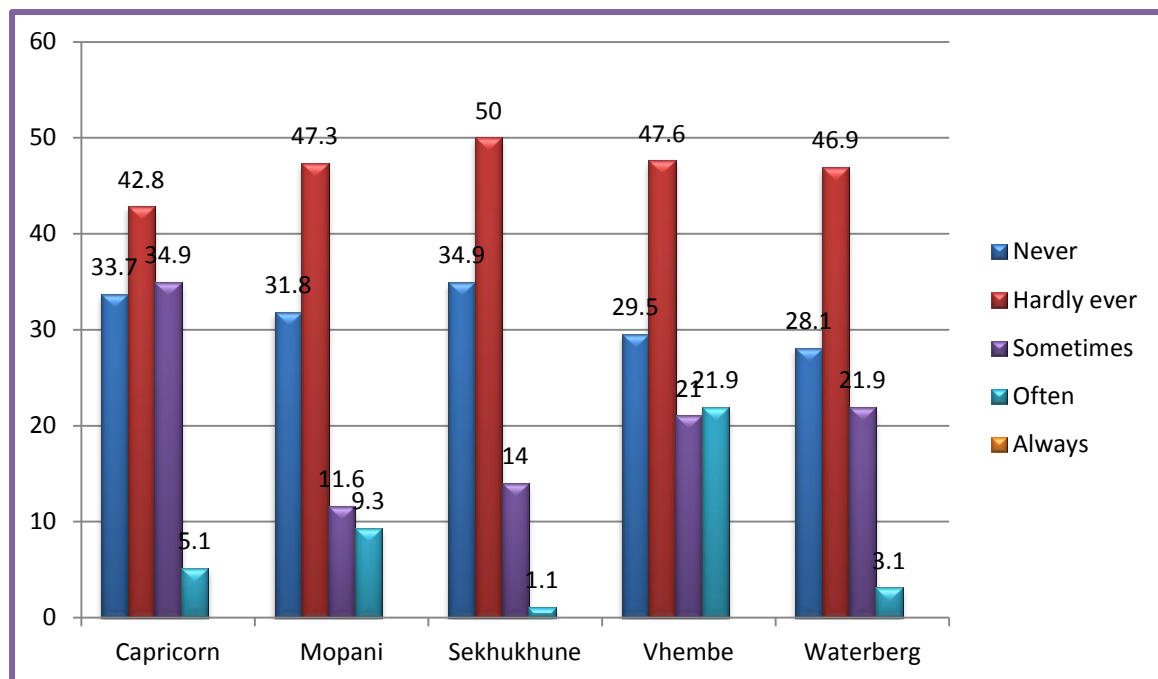


Figure 4.22: Availability of Condoms.

4.12.7 Availability of condoms in PHC facilities.

The following proportion of participants at 420 (93.3%) as shown in figure 4.22, indicated that condoms are often available in the various PHC facilities of Limpopo Province, while 30 (6.7%) participants indicated that condoms are never available in the various PHC facilities of Limpopo Province.

4.13 SECTION L: True or False statements on prevention of TB.

The findings in table 4.13 will be discussed in sub-heading 4.13.1 to 4.13.12.

Table 4.13: True or False statements on prevention of TB.

Item		Capricorn		Mopani		Sekhukhune		Vhembe		Waterberg	
		f	%	f	%	f	%	f	%	f	%
1. Opening of windows at home.	True	95	96.9	126	97.7	85	98.8	104	99	32	98.3
	False	3	3.1	3	2.3	1	1.2	1	1	0	0
2. Opening of windows at health facilities.	True	95	96.9	128	99.2	85	98.8	104	99	31	96.9
	False	3	3.1	1	0.8	1	1.2	1	1	1	3.1
3. Avoiding kissing a TB infected person.	True	36	36.7	59	45.7	35	40.7	41	39	15	46.9
	False	62	62.2	70	52.7	51	57	64	59	17	50
4. Not using the same toilet with the TB infected person	True	95	96.9	124	96.1	84	97.7	101	96.2	30	93.8
	False	2	2	5	3.9	2	2.3	4	3.8	3	6.2
5. Not using the same bath with the TB infected person	True	95	96.9	124	96.1	81	94.2	100	95.2	30	93.8
	False	3	2	5	3.9	5	4.7	5	4.8	2	6.2
6. Not using the same eating utensils	True	84	85.7	120	93	78	90.7	95	90.5	28	87.5
	False	14	13.3	9	7	8	9.3	10	8.6	4	15.5

7. Not hand shaking with the TB infected person.	True	86	87.8	117	90.7	79	91.9	96	91.4	28	87.5
	False	12	11.2	12	9.3	7	8.1	9	8.6	4	12.5
8. Not hugging the TB infected person.	True	88	89.8	124	96.1	79	91.9	99	94.3	28	87.5
	False	10	9.2	5	3.9	7	8.1	6	5.7	4	12.5
9. By isolating a TB infected person.	True	62	63.3	77	59.7	57	66.3	55	52.4	15	46.9
	False	36	33.7	52	39.5	29	33.7	50	47.6	17	53.1
10. By exercising.	True	70	71.4	95	73.6	58	67.4	67	63.8	26	81.3
	False	28	26.5	34	26.4	28	30.2	38	34.2	6	18.7
11. Patients using condoms during sex.	True	70	71.4	106	82.2	67	77.9	85	81	27	84.4
	False	28	27.6	23	17.8	19	22.1	20	18.1	5	15.6
12. Eating a well-balanced diet.	True	19	19.4	32	24.8	14	16.3	14	13.3	7	21.9
	False	79	79.6	97	75.2	72	83.7	91	86.7	25	78.1

4.13.1 Prevention of TB by Opening of windows at home.

The following proportion of participants shown in table 4.13 indicated that it is true that TB is prevented by opening of windows at home; Vhembe district at 104 (99%), followed by Waterberg district at 32 (98.3%), Sekhukhune district at 85 (98.8%) Mopani district at 126 (97.7%) and Capricorn district at 95 (96.9%); while a total of 8 (1.7%) of participants from all the districts of Limpopo Province indicated that it is false.

4.13.2 Prevention of TB by Opening of windows at health facilities.

The following proportion of participants indicated that it is true that TB is prevented by opening of windows at the health facilities; Mopani district at 128 (99.2%), followed by Vhembe district at 104 (99%), Sekhukhune district at 85 (98.8%), Capricorn district at 95 (96.9%) and Waterberg district at 31 (96.9%); which is a total of 443 (98.4%) respondent in Limpopo province; while only 7 (1.6%) participants from all the districts of Limpopo Province indicated that it is false that opening of windows at health facilities prevent the spread of TB.

4.13.3 Prevention of TB by avoiding kissing a TB infected person.

The following proportion of participants indicated that it is false that TB is prevented by avoiding kissing a TB infected person; Capricorn district at 36 (36.7%), Mopani at 59 (45.7%), Sekhukhune district at 35 (40.7%), Vhembe district at 41 (39%) and

Waterberg district at 15 (46.9%); a total of 264 (58.7%) participants from Limpopo Province indicated that it is false that TB is prevented by avoiding kissing a TB infected person; while 186 (41.4%) participants indicated that it is true that TB is prevented by avoiding kissing a TB infected person.

4.13.4 Prevention of TB by not using the same toilet with the TB infected person.

The following proportion of participants indicated that it is false that TB is prevented by not using the same toilet with the TB infected person; Capricorn district at 95 (96.9%), Mopani district at 124 (96.1%), Sekhukhune district at 84 (97.7%), Vhembe district at 101 (96.2%) and Waterberg district at 30 (93.8%); while 16 (3.6%) participants in the five districts of Limpopo Province indicated that it is true that avoiding sharing of the toilet with the TB infected person prevent the spread of TB.

4.13.5 Prevention of TB by not using the same bath with the TB infected person.

Capricorn district had the highest number of participants who indicated that it is false that TB is prevented by not using the same bath with the TB infected person at 95 (96.9%), followed by Mopani district at 124 (96.1%), Vhembe district at 100 (95.2%) Sekhukhune district 81(94.2%), while Waterberg district is the least at 30 (93, 8%). This is a total of 430 (95.6%) participants of Limpopo Province indicated that not using the same bath with the TB infected person can prevent TB is false; while a total of 20 (4.4%) of participants from all the districts of Limpopo indicated that it is true that TB is prevented by not using the same bath with the TB infected person.

4.13.6 Prevention of TB by not using the same eating utensils.

The following proportion of participants indicated that it is true that TB is prevented by not using the same eating utensils with the TB infected person; Capricorn district at 84 (85.7%), Mopani district 120 (93%), Sekhukhune district at 78 (90.7%), Vhembe district at 95 (90.5%) and Waterberg district at 28 (87.5%), which is a total of 405 (90%) of participants; while 45 (10%) of participants from all the districts of Limpopo Province indicated that it is false that TB is prevented by not using the same utensils with the TB infected person.

4.13.7 Not hand shaking with the TB infected person.

The following proportion of participants indicated that it is true that TB is prevented by not shaking hands with the TB infected person; Capricorn district at 84 (85.7%), Mopani district at 120 (93%), Sekhukhune district at 78 (90.7%), Vhembe district at 95 (90.5%) and Waterberg district at 28 (87.5%); which is a total of 406 (90.2%) respondents in Limpopo Province; while 44 (9.8%) participants from all the districts of Limpopo Province indicated that it is false that not shaking hands with the TB infected person prevent the spread of TB.

4.13.8 Prevention of TB by not hugging the TB infected person.

The following proportion of participants indicated that it is true that TB is prevented by not hugging the TB infected person; Capricorn district at 88 (89.8%), Mopani district at 124 (96.1%), Sekhukhune district at 79 (91.9%), Vhembe district at 99 (94.3%) and Waterberg district at 28 (87, 5%), which is 418 (92.9%) participants of the whole Limpopo Province. However only 32 (7.1%) of participants from all the districts of Limpopo Province indicated that it is false that avoiding hugging the TB infected patient can prevent the spread of TB.

4.13.9 Prevention of TB by Isolating a TB infected person.

The following proportion of participants indicated that it is true that TB is prevented by isolating the TB infected person; Capricorn district at 62 (63.3%), Mopani district at 77 (59.7%), Sekhukhune district at 57 (66.3%), Vhembe district at 55 (52.4%) and Waterberg district at 15 (46.9%), which is the total of 266 (59.1%) respondents from all the districts of Limpopo Province. While total of 184 (40.9%) participants indicated that it is false that TB is prevented by Isolating a TB infected person.

4.13.10 Prevention of TB by exercising.

The following proportion of participants indicated that it is true that TB is prevented by exercising; Mopani district at 57 (66.3%), followed by Capricorn district at 62 (63.3%), Sekhukhune district at 77 (59,7%), Vhembe district at 55 (52.4%) and Waterberg district at 15 (46.9%), which is a total of 316 (70.2%) participants from all the districts of Limpopo Province. However a total of 134 (29.8%) participants in the five districts of Limpopo Province indicated that it is false that exercising prevents the spread of TB.

4.13.11 Prevention of TB by using condoms during sex.

The following proportion of participants indicated that it is true that TB is prevented by using condoms during sex; Capricorn district at 70 (71.4%), Mopani district at 106 (82.2%), Sekhukhune district at 67 (77.9%), Vhembe district at 85 (81%) and Waterberg district at 27 (84.4%); which is 355 (78.9%) participants from the five districts of Limpopo Province; while a total of 95 (21.1%) participants from all the districts of Limpopo Province indicated that it is false that the spread of TB is prevented by using condoms during sex.

4.13.12 Prevention of TB by eating a well-balanced diet.

The following proportion of participants indicated that it is true that TB is prevented by eating a well balanced diet; Capricorn district at 19 (19.4%), Mopani district at 32 (24.8%) Sekhukhune district at 14 (16.3%), Vhembe district at 14 (13.3%) and Waterberg district at 7 (21.9%). A total of 86 (19.1%) participants in the five districts of Limpopo Province who indicated that it is true that the spread of TB is prevented by eating the well-balanced diet; while a total of 364 (80.9%) participants indicated that it is false that TB is prevented by eating the well-balanced diet.

4.14 Section M: Prevention of HIV spreading.

The findings in table 4.14 regarding the prevention of HIV spreading will be discussed in sub-heading 4.14.1 to 4.14.10.

Table 4.14 Prevention of HIV spreading.

Item		Capricorn		Mopani		Sekhukhune		Vhembe		Waterberg	
		f	%	f	%	f	%	f	%	f	%
1. Opening of windows at home.	True	80	81.6	117	90.7	72	83.7	96	91.4	31	96.9
	False	18	17.3	12	9.3	14	14	9	8.6	1	3.1
2. Opening of windows at health facilities.	True	78	79.6	116	89.9	73	84.9	95	90.5	31	96.9
	False	20	19.4	13	10.1	13	14	10	9.5	1	3.1

3. Avoiding kissing a TB infected person.	True	80	81.6	103	79.8	67	77.9	69	65.7	25	78.1
	False	18	16.3	26	19.4	19	20.9	36	34.3	7	21.9
4. Not using the same toilet with the TB infected person	True	93	94.9	127	98.4	82	95.3	103	98.1	32	100
	False	5	4.1	2	0.8	4	3.5	2	1.9	0	0
5. Avoid sharing injecting needles	True	88	89.8	120	93	79	91.9	96	91.4	31	96.9
	False	18	8.2	9	7	7	7	9	8.6	1	3.1
6. Not shaking hands with an HIV infected patient.	True	94	95.9	127	98.4	83	96.5	10	96.2	32	100
	False	4	3.1	2	1.6	3	2.3	14	3.8	0	0
7. Performing a male circumcision to all males	True	17	15.3	23	17.1	18	19.8	22	20	12	37.5
	False	81	82.7	106	82.2	68	79.1	83	79	20	62.5
8. By isolating an HIV infected patient.	True	95	96.9	120	93	85	98.8	98	93.3	31	96.9
	False	3	0	9	6.2	1	0	7	6.7	1	3.1
9. Eating a well-balanced diet.	True	52	53.1	84	65.1	51	59.3	55	52.4	21	65.6
	False	46	42.9	45	34.9	35	39.5	50	47.6	11	34.4
10. By using condoms during sex	True	94	95.9	126	97.7	79	91.9	98	93.3	32	100
	False	4	3.1	3	2.3	7	5.8	7	6.7	0	0

4.14.1 Prevention of HIV by opening of windows at home.

Waterberg district had the highest percentage of participants at 31 (96.6%), who indicated that it is true that HIV is prevented by opening of windows at home; followed by Vhembe district at 96 (91.4%), Mopani district at 117 (90.7%), Sekhukhune 72 (83.7%) and Capricorn at 80 (81.6%); which is a total of 396 (88%);

while a total of 54 (12%) participants in Limpopo Province indicated that it is false that HIV is prevented by opening windows at home. This will be achieved by calculating unpaired t-test of the means of the two groups.

Group 1 (False)	Group 2 (True)
18	80
12	117
12	72
9	96
1	31
Total: 54	Total: 396

Results

Group	Group 1	Group 2
Mean	10.40	79.60
SD	6.19	31.86
SEM	2.77	14.25
N	5	5

The two-tailed p-value equals: 0.0014
 The mean of Group 1 minus Group Two equals: -69.20.
 95% confidence interval of this difference: From -102.67 to -35.73.
 t=4.7671
 df=8
 Standard error of difference: 14.516

Conclusion.

By conventional criteria, this difference is considered to be “Very Statistically Significant”.

4.14.2 Prevention of HIV by opening of windows at health facilities.

The following proportion of participants indicated that it is true that HIV is prevented by opening windows at health facilities; Capricorn district at 78 (79.6%), Mopani district at 116 (89.9%), Sekhukhune district at 73 (84.9%), Vhembe district at 95 (90.5%) and Waterberg district at 31 (96.9%), which is a total of 393 (87.3%) participants who indicated that it is true that HIV is prevented by opening windows at health facilities, while a total of 57 (12.7%) in the five district of Limpopo Province indicated that it is false. A t-test was therefore calculated to establish whether there was any significant statistical difference between the participants who indicated that it is true and those that said is false.

Group 1 (False)	Group 2 (True)
20	78
13	116
13	73
10	95
1	31
Total: 57	Total: 393

Results

Group	Group 1	Group 2
Mean	10.40	79.60
SD	6.19	31.86
SEM	2.77	14.25
N	5	5

The two-tailed p-value equals: 0.0015
 The mean of Group 1 minus Group Two equals: -68.00
 95% confidence interval of this difference: From -101.11 to -34.89
 t=4.7355

df=8

Standard error of difference: 14.370.

Conclusion

By conventional criteria, this difference is considered to be “Very Statistically Significant”.

4.14.3 Prevention of HIV by avoiding kissing an HIV infected person

Sekhukhune district had the highest percentage of participants who indicated that it is true that HIV is prevented by avoiding kissing an HIV infected person; at 72 (83.7%), followed by Capricorn district at 80 (81.6%), Mopani district at 103 (79.6%), Vhembe district at 69 (65.7%) and Waterberg district at 25 (78.1%). This is a total of 349 (77.5%) respondents of the Limpopo Province who indicated that HIV is prevented by avoiding kissing an HIV infected person. However, 101 (22.5%) participants in the five districts of Limpopo Province indicated that it is false that HIV is prevented by avoiding kissing the HIV infected person. A T-test will now be conducted to establish if there is any significant difference between the participants who indicated that it is true and those who said it is false.

Group 1 (False)	Group 2 (True)
18	80
26	103
19	67
36	69
7	25
Total: 106	Total: 344

Results

Group	Group 1	Group 2
Mean	10.40	79.60
SD	6.19	31.86
SEM	2.77	14.25

N	5	5
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The two-tailed p-value equals: 0.0067
The mean of Group 1 minus Group Two equals: -49.60
95% confidence interval of this difference: From -81.12 to -18.08
t=3.6283
df=8
Standard error of difference: 13.670

Conclusion.

By conventional criteria, this difference is considered to be “Very Statistically Significant”.

4.14.4 Prevention of HIV by not using the same toilet with an HIV infected person.

The following propotion of participants indicated that it is true that HIV is prevented by not using the same toilet with an HIV infected person; Capricorn district at 93 (94.9%), Mopani district at 127 (98, 4%), Sekhukhune district at 82 (95.3%), Vhembe district at 103 (98.1%) and Waterberg district at 32 (100%). A total of 437 (97.1%) participants of the five districts in Limpopo Province. However,13 (2.9%) participants indicated that it is true that HIV is prevented by not using the same toilet with an HIV infected person.

To be clearer about the extent of the difference between participants who indicated that it is true and those who indicated that it is false, T-test will be conducted.

Group 1 (True)	Group 2 (False)
4	94
2	127
3	83
4	101

0	32
Total: 13	Total: 437

Results

Group	Group 1	Group 2
Mean	2.00	88.00
SD	1.58	35.43
SEM	0.71	15.85
N	5	5

The two-tailed p-value equals: 0.0006
 The mean of Group 1 minus Group Two equals: -86.00
 95% confidence interval of this difference: From -122.58 to -49.42
 t=5.4218
 df=8
 Standard error of difference: 15.862

Conclusion.

By conventional criteria, this difference is considered to be “Extremely Statistically Significant”.

4.14.5 Prevention of HIV by avoid sharing injecting needles.

The following propotion of participants indicated that it is true that HIV is prevented by avoiding sharing injecting needles; Capricorn district at 88 (89.8%), Mopani district at 79 (91.9%), Sekhukhune district at 120 (93%), Vhembe district at 96 (91.4%) and Waterberg district at 31 (96.9%); which is a total of 414 (92%) respondents of Limpopo Province. However 36 (8%) of the participants of Limpopo Province indicated that it is false that HIV is prevented by avoiding sharing injecting needles with an HIV infected person.

In order to know the extent of the difference between the participants who indicated that it is true and those who indicated that it is false, a T-test was conducted.

Group 1 (False)	Group 2 (True)
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10	88
9	120
7	79
9	96
1	31
Total: 36	Total: 414

The following are the results of the T-test:

Group	Group 1	Group 2
Mean	6.60	83.40
SD	3.36	32.78
SEM	1.50	14.66
N	5	5

The two-tailed p-value equals: 0.0008
The mean of Group 1 minus Group Two equals: -76.80
95% confidence interval of this difference: From -110.79 to -42.81
t=5.2109
df=8
Standard error of difference: 15.738

Conclusion.

By conventional criteria, this difference is “Extremely Statistically Significant”.

4.14.6 Prevention of HIV by not shaking hands with an HIV infected patient.

The following proportion of participants indicated that it is true that HIV is prevented by avoiding hand shaking with an HIV infected person; Capricorn district at 94 (95.4%), Mopani district at 127 (98.4%), Sekhukhune district at 83 (96.5%), Vhembe district at 101 (96.2%) and Waterberg district at 32 (100%). A total of 437 (97.1%) participants in the five districts of Limpopo Province. However, 13 (2.9%) respondents indicated that it is false that avoiding shaking hands with an HIV infected patient can prevent HIV. Therefore, to understand the extent of the

difference between the participants who said it is true and those who indicated that it is false, a T-test was conducted.

Group 1 (True)	Group 2 (False)
4	94
2	127
3	83
4	101
23	9
Total: 36	Total: 414

The following results were revealed by the T-test which was conducted.

Group	Group 1	Group 2
Mean	2.20	87.80
SD	1.48	34.97
SEM	1.66	15.64
N	5	5

The two-tailed p-value equals: 0.0006
 The mean of Group 1 minus Group Two equals: -85.60
 95% confidence interval of this difference: From -121.69 to -49.51
 t=5.4690
 df=8
 Standard error of difference: 15.662

Conclusion.

By conventional criteria, this difference is considered to be “Extremely statistically significant”.

4.14.7 Prevention of HIV by performing male circumcision to all males.

The following propotion of participants indicated that it is true that HIV is prevented by performing male circumcision to all males; Capricorn district at 17 (15.3%),

Mopani district at 23 (17.9%), Sekhukhune district at 18 (19, 8%), Vhembe district at 22 (20%) and Waterberg district at 12 (37.5%). A total of 92 (20.4%) participants of Limpopo Province; while 358 (79.6%) participants indicated that it is false that performing male circumcision to all males can prevent HIV.

In order to know the extent of the difference between the participants who indicated that it is true and who indicated that it is false, it was important to investigate the extent of the difference between participants and this was done by conducting a T-test.

Group 1 (False)	Group 2 (True)
17	81
23	106
18	68
22	83
12	20
Total: 92	Total: 358

The T-test revealed the following findings:

Group	Group 1	Group 2
Mean	72.60	17.40
SD	32.41	4.16
SEM	14.49	1.86
N	5	5

The two-tailed p-value equals: 0.0054

The mean of Group 1 minus Group Two equals: -85.60

95% confidence interval of this difference: From -21.50 to -88.90

t=3.777

df=8

Standard error of difference: 14.612

Conclusion.

By conventional criteria, this difference is considered to be “Extremely Statistically Significant”.

4.14.8 Prevention of HIV by isolating an HIV infected patient.

The following proportion of participants indicated that it is true that HIV is prevented by isolating an HIV infected patient; Capricorn district at 95 (96.9%), Mopani district at 120 (93%), Sekhukhune district at 85 (98.8%), Vhembe district at 98 (93.3%) and Waterberg district at 31 (96.9%), which is a total 429 (95.3%) participants of Limpopo Province who indicated that it is true that isolating the HIV infected patients will prevent HIV; while only 21 (4.7%) participants indicated that it is false that HIV is prevented by isolating the HIV infected patient.

It is important to use the T-test to investigate the difference between the participants who indicated that it is true and those that said it is false.

Group 1 (False)	Group 2 (True)
3	95
9	120
1	85
7	98
1	31
Total: 21	Total: 429

Prevention of HIV by isolating an HIV infected patient.

The T-test revealed the following findings:

Group	Group 1	Group 2
Mean	3.20	86.80

SD	3.96	33.67
SEM	1.77	15.06
N	5	5

The two-tailed p-value equals: 0.0006
The mean of Group 1 minus Group Two equals: -83.60
95% confidence interval of this difference: From -118.56 to -48.64
t=5.5139
df=8
Standard error of difference: 15.162

Conclusion.

By conventional criteria, this difference is “Extremely Statistically Significant”.

4.14.9 Prevention of HIV by eating a well-balanced diet.

The following proportion of participants indicated that it is true that HIV is prevented by eating a well-balanced diet; Capricorn district at 52 (53.1%), Mopani district at 84 (65.1%), Sekhukhune at 51 (93%), Vhembe district at 55 (52.4%) and Waterberg district at 21 (65.6%), which is a total of 263 (58.4%) participants of Limpopo Province; while 187 (41.6%) indicated that it is false that eating well balanced diet prevent HIV.

A T-test was used in this study to establish whether the difference is statistically significant.

The T-test revealed the following findings:

Group 1 (False)	Group 2 (True)
46	52
45	84
35	51
50	55
11	21
Total: 187	Total: 263

Group	Group 1	Group 2
Mean	36.40	53.60
SD	15.34	22.35
SEM	6.86	9.99
N	5	5

The two-tailed p-value equals: 0.1937
The mean of Group 1 minus Group Two equals: -17.20
95% confidence interval of this difference: From -45.15 to -10.75
t=1.4190
df=8
Standard error of difference: 12.121

Conclusion

By conventional criteria, this difference is considered to be “Not Statistically Significant”.

4.14.10 Prevention of HIV by using condoms during sex.

Waterberg district had the highest percentage of participants who indicated that it is true that HIV is prevented by using condoms during sex; at 32 (100%), followed by Mopani district at 126 (97.7%), Capricorn district at 94 (95.9%), Vhembe district at 98 (93.3%) and Sekhukhune at 79 (91.9%) which is a total of 429 (95.5%) participants who indicated that it is true that HIV is prevented by using condoms during sex, while 21 (4.7%) indicated that it is false that HIV is prevented by using condom during sex.

To achieve this, the researcher conducted the T-test of the two groups.

Group 1 (False)	Group 2 (True)
46	52
45	84
35	51
50	55
11	21
Total: 187	Total: 263

Group	Group 1	Group 2
Mean	3.60	86.40
SD	2.61	34.52
SEM	1.17	15.44
N	5	5

The two-tailed p-value equals: 0.0007
The mean of Group 1 minus Group Two equals: -82.80
95% confidence interval of this difference: From -118.50 to -47.10
t=5.3490
df=8
Standard error of difference: 15.480

Conclusion.

By conventional criteria, this difference is considered to be “Extremely Statistically Significant”.

4.15 Conclusion.

This chapter presented the results emanating from the quantitative data collected through administration of questionnaires to PHC nurses. The biographical information of participants such as gender, qualifications and experience in PHC facilities was collected. Knowledge of PHC nurses was established by asking PHC nurses about TB, HIV, STIs management and PMTCT courses they attended. Participants were also asked on the availability of TB and HIV guidelines. The manner in which TB and HIV services are provided in the PHC facilities was asked. The level of competency of PHC nurses in diagnosing and treatment of TB, HIV and STIs, integration of TB and HIV services was established. Availability of TB and HIV support services were established. Availability of TB and HIV drugs and commodities such as sputum bottles and HCT kits was also established. The qualitative results will

be discussed in Chapter 5.

