FACTORS CONTRIBUTING TO NON-COMPLIANCE TO PULMONARY TUBERCULOSIS TREATMENT AMONG PATIENTS IN WATERBERG DISTRICT LIMPOPO PROVINCE

by

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DECLARATION

I declare that FACTORS CONTRIBUTING TO NON-COMPLIANCE TO PULMONARY TUBERCULOSIS TREATMENT AMONG PATIENTS IN WATERBERG DISTRICT LIMPOPO PROVINCE is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references, and that this work has not been submitted before for any other degree at any other institution.

Signature
Cindy Nolungiselelo Dladla

Full names
February 2013

Date
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<table>
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<th>Description</th>
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<tr>
<td>AIDS</td>
<td>Acquired Immuno Deficiency Syndrome</td>
</tr>
<tr>
<td>ARV</td>
<td>Anti Retroviral</td>
</tr>
<tr>
<td>DoH</td>
<td>Department of Health</td>
</tr>
<tr>
<td>DOTS</td>
<td>Directly Observed Treatment Short Course</td>
</tr>
<tr>
<td>CB-DOTS</td>
<td>Community Based Directly Observed Treatment Short Course</td>
</tr>
<tr>
<td>DOT</td>
<td>Directly Observed Treatment</td>
</tr>
<tr>
<td>E</td>
<td>Ethambutol</td>
</tr>
<tr>
<td>FDC</td>
<td>Fixed Dose Combination</td>
</tr>
<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
</tr>
<tr>
<td>H</td>
<td>Isoniazid</td>
</tr>
<tr>
<td>IUATLD</td>
<td>International Union Against TB and Lung Disease</td>
</tr>
<tr>
<td>MDR TB</td>
<td>Multidrug Resistant Tuberculosis</td>
</tr>
<tr>
<td>NTCP</td>
<td>National Tuberculosis Control Programme</td>
</tr>
<tr>
<td>PLWH</td>
<td>People Living With HIV</td>
</tr>
<tr>
<td>PTB</td>
<td>Pulmonary Tuberculosis</td>
</tr>
<tr>
<td>R</td>
<td>Rifampicin</td>
</tr>
<tr>
<td>TB</td>
<td>Tuberculosis</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organisation</td>
</tr>
<tr>
<td>XDR TB</td>
<td>Extremely Drug Resistant Tuberculosis</td>
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ABSTRACT

The purpose of this study was to identify factors contributing to non-compliance to TB treatment amongst pulmonary TB patients in Waterberg district, Limpopo. The health-belief model was the conceptual framework which guided this study. A quantitative, cross-sectional, descriptive study design was used.

Data was collected using a structured questionnaire administered by trained data collectors. Data was collected from 215 respondents. Informed consent was obtained from each respondent prior to data collection. MS Excel and SPSS were used to analyse data. Findings on significant factors contributing to non-compliance to TB treatment include; non-availability of food whilst taking TB treatment, disbelief in the fact that TB can result in death if not treated, belief in traditional medicine for curing TB, bad healthcare worker attitudes, long distance to the clinic for treatment, belief that TB treatment takes very long and the pill burden.

Key Concepts: Non-compliance, Tuberculosis, health-belief model
CHAPTER 1: INTRODUCTION

1.1 BACKGROUND TO THE STUDY

Tuberculosis (TB) remains a major, worldwide, public-health problem in the 21st century (World Health Organisation (WHO), 2010:3). This disease is one of the leading causes of morbidity and mortality in South Africa, and its elimination remains a major challenge to the Department of Health (National Department of Health, 2009:9). Although there are treatment regimens that have a greater than 95% efficacy in tuberculosis patients infected with mycobacterium tuberculosis strains susceptible to first line drugs, there are a number of patients who are unable to comply with treatment in some parts of Africa such as Uganda (13.0%), Nigeria (10.0%) and South Africa, with a non-compliance rate of 9.1% (Vieira and Ribero, 2011:215-227). As a consequence of this, thousands of patients die from tuberculosis every year (WHO, 2010:3). The emergence of drug resistant tuberculosis has compounded the situation, increasing the mortality rate to 40 per 100 000 population (WHO, 2010:4).

Efforts to control the tuberculosis epidemic depend largely on patients’ compliance to tuberculosis treatment (Setswe, 2009:3). Currently compliance to treatment amongst tuberculosis patients is poor in South Africa as evidenced by high defaulter rates of 12% (WHO, 2010:6). Factors related to non-compliance to tuberculosis treatment in South Africa are: healthcare system, therapy-related, social, and economic, as well as client-related factors (National Department of health, 2009:47).