CHAPTER 5

DISCUSSION OF QUALITATIVE RESULTS.

5.1 Introduction

Chapter 4 discussed quantitative results based on the responses of the PHC nurses. This chapter discusses and interprets the qualitative data of the study. The results emanated from the five focus group discussions with Community Home-Based Carers (CHBCs) and five focus group discussions with TB and HIV co-infected patients. Content analysis was used and the results are presented as themes and sub-themes that were identified. Literature review was done to support the results.

The purpose of the qualitative sub-phase of the study was to obtain in-depth data on the challenges faced by CHBCs and the patients regarding TB/HIV co-infection. The objectives of the qualitative sub-phase were to:

- identify the challenges faced by CHBCs regarding care and support of the TB/HIV co-infected patients in Limpopo province.
- explore the experiences of TB/HIV co-infected patients regarding the TB/HIV services in Limpopo province

5.2 Results of the focus group discussions of CHBCs.

The focus group discussions were conducted with five groups of CHBC's from the five districts of Limpopo Province. The number of participants was 51; Capricorn district 9, Mopani district 12, Sekhukhune district 10, Vhembe district 10 and Waterberg district 10. The focus groups are numbered alphabetically as A, B, C, D and E for this chapter. The data were organised into themes and sub-themes. Four themes emerged from data analysis namely, motivation to become a CHBCs, knowledge on TB and HIV diseases management, roles and responsibilities of CHBCs in the care of TB and HIV patients and attitudes towards CHBCs. The themes and sub-themes are shown in table 5.1.

Table 5.1: Themes and sub-themes on knowledge and attitudes of CHBCs regarding the care and support of the TB/HIV co-infected patients.

Themes	Sub-themes
1. Motivation to become a Community Home Based Carer	1.1 Love and passion to help others 1.2 Desire to help others 1.3 To promote health and prevent diseases
2. Knowledge of CHBCs on the management of TB and HIV diseases	2.1 Training on TB and HIV management 2.2 TB as curable versus HIV as a controllable disease 2.3 Knowledge of TB and HIV drugs and related side-effects

3. Roles and responsibilities of CHBCs towards TB and HIV patients.	3.1 Patient education on TB and HIV diseases 3.2 Supervision of patients on TB and ARV treatment 3.3 Support to TB and HIV co-infected patients
4. Attitudes towards CHBCs	4.1 Attitudes of the clinic staff towards CHBCs 4.2 Attitudes of patients and their families towards CHBCs 4.3 Attitudes of community members towards CHBCs

5.2.1 Theme 1: Motivation to become a Community Home Based Carer.

Some participants expressed that they were motivated by the desire to take care of the sick, after they had taken care of sick family members and other patients in the community even if they don't get any stipend. Three sub-themes emerged from this theme as love and passion to help others, desire to help others and to promote health and prevent diseases.

- **Sub-theme 1.1: Love and passion to help others.**

Some participants indicated that they developed love for being CHBC after taking care of the sick family members as well as taking care of people who could not take care of themselves. They also indicated that they wanted people to lead better lives. Some indicated that they developed love and passion of being CHBCs after caring for orphans left by parents who died of TB and HIV. Others indicated that they love to give support to people who are infected and affected by TB and HIV.

The love and passion for CHBCs was expressed as follows:

“I can say love and patience to those people who are ill in the communities made me to take this, to participate as a community home based carer. To make sure that people become cured at the end of the day” (Participant E3).

“I was motivated by the way I saw how my deceased mother was cared, supported and loved by her community health worker, whilst suffering in my absence, when I was at school. I felt I must also continue to care for others” (Participant A9).

“I have seen that our community need care. That is why I am being a community health worker. To encourage them to visit the clinic for their illnesses. For them to live a better live and reduce death in our community” (Participant E1).

Doherty and Govender (2007), indicated that Limpopo Province is implementing the DOT strategy using trained Community Home-Based Carers (CHBCs), who supervise TB and HIV patient's treatment in the community voluntarily to show love and passion towards helping others. Some CHBCs are integrated into NGOs and provide comprehensive home-based care services and only receive a stipend from the Limpopo Provincial government. Community Home Based Carers and PHC nurses are tracing and screening TB contacts of the infectious patients to protect them against contracting TB and this supports the love and passion of CHBCs to assist others (Department of Health, 2009).

- **Sub-theme 1.2: Desire to help others**

Some of participants indicated that after realizing that many people were sick of TB and HIV, they developed the interest to help them by joining the CHBCs team. They also indicated that they needed to help communities to have better lives through giving them health education about TB and HIV diseases as they realised that many people are sick but not seeking help from health care facilities. Desire to help other people was stated as follows:

“I wanted to help sick people out there. Because, my fellow relatives died of HIV and AIDS because of lack of information and knowledge. Then I felt so bad, knowing that I can give information and make them aware of the decease” (Participant B3).

“Firstly I can say that as a community home based carer, there are some people who were discharged from hospital who are still ill, vulnerable and still need care from someone. That is what motivated me. So, that I can be able to care for those people in their own houses” (Participant E8).

TB and HIV infected patients should adhere to their treatment in order to improve cure rate to TB patients and sustain healthy live to HIV infected patients. Adherence to treatment by TB and HIV infected patients can be improved through patient support. CHBCs are included in the health team for care and support of patients though they are just doing this important work without remuneration. They are doing the work voluntarily without any incentive; those that are attached to the NGOs are receiving a little amount of stipend (Department of Health, 2009).

According to Guzman (2006), volunteerism is an important, an increasingly popular, mechanism for young people to bring about positive change in society. Volunteerism in youth is becoming more and more relevant as a mechanism to engage young people in health care activities and sustainable human development to continue taking care of them. This study confirmed the above literature as some of CHBCs who participated in the study were youth aged between 21-36 years old.

Increasing opportunities for community involvement makes the promotion of awareness about volunteering a key priority. For example, in 2006, Volunteer Development Scotland launched a campaign called 'You won't believe what you can do', which was meant to encourage volunteering in greater diversity and numbers. Key aims of the campaign were to challenge myths about the barriers to volunteering, educate the public on the range of volunteer opportunities they can undertake and to encourage people to get involved in care of their communities. Volunteering does not help the patients only; it also assists volunteers themselves to be empowered through the experiences and insights they gain during their engagement with patients and the community (Department of Health, 2009).

- **Sub-theme 1.3: To promote health and prevent diseases.**

Most of the participants indicated that they joined the CHBCs because they want to promote health and prevent diseases in the communities by delivering health education about TB and HIV to the community as well as encouraging people to live a healthy lifestyle and reduce deaths. These sentiments are:

*“Okay. To educate the family and also support them on caring for the patients”
(Participant B6).*

“To give information to our community about knowing the different diseases” (Participant D6).

“Healthy lifestyle. Even if she is TB she is on TB treatment, she or he should continue using condom when having sex” (Participant A5).

“To promote health in the community by educating them about HIV, TB and other chronic diseases” (Participant D4).

According to Dennil, King and Swanepoel (2007), education about prevailing health problems is one of the basic elements of primary healthcare in which diseases can be prevented. Prevention of diseases is described as the elimination of specific illnesses and conditions by one or more strategies. According to Department of Health (2009), patient education and conducting community health education activities are the roles of CHBCs. This was supported by Barnett (2006), who stated that it is important for PHC nurses and CHBCs to give health education to enable the patients to adjust to the conditions. Edington (2008), indicated that community and patient empowerment are central to the human rights approach to caring for TB and HIV infected patients and preventing the diseases.

5.2.2 Theme 2: Knowledge of CHBCs on the management of TB and HIV diseases.

Majority of participants expressed clear understanding in the management of TB and HIV diseases, they indicated that TB is curable and treatment should be taken for 6 months whiles HIV is incurable but controllable, and the treatment is taken for life. Three sub-themes emerged as training on TB and HIV management, TB as curable versus HIV as a controllable disease and knowledge of TB and HIV drugs and related side effects.

- **Sub-theme 2.1: Training on TB and HIV management**

All participants indicated that they received training on TB and HIV management. Some received training on TB and HIV during the 69 days of CHBC training and others received 5 days training. They indicated that they were trained on how to

screen for TB in HIV positive patients and trained on how to test for HIV in TB patients. This was expressed as follows:

“I have trained. They told me that I must monitor them when taking their medication. When they said 06:00 you must go to the patient and give him or his medication and see whether she is swallowing them. After giving him or her medication you must speak to him or her, some of them are keeping their pills under the tongues” (Participant A6).

“Yes. I have trained for five days for TB and HIV management. They teach us about how to screen the person who had TB. They teach us how to question the patients about the signs and symptom of TB. HIV and TB are just like linked together, because, even signs and symptoms are nearly the same” (Participant A4).

According to Shull et al. (2011), CHBCs need to be trained in TB and HIV as well as all health care services and continuous in-service training for nurses. This system seeks to optimize the clinical effectiveness of frontline healthcare workers in rural health centres in addressing HIV/AIDS and TB (Shull et al., 2011). According to Catholic AIDS Relief project there are several advantages of community-based training on HIV services and care of the TB and HIV patients. They learnt the National standards, protocols and reporting mechanisms for TB and HIV. HIV counselling and testing presents an opportunity for TB screening. Quality training can equip CHBCs to address TB, HIV and other health issues (Shull et al., 2011).

- **Sub-theme 2.2: TB as curable versus HIV as a controllable disease.**

The majority of participants had a good understanding of TB medication and antiretroviral therapy. The CHBCs know that TB is curable and that the medication lasts for six months. They also understand that TB medication is prescribed according to the weight and age of the client and also know the importance of strict adherence to therapy and the importance of directly observed therapy to ensure adherence. It was well understood among the CHBCs that patients can develop multidrug resistant TB if they do not adhere to their treatment which can lead to death. The CHBCs could also accurately list the side effects of TB and HIV treatment

including nightmares, painful legs (peripheral neuropathy), nausea and vomiting, urine discolouration, diarrhoea and dizziness.

This is what some participants said:

“I learned more about TB drugs because I understand now when we have TB, TB is a curable disease. When you take medication in the correct time you can be cured” (Participant C4).

“TB is curable. Then HIV it is not curable. So if you take treatment for HIV you take it for life. Though TB is just the infection that can be cured” (Participant A2).

“I have learned that adherence must be strictly practiced, when coming to the patient living with HIV and AIDS. You must encourage them to take treatment every day in time” (Participant E4).

“When coming to HIV drugs I read that if a person has started the HIV drugs he must take them for forever in order to sustain his or her life. The HIV drug must be taken at the same time every day” (Participant E8).

The Department of Health (2009), stated that the key to stopping the spread of TB is to start treatment for confirmed TB patients as soon as possible. Ghebrehwet (2006), also supports the participants' view by saying that nurses are aware that treatment helps limit the spread of TB. Therefore, early detection and treatment of TB is crucial. TB treatment should be started as soon as possible, particularly in infectious cases to prevent the disease from spreading (Bell, 2007).

The provision of HIV testing for TB patients is a critical entry point to interventions for both treatment and prevention. Ghebrehwet (2006), indicated that all TB patients should be offered HIV counselling and testing and HIV-positive clients to be screened for TB so that they all benefit from appropriate treatment. HIV infected TB patients should be provided with antiretroviral therapy, care and support for life. TB patients infected with HIV should be given Cotrimoxazole preventive therapy as well as antiretroviral treatment for the entire life in order to control the disease and

prevent opportunistic infections. Adherence to treatment to be maintained through care and supervision of treatment by CHBCs so that the patient may not develop AIDS related conditions.

- **Sub-theme 2.3: Knowledge of TB and HIV drugs and related side effects.**

Majority of participants indicated that TB drugs can cure TB, and HIV drugs control the disease. Furthermore, TB is curable if TB treatment is taken for 6 months. They also stated that TB drugs must be given according to body weight and age if TB treatment is taken for 6 months every day at the same time, the patient can be cured from TB. There should be DOT when taking TB treatment to ensure that treatment is taken without interruption. They also indicated that patients can develop MDR if TB treatment is not taken correctly. Patients must take TB drugs and finish them to avoid MDR-TB. Patient must have support from family when taking TB drugs and DOT to ensure adherence which will prevent the occurrence of MDR. If patients are not adhering to treatment they might contract MDR which can lead to death. TB medication should be taken on time to prevent MDR. Some participants also mentioned drug side effects such as nightmares, painful legs, hallucinations, swollen legs, nausea and vomiting, change of urine colour, rash, diarrhoea and dizziness. This was stated as follows:

“What I have learned about the TB drugs is that the TB drugs can cure TB. But when a patient does not take treatment according to the prescription it may cause the drug resistance” (Participant B1).

“TB drugs are given to the client immediately after the client has been diagnosed with TB and is given according to the weight of the client and the age of the client. We as community home based carers we DOT the client. To make sure that he or she takes her treatment accordingly. She takes that treatment for six months” (Participant E4).

The key to stopping the spread of TB in the community is to start treating TB patients as soon as possible, this entails taking the correct treatment, correct dose, at the correct time and for the correct period such as taking TB treatment for six months in case of the new TB patient (Department of Health, 2009). For the TB treatment to be

effective it is important that the correct drugs are given for the correct period. To increase adherence to treatment, PHC nurses and CHBCs said that they use strategies such as: giving continuous education and counselling to the patients and educate them about side effects of treatment. The public health priority in TB control and management is to cure positive TB cases while preventing the emergence of drug resistance (Department of Health, 2009).

Most participants indicated that HIV drugs should be taken for life in order to improve health and prolong life and that the patient must adhere to ARV's as advised. They should take all treatment given from the clinic and not stop in order to prolong life. If the patient has both TB and HIV they should start with TB drugs before taking ARV's because TB is infectious. Co-infected patients should receive TB treatment for 14 days and thereafter start HIV treatment. This was expressed as follows:

“When coming to HIV drugs I read that if a person has started the HIV drugs he must take them for forever, in order to sustain his or her life. The HIV drug must be taken at the same time every day” (Participant E8).

“I have learned that adherence must be strictly when coming to the patient living with HIV and AIDS. You must encourage them to take treatment every day in time” (Participant E4).

“Yes. When you take drugs of HIV correctly and then the disease will be manageable” (Participant C7).

“Then when you take HIV and AIDS drugs, it is controlled. Because, if the immune system is down less than 500 you can take the ARV's. It is controlled” (Participant C3).

“TB is curable but HIV it is not curable. So if you take treatment for HIV you take it for life. Though TB is just the infection that can be cured” (Participant A2).

The Department of Health (2011b), recommended that there should be effective management of TB/HIV co-infection. The provision of HIV testing for TB patients is a critical entry point to interventions for both treatment and prevention. Ghebrehiwet (2006), indicated that all TB patients should be offered HIV counselling and testing

and HIV-positive clients screened for TB so that they all benefit from appropriate treatment. HIV infected TB patients should be provided with antiretroviral therapy, care and support for life. Adherence to treatment can be maintained through care and supervision of treatment by CHBCs.

The interventions indicated by participants were that they tell the patient not to stop treatment, encourage patients to take treatment when going to sleep. If vomiting after taking treatment, the patient should wait for an hour and take another drug. In case of rash they will refer the patients to the clinic, and if side effects are severe patients will be referred to the clinic. This was stated as follows:

“Then to add more, if the patient has a side effect on treatment we do not tell them to leave the treatment. It is either we tell them to go back to the clinic, refer them to the facilities” (Participant B3).

“Some are developing this rash and some are vomiting. Then when they are vomiting I just refer them to the clinic to get treated” (Participant A6).

“Some are complaining about the pains on legs, hands and some are hallucinating” (Participant A5).

Bell (2007), indicated that information on side effects and their interventions should be given to patients to promote adherence to treatment. A study conducted by Rowe and Makhubele (2005), indicated that side effects of treatment can lead to non-adherence to treatment and therefore it is important to counsel and educate patients on the side effects of drugs. A study conducted by Monru, Lewin, Smith, Engel, Fretheim and Volmink (2006), revealed that some patients reported to have stopped medication due to side effects because they were never informed about those side effects and what to do in case they develop them. It is important to inform the patients about the side effects during counselling and also inform them on how to manage those side effects so that the patients continue taking treatment. Schilling and Cann (2003), emphasized the need for patient education with regard side effects of TB drugs and ARVs as well as the importance of reporting the side effects.

5.2.3 Theme 3: Roles and responsibilities of CHBCs towards TB and HIV patients.

Participants expressed their roles and responsibilities in the care of TB and HIV patients. They indicated that their role is to ensure that the patient adhere to the treatment; take correct treatment at the correct time. They also educate family members on how to take care of their sick patients. Participants also stated that their role is to give support to patient so that they may not default treatment even if they have some side effects. Three sub-themes emerged from this theme, Patient education on TB and HIV diseases, supervision of patients on TB and ARV treatment and support to TB and HIV infected patients.

Sub-theme 3.1: Patient Education on TB and HIV diseases

Majority of participants stated that their role included education of patients about different types of treatment for TB and HIV. They also indicated that they educate the patients and their families about TB and HIV diseases, about cough hygiene to prevent the spread of TB. They also educate them on abstinence or use of condoms to prevent HIV as well as early attendance of Ante Natal clinic to prevent mother to child transmission of HIV. They also stated that they educate patients about adherence to treatment. They indicated that patients should be educated about drug side effects and what to do if they encounter those side effects. This was expressed as follows:

“To promote health education to our community and support people living with HIV and AIDS, TB and other chronic diseases” (Participant D5).

“Encourage them to continue with both treatments. Until she finishes six months’ course of treatment and continue with HIV treatment for the whole of her life” (Participant E4).

Education about prevailing health problems is one of the basic elements of primary healthcare, it is important for PHC nurses and CHBCs to give health education to help patients to adjust to their conditions. Primary Health Care nurses and CHBCs have the capacity to decrease the burden of TB and HIV through patient education (Department of Health, 2009). They give health education in the facility, distribute pamphlets with TB and HIV messages and conduct awareness campaigns

in the community. According to the Department of Health (2009), patients' education, provision of appropriate education materials and conducting community health education activities are the responsibilities of PHC nurses and CHBC in the prevention of TB and HIV in communities.

- **Sub-theme 3.2: Supervision of patients on TB and ARV treatment**

All participants stated that they supervise patient when taking treatment (DOT). They encourage the patient to take treatment every day and record in the patient's clinical cards. They also encourage the family members to support the patient on treatment adherence. They stated that patients need to be supervised daily when taking treatment. Most participants indicated that they encourage the patient not to stop taking treatment because they can develop drug resistance if not taking treatment daily. This was expressed as follows:

“You observe the patient of TB when taking his medication” (Participant C9).

“TB drugs are given to the client immediately after the client diagnose TB and are given according to the weight of the client and the age of the client. We as community home based carers we DOT the client. To make sure that he or she takes her treatment accordingly. She takes that treatment for six months” (Participant E4).

“Like we have to monitor our patients for the TB when they start the treatment we have to do the direct observation. To see that they have swallowed the treatments” (Participant B1).

Patients on TB treatment and ARVs should be closely supervised by trained CHBCs on daily basis when taking their treatment. The CHBCs are trained to provide DOT to patients. WHO (2006), indicated that high quality DOTS expansion and enhancement should be pursued in the management of TB and HIV in South Africa. Bell (2004), indicated that it is the role of PHC nurses to ensure that the TB and HIV infected patients are allocated a trained, willing, responsible DOT supporter who is acceptable to the patient. According to (Ghebrehiwet, 2006), the success of TB treatment depends on the strict follow up of the prescribed treatment regimen that

will ensure that patients complete TB treatment and adhere to the ARVs. DOTS supporters are very helpful in assisting the patient to adhere to treatment. It is also stated in the Department of Health (2009), that DOT is recommended for all TB clients for the entire period of treatment to ensure adherence.

- **Sub-theme 3.3: Support to TB and HIV co-infected patients.**

Most participants indicated that they support the patients through continuous counselling and also encourage the patient to disclose their conditions to their families so that they can be supported by their own families. It was also stated by participants that they educate patients and encourage them to form support groups and adherence clubs to motivate one another to continue taking their treatment. They support each other emotionally and psychologically as they feel that they are not the only ones with these conditions. They motivate each other on adherence to treatment. This was stated as follows:

“Yes. It is to give the support. The thing that motivated me to join or to be a community home based carer is to give a support to the affected and infected people in our communities. Because there were a lot of people who were dying with HIV and TB. So, we support them to reduce reinfection of HIV and TB to the people within our communities” (Participant B1).

“The patient must get support from the caregiver and the family” (Participant B12).

“Like we have to monitor our patients for the TB when they start the treatment we have to do the direct observation. To see that they have swallowed the treatments” (Participant B1).

“The TB clients need support and care supporting them daily and integrate the family members to support them and monitor their treatment. Also in the HIV patient. They need care and support from their family members or their loved ones. Not to stigmatise them” (Participant D5).

“Some of patients take treatment. No food to eat. We take them to the social worker for Social Support Grant” (Participant D6).

The TB and HIV infected patients need to be supported so that they may accept their

conditions and this will encourage them to adhere to treatment and practice good health behaviour such as eating well balanced diet, exercising as well and practising safer sex. The patients need both social support, spiritual support as well as material support. Researchers have revealed the fact that there should be social support in order for clients to adhere to treatment (Simoni, Frick & Huang, 2006). According to Musheke, Bond and Merten (2013), good relationships between patients with their families, friends and health care providers motivated them to adhere to their treatment.

Family members and friends need to offer the social support to the TB and HIV infected patients through encouragement of the patient to adhere to their treatment. According to Johnson and Witt (2007), good relationship between the patient and health care professionals can improve adherence to treatment. This entails continuous counselling and education of the patients on the importance of adherence to treatment. In the study conducted in Tanzania, it was revealed that patients who felt that they were not receiving support from their family members stopped taking their treatment even in situations where their health status was improving (USAID, 2010). According to Hope and Israel (2007), some patients need spiritual support from a pastor of a particular church for them to adhere to treatment.

5.2.4 Theme 4: Attitudes towards CHBCs.

The results of the study found that some staff members had positive attitudes towards the CHBCs while others displayed negative attitudes towards the CHBCs. Three sub-themes emerged as attitudes of clinic staff towards CHBCs, attitudes of patients and their families towards CHBCs and attitudes of the community members towards CHBCs.

Sub-theme 4.1: Attitudes of the clinic staff towards CHBCs.

Some participants stated that some clinic staff members are having positive attitudes towards them while others have negative attitudes. Those that have positive attitudes from the clinic staff indicated that they hold meetings with the clinic staff where they discuss challenges regarding care of patients at home. They get the opportunity of being allocated sick patients during the meetings. Some indicated that the clinic staff supply them with Home Based Care (HBC) kits to use when caring for

sick patients at home. Sometimes the clinic staff and CHBCs go together to visit patients at home as well as tracing of patients who did not come back for follow up appointment at facilities. The clinic staff also conduct in-service training to CHBC's to update them with the new developments and on revised policies. The clinic staff calls the CHBCs when they have patients to allocate them for continuation of care at home; this is the down referral of patients to CHBC's. The clinic staff assists them in report writing. The clinic staff conducts campaigns with the CHBCs as well as accompanying the CHBCs to conduct door to door campaigns in the community.

However, some CHBCs reported negative attitudes from the clinic staff. They indicated that some clinic staff have negative attitude towards them because they do not give the feedback on the referred patient from CHBC's. Some do not hold meeting with the CHBC's. Some clinic staff do not accept referrals from CHBC's; they are left alone with patients. Participants expressed the attitudes of clinic staff as follows:

"We had meeting with them. They allocated patients to us. We give them challenges, from patients and achievements. We conduct community events with them. They order kit for us to care for patients" (Participant A4).

"Yes. They refer us the TB client. Also, attend with them the clinic meeting monthly and give us the kit refill. Like condoms, hand gloves and bandages. They give us all" (Participant D5).

"Yes. Because, every month we meet with staff and when we are at the meeting they give us health talk about different diseases. When we write the report at the end of the month the clinic staff gives us a stamp to put on the report. That is why we say yes. We work together with staff at the clinic" (Participant C4).

"Maybe we can say somewhere somehow we are working hand in hand. They do allocate the patients to us and we do the referral to the facilities. So, they give down referrals, we give up referrals on the new patient" (Participant B1).

The negative attitudes were expressed as follows:

"Sometimes our clinic sisters refused to refer patients to us. When we went to the

community to go and do door to door campaign we discovered the patient were at home, not at the clinic. So, when we take the patient to the clinic for the sister to write the referral letter they refused to give that” (Participant A8).

“In the clinic our care-givers are queuing, whereas they are going to care another patient outside. So, it is a challenge. Because when they queue they do not manage to care a patient outside” (Participant A4).

“Okay. Since we were talking about HIV and TB our experience with some of their facilities have been bad. In that you find that if a nurse or a professional health care worker who is working on TB is on leave or maybe is on training somewhere. You find that his or her colleagues do not assist us when we go to their facilities” (Participant B6).

According to the Department of Health (2009), DOT is recommended for all TB clients for the entire period of treatment to ensure adherence. Nurses and CHBCs should provide both physical and social supports to the patients and families through healthy relationship amongst themselves as they will be able to conduct joint support visits to the patient’s homes.

Sub-theme 4.2: Attitudes of patients and their families towards CHBCs.

It was mentioned by some participants that some family members are not taking care of their sick members. Some families disown their patients saying it is the CHBC’s patient. They also indicated that families do not give patients food before taking medication. Some families isolate the patient fearing the stigma from community. Other families hide the patient; they do not want people to know about their sick family member until they are very ill. Participants also stated that some families do not give their patients money to go for treatment. The following statements bear evidence:

“Patients are not adhering to treatment. Their families are not supporting. They even build some shacks for them. So, that they must be outside the house. Even the dishes. They are not sharing dishes with them” (Participant A6).

“Family members do hide their patients. Even though the situation is manageable. So, to the stage when the patient gets bed ridden it is where you will find out that there is a patient” (Participant B7).

“Some family members you find that they disown their patients and say no this is your patient. Telling us as community health care workers. As if those people they belong to us, but not to them. Not believing that we are there to support them” (Participant B6).

“Some family ignore their patients and they are waiting for a carers” (Participant C8).

It is important that PHC nurses should develop cordial relationship with CHBCs as well as the families of the patients. Family members should also be educated about the care of their family members to assist the CHBCs in order to form part in the care of their family member (Department of Health, 2014). PHC nurses and CHBCs should conduct joined home visits to the patient’s families as home visits are the best way of making holistic assessment of the patient’s challenges, needs and progress (Department of Health, 2009). Good relationship with the patient’s family will ensure patients adherence to treatment. According to Panos (2006), some women lost their homes after disclosing their HIV status, because they were wrongfully accused by their partners of being unfaithful. Some family members also reject their members who are suffering from TB and those that are HIV positive.

Some participants also mentioned that some patients are taking traditional medication due to traditional beliefs that they have been bewitched. In South Africa witchcraft refers to the manipulation by mischievous individuals of powers inherent in persons and spiritual entities to cause destruction to others. The study that was conducted in Soweto, South Africa, revealed that many people associated AIDS symptoms with “isidliso” poisoning (Ashforth, 2009). People who may be infected with HIV waste their time searching for witches who are responsible for their illness. Some patients are in denial of their condition and this results in refusal to take medication and hide when they see CHBC’s. Patients give wrong addresses for them to be untraceable. Patients do not report when they are moving to another area

so that they can be given referral letters to continue receiving treatment at the clinic where they are going. This was expressed as follows:

“Some of the patients they have the challenge, because they default, when the patient drink treatment every day after about two weeks the patient drinking herbal medications when they are on treatment. That is why they have been defaulters” (Participant C5).

“Sometimes the client gives the wrong information or false information to the health facility or to the nurse. So, you find that the address is true, but you find that there is no such a person in that family” (Participant E5).

“Some of our patients are defaulting, because, the family is crying about the money. They say the clinic is far. But as a home-based care we refer him and encourage him to visit the clinic. It is important” (Participant C3).

“The patients give us wrong address or telephone numbers and then we fail to find them” (Participant B3).

“The patient still believes in traditional healer. If one of the family members is sick. They do not believe that the patient is HIV positive or TB. They say the patient is bewitched” (Participant B2).

“The challenge is that our patients default because most of the time they complain about the queue at the clinics. So you find a patient visit the clinic and then they stay for a long time at the clinic before they get assistance from the nurses. The nurses also complain about the shortage of staff at the clinics” (Participant A2).

Bell (2007), indicated that many TB patients have social problems which can lead them to miss appointments at the facility such as lack of money to travel to the health facilities as indicated by some participants. The clinic nurse should make arrangements of tracing the patients who fails to come to health facilities with CHBCs. Home visits are the best strategies of making an assessment of the patient's needs and challenges. Ohkado (2009), indicated that active tracing of

patients is an integral part of TB and HIV control. They indicated that tracing of patients should be conducted in order to obtain reliable information about the challenges faced by the patient so that they may be assisted.

Ndjeka, Matji and Ogunbanjo (2008), also stated that all TB patients who interrupt treatment should be traced. Home visits should be conducted with the assistance of the CHBCs who provide DOT to patients. This should be stressed because patients who interrupt treatment can infect other community members and are at risk of developing complications.

- **Sub-theme 4.3: Attitudes of community members towards CHBCs.**

The study found that there are both positive and negative attitudes towards CHBCs from the community. Those who are positive towards CHBCs them allow them to come into their homes and give them patients to support and refer them to the clinics. Some community members say they appreciate the good work that the CHBCs are doing. Some community members reject the CHBCs and they refuse them to enter their homes. Other community members do not believe in western medicine, they believe in traditional medicine, they even discourage patients to take medication. This was expressed as follows:

“Community gradually seem to acknowledge our work because, when they have problems they also approach us. They can just when passing say stop right there, I am experiencing 1 and 2. It is a sign that they approve our work” (Participant A9).

“There is a good thing within the communities. Some of the communities they support us. The indunas, the Civic they are supporting us and giving us the hidden patient in the house. They can tell or show us where there is a patient. So we are working hand in hand with the community. We refer the patient to the clinic” (Participant B3).

“The community now understand because there are other patients that they were sick and now they are okay because of caregivers” (Participant C4).

“According to my experience the community now are having the full information. It is

better than before we started this home-based care. Because, they were like blind, not knowing anything about, what we are doing. So now, because everything is published everywhere in the medias, on the papers, everybody is having a full information about what we are teaching them. So, they do accept whatever we are doing in the community” (Participant E8).

“Some of the community members they do not love the community home based carers” (Participant D5).

“The patient still believes in traditional healer. One of the family members is sick. They do not believe that the patient is HIV positive or TB. They say the patient is bewitched” (Participant B2).

Dennil, King and Swanepoel (2007), indicated that community involvement and participation in health matters forms an integral part of primary healthcare services. Community should be educated about TB and HIV as well as healthy lifestyle to prevent these two conditions. They should be encouraged to participate in health activities to take ownership of their own lives. Ghebrehiwet (2006), supported the statement of community involvement, as he indicated that key figures and respected community leaders should be involved in order to reduce stigma about TB and HIV. Edington (2008), indicated that community and patient empowerment are central to the human rights approach to caring for TB and HIV infected patients and for the prevention of diseases. This was supported by the WHO (2006), which states that communities should be empowered through partnership, mobilizing civil societies and ensuring political support. This was also supported by the Department of Health (2007) which indicated that ACSM must be conducted in communities to prevent TB and HIV in order to prevent stigma and discrimination towards infected patients and their families.

5.3 Focus groups discussions with TB and HIV infected patients.

Five focus groups discussions were conducted with TB and HIV infected patients from the five districts of Limpopo Province to obtain an in depth understanding of their experiences. Total number of participants was 56, Capricorn district 11, Mopani district 15, Sekhukhune district 10, Vhembe district 8 and Waterberg district 12. The

focus groups were numbered alphabetically as A, B, C, D and E.

Four themes and related sub-themes emerged from data as shown in table 5.2.

Table 5.2: Themes and sub-themes related to the experiences of TB/HIV co-infected patients.

Themes	Sub-themes
1. Patients' knowledge on TB and HIV diseases	1.1 Knowledge on causes and the mode of TB transmission 1.2 Knowledge on causes and mode of HIV transmission 1.3 Knowledge on TB and HIV drugs and related side-effects
2. Emotional and psychological reaction of patients on being diagnosed with TB and HIV	2.1 Fear and anxiety 2.2 Denial and acceptance
3. Attitudes towards the TB and HIV co-infected patients	3.1 Clinic staff attitudes towards TB and HIV co-infected patients 3.2 Attitudes of the CHBCs towards TB and HIV co-infected patients
4. Education and Support to TB and HIV co-infected patients by clinic staff and CHBCs	4.1 Education of TB and HIV co-infected patients 4.2 Social support of TB and HIV co-infected patients 4.3 Emotional and psychological support of TB and HIV co-infected patients

5.3.1 Theme 1: Patients' knowledge on TB and HIV diseases

All participants expressed their knowledge about TB and HIV diseases. The study found that participants had knowledge about the causes and the spread of TB and HIV as expressed in the related sub-themes. Three sub-themes, which are knowledge on causes and the mode of TB transmission, knowledge on causes and

mode of HIV transmission and knowledge on TB and HIV drugs and related side effects.

- **Sub-theme 1.1: Knowledge on causes and the mode of TB transmission**

The patients had variable understanding of the ways TB can be transmitted. Some participants indicated that TB is caused by mycobacteria in the dust while some indicated that TB can be spread when a TB infected person coughs without covering his/her mouth. Some indicated that sleeping with a person who is suffering from TB in the small house without windows can cause TB, while others indicated that if there is a family member who is having TB, he/she can infect other family members with TB. Some indicated that TB is caused by staying in a place which is not clean and a lot of smoke or dust. The study also found that few of the participants lacked knowledge on causes and mode of TB transmission as they indicated that smoking too much tobacco could cause TB and some said TB is caused by unclean water.

These sentiments were:

“TB bacteria live in the atmosphere. By sneezing it can move from one person to the other. If a person has TB and is taking treatment it cannot be passed to another person” (Participant A3)

“TB can be spread by when a person is walking on the streets, has TB and spitting sputum and the ground/streets and leave that sputum uncovered. Sometimes when you come and seat in a toilet and you don’t see that sputum you can be infected” (Participant A4).

“Coughing anywhere or without covering your mouth” (Participant B4)

“If here is anyone in the family who once had TB” (Participant B13).

“If there is one family member who has TB she can infect other family members living with her” (Participant B7).

“Let me explain in full. When living in a small house with someone who is infected

with TB and the windows are closed. You find that when we wake up we don't open the windows in the morning because that person coughs throughout the night and they haven't started the treatment. So, that person can infect us and infect others in the yard" (Participant C4)

"You can get TB when you meet someone who has TB and that person coughs with his/her mouth not being covered you can get TB from that" (Participant A4).

"Spitting of sputum and not covering it in the street you can infect others" (Participant A10).

"TB can be caused by drinking unclean water" (Participant E4).

"Smoking tobacco too much" (Participant C2).

The Department of Health (2009), indicated that patient education and provision of appropriate education materials and conducting community health education activities will empower them with knowledge about causes of TB and its mode of spread.

Gadd (2006), indicated that primary health care is essentially a public health strategy that aims at preventing and containing the spread of communicable and non-communicable diseases through health education to community and immunization against some communicable diseases. Primary Health Care nurses can play a vital role in the prevention of TB through health education, immunization with BCG and the provision of preventive treatment against diseases.

- **Sub-theme 1.2: Knowledge on causes and mode of HIV transmission.**

The study found that all participants lacked knowledge on the cause of HIV. However, they had knowledge of the mode of HIV transmission. Participants indicated that unprotected sex, sharing of razor blades and mixing blood with infected person can cause the transmission of HIV. Others said HIV can be transmitted in accidents injuries. Some participants stated that HIV can be transmitted by having lots of sexual partners. A few participants lack knowledge on

the mode of HIV transmission as they stated that it can be transmitted through eating food with the HIV infected person who did not wash hands after using the toilet. Other participants indicated that bathing in the same water with HIV infected person if someone is injured can transmit HIV. This was expressed as follows:

“Because of unprotected sex. Sharing razor blades and needles. During accident especially when you have cuts and there is someone who is infected with HIV and your blood mixes” (Participant A3).

“Having unprotected sex with someone who is infected with HIV and not knowing that he/she has HIV” (Participant A4).

“Another thing that causes HIV is that when I have a wound and someone has a wound as well and our blood mixes, that person will infect me with HIV” (Participant B2).

“If I get injured and another person helps me and that person has an injury that person can be infected if our blood mixes” (Participant D8).

“Bathing in the same water with someone who is infected. Only if you are both injured” (Participant C9).

“Through food when eating with someone who is infected without washing hands properly and they come from the toilet” (Participant 9).

According to the Department of Health (2009), patients’ education, provision of appropriate education materials and conducting community health education activities are the responsibilities of PHC nurses and CHBCs in the prevention of TB and HIV in communities.

According to Limpopo Mentor Mother Programme (2015), there should be the ongoing peer support and education about Mother to Child Transmission (MTCT) and Prevention of Mother to Child Transmission (PMTCT). Education about healthy pregnancy for all HIV-positive women attending the health facility, as well as their

partners and family members is needed.

Knowledge on prevention of HIV from mother to child was not mentioned by any of Participants. It is therefore very important for the PHC nurses and CHBCs to intensify education to patients on HIV mode of spread reinforcing the issue of mother to child HIV transmission.

Sub-theme 1.3: Knowledge on TB and HIV drugs and related side-effects.

All participants had knowledge on the TB and HIV drugs side effects. They indicated that the drugs cause's nightmares and patient should take safety measures by locking doors when going to sleep as some develop sleep walking. Others indicated that treatment can cause dizziness, vomiting, rash, diarrhoea and nausea. They indicated that something sweet should be taken in case of nausea to prevent vomiting. Some indicated that they were told that ARVs can change their body shapes. This was indicated as follows:

“Yes they did. They told us that the side effects for TB and HIV drug can be diarrhoea, vomiting and sometimes you can have nightmares. When I start taking treatment it was around 7 in the evening. After taking my treatment I became dizzy” (Participant A4).

“Yes and they told me to continue taking treatment because that will come to pass as time goes on” (Participant A4).

“The first day I took my treatment the side effects that I had were headache and when I went to sleep I felt like my bed was moving. I didn't take it serious because they already told me about the side effects of the drugs. They also told me that regardless of the side effects I must not stop taking treatment” (Participant A1).

“Yes they told me about the side effects of the ARVs. They told me that I might get nightmares” (Participant E8).

“Yes they did. They told us that this treatment has side effects. It can happen that you develop rash or have running stomach as one of the side effects. We mustn't be

scared if we see those kinds of things as we start treatment. What we need to know is that those are some of the side effects” (Participant B12).

“They told us to lock the doors when you sleep because you can sleep walk without being notice by anyone” (Participant B4).

“They also told us the treatment can change your shape, you find that I am a woman and I start looking like a man and a man can start developing breasts” (Participant B8).

Patient’s education about drugs side effects is very important to ensure adherence to treatment. If not educated they can stop treatment when experiencing those unpleasant side effects. This was confirmed by a study conducted by Monru, et al. (2006), which revealed that some patients reported to have stopped medication due to side effects because they were never informed about those side effects. Knowledge about side effects can allay the anxiety to patients because adherence to medication is highly dependent on knowledge. Continuous education and counselling should be done to ensure patient’s adherence to treatment. A study conducted by Rowe and Makhubele (2007), indicates that side effects of treatment contribute to non-adherence and therefore it is very important to counsel and educate patients on the side effects. It is important to inform the patients about treatment side effects and how to manage these side effects for the patient to continue taking treatment.

5.3.2 Theme 2: Emotional and psychological reaction of patients on being diagnosed with TB and HIV.

Participants expressed their feelings and reactions after being diagnosed with TB and HIV diseases. Two sub-themes emerged from this theme as fear and anxiety, and denial and acceptance.

- **Subtheme 2.1: Fear and anxiety.**

Most participants indicated that they were anxious and scared after being diagnosed with HIV. They indicated that they feared that they are going to die and worried about who will take care of their children when they are dead. One participant indicated

that she was terrified and even fainted after she tested positive for HIV. Participants fear was expressed as follows:

“When I heard that I was HIV positive I was scared. I thought that I was going to die and leave my children and who is going to take care of them. I went to the hospital and they told me to take treatment. Now I’m feeling ok. I have been taking treatment since 2007 until now” (Participant B11).

“I was scared. I started thinking that I will die having only one child. I received counselling and I accepted my status and they even told me that’s it’s not the end of life. Now I have 3 children after being HIV positive” (participant B3).

“I was scared but after going for counselling at the hospital they gave me treatment. They gave me a small paper to give the Home Based Carers to help me or remind me to take treatment. Now I am fine” (Participant B4).

“After testing and found out that I was HIV positive I was hurt. They told me that it is not the end of the world and they also told me about support groups. I met with support group members and I started seeing that I’m not the only one being infected with HIV. I am no longer scared of HIV and I am not shy to tell people about my status” (Participant B9).

“When you have TB you cough a lot. I once had TB after finding out that I was HIV positive. I took treatment for six months, after they told me that I have TB I fainted because I was in denial. I was hurt” (Participant B15).

“I was hurt. I developed rash on my genitals and went to the clinic and they took my blood and they told me I was HIV positive it was difficult for me to accept when I got to Kopanong and found a lot of people then I accepted. I got home and told my kids and those close to me” (Participant C1).

Participants developed fear after being diagnosed with TB and HIV. The fear emanated from lack of knowledge about the condition. Continuous counselling and education to the patient about TB and HIV as well as treatment will allay the fear and

anxiety that patients have. Once diagnosed HIV positive, it is very crucial for the individual to accept their condition and to develop a positive attitude towards the illness by living positively with HIV. PHC nurses and CHBCs should provide education and counselling to patients' families so that they can also provide support to the patients.

A study conducted by Johnson and Witt (2007), indicated that different approaches were suggested to improve counselling which will allay the patients fears. These included involving patient's family in counselling and also offering spiritual counselling. According to Musheke, Bond and Merten (2013), good relationships between HIV positive patients with their families, friends and health care providers motivated them to adhere to their treatment. This will be possible if the fear is allayed and patients accepted their condition.

- **Sub-theme 2.2: Denial and acceptance.**

Some participants indicated that they denied that they are HIV positive and wondered why are they infected. Some indicated that they even move from one hospital to another for re-testing but the results were still HIV positive. Participants stated that they were devastated on hearing that they are infected with HIV. They indicated that after being diagnosed with TB and HIV, nurses provided them with education and counselling about their conditions. They also referred them to the support group. Participants then accepted their condition after attending the support group sessions and being aware that they are not the only ones that are infected. Denial and acceptance of the condition was stated as follows:

“After finding out I just asked myself why me? It took a long time not accepting I went to the hospital in 1989 and found out that I was positive. Tested in Polokwane, Alexander and then went to do the tests again in Thembisa. I then accepted and disclosed my status without anger” (Participant E12).

“No. I defaulted. I tested and the virus was lower than detected and thought that I no longer have HIV. I started losing weight and I went to the clinic and did HIV tests and they came out positive. So, I stopped taking the medication until my condition was bad. The nurses encouraged me to come back and take my medication” (Participant

C2)

“To tell the truth is not that easy. Is just like knowing that your mother or child has passed away. I went to so many clinics and the results came out the same which was positive. My family told me to go to church and see prophets. You need support group to accept your status because if you don't open up to others it's not going to be easy to accept” (Participant E9)

Denial of the condition can lead to non-adherence to treatment. This needs the intervention of health care providers in educating the patients as well as providing on-going counselling to patients. The counselling and education should be directed with the involvement of the patients and their families in the treatment plan. That will motivate the patient and their families to accept the patient's condition and the stigma and discrimination towards the patient will be reduced. According to Tejero (2011), patients' involvement in their care, boosts the level of trust and satisfaction as well as increasing compliance with medication and treatment plans. According to the Department of Health (2009), CHBCs should be allocated to conduct home visits to patients to provide DOT so that the patient can feel supported. Availability of the CHBC to the patient will calm them emotionally because they will feel that they are accepted by the health care providers. Patients need to be introduced to the support group to make them aware that they are not the only ones with these conditions.

Education and counselling are powerful strategies in health services as participants accepted their condition after education and counselling. Patients were referred to join support groups for emotional, psychological and social support. This encouraged them to adhere to treatment; adherence to treatment will improve health status of the patients and reduce the death rate due to TB and HIV. An important approach to improve adherence is the active participation of patient in their own treatment. Support groups of people living with HIV and AIDS are important, educational programmes that focus on behaviour change also play an important role (WHO 2008b). The patient on ART and TB treatment is the one who will have to decide whether they are going to remain on treatment or not. Patient has to show dedication in order for the treatment to be successful. According to McNichol (2008), health care providers should develop good relationship and non-judgmental attitude

to the patients and show unconditional acceptance in order to motivate patients to accept their conditions.

5.3.3 Theme 3: Attitudes towards the TB and HIV co-infected patients.

The TB and HIV infected patients indicated the attitudes of some people towards them. Two sub-themes emerged as Clinic staff attitudes towards TB and HIV infected patients and attitudes of CHBCs towards TB and HIV infected patients.

- **Sub-theme 3.1: Clinic staff' attitudes towards TB and HIV co-infected patients.**

Some participants indicated that some clinic staff members have positive attitudes towards them while others have negative attitudes. Those that have positive attitudes from the clinic staff indicated that the clinic staff is treating them well. They indicated that clinic staff teach them how to take their treatment and on adherence to treatment as well as on positive living with HIV. They stated that they educate them about side effects of drugs and what to do if they encounter those side effects.

However in contrast there were some patients who reported the negative attitudes from the clinic staff. They indicated that some clinic staff have negative attitude towards them because they refuse to give treatment to people whom they send to collect treatment on their behalf when they are at work. Nurses also refused to provide treatment to patients enrolled at other health services unless they had a referral letter. This expressed as follows:

“We have a good relationship with our Home Based Carers and our nurses. They teach us on how to take our treatment even if we are going to attend funeral so that we don't skip treatment” (Participant B4).

“We have good relationship with nurses. They tell us not to take traditional medication and treatment at the same time because traditional medication and treatment don't mix” (Participant B3).

We don't have a problem at all because they take out our file before we even get to

the clinic” (Participant C7).

“Our relationship is good and they prepare our things for us to avoid long lines waiting for medication” (Participant C8).

“They explain everything to us even when the time for taking blood comes they explain everything” (Participant D13).

“Yes I do have challenges. I am the only one who takes care of the family because the person who was helping me passed on. As the head of the family you find that when the time for my treatment collection date arrives I am at work. When I send someone to collect my treatment they refuse to give that person my treatment. Again you find that a person is working in Johannesburg and is back home for festive season, then the time to collect medication arrives when he is still at home they refuse to give that person medication. They want a referral form first and you find that in Johannesburg they refused to give that person a referral form” (Participant B14).

Positive attitudes of the clinic staff to TB and HIV infected patients will promote co-operation of patients and this will ensure adherence of patients to treatment. This will promote co-operation from the patients. CHBCs should be allocated to support the patients at home. These CHBCs should receive in-service trainings from the PHC nurses to update them about the new policies concerning their work (Department of Health 2009). The role of PHC nurses is to ensure that the TB and HIV infected patient is allocated a responsible, trained, willing CHBC who will provide DOT to the patients and who is acceptable to the patient. It is also stated in the Department of Health (2009), that DOT is recommended for all TB clients for the entire period of treatment to ensure adherence. Nurses and CHBCs should provide both physical social supports to the patients and families. This will be ensured by conducting joined support visits to the patient’s homes.

- **Sub-theme 3.2: Attitudes of the CHBCs towards TB and HIV infected patients.**

Some participants mentioned that CHBCs have positive attitude towards them. Some indicate that CHBCs help them with supervision of treatment as well as giving

them health education about healthy lifestyle such as taking good nutrition. This was indicated as follows:

“We have good relationship with our Home Based Carers. They don’t just help us take our treatment; they also give us health talks and how to live with this virus. They also teach us about good nutrition on which kind of food is good for our body” (Participant B7).

“I have no problem with them because I wasn’t taking my treatment properly but the home based carers made sure that I take my treatment correctly” (Participant C10).

“I do not have a problem with them at all” (Participant D9).

“Even myself at Sekgakgapeng Clinic they treat me well” (Participant D11).

“When DOT Supporters come to your house is when he/she was referred by the clinic staff. It’s because some of us are still in denial and don’t want their neighbours to know their status” (Participant D12).

CHBCs will motivate the patients to co-operate on their treatment plans and be involved in their own care through their positive attitude. Trained CHBCs should closely supervise patients on TB treatment and ARVs on daily basis when taking their treatment. The CHBCs are trained to provide DOT to TB and HIV patients to ensure adherence. To support this statement, WHO (2006), indicated that high quality DOTS expansion and enhancement should be pursued in the management of TB and HIV in South Africa. It is the role of PHC nurses to ensure that the TB and HIV infected patients are allocated a trained, willing, responsible DOT supporter who is acceptable to the patients (WHO, 2006).

5.3.4 Theme 4: Education and Support to TB and HIV infected patients by clinic staff and CHBCs.

The majority of participants expressed the support they receive from Nurses and CHBCs. Three sub-themes emerged as education of TB and HIV infected patients, social support of TB and HIV infected patients and Emotional and Psychological

support of TB and HIV infected patients.

- **Sub-theme 4.1: Education of TB and HIV co-infected patients.**

Participants indicated that nurses are educating them on how to take treatment and the importance of adherence to treatment. They also taught them about prevention of TB and HIV spreading and on healthy nutrition. Participants indicated that nurses educate them about side effects of drugs and what to do in case of those side effects. This was expressed as follows:

“Yes they did. They told us that the side effects for TB and HIV drug can be diarrhoea, vomiting and sometimes you can have nightmares. When I start taking treatment it was around 7 in the evening. After taking my treatment I became dizzy” (Participant A4).

“They even teach us about prevention. They support us so that we know our status. They tell us that we must never get tired of taking treatment” (Participant A4).

“Yes they do. They gave me all the support and taught me how to take my treatment” (Participant C5).

Knowledge of patients about their conditions and their treatment is very important. Patient’s education improves trust and patient satisfaction and encourages patient’s adherence to treatment. Uninformed patient leads to lower patient satisfaction, lower adherence to health-optimizing medications and other adverse consequences such as costly readmissions to hospitals (Ahrens & Wirges, 2013). Nurses should facilitate learning by interactively instructing the patient about their medications. This will result in patient’s satisfaction towards the nursing care. According to Tejero (2011), patient’s involvements in their care boost the levels of trust and satisfaction as well as increasing compliance with medication and treatment plans. Greater patient involvement in the education process may be a useful strategy to improving patient’s satisfaction and adherence to treatment which will improve their health status that will prolong their lives.

Tejero (2011), examined the unique communication characteristics between a nurse and the patient and found that communication dynamics between the two individuals

play a very powerful role in determining patient outcomes, particularly the level of satisfaction a patient feels with the services provided by the nurse. Openness and warmth from the nurse will lead to a more positive reception by the patient; the nurse's level of engagement with the patient will impact on the outcomes of the patient's condition.

- **Sub-theme 4.2: Social support of TB and HIV co-infected patients**

All participants indicated that nurses provide them with counselling and introduce them to the support group where they meet other patients with the same condition. They discuss their challenges and motivate one another to accept their condition and adhere to the treatment. Continuous counselling is also offered by nurses in the support group meetings. This was indicated as follows:

“Still it was not easy to accept. Support groups are helpful and I can share openly and people are afraid to talk about your situation around you. But if you disclose it's much easy to talk about it” (Participant E9).

“From my side they are treating us very well. They never shouted at us not even a single day. We just collect our cards and they check us then give us our treatment. They even ask if we are suffering from other sicknesses like flue. If we have flue they give us medication for flue as well” (Participant A4).

PHC nurses should offer the Social support to the TB and HIV infected patients for them to feel accepted. Social support can be in a form of introducing them to the support group and referring them to the social workers for assistance in food parcels in case of the needy patients (Sarna, 2008).

Simoni et al., (2006), revealed that in order for the patient to adhere to treatment, there has to be social support which is the moral support and continuous encouragement of patients on ARVs and TB treatment by family members and friends. The family is the primary institution of socialisation, hence many people choose to disclose to family members after being diagnosed HIV positive. Families need to be empowered to provide the necessary care and support to the patients.

The relationship between the patients and health care professional improves patient's adherence to treatment (Johnson et al., 2007). The study that was conducted in Tanzania revealed that patients who felt that they were not receiving support from their family members stopped taking their treatment even in situations where their health was improving (USAID, 2010). This confirms that social support is important for the patient's adherence to treatment.

- **Sub-theme 4.3: Emotional and Psychological support of TB and HIV co-infected patients**

All participants indicated that nurses and CHBCs offer them emotional and psychological support through counselling and encouraging them to join support groups where they encourage one another about positive living and acceptance of their condition. They also encourage them to disclose their condition to someone they trust, and this will relieve them from stress. This was expressed as follows:

“After testing and found out that I was HIV positive, I was hurt. They told me that it is not the end of the world and they also told me about support groups. I met with support group members and I started seeing that I’m not the only one being infected with HIV. I am no longer scared of HIV and I am not shy to tell people about my status” (Participant B9).

“Yes, they teach us how to disclose our status. They even teach us to accept that we are HIV positive and how to help others who are infected with HIV. They teach us to counsel others who are infected so that they can be able to disclose their status as well” (Participant B8).

“Still it was not easy to accept. Support groups are helpful and I can share openly. People are afraid to talk about their conditions. But if you disclose it’s much easy to talk about it” (Participant E9).

All participants indicated that they were emotionally distressed after being diagnosed with HIV. Emotional and psychological disturbance can lead to non-adherence to treatment because the patient lose hope in life. It is the role of PHC nurses and CHBCs to offer emotional and psychological support to the patients so that they may

accept their conditions (Department of Health, 2009). Patient support includes education, counselling by a health care worker, and social worker, counsellor and peer group to the patients. The encouragement and support from a family member, co-workers and church members also form part of support system which plays an important role for the TB and HIV positive patient's health. It is also stated in the Department of Health (2009), that CHBC is recommended to provide DOT to the patient to ensure adherence to treatment.

Availability of the CHBC to the patient will support them emotionally and psychologically because they will feel that they are accepted by the health care providers. Nurses and CHBCs should provide psychological and emotional as well as physical care to patients. Measures to reduce depression among patients with TB and HIV should include effective symptom control, particularly of coughing, and measures to improve the financial status of this group of patients by referring the needy to social workers. Financial empowerment of patients may reduce their depression, and this will improve adherence to treatment and could furthermore bring an improvement to the quality of their lives (WHO, 2008).

5.4 Interpretative integration, Compilation and Comparison of Results.

The interpretive and integration of results of the PHC nurses, CHBCs and TB/HIV co-infected patients are presented in table 5.3.

Table 5.3: Interpretative integration of results.

Results	PHC nurses	CHBCs	TB/HIV co-infected patients
Knowledge on TB and HIV	Lack of training on management of TB and HIV	TB caused by bacteria and can be cured if treatment taken for 6 months HIV can be controlled	TB and HIV mode of transmission and drug side-effects
Attitudes		Some PHC nurses have positive attitudes, hold meeting with CHBCs, offer them materials such as gloves and dressings	Some PHC nurses have positive attitudes, treat them well and give them health education and continuous counselling about adherence to treatment; while some

		for patients; while some have negative attitude. Some patient have negative attitudes of hiding themselves when they see the CHBCs. Some families have negative attitudes and some are having positive attitudes and work well with them	have negative attitudes and refuse to issue their treatments to family members when they are not available and refuse to give them treatment when they are temporarily at home, they need the referral letter from the facility where treatment was started.
Staff shortage in the PHC facilities	PHC facilities are having staff shortage which course the delay in attending to patients		
Long waiting period at PHC facilities		Long waiting period at PHC facilities when accompanying patients for follow up visits	Waiting for long time at the PHC facilities before they can be attended to
Lack of social support to TB/HIV co-infected patients	No social support for patients such as food parcels and Conditional Grant to the unemployed patients	Lack of social support result in some patients non adherence to treatment because they cannot take treatment without food	Non adherence to treatment by some patients due to lack of food as they cannot take treatment in the empty stomach

- **Similarities in the results of PHC nurses, CHBCs and the TB/HIV co-infected patients.**

PHC nurses indicated shortage of staff which resulted in long waiting periods for patients at PHC facilities. The Community Home Based Carers and TB/HIV co-infected patients also indicated the challenge of long waiting period at PHC facilities before they can be assisted, and as a result some patients stop coming to PHC facilities to collect their treatment. Both PHC nurses, CHBCs and the TB/HIV co-infected patients indicated that there is lack of social support such as food parcels and Disability Grant to TB and HIV patients which resulted in patient's non-adherence to treatment as they indicated that they cannot take medication on an empty stomach.

- **Differences in the results of PHC nurses, CHBCs and the TB/HIV co-infected patients.**

Community Home Based Carers and the TB/HIV co-infected patients indicated that some PHC nurses have positive attitudes to them and treat them well; while others indicated that some PHC nurses are having negative attitudes towards them as they refuse to issue treatment to their family members on their behalf when they are not available. Some patients indicated that PHC nurses refuse to issue treatment to them if they do not have the referral letter from the facilities where they have started treatment. These attitudes may lead in patient's non adherence to treatment. Some patients displayed the lack of knowledge about causes of TB and HIV, and this may result in further spreading of diseases. Nurses indicated the lack of training plans and lack of skills audit in their facilities, as a results some of the PHC nurses might not attend the trainings as they will not be noticed that they did not attend the trainings. Nurses who are not trained on TB and HIV may not be able to offer both TB and HIV services to patients.

5.5 Conclusion.

This chapter focused on the discussions and interpretation of qualitative data collected from CHBC's and TB and HIV co-infection patients from the 5 districts of Limpopo province. Themes and sub-themes were identified and discussed. Four main themes were identified from CHBCs focus group discussions namely:

Motivation to become a Community Home Based Carers, Knowledge on TB and HIV diseases management, Roles and responsibilities of CHBCs towards TB and HIV patients and attitudes towards CHBCs. The following themes were identified and discussed from the TB and HIV patients' focus groups: Knowledge of patients about TB and HIV diseases, Feelings and reactions after being diagnosed with TB and HIV, Attitudes towards the TB and HIV infected patients and support to TB and HIV Patients. It was identified that participants were motivated to become CHBCs through the love and passion to the sick community members because they are doing the work voluntarily, though some are receiving the little stipend from NGOs. The love and passion of CHBCs was supported by TB and HIV patients who indicated that they receive care and support from CHBCs who visit their homes to conduct treatment supervision. The results from the quantitative and qualitative data were compiled and integrated.

CHAPTER 6

A MODEL TO ENSURE INTEGRATION OF TB AND HIV SERVICES.

6.1 Introduction

Qualitative results were discussed in chapter 5. This chapter discusses the TB and HIV integration model development. The results derived from the PHC nurses' questionnaires responses and from CHBCs and TB/HIV co-infected patients' focus group discussions were utilised in the model development. The objective of the model development phase was to:

- Develop a model to ensure integration of TB and HIV services in Limpopo Province.

6.2 Model development process

In the model development, the following reasoning strategies were followed: Analysis, synthesis and derivation.

6.2.1 Analysis.

The model development process was informed by the results that emanated from analysis of quantitative and qualitative data. The results revealed lack of integration of TB and HIV services as evidenced by offering TB and HIV services at different service points in the PHC facilities of Limpopo Province. Furthermore, the lack of integration was shown by insufficient training of PHC nurses in TB and HIV, 68.4% received TB training only and 67.2% HIV training only. This resulted in patients being referred from one service point to another. Patients ended up not adhering to their treatment as they missed appointments for follow up treatment. Lack of social support was also identified as a challenge because patients did not have money for travelling to the PHC facilities for separate services. Integration of TB and HIV

services will address the problem of missing appointments as the patients will be seen by one PHC nurse who will offer both TB and HIV service at the same time.

6.2.2 Synthesis.

Information was extracted from quantitative and qualitative data in order to obtain the key challenges such as lack of knowledge of PHC nurses about TB and HIV due to insufficient training. The lack of knowledge from PHC nurses impacted on the CHBCs who are supposed to be trained by PHC nurses on the care and support of TB and HIV patients in the community. Knowledgeable CHBCs will be able to educate patients and families in the community and this will strengthen patient's adherence to treatment.

6.2.3 Derivation.

The results derived from quantitative data were compared to determine how they are related, such as knowledge of PHC nurses about TB and HIV which will result in them managing to integrate TB and HIV services. Knowledgeable PHC nurses will be able to train CHBCs on integrated care and support of the TB/HIV co-infected patients.

Reasoning strategies used in the model development:

Two reasoning strategies, deductive and inductive reasoning were used in the model development (Babbie & Mouton, 2010).

6.2.4 Deductive reasoning.

Deductive reasoning is needed to operationalize the developed model. Deductive reasoning is moving from the general to the specific conclusions. Deductive reasoning enables the researcher to move from the general theoretical understanding to the hypothesis that can be tested (Babbie and Mouton, 2010). The TB/HIV service integration model should be abstract in nature to enable it to direct it to deductive reasoning and move from abstract concept to well defined strategy in order to be implemented in the PHC facilities.

6.2.5 Inductive reasoning.

According to Babbie and Mouton (2010), inductive reasoning is when specific circumstances are combined to form the general statement, it is an analytic reasoning which is used when the information needs to be generalized from a small sample to a larger sample. This begins with an observation and thereafter, finding the patterns in the observation made. In this study, inductive reasoning was used in the model development process to analyse the data generated from the focus group discussion to extract the central concept which is integration.

6.3 Concept analysis.

According to Rhodes (2012), concept analysis is a process that allows examination of the attributes or characteristics of the concept. This is the step in research where concepts to be used in the study were identified, described and classified. Concept analysis involves the process through which the attributes necessary to the meaning of the concepts are identified and it also entails identification and clarification of concepts and variables on which the model is developed. According to Ridley (2007), the nature and the organization of the concept should be ascertained if it is the major concept with sub concepts under it.

In the process of concept analyses, related concepts with same meanings and some with different meanings but having relationship with the central concept will emerge to empower the central concept (Margolis & Lawrence, 2012). The related concepts should be analysed in order to establish their interrelationship and connection with the major concepts in the model. In this study, the pattern of concept analysis includes definition of the central concept which is integration, related concept, critical attributes antecedents and consequences.

6.3.1 The concept “integration”.

Integration is the state of combination or the process of combining into completeness and harmony (Donald’s Medical Dictionary, 2007). Integration in this study refers to diagnosis and treatment of TB and HIV in the same consulting room by the same Primary Health Care nurse guided by National Department of Health policy guidelines and protocols of how to diagnose and treat the TB and HIV. Management and treatment of the TB/HIV co-infected patients at the same time will

ensure trust and patients adherence to treatment which will improve the patient's quality of life.

Integration of TB and HIV services will be ensured if PHC nurses are using the knowledge gained from the trainings; they will offer comprehensive treatment care and support to patients that come to health facilities. PHC nurses are able to manage both TB and HIV at the same time without referring the patient from one service point to another. Effective integration of TB and HIV services in the PHC facilities will benefit the patients as well as PHC nurse as patient's loss to follow up will be reduced and the treatment outcomes will be improved. The Government will also benefit because patients will be treated with first line drugs which is cost effective as compared to complicated treatment of MDR -TB.

6.3.2 Concepts related to integration.

Related concepts refer to ideas that are similar to the concept being analysed, but have subtle differences when examine closely (Ridley, 2007). According to Chinn and Kramer (2011), concept relationships are used to structure the concept of the theory in a manner that the interactions of concepts are clear. The researcher identified the concepts related to integration as collaboration, team work, support TB and HIV services and Communication. Collaboration occurs when the TB and HIV services are conducted in the PHC facilities but separately, referrals made between the two services through effective communication. PHC nurses will work collaboratively by referring patients from one service to another. TB service provider will refer the patient to the HIV site for HIV counselling and testing and the HIV site will refer the HIV patient to TB site for TB screening. This is time consuming which will result in the loss to follow up of patients. Team work, support and Communication with other stake holders in the care of TB and HIV patients will ensure integration of TB and HIV services.

Integration of services is essential because the patient will receive both treatments in one consulting room and treated by one PHC nurse. Collaboration also entails interaction with multidisciplinary teams such as involvement of community stakeholders, working with Non-Governmental Organizations (NGOs), referring TB and HIV patients to Medical practitioners, social workers and dieticians. Traditional

health practitioners and faith based healers are capacitated through trainings and involved in supporting the TB and HIV patients who go to them for traditional treatment as well as faith healing respectively.

Team work, communication and support between PHC nurses, CHBCs and the multidisciplinary team will improve service provision to TB and HIV services. Effective communication will result in co-operation amongst the team of health care providers in different levels and this will result in achieving the goal which is integration. Involvement and education of traditional health practitioners will correct the misconceptions and myths about the diseases.

The relationship between integration and collaboration, team work, support and communication is graphically described in figure 6.1.

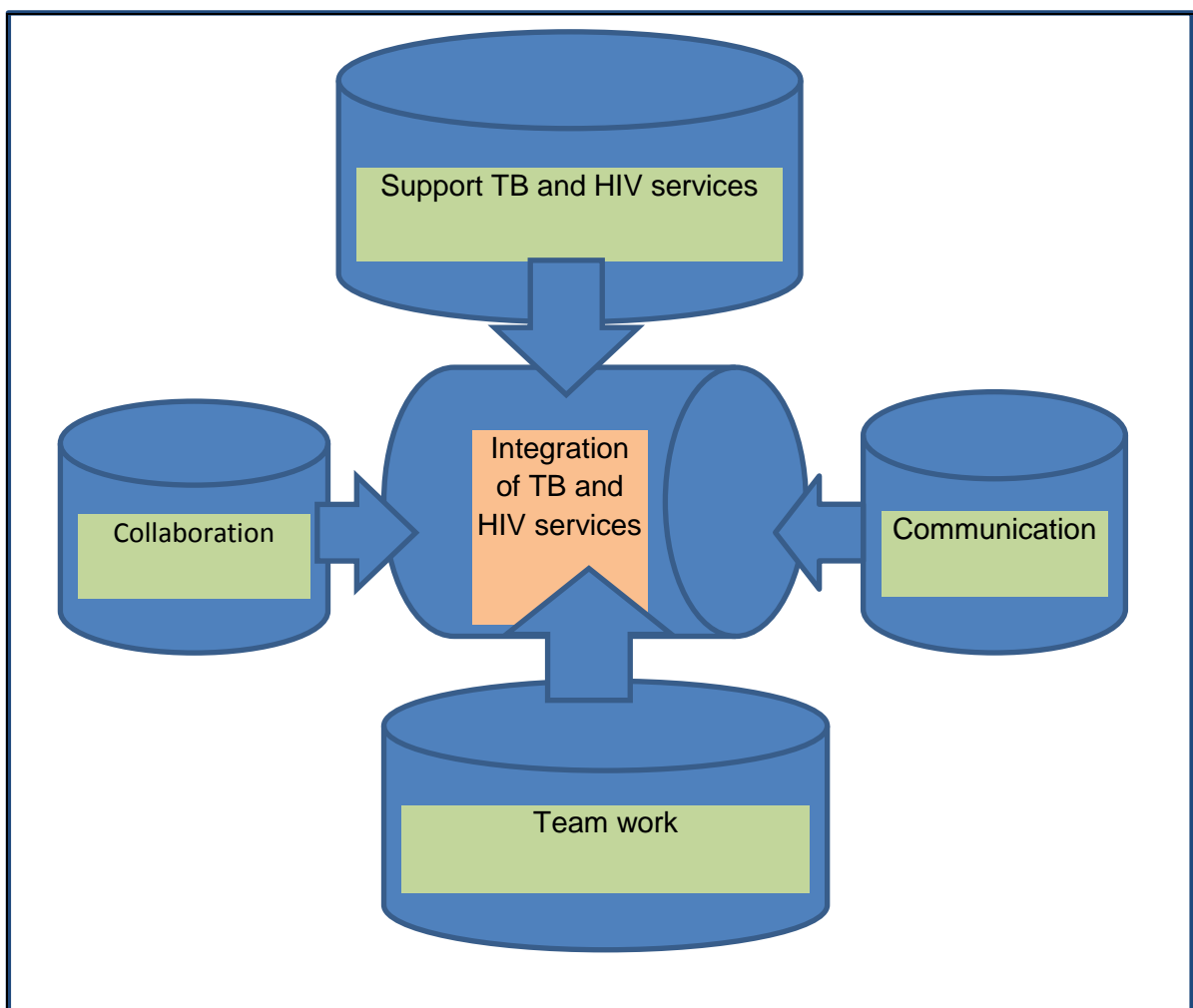


Figure 6.1: The concepts related to integration.

Figure 6.1 shows integration as the central concept. Furthermore, it shows the concepts related to integration which is discussed as follows:

- **Collaboration**

Collaboration is the process of two or more people or organization working together to build consensus on common goals, approaches and outcomes. It requires an understanding of own and others' roles, mutual respect participants, commitment to common goals, shared decision making, effective communication relationships and accountability for both the goals and team members (Donald's Medical Dictionary, 2007).

- **Team work.**

Team work entails when a group of people work together cohesively towards a common goal, creating a positive working atmosphere and supporting one another and combine individual strengths to enhance team performance. In health, teamwork is a dynamic process involving two or more healthcare professionals with complementary background and skills, sharing common health goals and exercising concerted physical and mental efforts in assessing, planning, implementing and evaluating patient care (Valentine, Nembhard & Edmond, 2011).

- **Communication.**

Communication is the act of conveying intended meaning to another entity through the use of mutually understood signs and semiotic rules. Communication can be verbal which involves listening to a person to understand the meaning of a message. Written communication in which a message is read, and nonverbal which involves observing a person and inferring the meaning (Oxford English Dictionary, 2007).

- **Support TB/HIV services.**

According to Webster's Dictionary (2011) support means to agree or approve of someone or something to show approval of someone or something by doing something, to give help or assistance to someone or something.

Support means to agree with and give encouragement to someone so that he can succeed. It also means to hold something firmly or carrying its weight especially from below to stop it from falling, or encouragement for an idea to a group or a person (Oxford English dictionary, 2007).

- **Theoretical relationships.**

After the identification of concepts, ideas about their relationship start to form. The nature of these relationships will be examined to check if these relationships are descriptive, exploratory or predictive. Relationship statements describe, explain or predict the nature of the interactions between the concepts of the theory. Related concepts sometimes convey how empiricism occurs and provision of details on the relationship and interaction of concepts.

Chinn and Kramer (2011) indicated that some theoretic relationships can create meaning and share understanding without explanation. It was also stated by Chinn and Kramer (2011), that the structure of the theory gives an overall form to the conceptual relationships within it and emerges from theory relationship. In this study the relationships among the concepts of the integration model are shown by arrows in Figure 6.2.

The structure of the model is as follows:

Dickoff, James and Wieldenbach (1968), used the following six steps in a form of questions for model development:

- Who is the agent? Who is the recipient? What is the context? What are dynamics? What is the process? What is the terminus?

The agent refers to the person on the entity that performs the action (Dickoff, James and Wieldenbach, 1968). In this study agents are PHC nurses and CHBCs. The recipient is the person to whom the agent performs the action (Dickoff, James and Wieldenbach, 1968). In this study recipients are TB and HIV infected patients that come to the clinic for TB and HIV services provided by PHC nurses and CHBCs.

The context represents the area where the action takes place (Dickoff, James and Wieldenbach, 1968). In this study the context is the PHC facilities. The dynamics are the internal motivation of the agent and the recipient that contributes to reaching the desired outcome (Dickoff, James and Wieldenbach, 1968). In this study the dynamics are challenges that will make it difficult for TB/HIV integration to take place which is lack of training of PHC nurses which will cause them fail to take care of TB and HIV patients who are recipients. The process is the procedure of the action performed by the agent. PHC nurses diagnosing and treating TB and HIV infected patients.

The terminus is the results of the procedure performed by the agent to the recipient (Dickoff, James and Wieldenbach, 1968). In this study the terminus is the One-stop integrated TB and HIV services, which is diagnosing, treatment and management of TB and HIV patients by PHC nurses.

6.3.3 The procedure for concept analysis.

The procedure for concept analysis is divided in the following steps:

Step 1

The first step in concept analysis is to identify a concept that reflects the topic of interest. In this step integration of TB and HIV services in the PHC facilities of Limpopo Province was identified. Questionnaires that were administered to PHC nurses examined their knowledge of TB and HIV; as well as the manner in which TB and HIV services are provided in the PHC facilities

Step 2

The second step in concept analysis was to determine the aim of analysis (Walker and Avant 2011). The central concept and its meaning was clarified out. Related concepts were also identified and discussed as collaboration, communication, team work and support of TB and HIV services.

Step 3

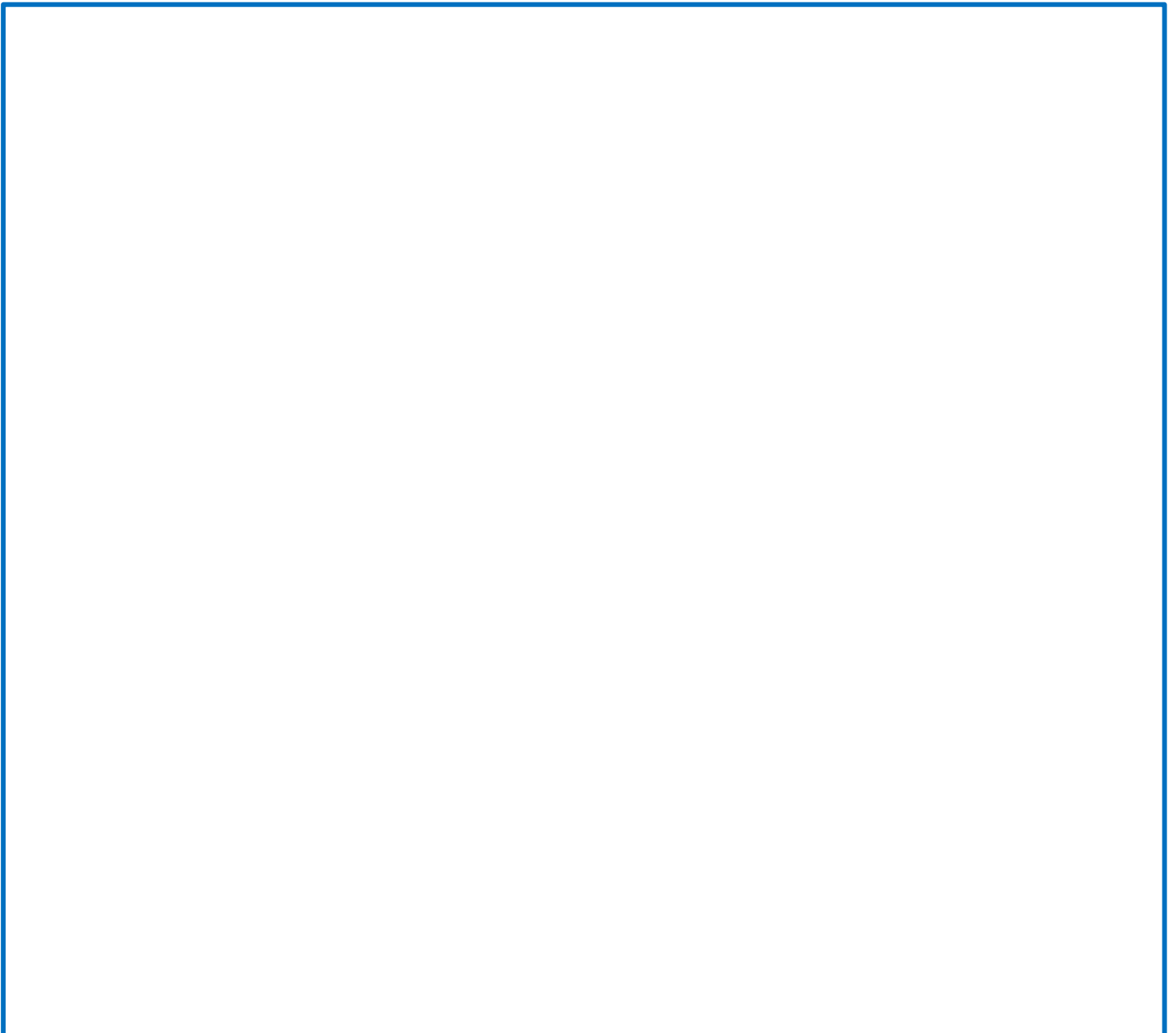
The third step was the model development which followed the theory of Dickoff, James and Wieldenbach (1968), following six steps in a form of the following questions: Who is the agent? Who is the recipient? What is the context? What are

dynamics? What is the process? What is the terminus? which were discussed in 6.3.2.

Step 4

The fourth step was the guidelines to operationalise the model which was discussed in 6.2 based on the following questions: Clarity of the structure of TB/HIV services integration model, a critical reflection of a model and generality and the importance of TB/HIV services integration model.

6.4 The TB and HIV services integration model.



Context: Primary Health care setting.

Goal: To ensure integration of TB and HIV services in the PHC facilities of Limpopo Province.

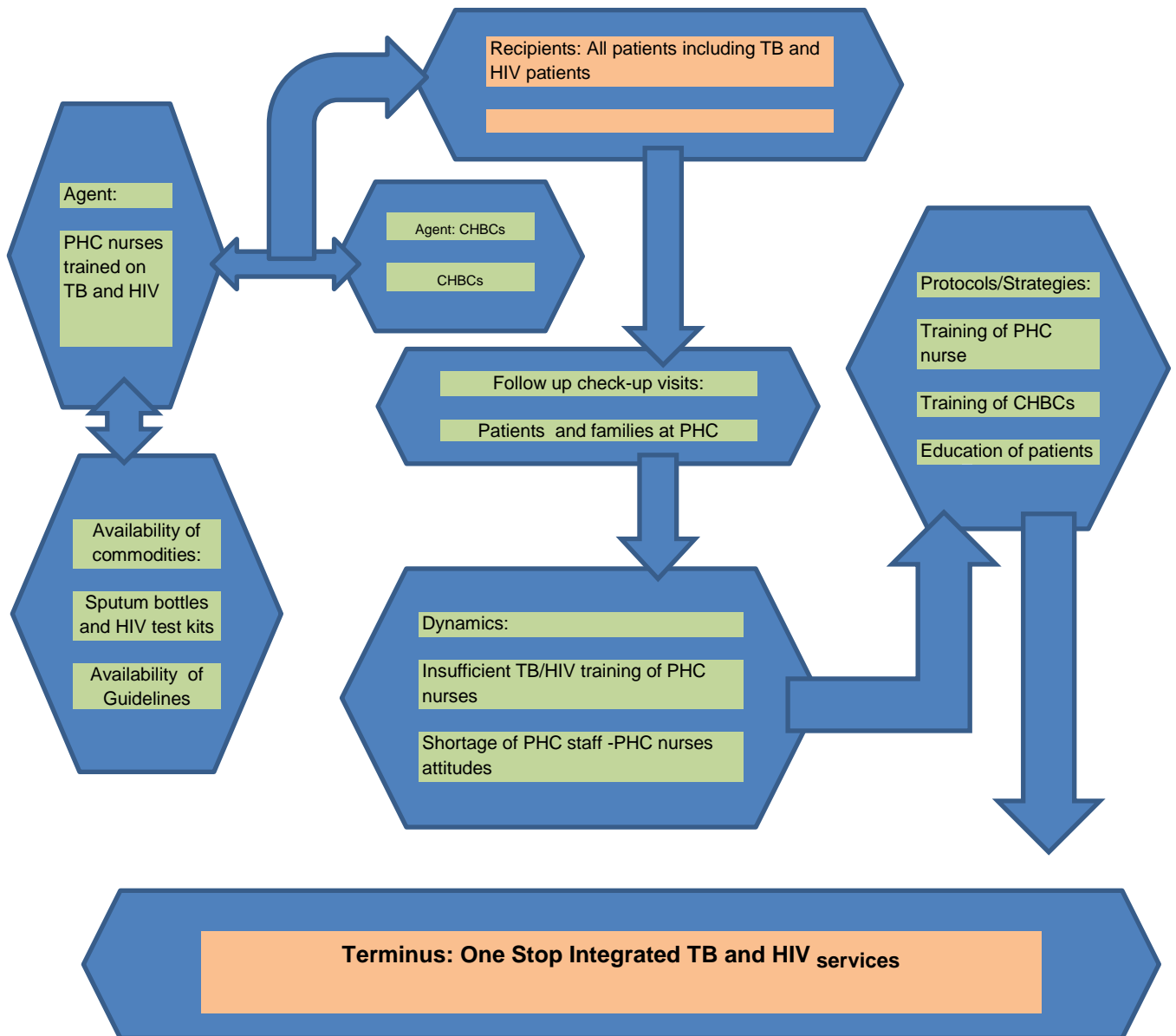


Figure 6.2: The TB and HIV services integration model

Figure 6.2 presents a model that represents the integration of Tuberculosis and Human Immunodeficiency virus services in the Primary Health care facilities of Limpopo Province.

6.4.1 Agents

Agents are the PHC nurses and CHBCs. The PHC nurses diagnose and initiate treatment to TB/HIV co-infected patients. These patients are then referred to the CHBC for care, treatment supervision and support in their homes. PHC nurses and CHBCs offer health education about TB and HIV to all patients in the facilities including TB/HIV co-infected patients.

6.4.2 Recipients

Recipients are TB and HIV co-infected patients that come to the clinic for TB and HIV services provided by PHC nurses and CHBCs.

6.4.3 The Context

The context for the TB/HIV integration model is the PHC facilities of Limpopo Province. The context of the model is meaningful because the fieldwork, which is data collection, was conducted in the PHC facilities of Limpopo Province. The TB and HIV services are provided in the Primary Health care facilities in the 5 districts of Limpopo Province. The TB and HIV services are provided by the PHC nurses who are working jointly with the CHBCs as they refer patients who need home based care to the CHBCs for continuation of care and support (Chinn and Kramer, 2011).

- **TB screening and HIV counselling and testing**

TB screening is conducted on all HIV-positive patients and everybody entering the PHC facilities and HIV counselling and testing is conducted on TB patients and all patients coming for consultation in the PHC facilities.

6.4.4 Dynamics

The results of the questionnaires and focus group discussions indicated the challenges that prevented PHC nurses and CHBCs from providing high quality care to TB and HIV co-infected patients. Those challenges are shortage of PHC nurses who are trained in TB and HIV co-infection, which result in patient's long waiting period at facilities when coming for check-ups. CHBCs and TB and HIV co-infected patients explained the challenge of waiting for long periods at PHC facilities before they can be assisted. CHBCs and patients indicated the negative attitudes of PHC

staff to them when coming for check-up. Lack of social support to the needy patients was indicated as they need assistance in the form of food parcels and Disability Grant. Patients found it hard to adhere to treatment particularly if they didn't have enough food.

6.4.5 Protocols/Strategies

Strategies to ensure integration of TB and HIV services in the PHC facilities include built capacity of PHC nurses and CHBCs through training them about TB and HIV management. Patient's receives education about their condition, treatment and about the benefits of adherence to treatment.

- **Availability of commodities**

Commodities refer to the sputum bottles for collection of sputum for TB testing and HIV test kits for HIV testing to patients. These commodities should be available for the smooth provision of TB and HIV services.

- **Availability of Guidelines**

The availability of TB and HIV guidelines in the PHC facilities will assist PHC nurses on how to manage and treat the patients. Guidelines will assist PHC nurses on how to manage patients and to implement new policies.

- **Follow up check-up visits of patients and family**

Patients follow up visit gives the opportunity to PHC nurses and CHBCs to meet and educate them as well as to counsel both patients and their families. Families are involved in the care and management of patients. Families are educated about the condition of the patients and how to take care of them. Patients and family involvement in the care and management reduces stigma and discrimination to patients and improves adherence to treatment. This results in improved quality of life.

- **Monitoring and Evaluation**

Monitoring and Evaluation visits are conducted at the PHC facilities by the Provincial and District office managers for guidance on service provision. The outcome of all

activities will be the provision of an integrated TB and HIV services in the PHC facilities of Limpopo Province as they happen in the PHC context.

6.4.6 Terminus

The terminus is the results of the procedure performed by the agent to the recipient. In this study the terminus is the integration of TB and HIV services in the PHC facilities where the patients receive the comprehensive care for TB and HIV.

6.4.7 Arrows

- **Two way arrows**

Arrow between the agents who are PHC nurses and CHBCs indicate that they work together as a team, they collaborate and communicate.

Arrow between Agents, PHC nurses and CHBCs and Availability of commodities which are sputum bottles, HCT test kits and guidelines indicates that PHC nurses and CHBCs depends one another for the service to be provided, PHC nurses and CHBCs needs guidelines, sputum bottles and HCT to diagnose TB and HIV.

- **One way arrows:**

Arrow from recipients and their families shows that families accompany their patients to PHC facilities for follow up visit.

Arrow shows that recipients encountered dynamics which are challenges at PHC facilities, such as insufficient TB/HIV training of PHC nurses, shortage of PHC staff, PHC nurses' attitudes, attitude of patients and families and lack of social support to patients.

Arrow from dynamics which are insufficient TB/HIV training of PHC nurses, shortage of PHC staff, PHC nurses' attitude, attitude of patients and families and lack of social support for patients to protocols/strategies indicates that challenges will be addressed by strategies such as training of PHC nurses and CHBCs on TB and HIV programmes, education of patients and families, Monitoring and Evaluation by the Province and district.

Arrow from Protocols/ strategies which are training of PHC nurses and CHBCs on TB and HIV programmes, education of patients and families, Monitoring and Evaluation by the Province and district to the terminus which is the result of protocols.

That is One-stop integrated TB and HIV services. After the model development, the guidelines for its use were designed as in figure 6.3.

6.5 Guidelines for utilizing the TB/HIV integration model.



Figure 6.3: Guidelines for utilizing the integration of TB and HIV model.

The guidelines for operationalizing the TB/HIV integration model are outlined in figure 6.3 to enable the clinical implementation of the model in the PHC facilities of Limpopo Province. The guidelines include analysis of the context, commodities and guidelines, dynamics, protocols and strategies, monitoring and evaluation and the outcomes/ terminus.

6.6 Conclusion

This chapter discussed the TB and HIV integration model development. The structure of the model was outlined following the steps which are the agent who performed an activity, the recipient, the context where the activity was performed, the dynamics which are obstacles for activity to be smoothly performed, the process and the terminus which is the end results. Monitoring and evaluation was conducted to check on the implementation of the model as well as the guidelines for operationalisation of the model were discussed. Validation of the model will be discussed in Chapter 7.

CHAPTER 7

VALIDATION OF THE MODEL

7.1 Introduction

Model validation is the activity which is conducted to test the effectiveness of the model. Model validation determines whether the model answers the research question and met the objectives of the study. In this study validation of model was conducted to determine if the model met the objective of this study. The structure of the model and the questionnaires were given to PHC nurses and research and model development experts from University of Limpopo to validate the model.

The objective of model validation was to validate the model for its relevancy to integration of TB and HIV services in the PHC facilities of Limpopo province.

Validation was conducted to test the effectiveness of the model and determined whether the model answers the research question and the objectives of the study.

The following aspects were included in the validation of the model:

- Clarity of concepts
- Scope of model
- Extend of model use
- Logical development of the model

7.2 Validation process

The validation process included population and sampling, data collection, validity and reliability.

7.2.1 Population and sample of the study

Polit and Beck (2010), described the population as a group of individuals who have the same characteristics. The population was PHC nurses from the five districts of Limpopo province and research experts from University of Limpopo Nursing

Sciences Department. Due to the limited number of PHC experts and the model development experts, all the 43 participants were used for validation of the model.

7.3 Data collection

A self-administered questionnaire was used for data collection. According to de Vos et al. (2012), a questionnaire is a set of questions on a form which is completed by the respondents in respect of a research project. Questionnaires were given to respondents (PHC nurses) to complete during the presence of the researcher and collected them. Respondents from the districts were invited to a central venue per district. The researcher distributed the questionnaires and collected them after completion. The research expert was given questionnaires to complete and collected after 3 days (de Vos et al., 2012).

- **Description of the questionnaire:**

The questionnaire comprised the following 3 sections (Appendix 21)

Section A: Clarity of the structure of TB/HIV services integration model

This refers to whether the model describes the integration of TB and HIV services, and whether the integration model serve its purpose. This section consists of 12 items relevant to structure, concepts relationship and logical coherence. The structure refers to whether the context of the TB/HIV integration model was clearly described, is the goal clearly set as well as the structural connectivity within the model. Context relationship entails the connectivity between the concepts that were used in the model as well as establishment of logical coherence on the frame of reference of the model.

Section B: A critical reflection of a model

This section consists of 8 items that needs respondents to critically evaluate the nature of the model such as clarity of the model as to whether it can be easily used at PHC facilities and the simplicity of the Model.

Section C: Generality and importance of TB and HIV services integration model.

This section consists of 6 items which ascertain if the model can be used in the different disciplines of Health service provision, as well as to asses if the model can address the real situation of TB and HIV services integration.

7.4 Validity and reliability.

- **Validity.**

According to (Polit & Beck, 2010), validity refers to the extent to which an empirical measure accurately reflects the concept it is intended to measure. Validity of a measurement procedure is the degree to which the measurement process measures the variable it claims to measure. Validity refers broadly to the degree to which an instrument is doing what it is intended to do. The term validity generally refers to the process of ensuring the survey accurately measures what it is intended to measure (Trochim, 2006). In this study the questionnaire was administered to research and model development experts and PHC nurses experts to check the content and face validity.

- **Reliability.**

Per Polit and Beck (2010), reliability refers to the extent to which independent administration of the same instrument or highly similar instrument consistently yields the same or similar results under comparable conditions. Reliability is primarily concerned not with what is being measured, but with how well it is being measured. The questionnaire was administered to ten experts in PHC to test for consistency.

7.5 Data analysis.

The SPSS computer programme version 22 was used for data analysis. Descriptive statistics were calculated as frequencies and percentages.

7.6 Discussion of validation results.

The results are presented in tables followed by the discussions of the items in the relevant table and sections as follows:

7.6.1 Section A: Clarity of the structure of TB/HIV services integration model.

- The description of the TB/HIV Services Integration Model

Table 7.1: Description of the model

	Strongly Disagree		Disagree		Agree		Strongly Agree	
	F	%	f	%	f	%	f	%
A1 Title describes the TB/HIV service integration model	0	0.0%	0	0.0%	16	36.4%	28	63.6%
A2 The Structure of TB/HIV service integration is clear	0	0.0%	1	2.3%	14	31.8%	29	65.9%
A3 Concepts used in the TB/HIV integration model is simple	0	0.0%	2	4.5%	22	50.0%	20	45.5%
A4 The TB/HIV service integration model shows that it will serve the purpose	0	0.0%	1	2.3%	24	54.5%	19	43.2%

- **The title describes the TB/HIV services integration model.**

The participants were asked this question in order to verify if the title of the model describes the TB/HIV services integration model. The results revealed that 63.6% of the participants strongly agreed that the title clearly describes the model and 36.4% of the participants agreed that the title of the model describes the model. Which means 100% participants agreed that the title describes the TB/HIV service integration model. This implies that the title of the model clearly describes the TB/HIV services integration model.

- **The structure of TB/HIV services integration model is clear.**

The concept “structure” refers to the arrangement of and relations between the parts or elements of the integration model (Oxford Advanced English Dictionary, 2007). The participants were asked this question in order to establish if they understand the components or parts which constitute the integration model. The results revealed that 69.5%, respondents strongly agreed that the structure of TB/HIV services integration model is clear and well understood; while 31.8% agreed and 2.3% disagreed that the structure of TB/HIV service integration model is clear. This implies that majority of 97.7% of the participants agree that the TB/HIV Integration Model is very clear and well understood.

- **The concepts used in the TB/HIV service integration model are simple.**

The participants were asked a question to determine whether they agree or disagree that the concepts used in the TB/HIV service integration model are simple. The results revealed that 45.5% the participants strongly agreed that the concepts used in the TB/HIV service integration model are simple, while 50% of the participants agreed that the concepts used are simple. Only 4.5% of the participants disagreed, which implies that the concepts are complex to comprehend. This implies that the words, ideas or plans used in the TB/HIV service integration model are well understood by the participants, because the total of 95.5% of the participants agree that the concepts used in the model are simple.

- **The TB/HIV services integration model shows that it will serve its purpose.**

To serve a purpose means that something is useful or meets or satisfies the needs or requirements of something (Oxford Advanced English Dictionary, 2007). In order to ascertain whether the participants agree that the TB/HIV services integration model will serve its purpose, the participants were asked a question. The results revealed that 97.7% (Table 7.1) of the participants agreed that the TB/HIV services integration model will serve its purpose. Only 2.3% of the participants disagreed that the TB/HIV services integration model will serve its purpose.

The structure of the TB/HIV Services Integration Model

Table 7.2: The structure of the model

	Strongly Disagree		Disagree		Agree		Strongly Agree	
	f	%	f	%	f	%	f	%
A5.1 Goal of TB/HIV service integration model clearly set	0	0.0%	1	2.3%	18	41.9%	24	55.8%
A5.2 The context of TB/HIV service integration is clearly set	0	0.0%	1	2.3%	16	37.2%	26	60.5%
A5.3 There is a structural clarity in understanding the interactions within the structure of the model	0	0.0%	2	4.7%	22	51.2%	19	44.2%
A5.4 The structural consistency is related to the use of other structures in the model	0	0.0%	1	2.3%	26	60.5%	16	37.2%
A5.5 The model is displayed well graphically for visual presentation	0	0.0%	1	2.3%	18	41.9%	24	55.8%

- **The goal of TB/HIV Services Integration Model is clearly set.**

The respondents were asked a question to determine whether they agree that the goal of the TB/HIV services integration model is clearly set. A goal is a desired result, aim or end that a person or a system envisions (Oxford Advanced English

Dictionary, 2007). According to Zoldak (2015), there are five characteristics of successful goal setting, namely; specific, measurable, achievable, realistic and timely (SMART). The results revealed that 7.2, 97.7%, participants agreed that the goal of the TB/HIV Services Integration Model is clearly set. The minority 2.3% of the participants disagreed that the goal of the TB/HIV Services Integration Model is clearly set.

- **The Context of TB/HIV services integration model is clearly described.**

The term context refers to the surrounding circumstances that form the setting for TB/HIV services integration model in terms of which it can fully understood (Webster Dictionary, 2011). The participants were asked a question in order to verify whether they understand the surrounding circumstances of the TB/HIV services integration model. The results revealed that 60.5% and 37.2%, of the participants strongly agreed and agreed that the TB/HIV services integration model is clearly described. The total majority of 97.7% of the participants agreed that the TB/HIV services integration model is clearly described while only minority of 2.3% disagreed.

- **There is a structural clarity in understanding the interactions within the structure of the model.**

The respondents were asked whether they agree or disagree that there is a structural clarity in understanding the interactions within the structure of the model. The structural clarity refers to the quality of the model for being easily expressed, the results revealed that 44.2% of participants strongly agreed, while 51.2% of the participants agreed. This indicates that a total majority of 95.4% agreed that there is a structural clarity in understanding the interactions within the structure of the model. There are however, small groups of 4.7% of the participants who disagreed that there is a structural clarity in understanding the interactions within the structure of the model. This group indicates that the design of the model and the interactions of the various elements of the model are not understandable.

- **The structural consistency is related to the use of other structures within the model.**

The participants were also asked to respond whether they agree or disagree whether the structural consistency is related to the use of other structures within the model. Consistency means the ability to remain the same in behaviour and quality (Donald's Medical Dictionary, 2007). A consistent structure of the model is always guided by the same principles. The results revealed that 97.7% agreed, while 2.3% disagreed that the structural consistency is related to the use of other structures within the model.

- **The model displayed well graphically for visual presentation.**

The responses of the participants revealed that 55.8% of the respondents strongly agreed, 41.9% agreed and 2.3% disagreed that model displayed well graphically for visual presentation. That revealed that the majority of 97.7% of the participants agreed, while only a small group of 2.3% disagreed.

- **Concepts relationship of the TB/HIV Services Integration Model.**

Table 7.3: Concepts relationship

	Strongly Disagree		Disagree		Agree		Strongly Agree	
	f	%	f	%	f	%	f	%
A6.1 The concepts used in the model are well interconnected	0	0.0%	2	4.5%	18	40.9%	24	54.5%
A6.2 The interrelationships between the concepts and components are clearly displayed	0	0.0%	1	2.3%	19	43.2%	24	54.5%
A7 The model has evidence of logical coherence	0	0.0%	1	2.3%	21	47.7%	22	50.0%

- **The concepts used in the model are well interconnected.**

The participants were requested to evaluate if the concepts used in the model are well interconnected. The participants' responses revealed that 95.5% of the participants agreed that the concepts used in the model are well interconnected, while 4.5% of the participants disagreed. This indicates that the majority of the participants agreed that the concepts used in the model are well interconnected. This implies that the proposed TB/HIV Services Integration Model is very comprehensive and easy to implement by PHC nurses in the various PHC facilities of the Limpopo Province.

- **The interrelationships between the concepts and components are clearly displayed.**

The participants were asked to evaluate if there is any interrelationship between the concepts and components and if the relationship is clearly displayed. The results revealed that 54.5% of the participants strongly agreed, 43.2% of the participants agree, while 2.3% of the participants disagreed. This implies that majority of 97.7% agreed that there are interrelationships between the concepts and components are clearly displayed.

- **The model has evidence of logical coherence.**

One of the major characteristics of a model is logical coherence which means to stick together. When something has coherence, it means that all its parts fit together. An argument with coherence is logical and complete with plenty of supporting facts. A model which has logical coherence is a model which consistently making sense. The results revealed that 50% of the participants strongly agreed, 44.7% agreed and 2.3% of the participants disagreed. The responses indicate that most 94.7% of the participants agreed that the proposed model has logical coherence.

7.6.2 Section B: A critical reflection of a model.

The Clarity of the TB/HIV Services Integration Model.

Table 7.4: Concepts relationship

	Strongly Disagree		Disagree		Agree		Strongly Agree	
	f	%	f	%	f	%	f	%

B8 The TB/HIV integration model is clearly written	0	0.0%	0	0.0%	18	40.9%	26	59.1%
B9 The TB/HIV services integration model is understandable	0	0.0%	0	0.0%	16	36.4%	28	63.6%
B10 The concepts are easy to read	0	0.0%	1	2.3%	13	29.5%	30	68.2%
B11 The description of concepts helps to establish the empirical meanings	0	0.0%	3	6.8%	25	56.8%	16	36.4%
B12 The operational descriptions will ensure operational adequacy of TB/HIV services integration model	1	2.3%	0	0.0%	27	61.4%	16	36.4%
B13 The outcome of the TB/HIV services integration model is clear	1	2.3%	0	0.0%	14	31.8%	29	65.9%
B14 Operational guidelines are clear for the implementation of TB/HIV services integration model	0	0.0%	1	2.3%	17	39.5%	25	58.1%
B15 The model is simple for use	0	0.0%	2	4.5%	17	38.6%	25	56.8%

- **The TB/HIV integration model is clearly written.**

The participants were asked to confirm whether the TB/HIV integration model is clearly written or not that if it is easy to perceive, understand or interpret. The results revealed that 59.1% of the participants strongly agreed and 40.9% of the participants agreed that the TB/HIV integration model is clearly written (Table 7.4). This implies

that an overwhelming 100% of the participants agreed that the TB/HIV integration model is clearly written as there is no participant who disagreed.

- **The TB/HIV services integration model is understandable.**

A model which is understandable is a model which makes sense and is not confusing. The results revealed that all the participants (100%) agreed that the TB/HIV services integration model is understandable. It revealed that 63.6% of the participants who strongly agreed and 36.4% of the participants who agreed. There is not a single participant who disagreed.

- **The concepts are easy to read.**

The concepts that are easy to read are the concepts which are simple, understandable and logical. The participants were asked if the concepts used in the model are easy to read, which will render it easy to implement. The results reflected that 97.7% of the participants agreed, while 2.3% of the participants disagreed that the concepts are easy to read (Table7.4). This indicates that there are few participants who do not understand the TB/HIV services integration model.

- **The description of concepts helps to establish the empirical meanings.**

The participants were asked whether the concepts used in the TB/HIV services integration model have empirical meanings. Empirical meanings are based on, concerned with or verifiable by observation or practical experience rather than theory. The results revealed that 93.2% participants agreed that the description of concepts helps to establish the empirical meanings. Only 6.8% participants disagreed that the description of concepts helps to establish the empirical meanings.

- **The operational descriptions will ensure operational adequacy of TB/HIV services integration model.**

The participants were asked if the operational descriptions will ensure operational adequacy of TB/HIV services integration model. The results revealed that 36.4% of the participants strongly agreed, 61.4% of the participants agreed and 2.3% of the participants disagreed that operational descriptions will ensure operational adequacy

of TB/HIV services integration model. It is clear that a total of 97.8% of the participants agreed that operational descriptions will ensure operational adequacy of TB/HIV services integration model.

- **The outcome of the TB/HIV services integration model is clear.**

The participants were asked a question on whether the outcomes of the TB/HIV Services Integration Model are clear. The results indicated that 65.9% of the participants strongly agreed and 31.8% of the participants agreed while there are 2.3% of the participants who disagreed. The responses indicate that the majority (97.7%) of the participants agreed and have confidence on the TB/HIV Services Integration Model.

- **Operational guidelines are clear for the implementation of TB/HIV services integration model.**

The operational guidelines provide instruction on how to use the TB/HIV services integration model. The participants were asked whether operational guidelines are clear for the implementation of TB/HIV services integration model. The results revealed that 97.6% of the participants agreed, while 4.5% of the participants disagreed that operational guidelines are clear for the implementation of TB/HIV services integration model. This implies that there is an overwhelming total of 97.6% of the participants who accept that the operational guidelines are clear for the implementation of TB/HIV services integration model. There is however a small group of participants 4.5% who believe that the operational guidelines are not clear for the implementation of TB/HIV services integration model.

- **The model is simple for use.**

The respondents were asked whether the TB/HIV services integration model is easy to implement. The results revealed that 95.4% of the participants agreed and only 4.5% of the participants disagreed, that the model is simple to use. This indicates that there are only few people who will find it difficult to use the TB/HIV services integration model. It is however pleasing to realize that the majority of the participants, 95.4% find the model simple to use.

7.6.3 Section C: Generality and the importance of TB/HIV services integration model.

Table 7.5: The generality and the importance of TB/HIV services integration model.

	Strongly Disagree		Disagree		Agree		Strongly Agree	
	F	%	f	%	f	%	f	%
C16 The TB/HIV services integration model is designed in broad implications that can make it applicable in different health care settings	0	0.0%	3	6.8%	23	52.3%	18	40.9%
C17 The Model is important to Primary Health Care practice	0	0.0%	1	2.3%	16	36.4%	27	61.4%
C18 The Model is important in nursing education	0	0.0%	1	2.3%	18	40.9%	25	56.8%
C19 The model is important for researchers	0	0.0%	3	7.0%	16	37.2%	24	55.8%
C20 The TB/HIV service integration model addresses the realities of the situation	1	2.3%	1	2.3%	23	52.3%	19	43.2%

C21 The TB/HIV service integration model is practice oriented	1	2.3%	0	0.0%	21	47.7%	22	50.0%
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The TB/HIV services integration model is designed in broad implications:-

- **That can make it applicable in different health care settings;**

The participants were asked whether the TB/HIV services integration model can be implemented in various health care settings. The results revealed that 93.2% of the participants agreed that the model can be applied in various health care settings and 6.8% of the participants disagreed. This implies that majority of the participants agreed that the model can be applied in various health care settings.

- **The Model is important to Primary Health Care practice;**

The participants were asked whether the model is significant for the primary health care practice, which refers to the whole field of health care service. The results revealed that 97.8% of the participants agreed, while only 2.3% of the participants disagreed that the model is significant for the primary health care practice.

- **The Model is important in nursing education;**

The results reflected on table 6.5, indicates 56.8% of the participants strongly agreed that the model is important in nursing education, 40.9% of the participants agreed and 2.3% of the participants disagreed. It is pleasing to realize that a total majority of 97.7% participants agreed that the model is important for the education of nurses.

- **The model is important for researchers;**

A model is important for researchers if it fills a gap which the researchers were not able to fill. If the researchers were struggling to explore and design an effective TB/HIV services integration model for PHC facilities, then this model will be able to fill that gap. The results revealed that 55.8% of the participants strongly agreed and 37.2% of the participants agreed that the model is important for researchers. This implies that majority of 93% agree that the model is important for researchers. There

is however 7% of participants who believe that the model is not relevant for researchers.

- **The TB/HIV service integration model addresses the realities of the situation;**

The participants were asked whether the TB/HIV service integration model addresses the realities of the situation in the PHC facilities. The results indicated that 95,5% of the participants agreed, while only 2.3% of the participants disagreed that the TB/HIV service integration model addresses the realities of the situation in the PHC facilities.

- **The TB/HIV service integration model is practice oriented.**

The participants were asked whether it will be possible to implement the TB/HIV service integration model in order to solve challenges faced by TB and HIV patients. The results revealed that 50% of the participants strongly agreed, 47.7% agreed and 2.3% of the participants disagreed that the TB/HIV Service Integration Model is practice oriented. It is therefore concluded that the TB/HIV service integration model is practice oriented because the majority of 97.7% agreed that the model is practice oriented.

7.7 Conclusion.

Chapter 7 presented the validation of the model to ensure integration of TB and HIV service which is recommended for improving the TB and HIV health care in the various districts of the Limpopo Province. The validation included clarity of the structure, critical reflection of the model, concepts relationship, logical coherence and generality and the importance of TB/HIV services integration model. The chapter also described the validation data analysis based on the data collected from PHC and research experts from the University of Limpopo. The results showed that an average of 97.7% of the respondents indicated that the TB/HIV Service Integration Model is credible, valid, and suitable for improving TB and HIV services in the five districts of the Limpopo Province.

CHAPTER 8

SUMMARY, LIMITATIONS, RECOMMENDATIONS AND CONCLUSION

8.1 Introduction

In chapter 7, the model for ensuring the integration of Tuberculosis and Human Immunodeficiency Virus services was presented and discussed. This chapter will focus on the summary of the study, limitations, recommendations and conclusions.

8.2 Summary of the study

The aim of the study was to develop a model to ensure integration of TB and HIV services in the PHC facilities of Limpopo Province.

The purpose of this study was to establish the knowledge and skills of PHC nurses in the diagnoses, treatment and management of TB and HIV patients. To establish the availability of resources such as guidelines and policies, this will direct nurses on the implementation of the TB and HIV programme. Management support will ensure availability of the budget for commodities such as HCT test kits, sputum specimen bottles as well as TB drugs and ARVs for integration to be implemented successfully. Experiences of CHBCs and TB/HIV co-infected patients will be also determined to

ensure the development of the model of HIV and TB integration services at PHC level. This section will focus on the achievement of objectives of each phase of the study; the quantitative and qualitative phase, Model development phase and validation of the model of this study.

8.2.1 The Empirical phase

- **The quantitative sub-phase**

The objective of the quantitative sub-phase was to determine the PHC nurses' knowledge and skills on management, care and treatment of the TB/HIV infected patients in Limpopo Province. The findings of this study revealed that most of the PHC nurses of Limpopo Province have the necessary knowledge and skills on management, care and treatment of the TB/HIV infected patients. The following are the findings of the quantitative phase:

- **Courses attendance**

The findings of this phase revealed that PHC nurses attends various types of courses, namely; HIV management, HIV counselling and testing, Mode of transmission, Prevention of HIV, Prevention of mother to child transmission, Adherence counselling, TB management course which includes TB screening to patients, TB diagnosing, Mode of transmission, Prevention of TB and TB treatment, TB/HIV integrations management, HIV counselling and testing to TB patients, HIV treatment to TB patients, TB screening to HIV positive patients, Diagnosing TB to HIV positive clients, TB treatment to HIV positive clients, sexually transmitted infections management which includes types of STIs, treatment of patients with STIs, Multiple drug-resistant TB management which includes diagnosing MDR-TB and treatment supervision to MDR-TB patients. The findings reveal that Vhembe and Capricorn districts had the highest proportion of PHC nurses attending TB and HIV courses.

- **Availability of guidelines**

The findings of this study revealed that the PHC facilities of Limpopo have the following Guidelines: TB Guidelines, HIV Guidelines, IPT Guidelines, STI Guidelines,

TB-Infection Control Guidelines, MDR-TB Guidelines and TB-HIV integration Guidelines. The findings also revealed that Sekhukhune District always has the most Tuberculosis management guidelines than the other districts in the Limpopo Province.

- **TB and HIV services provision**

The quantitative study findings indicate that most of the PHC facilities in Limpopo do not provide the TB and HIV services in the same building.

Capricorn District and Vhembe District have more facilities providing TB and HIV services in the same building than other districts in Limpopo Province.

- **Human resources and development**

The results of this study revealed that only 25.3% PHC facilities of Limpopo Province have adequate staff allocated to the facilities at all times, 74.7% facilities do not have adequate staff, and do not have adequate staff trained on TB and HIV management.

- **Client/patients Educational information, Advocacy Communication and Social Mobilization (ACSM)**

The findings of this study revealed that the PHC nurses of Limpopo Province conduct the following education sessions adequately: health talks on TB in patient waiting area, health talks on HIV in patient waiting area, distribution of educational materials on TB and distribution of educational material on HIV in the appropriate language as well Intensive education to patients diagnosed with TB and HIV.

- **Rate of Competency**

The findings of this study revealed that the PHC facilities of Capricorn, Mopani, Sekhukhune and Vhembe Districts have competent PHC nurses and only Waterberg District do not have sufficiently competent PHC nurses in the management of TB and HIV.

- **Integration of TB and HIV services**

The findings of this study revealed that Integration of TB and HIV is not offered in all PHC facilities of Limpopo Province and not all PHC nurses are responsible for TB and HIV management.

- **TB and HIV Programme support**

The results of this study indicate that all the PHC facilities of Limpopo Province have support groups but Vhembe and Waterberg Districts have more support groups than the other districts.

- **Availability of TB and HIV drugs and commodities in the facilities**

The findings of this study indicated that the PHC facilities of Limpopo Province are well supplied with TB drugs but Mopani district is well supplied with TB drugs more than other districts of Limpopo Province. The findings also reveal that 2.9% of the PHC facilities of Limpopo Province are not well supplied with ARV drugs.

- **Prevention of TB and HIV spreading**

The findings of this study revealed that the PHC nurses of Limpopo Province have the necessary knowledge on prevention of TB spreading and HIV transmission. PHC nurses of Limpopo Province understand that HIV infections are not prevented by opening of windows, TB and HIV cannot be transmitted by using the same eating utensils, toilet and bath with the TB and HIV infected person and hugging or hand shaking. The results revealed that some PHC nurses did not attend courses on management of Drug-Resistant TB hence they are not confident in management of Drug-Resistant TB patients.

- **The qualitative sub-phase phase**

The purpose of the qualitative phase of the study was to obtain in-depth information on the challenges faced by CHBCs and the patients regarding TB/HIV co-infection. The objectives of the qualitative phase were to:

- Determine the challenges faced by CHBCs regarding care and support of the TB/HIV co-infected patients in Limpopo province.
- Explore the experiences of patients regarding the TB/HIV co-infection in Limpopo province.

Focus group discussions were conducted to explore intensive information from five groups consisting of 51 participants of CHBC's from the five districts of Limpopo Province. The data obtained from the focus group discussions were organized into themes and sub-themes. Four themes emerged from data analysis namely; motivation to become the CHBCs, Knowledge on TB and HIV diseases management, Roles and responsibilities of CHBCs in the care of TB and HIV patients and attitudes towards CHBCs

- **Motivation to become the CHBCs**

The participants expressed the motivation for them to become the CHBCs. Three sub-themes emerged from this theme, namely; love and passion to help others, desire to help others and to promote health and prevent diseases. The findings of the study revealed that the participants developed love for CHBC after taking care of the sick family members as well as taking care of people who could not take care of themselves. The participants want people to leave better lives, developed love and passion of being CHBCs after caring for orphans left by parents who died of TB and HIV and they love to give support to people who are infected and affected by TB and HIV. The participants joined the CHBCs because they want to prevent diseases, reduce deaths, give health education about TB and HIV and encourage people to live a healthy lifestyle.

- **Knowledge on TB and HIV diseases management**

According to the participants, knowledge on TB and HIV diseases management is a major priority to all PHC nurses. Three sub-themes emerged from this theme, namely; training on TB and HIV management, TB as curable versus HIV as a controllable disease and Knowledge of TB and HIV drugs and related side effects. The findings revealed that CHBCs received 69 days training on management of TB and HIV, how to screen for TB in HIV positive patients and to test HIV in TB patients. The findings revealed that the participants know that TB is caused by bacteria, that it can be cured when treatment is taken for 6 months and that HIV can be controlled when patients take care of themselves and adhering to treatment.

- **Roles and responsibilities of CHBCs in the care of TB and HIV patients**

The findings of the study revealed that the participants understand their roles and responsibilities in the care of TB and HIV patients. Three sub-themes emerged from this theme namely: education of patient on TB and HIV diseases, supervision of patients on TB and ARV treatment and support to TB and HIV co-infected patients. According to the participants, the patients and their families should be educated about different types of TB and HIV treatment, cough hygiene to prevent the spread of TB, abstinence or condomising to prevent HIV as well as early attendants of ante natal clinic to prevent mother to child transmission of HIV.

CHBCs also stated that patients need to be educated about adherence to treatment. Participants indicated that they observe patient when taking treatment (DOT) as well as encourage the family members to support the patient and encourage them to adhere to treatment and practice good health behaviour such as eating well balanced diet, exercising as well and practising safer sex. The patients also need both social support, spiritual support as well as material support. Patients on TB treatment and ARVs should be closely supervised by trained CHBCs on daily basis when taking their treatment.

- **Attitudes towards CHBCs.**

The findings of this study revealed that there are some clinic staff members who have positive attitudes and those that have negative attitudes towards CHBCs. The clinics staffs with positive attitudes visit patients in their homes, conducts door-to-door campaigns with the CHBCs and attend meetings and conduct in-service training where they discuss challenges regarding care of patients at home. Those with negative attitudes do not give the feedback on the referred patient from CHBC's, do not hold meetings with the CHBC's and do not accept referrals from CHBC's and do not support the CHBCs. The findings also revealed that some family members are not taking care of their sick members, disown and isolate their patients saying it is the CHBC's patient and do not give patients food before taking medication. The findings also revealed that community members allow CHBC's to come into their homes and appreciate the good work that the CHBCs are doing.

8.2.2 The model development phase

The objectives of the model development phase were to:

- Develop a model to ensure integration of TB and HIV services in Limpopo Province.
- Determine availability of resources for implementation of the model for TB and HIV services integration.

The structure of the TB and HIV services integration model is as follows:

Agents: The agent refers to the person on the entity that performs the action, in this study agents are PHC nurses and CHBCs. The PHC nurses diagnose and initiate treatment to TB/HIV co-infected patients. These patients are then referred to the CHBC for care, treatment supervision and support in their homes.

Recipients: The recipient is the person to whom the agent performs the action. Recipients are TB and HIV infected patients that come to the clinic for TB and HIV services provided by PHC nurses and CHBCs. TB screening is conducted to all HIV positive patients and HIV counselling and testing is conducted to TB patients and all patients coming for consultation in the PHC facilities.

The Context: The context represents the area where the action takes place. The TB and HIV services are provided in the Primary Health care facilities in the 5 districts of Limpopo Province. The TB and HIV services are rendered by the PHC nurses who are working jointly with the CHBCs.

The dynamics: These are the internal motivations of the agent and the recipient that contributes to reaching the desired outcome of the agent. In this study dynamics are lack of training of PHC nurses which will lead them to fail to take care of TB and HIV patients who are recipients.

The process: This is the procedure of the action performed by the agent. PHC nurses diagnosing and treating TB and HIV.

Monitoring and Evaluation: Monitoring and Evaluation visits are conducted at the PHC facilities by the Provincial and district office managers for guidance on service rendering.

The terminus: This is the results of the procedure performed by the agent to the recipient, which is diagnosing, treatment and management of TB and HIV patients by PHC nurses. This will result in “**One Stop service**”: The One Stop service indicates that the TB and HIV infected patients are receiving care treatment, management and support at the same time in the same consulting room rendered by one PHC nurse without referring the patient from one service point to another.

8.2.3 The model validation phase

The objective of model validation is to validate the model for its relevancy to integration of TB and HIV services in the PHC facilities of Limpopo province. Validation was conducted to test the effectiveness of the model and determined whether the model answers the research question and the objectives of the study. The following aspects were included in the validation of the model namely; clarity of concepts, scope of model, extension of model use and logical development of the model. The following are the results of the model validation:

- **Clarity of the structure of TB/HIV services integration model**

The findings of the validation revealed that many respondents indicate that the title of the model is relevant and the structure of TB/HIV services integration model is clear. It also revealed that the concepts used in the TB/HIV service integration model are simple, the TB/HIV services integration model will serve its purpose and the goal of TB/HIV services integration model is clearly set. Respondents indicated that the context of TB/HIV services integration model is clearly described. The findings also revealed that there is a structural clarity and consistency in understanding the interactions within the structure of the model and the model displayed well graphically for visual presentation. The concepts used in the model are also well interconnected, the interrelationships between the concepts and components are clearly displayed and the model has evidence of logical coherence.

- **A critical reflection of a model**

The results of the model validation revealed that the TB/HIV integration model is clearly written, the TB/HIV services integration model is understandable, the concepts are easy to read, the description of concepts helps to establish the empirical meanings, the operational descriptions will ensure operational adequacy of

TB/HIV services integration model, the outcome of the TB/HIV services integration model is clear, operational guidelines are clear for the implementation of TB/HIV services integration model and the model is simple for use.

- **Generality and the importance of TB/HIV services integration model**

The findings of the validation revealed that the TB/HIV services integration model is designed in broad implications that can make it applicable in different health care settings, the Model is important to Primary Health Care practice, the Model is important in nursing education, the model is important for researchers, the TB/HIV service integration model addresses the realities of the situation and the TB/HIV service integration model is practice oriented.

8.3 Comparison of the TB/HIV service integration model with other models in the study

In the TB/HIV service integration model developed by the researcher, the TB and HIV services are provided in the same consulting room by the same PHC nurse at the same time. The PHC nurse provide the HIV counselling and testing to diagnose HIV, TB screening and sputum collection to diagnose TB; as well as provision of the ARVs and TB treatment. This model is easy to use, saves time and economic to the patient as he/she need not travel to the facility many times for different services. Adherence to treatment will also be improved as the patient will receive continuity of care in the same place. The other models presented earlier in the study such as separate TB and HIV service provision model where the TB staff provide the TB service and refer the patient to another building for HIV service provision. This model is time and money consuming as the patient will have to queue twice and given different return dates. This can result in nonadherence to treatment as the patient might sometimes run short of transport money to the Health facility for follow up visit. Another model presented earlier is the partial integrated model where TB and HIV services are provided under one roof in the different consulting rooms by different PHC nurses; in this model there is a TB focal point and HIV focal point. This is also time consuming as the patient is attended by two nurses at different times. It is also not economic as the patient might be given different return dates.

8.4 Limitations of the study

The study was limited to one Province of South Africa and the findings cannot be generalised to all Provinces.

8.5 Recommendations of the study

This study is presenting the integration model to all the stakeholders involved in the control and management of TB and HIV in PHC facilities. The main stakeholders in the Department of Health included medical practitioners and professional nurses. It is recommended that the model, namely; “The TB/HIV Services Integration Model” be studied and implemented on trial in order to investigate whether it can positively transform the control and management of HIV and TB in the Limpopo Province.

The following recommendations are made:-

- **Department of Health**

It is recommended that the Department of Health should ensure that all the healthcare workers of the Limpopo Province implement integration activities of TB and HIV in the healthcare centres. This can be ensured through training of all PHC nurses on TB and HIV management.

- **The TB/HIV Programme**

It is recommended that the proposed model, namely; “The TB/HIV Services Integration Model” be studied and implemented on trial in order to investigate whether it can positively transform the control and management of HIV and TB in the Limpopo Province.

- **PHC Nurses**

It is recommended that all the PHC nurses of the Limpopo Province should attend professional development courses in order to acquire more knowledge about the TB and HIV programmes for them to give comprehensive care of patients.

- **Further research**

This study focused on the development of a model that can be used to integrate the TB and HIV services in the PHC facilities of Limpopo Province. Since the study was mainly focused on the development of a model that can be used to integrate the TB

and HIV services in the PHC facilities of Limpopo Province, it would be ideal if the study could be extended to the other Provinces of South Africa. The findings of such a study could be vital in improving the control and management of HIV and TB in South Africa.

8.6 Conclusion

Chapter 8 discussed the summary, limitations, recommendations and conclusion. The overview of the study was outlined in chapter 1, literature review conducted in chapter 2. Chapter 3 described the research methodology as well as the overview of the model development. Chapter 4 discussed the results of the quantitative data and chapter 5 discussed the results of the qualitative data. In chapter 6 the TB and HIV service integration model was developed and described. In chapter 7 validation of the model was discussed.

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APPENDICES

APPENDIX 1: Ethical clearance from Sefako Makgatho University Research Ethics Committee



APPROVAL NOTICE - NEW APPLICATION

07 May 2015

Mrs MA Maake
University of Limpopo
Department of Nursing & Human Nutrition

MEETING: 04/2015
SMUREC Ethics Reference Number: SMUREC/HS/120/2015: PG

The New Application received on 12 September 2014, was reviewed by members of Sefako Makgatho University Research Ethics Committee on 02 October 2014 and was approved on 07 May 2015.

Title: A model to ensure the integration of tuberculosis and human immunodeficiency virus services in the primary health care facilities of Limpopo Province

Researcher: Mrs MA Maake
Supervisor: Prof ME Lekhuleni
Co-supervisor: Prof JC Kgole
Department: Nursing & Human Nutrition
Degree: PhD

Please note the following information about your approved research protocol:

Protocol Approval Period: 07 May 2015 – 07 May 2016

Please remember to use your protocol number (SMUREC/HS/120/2015: PG) on any documents or correspondence with the REC concerning your research protocol.

Please note that the REC has the prerogative and authority to ask further questions, seek additional information, require further modification, or monitor the conduct of your research and the consent process.

After Ethical Review: Please note a template of the progress report is obtainable in the Research Office and should be submitted to the Committee before the year has expired. The Committee will then consider the continuation of the project for a further year (if necessary). Annually a number of projects may be selected randomly for an external audit. Translation of the consent document in the language applicable to the study participants should be submitted.

International Organisation (IORG0004319), Institutional Review Board (IRB00005122), Federal Wide Assurance (FWA00009419)
Expiry date: 11 October 2016 and NHREC No: REC 210408-003

Sincerely

DR C BAKER
DEPUTY CHAIRPERSON SMUREC



**SEFAKO MAKGATHO
HEALTH SCIENCES UNIVERSITY
SMU Research Ethics Committee
Chairperson**

Date: 07/05/2015

Members of the Interim Council:

Prof O Shisana (Chairperson), Ms SA Mchunu, Mr P Slack, Dr N Simelela, Prof AM Segone, Dr E van Staden

APPENDIX 2: Letter of permission to conduct the study from the Department of Health Limpopo Province Head of Department



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH

Enquiries: Stols M.L.

Ref:4/2/2

Maake MA
15 African Dawn street
Bendor Ridge
Polokwane
0699

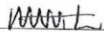
Greetings,

RE: A Model to Ensure Integration of Tuberculosis and Human Immunodeficiency Virus Services in the Primary Health Care Facilities of Limpopo Province

The above matter refers.

1. Permission to conduct the above mentioned study is hereby granted.
2. Kindly be informed that:-
 - Research must be loaded on the NHRD site (<http://nhrd.hst.org.za>) by the researcher.
 - Further arrangement should be made with the targeted institutions.
 - In the course of your study there should be no action that disrupts the services.
 - After completion of the study, a copy should be submitted to the Department to serve as a resource.
 - The researcher should be prepared to assist in the interpretation and implementation of the study recommendation where possible.
 - The above approval is valid for a 3 year period.
 - If the proposal has been amended, a new approval should be sought from the Department of Health.

Your cooperation will be highly appreciated.


Head of Department

15/06/2015
Date

APPENDIX 3: Permission letter to conduct the study from Capricorn District



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH AND SOCIAL DEVELOPMENT
CAPRICORN DISTRICT

Enq : Malema DMM
Tel : 015 290 9266
From : Primary Health Care
Date : 23 June 2015
To : Maahe MA
15 African Dawn Street
Bendor Ridge
Polokwane
0700
Subject : A model to Ensure integration of tuberculosis and human immunodeficiency virus services in the Primary Health Care facilities in Limpopo

The above matter bears reference

1. Permission has been granted to conduct the above mentioned study.
2. Kindly be informed that :
 - In the course of your research there should be no action that disrupts the services.
 - After completion of the research, a copy should be submitted to the Department to serve as a resource.
 - The researcher should be prepared to assist in the interpretation and implementation of the study recommendation where possible.

Your cooperation will be highly appreciated.


Senior Manager PHC

2015-06-24
Date

APPENDIX 4: Permission letter to conduct the study from Mopani District



REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH MOPANI DISTRICT

Ref: S5/4/1
Enq: Mohatli I.E
Tel: 015 811 6543

TO: MAAKE M.A
15 African Dawn street
Bendoor Ridge
Polokwane
0699

RE: PERMISSION TO CONDUCT RESEARCH AT MOPANI DISTRICT PHC FACILITIES. [A Model to ensure integration of Tuberculosis and Human Immunodeficiency virus Services in the PHC facilities of Limpopo Province]

1. The above matter refers.
2. It is with great pleasure to inform you that permission to conduct research at Mopani District PHC facilities has been granted by the District Executive Manager.
3. Further arrangements should be made with respective PHC facilities.
4. In the course of your study there should be no action that disrupts services.
5. Upon completion of the study, a copy should be submitted to the Department to serve as a resource.
6. The researcher should be prepared to assist in the interpretation and implementation of the study recommendation where possible.
7. You shall not wilfully disclose any information which may prejudicially affect the Department.
8. Hope you find the above in order.


SENIOR MANAGER: CORPORATE SERVICES

DATE: 29/7/2015

APPENDIX 5: Permission letter to conduct the study from Sekhukhune District



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH
SEKHUKHUNE DISTRICT

Ref: 4/3/6/3

Eng: Masopoga K.M

Tel: 015 633 2399

Date: 09/07/2015

To: Ms. Maake M.A

From: District Executive Manager: Sekhukhune District

Subject: A Model to ensure integration of Tuberculosis and Human Immunodeficiency Virus Services in the Primary Health Care Facilities in Limpopo Province.

The above matter bears reference.

1. Permission has been granted to conduct the above mentioned study.
2. Kindly be informed that:
 - In the course of your research patient care services should not be interrupted.
 - The researcher should provide the Department of Health with the copy of the research document after completion.
 - The researcher should be prepared to assist the implementation of the study recommendations.

Your cooperation will be highly appreciated


District Executive Manager
Mrs. Maepa M.L.

15/07/2015
Date

Private Bag X 04
Chuenespoort 0745. Tel: 015 633 2300. Fax 015 633 7927. Website: <http://www.limpopo.gov.za>
The heartland of southern Africa – development is about people

APPENDIX 6: Permission letter to conduct the study from Vhembe District



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

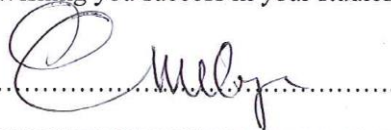
DEPARTMENT OF HEALTH VHEMBE DISTRICT

Ref: S5/6
Enq: Muvuri MME
Date: 24 July 2015

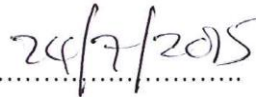
Dear Sir/Madam

PERMISSION TO CONDUCT A STUDY: MAAKE M.A

1. The above matter bears reference
2. Your letter dated 24/06/2015 requesting for permission to conduct a study is hereby acknowledged.
3. The approval from the Provincial office that you included in your request makes it easier for this office to help you.
4. Permission is therefore granted for the study to be conducted within Vhembe District
5. Wishing you success in your studies



ACTING DISTRICT EXECUTIVE MANAGER



DATE

Private Bag X5009 THOHOVANDOU 0950
OLD parliamentary Building Tel (015) 962 1000 (Health) (015) 962 4958 (Social Dev) Fax (015) 962 2274/4623
Old Parliamentary Building Tel: (015) 962 1848, (015) 962 1852, (015) 962 1754, (015) 962 1001/2/3/4/5/6 Fax (015) 962
2373, (015) 962 227

The heartland of Southern Africa – development is about people!

APPENDIX 7: Permission letter to conduct the study from Waterberg District



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH WATERBERG DISTRICT

REF: 4/3/3
ENQ: NKGODI D.R (PA TO THE DISTRICT EXECUTIVE MANAGER)
CELL NO: 082 344 0227.
DATE: 24/07/2015

TO: Ms. MAAKE M.A
UNIVERSITY OF LIMPOPO
FACULTY OF HEALTH SCIENCES

RE: PERMISSION TO CONDUCT RESEARCH: YOURSELF.

The above bear's reference:-

1. The office of the Acting District Executive Manager, hereby confirms receipt of your request to conduct a research on A Model to ensure integration of Tuberculosis and Human Immunodeficiency Virus service in the Primary Health Care facilities in Limpopo Province - Waterberg District.
2. Permission is hereby granted as per approval by the HOD.
3. You are further requested to notify this office on when you are going to start with the research.

Your support and cooperation in terms of the above will be highly appreciated.

=====  =====
ACTING DISTRICT EXECUTIVE MANAGER
WATERBERG DISTRICT

27/07/15
=====

DATE



Waterberg District Office Private Bag X 1026 Modimolle,
0510 Tel (014) 713 0600 Fax (014) 718 0675

The heartland of Southern Africa – development is about people!



APPENDIX 8: QUESTIONNAIRE FOR PRIMARY HEALTH CARE NURSES

INSTRUCTIONS

1. Do not write your name on this questionnaire
2. Mark the appropriate box with an "X"

SECTION A: BIOGRAPHIC DATA

1. Gender

Male	
Female	

2. Programme that you qualified from

Four-year degree comprehensive course R425	1
Four- year diploma comprehensive course R425	2
Integrated general nursing and midwifery	3
General nursing (3 years)	4
Bridging course	5

3. For how long have you been working in this Primary Health Care facility?

3-5yrs	1
6-7 years	2
8-9 years	3
10-12 years	4
More than 13years	5

4. In which District are you currently working?

	The name of the district you are working in	
1.	Capricorn	1
.	Mopani	2
3.	Sekhukhune	3
4.	Vhembe	4
5.	Waterberg	5

SECTION B: Course attendance

Indicate whether you attended the following programme/courses:

		Yes	No
1	Human Immune Virus (HIV) management	1	0
2	HIV counselling and testing	1	0
3	Mode of transmission of HIV	1	0
4	Prevention of HIV	1	0
5	Prevention of Mother to Child transmission (PMTCT)	1	0
6	Adherence counselling	1	0
7	Tuberculosis(TB) management	1	0
8	TB screening to patients	1	0
9	TB diagnosing	1	0
10	Mode of TB transmission	1	0
11	Prevention of TB	1	0
12	TB treatment	1	0
13	TB/HIV integrations management	1	0
14	HIV treatment to TB patients	1	0
15	TB screening to HIV positive patients	1	0
16	Diagnosing TB to the HIV positive clients	1	0
17	Treatment of TB to the HIV positive clients	1	0
18	Sexually transmitted infections (STI) management	1	0
19	Types of STIs	1	0
20	Mode of transmission of STIs	1	0
21	Examination of patients for STIs	1	0
22	Diagnosing of STIs	1	0
23	Treatment of patients with STIs	1	0
24	Multiple Drug Resistant (MDR) TB management	1	0
25	Diagnosing MDR TB	1	0
26	Treatment supervision to MDR TB patients	1	0

SECTION C: Availability of guidelines

Indicate the availability of Guidelines in your facility using the following keys:

0= Never Available: 1 = Rarely Available: 2 = Often Available; 3 = Always Available.

		NA	RA	OA	AA
1	Tuberculosis management guidelines	0	1	2	3
2	Human Immune Virus management guidelines	0	1	2	3
3	Isoniazid Preventive therapy (IPT) management guidelines	0	1	2	3
4	Sexually transmitted infections management guidelines	0	1	2	3
5	Tuberculosis infection control guidelines	0	1	2	3
6	Multiple Drug Resistant TB guidelines	0	1	2	3
7	TB/HIV integration guidelines	0	1	2	3

SECTION D: TB and HIV services provision

Indicate the manner of TB and HIV service provision:

		Yes	No
1	TB and HIV services are offered in the same building	1	0
2	TB and HIV services are offered in the same rooms at different times	1	0
3	TB and HIV services are offered in the same rooms at the same time by one professional nurse.	1	0

SECTION E: Human resources and development:

Indicate whether you agree with the following statements on your facility using the key:

1 = Strongly Agree; 2 = Agree; 3 = Disagree; 4 = Strongly Disagree

		SA	A	D	SD
1	There is adequate staff allocated in the facility at all times	1	2	3	4
2	The training plan for TB is available in the facility	1	2	3	4
3	The training plan for HIV is available in the facility	1	2	3	4
4	The training plan for TB/HIV integration is available in the facility	1	2	3	4

5	There are adequate trained staff on TB management at all times	1	2	3	4
6	There are adequate trained staff on HIV management at all times	1	2	3	4
7	The skills audit of HIV training is available and updated regularly	1	2	3	4
8	The skills audit of TB training is available and updated regularly	1	2	3	4
9	The skills audit of TB/HIV integration training is available and updated regularly	1	2	3	4

SECTION F: Client/patients Educational information, Advocacy Communication and Social Mobilization (ACSM)

How often are the following education sessions offered in your facility?

• 0 = Never; 1 = Rarely; 2 = Sometimes; 3 = Often; 4 = Always

		N	R	S	O	A
1	Educational health talks on TB in patient waiting area	0	1	2	3	4
2	Educational health talks on HIV in patient waiting area	0	1	2	3	4
3	Distribution of educational material on TB	0	1	2	3	4
4	Distribution of educational material on HIV	0	1	2	3	4
5	Distribution of education material on TB/HIV co-infection	0	1	2	3	4
6	Distribution of educational material in the appropriate language	0	1	2	3	4
7	Intensive education on the disease to patients diagnosed with TB	0	1	2	3	4
8	Intensive education on treatment to patients diagnosed with HIV	0	1	2	3	4
9	Intensive education on disease to patients diagnosed with TB and HIV	0	1	2	3	4
10	Information to patients about side effects of TB drugs	0	1	2	3	4
11	Information to patients about side effects of Anti Retro Virus (ARVs)	0	1	2	3	4
12	Adherence counselling offered to patients	0	1	2	3	4
13	Education to patients about the duration of the treatment of TB and HIV	0	1	2	3	4
14	Family education about TB	0	1	2	3	4

15	Family education about HIV	0	1	2	3	4
16	Family education about care of patient with TB and HIV co-infection	0	1	2	3	4

SECTION G: Competency in the following:

Indicate your level of competency in the performance of the following using the key:

1= Very competent; 2= Competent; 3= Unsure; 4= Incompetent

		VC	C	Un	In
		1	2	3	4
1	HIV Counselling and testing (HCT)	1	2	3	4
2	HIV treatment	1	2	3	4
3	Prevention of Mother to Child HIV Transmission (PMTCT)	1	2	3	4
4	Couple counselling for HIV	1	2	3	4
5	Treatment adherence counselling	1	2	3	4
6	Diagnosing TB	1	2	3	4
7	Diagnosing HIV	1	2	3	4
8	Diagnosing STI	1	2	3	4

SECTION H: Competency in the following:

Rate your competency in the performance of the following using the key:

1= Excellent; 2= Very competent; 3= Competent; 4= Poor; 5= Incompetent

		E	VC	C	P	In
		1	2	3	4	5
1	TB screening	1	2	3	4	5
2	Treatment of patients with TB	1	2	3	4	5
3	Prevention of TB	1	2	3	4	5
4	Prevention of Multiple Drug Resistant (MDR) TB	1	2	3	4	5

SECTION I: Integration of TB and HIV services

Indicate whether you agree with the following statements on TB/HIV integration services in your facility:

1 = Strongly Agree; 2 = Agree; 3 = Disagree; 4 = Strongly Disagree

		SA	A	D	SD
1	All PHC nurses are responsible for TB and HIV management	1	2	3	4
2	Integration of TB and HIV is offered in this facility	1	2	3	4
3	TB and HIV statistics is compiled Quarterly in this facility	1	2	3	4
4	TB/HIV data is used to improve the service in this facility	1	2	3	4
5	Professional nurses know how to prescribe correct treatment of TB	1	2	3	4
6	Professional nurses know how to prescribe correct treatment of HIV	1	2	3	4
7	Professional nurses know how to treat side effects of TB treatment and ARVs	1	2	3	4

SECTION J: TB and HIV Programme support

Indicate the manner of support to TB and HIV control programme using the following key:

1 = Strongly Agree; 2 = Agree; 3 = Disagree; 4 = Strongly Disagree

		SA	A	D	SD
1	TB/HIV support groups are available in this facility	1	2	3	4
2	TB and HIV patients benefit from the support group	1	2	3	4
3	TB and HIV patients understand their condition	1	2	3	4
4	The district/sub-district supervision visit the facility for TB and HIV Services monthly	1	2	3	4
5	Written feedback is provided from the supervisor after the visit	1	2	3	4

SECTION K:

Indicate the availability of TB and HIV drugs and commodities in your facility:

0 = Never; 1 = Hardly ever; 2 = Sometimes; 3 = Often; 4 = Always

		N	HE	S	O	A
1	TB drugs are available	0	1	2	3	4
2	TB drugs are properly stored in a cool room	0	1	2	3	4
3	ARV drugs are properly stored in a cool room	0	1	2	3	4
4	ARV Drugs are available	0	1	2	3	4
• 5	Sputum bottles are available	0	1	2	3	4
• 6	Rapid HIV tests are available	0	1	2	3	4
• 7	Condoms are available	0	1	2	3	4

SECTION L: Prevention of TB spreading

Indicate whether the following statement on prevention of TB spreading is true or false

		True	False
1	Opening of windows at home.		
2	Opening of windows at health facilities.		
3	Avoiding kissing a TB infected person.		
4	Not using the same toilet with the TB infected person.		
5	Not using the same bath with the TB infected person.		
6	Not using the same eating utensils.		
7	Not hand shaking with the TB infected person.		
8	Not hugging the TB infected person.		
9	By isolating a TB infected person.		
10	By exercising.		
11	Patients using condoms during sex.		
12	Eating a well-balanced diet.		

SECTION M: Prevention of HIV spreading

Indicate whether the following statement on HIV prevention is true or false

		True	False
1.	Opening of windows at home.		
2.	Opening of windows at health facilities.		
3.	Avoiding kissing an HIV infected person.		
4.	Not using the same toilet with an HIV infected person		
5.	Avoid sharing injecting needles		
6.	Not shaking hands with an HIV infected patient.		
7.	Performing a male circumcision to all males.		
8.	By isolating an HIV infected patient.		
9.	Eating a well-balanced diet.		
10.	Patients using condoms during sex.		

APPENDIX: 9

FOCUS GROUP DISCUSSION WITH CHBCS OF CAPRICORN DISTRICT

GROUP A

VENUE: Karibu Lodge

DATE: 12 February 2016

Interviewer: Good afternoon

All: Afternoon mam.

Interviewer: How is everybody?

All: Fine and you?

Interviewer: I am fine. I am Mrs. Maake M.A. I am a student in the University of Limpopo. I am conducting a research on the topic: A model to ensure integration of TB and HIV services in the primary health care facilities of Limpopo province. The reason for me calling you is to conduct a focus group discussion, where we are all going to participate. Everybody is requested to participate in answering the questions as I will be asking. I am with Mrs MN Ngobeni who will be capturing the notes. Another thing is that as we are talking I will be using the tape recorder to record whatever we are discussing. This information is going to be treated confidentially. As you can see we are not going to call one another by name. We are just going to call you by numbers. So, that we can remain anonymous. You are free to communicate.

I am requesting for active participation. This is done voluntarily. As I requested you to complete the consent form and then you went through the consent forms that indicated that participation is a voluntary. You are allowed to withdraw from participation any time if you do not want to participate any longer. I have got some few questions that I am going to ask. Then we are going to discuss about them. This discussion session is only going to take 45 minutes to one hour. .

Interviewer: Are we all fine and comfortable?

All: Yes.

Question 1:

Interviewer: What motivated you to become a community home based carer?
If you want to answer raise up your hand. A9?

Responses:

A9: Thank you very much. I was motivated by the way I saw how my deceased mother was cared, supported and loved by her community health worker, whilst suffering in my absentia, when I was at school. I felt I must also continue to care for others.

Interviewer: Thank you very much. If I understood, you very well it is that you have been motivated by other community health workers who took care of your sick mother whilst you were at school?

Interviewer: Any other person who would like to tell us what motivated her?

A2: After I completed my practical on the care course at one of the old age homes at Pretoria I developed more interest and love to care for someone who is sick, or not being able to do things, or daily activities on his or her own.

Interviewer: Thank you.

Interviewer: Thank you very much. A5 do you have something to say?

A5:Yes. When I started home based care it is when my aunt passed away from TB and then I did not know that she was having TB. Even my parents did not tell us about the decease. So I had to take care of her. Not knowing really. Then I did not even know that TB is infectious. Then she passed away. After three years two men from Mankweng they came looking for her. They said where is your aunt? Then I said she passed away. So when I told them the year that she passed away. Then they asked me how was she. Then I told them that she was very ill. Then they told me that she was

having HIV and TB. I did not know and I took care of her. Then i had to take care of her child. She was six months old, but she did not have the decease. So; then I had to say I must just do something about the community. Because, I did not know about the decease. Until these two men from Mankweng told me that your aunt was having TB. By then it was in 1991. I did not know this thing, I felt I must do something for other communities and my family as well.

Interviewer: Thank you very much sissy. In other words you were motivated by nurses who came to your house. A5?

A5: Yes.

Interviewer: Looking for your aunt. Only to find that you were taking care of the aunt not knowing. In fact, you were a community home based carer before you can even be trained as a community home based carer.

A5: Yes.

Question 2:

Interviewer: Were you trained about TB and HIV management? Who can tell us? Were you trained? A7?

A7: I received the CHBC training of 69 days.

Interviewer: Thank you

Interviewer: A4?

A4: Yes. I have trained for five days for TB and HIV management. They teach us about how to screen the person who had TB. They teach us you must question the patient to know if they have TB or not. HIV and TB are linked together. Because, even signs and symptoms are nearly the same.

Interviewer: Thank you very much.

Interviewer: A1?

A1: Yes. I do the TB and HIV management. Yes. I was trained on TB and also HIV management for one week at the clinic. I am now able to take of TB and HIV patients.

Interviewer: Thank you. You said you were trained about T TB management and then now you are able to take care of TB patients. A6?

A6: Yes. I have trained. They told me that I must monitor them when taking their medication. When they said 06:00 you must go to the patient and give him or his medication and see whether she is swallowing them. After giving him or her medication you must speak to him or her. Some of them are keeping their pills under the tongues.

Interviewer: Thank you very much A6? You have already covered even question 3. But nevertheless I am going to ask others.

Question 3:

Question 3 says what did you learn from the training about TB and HIV decease? So, who can tell us about the TB treatment or TB drugs? About HIV drugs? About TB and HIV Drugs? A3?

A3 Medication must be taken on time and ensure that the TB is not turning MDR. TB drugs need to be taken for a period of six months. The patients need to take that to Prevent MDR.

Interviewer: Thank you very much. The most important principle of TB treatment says TB treatment to be taken for six months non-stop.A2?

A2: Multi drug resistant.

Interviewer: Multi drug resistant. Good. Then who else can tell me what did she learn about TB drugs and HIV drugs and HIV and TB drugs for co-infected? A2?

A2: TB is curable. Then HIV it is not curable. So if you take treatment for HIV you take it for life. TB is just the infection that can be cured.

Interviewer: Okay. Thank you very much.

Question 4:

Can we go to question 4 about drugs side effects? You talked about TB drugs, ARV's and then did you learn about side effects of drugs?

Interviewer: Who can tell us about, maybe one, side effect. A6?

A6: Some are developing the rash and some are vomiting. Then when they are vomiting I just refer them to the clinic to get treated.

Interviewer: Thank you very much. A7?

A7: Wrong dreams.

Interviewer: A5?

A5: Some are complaining about the pains on legs, hands and some are hallucinating.

Interviewer: Then what can you tell me about hallucinating? You. What is hallucination?

A5: Yes. They see the things that are not there.

Interviewer: Okay. They see things that do not exist. Thank you very much. Then do you still have some side effects that you wanted to share with us? A2?

A2: Some are complaining about swollen legs. Especially those who are taking TB treatment.

Interviewer: Okay. Thanks.

Interviewer: We come to question 4. From the training that you attended what do you think are your roles and responsibilities in the care of TB and HIV patients and TB and co-infected patients? Your Roles? A3?

A3: Yes, to ensure that our community are living healthy lifestyle after being trained. Yes.

Interviewer: Thank you very much. Training assisted you that you can teach patients to live healthy lifestyles. Then like what? Healthy lifestyles like this? A5?

A5: Healthy lifestyle. Even if she is TB she is on TB treatment, she or he should continue using condom when having sex.

Interviewer: Thank you very much. Are we still have something to say? A2?

A2: Balanced diet.

Interviewer: Healthy lifestyle, like eating balanced diet.

A2: Exercise.

Interviewer: Thank you. Exercising. Thank you very much I think that is enough.

Question 5:

How is your working relationship with the clinic staff? Relationship with the clinic staff. A8?

A8: Sometimes our clinic sister refuse to give the referral for the patient. When we went to the community to go and do door to door campaign we discovered the patient were at home, not at the clinic. So when we take the referral to the clinic to ask the sisters to take care of that patient they refuse.

Interviewer: Okay. Some clinic sisters are not cooperative with you?

A8: Yes.

Interviewer: Okay. A4?

A4: We had meeting with them. They allocate patient to us. We gave them challenges, patient and achievement. We did event with them. They order kit from us to care for patients.

Interviewer: For you, in other words you A4, in the facility that you are attached to, you have good relationship with nurses?.

A4: Yes.

Interviewer: They order the kits for you, so that you can be able to work, like gloves.

A4: Yes.

Interviewer: Thank you. A7?

A7: The service is good in the clinics in the clinic, the nurses give us in-service training support during door to door campaign.

Interviewer: Okay.

T A9 do you still have something about the relationship?

A9: Yes. Thank you. Mine will be far different from others. Because I am working on mobile clinic. You know we are working, but not resourced. We have a challenge. At time we find ourselves in an exposure of some sicknesses because when we tell the mobile sisters they are always saying they do not have enough. At times we go running out of even hand gloves. So it is very much challenging and it is very much threatening, but we keep on doing the job.

Question 6:

Interviewer: Thank you very much. So we go to question 7. Are you receiving a stipend from the government? If no you must motivate now what really motivates you to continue caring for the patients. Even if you are not getting a stipend? Are you getting the stipend? A2?

A2: Yes.

Interviewer: All of you?

All: Yes.

Question 7:

Interviewer: Thank you. What challenges do you encounter with the patients and their families? Because we are talking about the nurses at the clinics and then what about patients? A6?

A6: Patients are not adhering to treatment. Their families are not supporting. They even build some shacks for them. So that they must be outside the house. Even the dishes. They are not sharing dishes with them.

Interviewer: If I want to understand you is that the relatives, the families do not cooperate but patients do cooperate with you, but the families isolate the patients?

A6: Yes.

Interviewer: Then who else? A3?

A3: For us administration of medication in an empty stomach is a huge problem. It has become the challenge to us.

Interviewer: I need to hear you very well. Is it your challenge or the challenge of the patient?

A3: It is the challenge that we encounter from the patient.

Interviewer: Okay. They tell you?

A3: Yes. Like most of them they administer their health medication with empty stomach. But as an organisation we ensure that we encourage them to have some food so that they can just have something before they can take their medication.

Interviewer: Thank you. Thank you very much. In other words some patients tend not to drink the medication because, they said they cannot take the medication in the empty stomach?

A3: Yes.

Interviewer: Okay. A2?

A2: We also try to talk to or to speak to family of a patient and teach them how to take care of their loved ones. Because, we know that we only come during the working hours. But them, they are the ones who is staying with the patient for 24 hours. So we take care of many patients at the community. So that first care is for them. They should provide more care, because they are staying with the patient for a long time.

Interviewer: Thank you very much

Question 8:

Then this is question 9. It is nearly the same with, with question 5. It says what challenges do you encounter with clinic staff? What challenges do you encounter with clinic staff? A2?

A2: The challenge is that our patients most of the time they complain about the queue at the clinics. So you find a patient visit the clinic and then they stay for a long time at the clinic before they get assistance from the nurses. The nurses also complain about the shortage of staff at the clinics.

Interviewer: Okay. A challenge is that when you take the patient to the clinic for some sort of care or medication you queue for a long time at the clinic and when you try to talk to nurses to assist they say they are also having staff shortage.

A2: Yes.

Interviewer: Then is there anybody with another challenge? A4?

A4: In the clinic we are queuing, whereas we are going to take care of another patient outside. So it is a challenge. Because when we queue they do not manage to care a patient outside.

Interviewer: Okay. Still a challenge of queuing. Waiting for a long time at facilities and then A9?

A9: Thank you again. Minority of nurses still undermine our work. In a way that at times they feel that we are overtaking them without proper experience.

Interviewer: Oh, okay. Which means some nurses are having challenges. They have that fear of saying you seem like overtaking their work. You seem like behaving like nurses? Okay.

Question 9

What other experiences do you encounter in the community at large? Not specific. Community at large. How do they treat you? How do they view you? A5?

A5: They regard us as our nurses. Because when we are doing campaigns they also do participate and then they test for HIV and collect sputum.

Interviewer: Thank you. Then any other person who can tell us the view of the community? A9?

A9: Community gradually seem to acknowledge our work because, when they have problems they also approach us. They can just when passing say stop right there, I am experiencing 1 and 2. It is a sign that they approve our work.

Interviewer: Thank you very much. Which means the communities really is recognising your work. They can even approach you whenever you are passing by and asking you about health-related challenges. Thank you very much. It is the end of our questioning. Then i just want to know out if you still have anything that you want to know about TB and HIV? Concerning what we have already discussed? How did you feel, maybe I should have included? If you are fine you can say we are fine. A9?

A9: Thank you. I still feel that we have been blessed to have this kind of session. Really. I feel or i so wish that these kinds of sessions must be

conducted at least several times in the year because it educates us. It makes us share. It makes us share experiences. You know? We are very much happy.

Interviewer: Thank you very much. Which means you see this discussion as a fruitful exercise.

All: Yes.

Interviewer: Okay. Thank you very much.

Interviewer: Thank you very much.

Woman: Rotate it at the other municipalities.

Interviewer: Okay. Thank you very much. This is the end of our discussion with group A, which are participants or community home based carers from Capricorn district. Which is our first district according to the alphabet. Then with me as I indicated I am having Mrs. Ngobeni, who assisted me a lot in taking some field notes. Mrs. Ngobeni has done masters in advance community health care, community health nursing with University of Pretoria. Mrs. Ngobeni can you share with us, how was the discussions?

MS. Ngobeni: Thank you mam. I think the session went on well. Because, all the participants took part in the discussions and they showed to be having knowledge on TB HIV collaboration. So, I can say it was a very fruitful discussion. They all participated. I am satisfied.

Interviewer: Thank you. Thank you Mrs. Ngobeni and thank you everybody.

END OF GROUP DISCUSSION GROUP A

APPENDIX 10: FOCUS GROUP DISCUSSION WITH TB AND HIV PATIENTS OF MOPANI DISTRICT

Date: 15 February 2016

Venue: Dzekula CHBC

Time: 14:00

GROUP B

Interviewer: Afternoon

All: Afternoon to you too.

Interviewer: How are you?

All: We are fine.

Interviewer: My name is Mrs. Maake. I am the Student at the University of Limpopo. I am doing PHD in the Department of nursing science. With me is Mrs MN Ngobeni. She shall be asking the notes of our discussion. Recording our discussion will be done using the audio tape. Kindly note that whatever that we are going to discuss will be recorded so that we can be able to write the report. I promise that whatever that we are going to discuss ends in this room. That is why we are not going to call you by your names. We are going to use numbers as your names. I have prepared some questions for our discussion. This is the group of TB and co-infected patients from Dzekula Community Home Based Care in Mopani District. They volunteered and completed the consent forms in order to participate in this study.

Question 1

What are the causes of TB? B6?

B6: It is caused by a virus called mycobacterium.

Interviewer: Thank you. Anyone who wants to say something? Ok, this means that you agree with what she said.

All: Yes!

Interviewer: Ok thank you.

Question 2:

What do you think causes HIV? B1?

B1: Mixing of blood

Interviewer: Thank you. B2?

B2: Another thing which causes HIV is that when I have a wound and someone has a wound as well and our blood mixes, that person will infect me with HIV.

Interviewer: Thank you.

Question 3:

How can TB be passed from one person to another? B4?

B4: Coughing anywhere or without covering your mouth.

Interviewer: Thank you

B13: If here is anyone in the family who once had TB.

Interviewer: B13 says that if in the family there was once a family member with TB it is likely for one to have TB in the family. Ok, B7?

B7: If there is one family member who has TB she can infect other family members living with her.

Interviewer: B7 say that if you are living with someone who has TB, that person can infect you with TB.

Question 4.

How can HIV be passed from one person to another? B4?

B4: It can be passed from one person to another through sex.

Interviewer: Thank you B8?

B8: Taking care of a person who has HIV and that person not knowing that she is infected with HIV and not wearing gloves while taking care of her. You can be infected if you have a wound and your blood mixes with the blood of someone who is infected.

Interviewer: Thank you. Anyone who want to say something Ok. B10?

B10: If you share razor blades with someone who is infected you can be infected. If that person uses the razor blade first.

Interviewer: You just said that if you remove hair with razor blade and the first person to use that razor blade is infected with HIV then he will infect the second one using the same razor blade. Thank you. Now we are at question 5.

Question 5.

For how long have you been suffering from TB & HIV? B9?

B9: I've been having HIV for the past 18 years.

Interviewer: Thank you

Interviewer: Is there anyone who wants to share with us? B3?

B3: I knew that I had this virus in 2007.

Interviewer: ok, you knew in 2007?

B3: Yes.

Interviewer: Thank you. B14?

B14: I knew in 2002. I suspected that I might be having HIV in 2002 and I went to the clinic to do the tests. The test came out being HIV positive.

Interviewer: Ok. You knew in 2002 that you have HIV Virus?

Interviewer: Ok. B8?

B8: I found out that I was HIV positive in 2005 when I was pregnant.

Interviewer: Thank you. Now we are going to question 6.

Question 6:

How did you feel and reacted for the first time when you were told that you are co-Infected with TB & HIV? B11?

B11: When I heard that I was HIV positive I was scared. I thought that I was going to die and leave my children and who is going to take care of them. I went to the hospital and they told me to take treatment. Now I'm feeling ok. I have been taking treatment since 2007 until now.

Interviewer: Ok. If I understand you well you said you were scared. B11: Yes.

Interviewer: B3?

B3: I was scared. I started thinking that I will die having only one child. I received counselling and I accepted my status and they even told me that's it's not the end of life. Now I have 3 children after being HIV positive.

Interviewer: Thank you for sharing.

B4: I was scared but after going for counselling at the hospital they gave me treatment. They gave me a small paper to give the Home Based Carers to help me or remind me to take treatment. Now I am fine.

Interviewer: Thank you. B9?

B9: After testing and found out that I was HIV positive I was hurt. They told me that it is not the end of the world and they also told me about support

groups. I met with support group members and I started seeing that I'm not the only one being infected with HIV. I am no longer scared of HIV and I am not shy to tell people about my status.

Interviewer: Thank you. You were hurt but after meeting with support group members you accepted that you are not alone. Thank you.

Question 7:

What is the relationship between HIV & TB? B12?

B12: What I know is that HIV and TB they fight with your immune system. What happens is that when you have HIV & TB lives in the atmosphere HIV would fight with the immune system and is then that TB takes advantage.

Interviewer: Thank you. He just said that HIV virus and TB fights with the immune system. TB takes advantage when the immune system is low due to HIV virus. Thank you. Is there anyone who wants to say something regarding the relationship of HIV & TB? B15?

B15: When you have TB you cough a lot. I once had TB after finding out that I was HIV positive. I took treatment for six months after they told me that I have TB I fainted because I was in denial. I was hurt.

Interviewer: Thank you. She said that she was in denial that she has TB and she was hurt after finding out she had TB. How do you feel now?

B15: I am fine now.

Interviewer: Thank you.

Question 8:

Are nurses giving you information and counselling about TB & HIV Co-Infection? B8?

B8: Yes, they teach us how to disclose our status. They even teach us to accept that we are HIV positive and how to help others who are infected with

HIV. They teach us to counsel others who are infected so that they can be able to disclose their status as well.

Interviewer: Ok. Which means that they have given you counselling so that you can accept your status and how to support others who are infected? Ok B6?

B6: Something that they teach us about is Adherence on how to take our treatment and when to take our treatment. The time to take treatment must not pass without taking treatment.

Interviewer: Thank you. Ok. B2?

B2: They even teach us about prevention. They support us so that we know our status. They tell us that we must never get tired of taking treatment.

Interviewer: Thank you.

Question 9:

Have you been treated for TB before? If yes, what was your experience of taking treatment for such a long period of 6 months? B12?

B12: First months were difficult for me especially because I had no one to support me. It was even difficult to urinate. You can leave treatment if you don't have someone to support you. I was taking TB treatment and it was difficult for me to urinate. You can leave treatment because of that.

Interviewer: Thank you. He said that he once took treatment and when he started it was very difficult. The side effects that he had was difficulty in urinating. Thank you. Is there anyone who wants to say something?

Question 10.

Do you receive TB & HIV treatment/drugs in the same consulting room offered by one professional nurse? B6?

B6: In our clinic we take treatment in different consulting rooms. There is a nurse who deals with TB and one which deals with HIV.

Interviewer: Ok. If I understand you, you are saying that TB treatment and HIV treatment in your clinic is not collected in the same consulting room. There is someone who deals with HIV and someone who deals with TB.

B6: Yes.

Interviewer: Thank you. B12?

B12: No. What bothers us is that it takes lots of our time and we end up not feeling like collecting our treatment.

Interviewer: Thank you. This means that you take long time at the clinic because you must take TB treatment and ARVs in different consulting rooms.

Question 11:

Did you have somebody to supervise you (DOT Supporter) when taking your treatment? B8?

B8: Yes they do. They gave me a form at the clinic so that I give it to the carers to come assist me at home.

Interviewer: Ok. Which means that after you found out that you are HIV positive they gave you a form at the clinic to give the Home Based Carers so that they help you on how to take your treatment? Ok. B15?

B15: Yes. A carer comes to my house and reminds me on how to take my treatment.

Interviewer: Ok thank you.

Question 12:

Did you ever miss your treatment? If yes, what were your reasons? B10?

B10: No, but most of the people we meet they do forget to take treatment. They are also scared to join support groups. When they give them referral form to come join the support group they sit with it at home and not come to join us. The support group helps in reminding people to take treatment. Some

people stop taking treatment and when they start taking treatment again it becomes difficult for them.

Interviewer: Thank you. B10 said that she never stopped taking treatment but she knows others who stopped taking treatment. B12?

B12: Yes I did because sometimes I had no food and I would sleep on an empty stomach. I couldn't take treatment on an empty stomach.

Interviewer: Ok. B12 say that he once stopped taking treatment because he had no food in the house and he couldn't take treatment on an empty stomach. Ok. B13?

B13: Yes because sometimes I would finish 5 days without food in the house and I can't take treatment on an empty stomach.

Interviewer: Ok. B13 say that stopped taking treatment because she had no food. Now let's go to question 13.

Question 13:

How is your relationship between yourself and the clinic staff and the DOT supporter? B4?

B4: We have a good relationship with our Home Based Carers and our nurses. They teach us on how to take our treatment even if we are going to attend funeral do that we don't skip treatment.

Interviewer. Thank you Ok. B8?

B8: Yes, they told me that everywhere I go; I go with my treatment in a small bag or handbag so that if the time for treatment and I'm not at home yet I'll be able to take my treatment. If I skip treatment, the treatment cannot work the way it's supposed to.

Interviewer: Ok. B7?

B7: We have good relationship with our Home Based Carers. They don't just help us take our treatment; they also give us health talks and how to live with

this virus. They also teach us about good nutrition on which kind of food is good for our body.

Interviewer: Ok. You have good relationship with nurses and Home Based Carers. They also teach you about nutrition and how to take treatment. Ok. B3?

B3: We have good relationship with nurses. They tell us not to take traditional medication and treatment at the same time because traditional medication and treatment don't mix.

Interviewer: Ok. Thank you.

Question 14:

What challenges are you encountering with the clinic staff and CHBCs offering DOT? B14?

B14: Yes I do have challenges. I am the only one who takes care of the family because the person who was helping me passed on. As the head of the family you find that when the time for my treatment collection date arrives I am at work. When I send someone to collect my treatment they refuse to give that person my treatment. Again you find that a person is working in Johannesburg and is back home for festive season then the time to collect medication arrives when he is still at home they refuse to give that person medication. They want a referral form first and you find that in Johannesburg they refused to give that person a referral form.

Interviewer: Ok. There is a challenge for example is you are staying here and you visit Johannesburg and the time to collect treatment arrives they refuse to give you treatment because you don't have referral forms. Ok. Let's go to the last one.

Question 15:

Were you taught about the side effects of TB and HIV drugs and what to do when experiencing them? B8?

B8: Yes they told me about the side effects of the ARVs. They told me that I might get nightmares.

Interviewer: Ok. You are saying that you sometimes had nightmares. Thank you. B12?

B12: Yes they did. They told us that this treatment has side effects. It can happen that you develop rash or have running stomach as one of the side effects. We mustn't be scared if we see those kinds of things as we start treatment. What we need to know is that those are some of the side effects.

Interviewer: Ok. They taught you. They even told you what to do when you see those kinds of things. What did they say about those side effects?

All: We must not stop taking treatment.

Interviewer: They told you about the side effects and if you see this and that you must go to the clinic. So, that you can report how you feel. Anyone B4?

B4: They told us to lock the doors when you sleep because you can sleep walk without being notices by anyone.

Interviewer: Ok. They told you that some of the treatment can make you sleep walk so you must lock your doors before you sleep. Ok. Thank you. B8?

B8: If you feel nausea after taking treatment you must eat something sweet like an orange or candy to avoid vomiting.

Interviewer: Ok. They told you that you might feel like vomiting after taking treatment and they told you what to do.

All: Yes.

Interviewer: Ok.

B8: If you vomit and see the pill that you took, you must take another pill.

Interviewer: Thank you. She is saying that if you vomit after taking treatment you must drink another treatment because that one you took first won't work. Ok. B9?

B9: After I started taking treatment I was bleeding a lot. Then I went to the clinic and was admitted. They made a plan to reduce the bleeding. They also told me not to stop taking treatment. I was very scared.

Interviewer: Ok. Thank you

B8: They also told us the treatment can change your shape, you find that I am a woman and I start looking like a man and a man can start developing breasts.

Interviewer: Ok, Thank you group B, Mopani Dzekula Support group. Thank you. Is there something you want to know regarding what we spoke about or are you fine?

B8: we are fine. You really helped us by coming to visit us.

Interviewer: thank you. My co-facilitator Ms. MN Ngobeni how did you feel about the session?

Ms Ngobenii: Ok. I think everything went well and everybody was participating,

Interviewer: Thank you for taking part on this discussion. Thank you.

END OF GROUP DISCUSSION GROUP B

APPENDIX: 11 TSHIVENDA CONSENT FORM

**UNIVERSITY OF LIMPOPO (Medunsa Campus) TSHIVENDA
CONSENT FORM**

Tshitatamennde malugana na u dzhenelela kha Phurodzhekithi ya Thodisiso

Dzina la Phurodzhekithi/ Ngudo

Mmbekanyamushumo ya thanganelano ya tshumelo ya TB na HIV kha dzi kiliniki dza Vundu la Limpopo

Ndo vhala nda pfesesa mafhungo na zwipikwa zwa heino thodisiso/gundo nahone ndo fhiwa tshifhinga tsha u vhudzisa dzimbudziso na u humbula nga fhungo heli. Zwipikwa zwa ngudo heyi zwi khagala kha nne. Athi kho kombetshedzwa u dzhenelela na khathihi.

Ndi a zwidivha uri zwine nda do zwi amba zwi do dzhielwa nzhele. Ndi na tshenzhemo ya uri thodisiso hedzi dzi do shumisiwa kha nyandadziso dza sainsi shango nga vhuphara. Ndi kho u tenda u dzhenelela arali dzina langa na nomboro ya vhuongelo hanga zwi songo buliwa.

Ndi na ndivho na thalukanyo uri ndi nga lutamo lwanga u dzhenelela kha heino phurodzhekithi nahone ndi nga di bvisa khayi 0tshifhinga tshinwe na tshinwe ndi songo fha na dzirisini. Hezwi azwi nga do shandukisa tshumelo ine nda I wana ngamisi ma lugana na tshiimo tshanga tsha mutakalo nahone a zwi nga shandukisi tshumelo yanga na dokotela.

Ndi a zwi divha uri Phurodzhekithi/ Ngudo heyi yo aphuruviwa nga Medunsa Research Ethics Committee (MREC), University of Limpopo(Medunsa campus). Ndi na thalukanyo yo fhelelaho uri mvelele dza ngudo heyi dzi do shumisiwa nga vhorasainsi nda nyandadziso. Ndi kho tendelana nayo arali madzina anga asa do divhadzwa.

Ndi khou tenda u dzhenelela kha Ngudo/Phurodzhekithi heyi

.....
Dzina la mulwadze/ volunteer
mulwadze/ mubebi

.....
Hune ha sainwa nga

.....

Fhethu

Datumu

Thanzi

Tshitatamennde nga mutodisasi

Ndo nekedza ndivho ya u amba kana u nwala malugana na Ngudo/Phurodzhekhiti heyi

Ndi khou tenda u fhindula mbudziso dzothe nga hune nda kona ngaho malugana na Ngudo /Phurodzhekhiti heyi.

Dzina la Mutodisasi

U saina

Datumu

Fhethu

.....

APPENDIX 12: TSONGA CONSENT FORM

UNIVERSITY OF LIMPOPO (Medunsa Campus) TSONGA CONSENT FORM

Xivulwa eka ku ngenelela eka vulavisisi

Endlelo ra ku vonisisa leswaku ku hlanganeriwa mintiro ya vuvabyi bya xiifuva na xitsongwatsongwana xa HIV eka Xifundza xa Limpopo.

1. Ni hlayile mahungu ni twa hi xikongomelo na leswi swi fanelaka ku fikeleriwa.
Xo dyonza na kambe ni nyikiwe na nkari wo vutisa swivutiso na nkari wo ringanela wo ehleketesisa hi mhaka leyi. Xikongomelo xa dyondzo xi ringanerile kahle e ka mina. A ni nga sindzisiwe ku ngenelela hi ndlela yi n'wana .
2. Na swi tiva leswaku mpfumawulo wa mina wa ku vulavula wu nga kandziyisiwa Na swi tiva leswaku switirisiwa leswi swi nga tihrisiwa hi ndlela ya xisayitifiki leyi nga kumekaka hi michini e ka misava hinkwayo. Na pfumela e ka sweswo loko ku ri hiku vito ra mina na nomboro ya xibendlele a swi nga vuriwe.
3. Na twisisa leswaku ku ngenelela ek dyondzo leyi swi ya hi ku na swi lava na kona ni nga ti humesa e ka swona nkarhi wun'wana na wu n'wana na swona ku nga ri na ku nyika swi vangelo. Le swi a swi ngeneleli e ka vutshunguri lebyi ni byi kumaka kumbe ku ngenelela e ka ku tshunguriwa ka mina ku suka ka Dokodela wa ntolovelo.
4. Na pfumela kuri dyondzo leyi yi pfumeleriwe hi va Medunsa Research Ethics Committee (MREC), University ya Limpopo (Medunsa Campus). Ni swi tiva kahle leswaku mbuyelo wa dyondzo wu ta tirhisiwa hi ndlela ya sayense yi tlhela yi kandzisiwa. Na pfumela e ka leswi , ntsena loko swi hundla swa mina swi tiyisisiwa.

Na pfumela ku nyika mpfumelelo wo ngenelela e ka dyondzo leyi.

Vito ra movabyi/ mutinyiketeri

Sayino wa movabyi kumbe muhlayisi

-----	-----	-----
Ndzawu	Siku	Mbhoni

Xiga hi mulavisisi

Ndzi nyikerile hi nomu/ hi ku tsala mahungu mayelano na dyondzo leyi.

Ndzi pfumela ku hlamula swivutiso leswi nga ta kondzela mayelana na dyondzo leyi ku fika laha ndzi nga swi kotaka.

Ndzi ta endla hi laha leswi swi lavekisaka xi swona swi nga pfumeleriwa.

-----	-----	-----	-----
Vito ra mulavisisi	Sayino	Siku	Ndzawu

APPENDIX 13: Participant (Professional nurses) Consent Form

A MODEL TO ENSURE THE INTEGRATION OF TUBERCULOSIS AND HUMAN IMMUNODEFICIENCY VIRUS SERVICES IN THE PRIMARY HEALTH CARE FACILITIES OF LIMPOPO PROVINCE.

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

I understand that participation in this Clinical Project is completely voluntary and that I may withdraw from it at any time and without supplying reasons. I know that this Study has been approved by the Sefako Makgatho University Research Ethics Committee (SMUREC), and I am fully aware that the results of this Study will be used for scientific purposes and may be published. I agree to this, provided my privacy is guaranteed.

I hereby give consent to participate in this Study.

.....
Name of participant	Signature of participant
.....
Place.	Date

Statement by the Researcher

- I provided written information regarding this Study.
- I agree to answer any future questions concerning the Study as best as I am able.
- I will adhere to the approved protocol.
-

Mphele Agnes Maake	_____	_____	_____
Name of Researcher	Signature	Date	Place

APPENDIX 14: Consent to use audio tape for Community Home Based Cares focus group interview

A MODEL TO ENSURE THE INTEGRATION OF TUBERCULOSIS AND HUMAN IMMUNODEFICIENCY VIRUS SERVICES IN THE PRIMARY HEALTH CARE FACILITIES OF LIMPOPO PROVINCE.

I understand that the interview will be recorded on audio tape and will be used strictly for analysing data and that my privacy is guaranteed. I also understand that the tapes will be destroyed after the data has been extracted.

I hereby give consent to being recorded on audio tape for the collection of data needed in this study. I also consent to having my words quoted anonymously in the research report.

.....
Name of participant

.....
Signature of participant

.....
Place.

.....
Date

Statement by the Researcher

- I provided written information regarding this Study.
- I agree to answer any future questions concerning the Study as best as I am able.
- I will adhere to the approved protocol.

Mphele Agnes Maake _____

Name of Researcher Signature Date Place

APPENDIX 15: Consent to use the audiotape

A MODEL TO ENSURE THE INTEGRATION OF TUBERCULOSIS AND HUMAN IMMUNODEFICIENCY VIRUS SERVICES IN THE PRIMARY HEALTH CARE FACILITIES OF LIMPOPO PROVINCE.

I understand that the interview will be recorded on audio tape and will be used strictly for analyzing data and that my privacy is guaranteed. I also understand that the tapes will be destroyed after the data has been extracted.

I hereby give consent to being recorded on audio tape for the collection of data needed in this study. I also consent to having my words quoted anonymously in the research report.

.....
Name of participant

.....
Signature of participant

.....
Place.

.....
Date

Statement by the Researcher

- I provided written information regarding this Study.
- I agree to answer any future questions concerning the Study as best as I am able.
- I will adhere to the approved protocol.

Mphele Agnes Maake _____
Name of Researcher Signature Date Place

APPENDIX 16: FOCUS GROUP INTERVIEW GUIDE FOR COMMUNITY HOME BASED CARERS WORKING IN THE FIVE (5) DISTRICTS OF LIMPOPO PROVINCE.

1. What motivated you to become a CHBC?
2. Were you trained about TB and HIV management?
3. What did you learn from the training about TB and HIV diseases?
 - 3.1. about drugs for TB?
 - 3.2. about drugs for HIV?
 - 3.3 about drugs for TB/HIV co-infected patient?
 - 3.4. about drugs side effects and what to do?
4. From the training you attended: What are your roles and responsibilities in:
 - 4.1 the care of TB and HIV patients?
 - 4.2 the care of the TB/HIV co-infected patients?
5. How is your working relationship with the clinic staff?
6. Is the clinic staff giving you any support? If yes, what kind of support are you receiving from them?
7. Are you receiving any stipend from the Government? If No; what motivates you to continue caring for the patient?
8. What challenges do you encounter with the patients and their families?
9. What challenges do you encounter with the clinic staff?
10. What are the experiences do you encounter in the community at large?

APPENDIX 17: ENGLISH FOCUS GROUP INTERVIEW GUIDE FOR TB/HIV CO-INFECTED PATIENTS IN THE FIVE [5] DISTRICTS OF LIMPOPO PROVINCE.

1. What are causes Tuberculosis?
2. What do you think can be causing HIV?
3. How can TB be passed from one person to another?
4. How can HIV be passed from one person to another?
5. For how long have you been suffering from TB and HIV?
6. How did you feel and reacted for the first time when you were told that you are co- infected with TB and HIV?
7. What is the relationship between TB and HIV?
8. Are nurses giving you information and counselling about TB and HIV co-infection?
9. Have you been treated for TB before? If yes, what was your experience of taking treatment for such a long period of 6 months?
10. Do you receive TB and HIV treatment/drugs in the same consulting room offered by one professional nurse?
11. Did you have somebody to supervise you (DOT supporter) when taking your treatment?
12. Did you ever miss your treatment? If 'yes' what were your reasons?
13. How is your relationship between yourself and the clinic staff and the DOT supporter?
14. What challenges are you encountering with the clinic staff and CHBCs offering DOT?
15. Were you taught about the side effects of TB and HIV drugs and what to do when experiencing them?

APPENDIX 18:SEPEDI: FOCUS GROUP INTERVIEW GUIDE FOR TB/HIV CO-INFECTED PATIENTS IN THE FIVE [5] DISTRICTS OF LIMPOPO PROVINCE.

LENANELO LA THERISHANO LE SEHLOPHA SA BATHO BAO BA NAGO LE BOLWETSI BJA MAFAPHLA LE TSHWAETSO YA HIV GO TSWA DILETENG TSE HLANO TSA POROVENSI YA LIMPOPO.

1. Bolwetsi bja mafahla bo hlolwa ke eng?
2. Go ya ka wena HIV e hlolwa ke eng?
3. Bolwetsi bja mafahla bo fetela bjang?
4. Twatsi ya HIV e ka fetela motho yo mongwe bjang?
5. Ke lebaka le lekakang o swerwe ke bolwetsi bja mafahla le twatsi ya HIV, maikutlo a gago a bile bjang letsatsi la mathomo ge o botswa gore o na le bolwetsi bja mafahla le tshwaetsoya HIV?
6. Bolwetsi bja mafahla le HIV di amana bjang?
7. Kamano ya gago le baaki ba kiliniki le mohlakomedi wa gago ke e bjang?
8. Ke dihlohlo difetse di lego magareng a gago le baaki le bahlakomedi ba gago mo setshabeng?
9. O rutilwe ka ditlamorago tsa dihlare tsa mafahla le tsa HIV le magato a o swanetsego go a tsea ge o ekwa ditlamorago tseo?
10. E ka ba baaki ba go file tshedimosho le dikgothatso mabapi le bolwetsi bja mafahla le tshwaetsoya HIV?
11. O kile wa alafiwa bolwetsi bja mafahla mohla o mongwe naa? Gee le gore go bjale ke maitemogelo afe a o bilego le ona go nwa dihlare lebaka le le telele la dikgwedi the di tshelago?
12. E kaba o humana dihlare tsa bolwetsi bja mafahla le tsa HIV ka phaposhing e tee, o di fiwa ke mooki o tee?
13. E kaba o na le motho yo a go hlohletsago go nwa dihlare tsa gago ka mehla?
14. Naa o kile wa thesha go nwa dihlare tsa gago le lengwe la matsatsi? Ge ale gore go bjale mabaka a gago ke afe?

APPENDIX 19: TSONGA: FOCUS GROUP INTERVIEW GUIDE FOR TB/HIV CO-INFECTED PATIENTS IN THE FIVE [5] DISTRICTS OF LIMPOPO PROVINCE.

NHLENGETANO YO LAVISISA HI XIKOMBISO MAYELANA NA VOVABYI BYA XIFUVA NA XITSONGWATSONGWANA XA HIV EKA XIFUNDANKULU XA LIMPOPO

1. Vuvabyi bya rifuva byi vangiwa hi yini?
2. U hleketa leswaku iyini lexi xi vangelaka HIV eka munhu?
3. Rifuva rihundzela njhani eka munhu un'wana?
4. Xana xitsongwatsongwana xa HIV xi tlulela njhani eka munhu un'wana?
5. Ku sukela rini u karhatiwa hi rifuva na HIV?
6. U ti twe njhani loko u ta va u byeriwa leswaku una vuvabyi bya Rifuva na HIV?
7. Hi byini vuxaka le byi nga kona exikari ka rifuva na xitsongwatsongwana xa HIV?
8. Xana va ongori va kubyerile vuxoko-xoko hi mayelana Rifuva na HIV?
9. Xana u tshame u nga tshunguriwa vuvabyi bya rifuva? ,loko ku ri ina, swi ve njhani ku nwama pilisi nkarhi wo leha ku ringana tinhweti ta ntsevu?
10. Xana u kume vutshunguri bya Rifuva na HIV e ka yindlo yinwe ya vutshunguleri, u nyikiwa hi muongori wunwe xana?
11. Ku na munhu loyi a ku pfunaka hiku teka vutshungur ibya tipilisi?
12. Xana u tshama u rivala ku teka muri wa wena? Loko ku riina, xi vangelo a kuriyini?
13. Vuxaka bya wena na vaongori va le tlinikini na vahlayisi byi njani?
14. Xana kutikeriwa lo ku hlanganako na vaongori na vahlayisi hi byihi?
15. Xana u dyondzisiwile switandzaku swa vuvabyi bya rifuva xana, mirhi yo tshungula xitsongwatsongwana xa HIV na leswaku u nga endla yini loko byo va eka wena?

APPENDIX 20: VENDA FOCUS GROUP INTERVIEW GUIDE FOR TB/HIV CO-INFECTED PATIENTS IN THE FIVE [5] DISTRICTS OF LIMPOPO PROVINCE.

Tshigwada tsholavhelesiwaho u vhudziswa nga ha TB/HIV kha vhalwadze vho kavhiwaho zwitirikini zwitanu zwa Limpopo Province.

1. Ndi zwifhio zwivhangi zwa lufhia?
2. Ni vhona u nga ndi mini zwivhangizwa HIV?
3. Lufhia lu nga pfukhela hani u bva kha munwe u ya kha munwe?
4. HIV I nga pfukhelahani u bva kha munwe u ya kha munwe?
5. Zwi na tshifhinga tshingafhani ni tshi khou vha isala lufhia na HIV?
6. No di wana ni khatshiimo de nga murahu ha musu no wanulusa uri ni na lufhia na HIV lwa u tou u thoma?
7. Ndi vhufhio vhushaka vhu re hone vhukati ha lufhia na HIV?
8. Vhaongi vha khou fha naa? Ngeletshedzo nga ha lufhia na HIV?
9. No vhuya na alafhiwa lufhia naa? Arali zworalo tshenzhemo yavho yovha hani nga murahu ha musu vho wana ngalafho yavho ngamurahu ha minwedzi mitanu na muthihi?
10. Ni a wana dzilafho la lufhia na HIV kha pheranthihi naa? Futhi I tshi khou nekedzwa nga muongi muthihi naa?
11. Hovha na muthunaa we a vha a tshi khou vha sumbedza uri zwiitiswa hani?
12. No vhuya na pfukwa nga dzilafho naa? Zwiitisi hovha hu mini?
13. Ndi vhufhio vhushaka hani na tshitafutsha clinic na DOT supporter?
14. Ndi dzifhio khaedu dzine na khou tangana nadzo kha tshitafu tsha clinic na Moseketirhi wa DOT ?
15. Vho vhuya vha funzwa nga ha khombo ya zwidzidzivhadzi zwa lufhiana HIV – Na uri ndi zwifhio zwine na nga ita musu ni tshi khou tangana nazwo?

APPENDIX 21: QUESTIONNAIRE FOR TB/HIV SERVICES INTEGRATION MODEL

VALIDATION OF A TB/HIV SERVICES INTEGRATION MODEL

QUESTIONNAIRE FOR TB/HIV SERVICES INTEGRATION MODEL

INSTRUCTIONS

1. Do not write your name and the name of your employment institution on this questionnaire.
2. Mark the appropriate box with an "X".
3. Complete the sentences in section D.

SECTION A: CLARITY OF THE STRUCTURE OF TB/HIV SERVICES INTEGRATION MODEL

Please respond to the following questions using the following key:
SD=Strongly Disagree: D=Disagree: A=Agree: SA=Strongly Agree

Number	Criteria	SD	D	A	SA
1.	The title describes the TB/HIV services integration model	1	2	3	4
2.	The structure of TB/HIV services integration model is clear	1	2	3	4
3.	The concepts used in the TB/HIV service integration model are simple	1	2	3	4
4.	The TB/HIV services integration model shows that it will serve its purpose	1	2	3	4
5.	STRUCTURE				
5.1	The goal of TB/HIV services integration model is clearly set	1	2	3	4
5.2	The Context of TB/HIV services integration model is clearly described	1	2	3	4
5.3	There is a structural clarity in understanding the interactions within the structure of the model	1	2	3	4
5.4	The structural consistency is related to the use of other structures	1	2	3	4

	within the model				
5.5	The model displayed well graphically for visual presentation	1	2	3	4
6.	CONCEPTS RELATIONSHIP				
6.1	The concepts used in the model are well interconnected	1	2	3	4
6.2	The interrelationships between the concepts and components are clearly displayed	1	2	3	4
7.	LOGICAL COHERENCE				
7.1	The model has evidence of logical coherence	1	2	3	4

SECTION B: A CRITICAL REFLECTION OF A MODEL

Please respond to the following questions: SD=Strongly Disagree:
D=Disagree: A=Agree: SA=Strongly Agree

Number	Criteria	SD	D	A	SA
8.	The TB/HIV integration model is clearly written	1	2	3	4
9.	The TB/HIV services integration model understandable	1	2	3	4
10.	The concepts are easy to read	1	2	3	4
11.	The description of concepts helps to establish the empirical meanings	1	2	3	4
12.	The operational descriptions will ensure operational adequacy of TB/HIV services integration model	1	2	3	4
13.	The outcome of the TB/HIV services integration model is clear	1	2	3	4
14.	Operational guidelines are clear for the implementation of TB/HIV services integration model	1	2	3	4
15.	SIMPLICITY OF THE TB/HIV SERVICES INTEGRATION MODEL				
15.1	The model is simple for use	1	2	3	4

SECTION C: GENERALITY AND THE IMPORTANCE OF TB/HIV SERVICES INTEGRATION MODEL

Please respond to the following questions: **SD=Strongly Disagree: D=Disagree: A=Agree: SA=Strongly Agree**

Number	Criteria	SD	D	A	SA
16.	The TB/HIV services integration model is designed in broad implications that can make it applicable in different health care settings	1	2	3	4
17.	The Model is important to Primary Health Care practice	1	2	3	4
18.	The Model is important in nursing education	1	2	3	4
19.	The model is important for researchers	1	2	3	4
20.	The TB/HIV service integration model addresses the realities of the situation	1	2	3	4
21.	The TB/HIV service integration model is practice oriented	1	2	3	4

SECTION D:

Additional inputs/ Comments

THANK YOU FOR YOUR TIME IN COMPLETING THIS MODEL VALIDATION REPORT

APENDIX 22: STATISTICIAN'S REPORT

P.O.Box 2812,
Polokwane, 0700
August 1, 2016.

To whom it may concern,

I herewith confirm that I analysed the quantitative and model validation data for the PhD thesis of

Ms MPHELE AGNES MAAKE, titled:

A MODEL TO ENSURE THE INTERGRATION OF TUBERCULOSIS AND
HUMAN IMMUNODEFICIENCY VIRUS SERVICES IN THE PRIMARY
HEALTH CARE FACILITIES OF LIMPOPO PROVINCE

Kind regards,



Ms Rita Olwage

BSc Honours (Statistics) and former Research Statistician, University of Limpopo.

APPENDIX 23: INDEPENDENT CODER'S REPORT

QUALITATIVE DATA ANALYSIS

DOCTOR OF PHILOSOPHY

MPHELE AGNES MAAKE

THIS IS TO CERTIFY THAT

Professor Martha Nozizwe Jali has co- coded the following qualitative data:

- 5 Focus group discussions with Community Home Based Carers
- 5 Focus group discussions with TB and HIV positive patients

For the study:

A MODEL TO ENSURE THE INTEGRATION OF TUBERCULOSIS AND HUMAN IMMUNODEFICIENCY VIRUS SERVICES IN THE PRIMARY HEALTH CARE FACILITIES OF LIMPOPO PROVINCE

I declare that the candidate and I have reached consensus on the major themes reflected by the data during a consensus discussion. I further declare that data saturation was reached as evidenced by repeating themes

Prof M.N. Jali



APPENDIX 24 :LANGUAGE EDITOR'S REPORT

Fax: 01526828683174
Tel. 0152862684
Cell: 0822198060
Rammalaj@ul.ac.za

Dr J R Rammala
440B Mankweng
Box 4019
Sovenga
0727

To whom it may concern

4 November 2016

Confirmation letter: MPHELE AGNES MAAKE

This memo serves to confirm that I edited a dissertation by the above-mentioned candidate entitled: **A model to ensure the Integration of Tuberculosis and Human Immunodeficiency Virus Services in the Primary Health Care Facilities of Limpopo Province**

The first document send is marked with track changes indicating what I changed and what I suggested should be changed. I then accepted the track changes on the second document which I send for the candidate to submit for assessment.

Editing was done on language, typesetting and technical appearance. There were not so many language errors but a few on agreement and tense. Technically the document was a bit challenging with font sizes, spacing, punctuation and differentiation of subheadings.

I confirm that the document is now readable and clean with regard to language issues and recommend that it can be submitted for assessment.

Thanks

Signed: 

Dr J R Rammala