Efforts to improve compliance to tuberculosis treatment have been made by the South African TB control programme, which adopted a client-centred approach that enhances compliance by ensuring that TB services are convenient to the client, and were aimed at increasing the cure rate to 85% by 2011 (National Department of Health, 2009:11).
Despite this strategy, TB cure rates in South Africa remain below 85%. Kandel, Mfenyana, Chandia & Yogeswaran (2008:47) observe that three factors may contribute to non-compliance to TB treatment, these being poor communication between health care providers and patients, financial constraints limiting access to health care facilities and lack of nutritious food which supports TB treatment. The National Institute of Health (2010:5) is of the view that illiteracy is the main factor in non-compliance to TB treatment, as clients may not understand written instructions about the treatment. Other researchers assert that TB may not be completely cured by scientific treatment and that patients will resort to alternate modes of treatment (Matebesi and Timmerman, 2006:2). The National Institute of Health (2010:5) report states that substance abuse, being home-bound, stigma and lack of trust in Western medication all cause patients to be non-compliant to TB treatment.

In the light of the high morbidity and non-compliance rates to pulmonary TB treatment, the South African National TB Control Programme (NTCP) adopted the World Health Organisation (WHO) strategy of Directly Observed Treatment Short Course (DOTS) in 1996. This approach encourages a support person to enhance compliance to TB treatment (WHO, 2011b:27). The ‘Stop TB strategy’ states that compliance to TB treatment can be increased by using a patient-centred approach to care and treatment delivery. It further emphasizes innovative measures designed to identify and address physical, financial, social and cultural obstacles that may contribute to non-compliance to TB treatment (WHO, 2010:78).

The aims of the ‘Stop TB’ and DOTS strategy are to increase the TB treatment success rate from 60% to 85% for all smear positive Pulmonary TB cases and to detect 70% of such cases (WHO, 2006-2015:32). The ultimate goal of the ‘Stop TB’ and DOTS strategy is to encourage family members to actively support patients and enhance compliance to TB treatment (WHO, report 2010:5).
According to the South African National Department of Health (2009:48) and McKinney (2010:1), a basic approach should be used in promoting compliance to TB treatment, such as: access to treatment; education on the benefits of complying with treatment; and rendering user-friendly services, that are culturally acceptable and convenient to patients. These factors are critical to TB treatment as the treatment of active tuberculosis involves taking multiple drugs daily for 8 months (WHO, 2010:21).

The standard treatment recommended by the South African National TB Control Programme as stated in the National Department of Health (2009:38), includes an initial drug combination of four drugs, namely Rifampicin, Isoniazid, Pyrazinamide and Ethambutol, which are administered daily through the intensive phase (2 months) and then two drugs (Rifampicin and Isoniazid) taken daily in the continuation phase (4 months). Non-compliant patients are given a five drug combination (Rifampicin, Isoniazid, Pyrazinamide, Ethambutol and Streptomycin) daily in the first 2 months, followed by a four-drug combination (Rifampicin, Isoniazid, Pyrazinamide and Ethambutol) for an additional month of the intensive phase and three drugs (Rifampicin, Isoniazid and Ethambutol) daily throughout the continuation phase (5 months). Compliance to treatment is critical in order to prevent the development of resistance to TB which will ultimately cause premature death (Rieder, 2002:11).

In order to enhance compliance, the South African National Department of Health (2009:37) state that fixed dose combination drugs should be used in order to lessen the pill burden. Additionally, negative socio-cultural issues must be addressed (National Department of Health, 2009:37). Patient education should be strengthened (WHO, 2011b:61) and TB services must be accessible, affordable and convenient to patients (National Department of Health, 2009:38).
The Department of Health is of the view that if more DOTS supporters are recruited, the non-compliance rate may be reduced to less than 5% in Waterberg District. This approach is likely to improve the current non-compliance rate of 13.2% in the District. Globally, tuberculosis (TB) is responsible for 5000 mortalities per day and more than 2.3 million per year (WHO, 2009:13). The global tuberculosis incident rates reported each year are above 9 million (WHO, 2009:13). This number is likely to increase as a result of TB/HIV co-infection (WHO, 2009:13). About 30% of the tuberculosis cases reported globally occur in Africa (WHO, International Labour Organisation (ILO) & United Nations Against AIDS (UNAIDS), 2010:2). Countries with the largest number of incidents of tuberculosis cases in Africa are South Africa (0.40-0.59 million) and Nigeria (0.37-0.55 million) respectively (WHO Report, 2010:5).

South Africa has the highest TB incidence in the world, at over 5 times the average incidence rate found in 22 high-burden countries (WHO, 2010:5). The country has the fourth highest estimated total burden of TB incidence in the world compared to China (99/100 000), India (168/100 000) and Indonesia (234/100 000), countries with much larger populations (WHO, 2010:6). In 2009, a total number of 405 982 TB cases were diagnosed and initiated on TB treatment in South Africa (National Department of Health 2011:9). Pulmonary TB cases accounted for 84% of the total caseload and extra-pulmonary TB for 16% (National Department of Health, 2011:9). The same report states that 7 343 MDR TB cases were reported in South Africa in the same year. Approximately 26 000 people died from TB in 2009 in South Africa of whom 80% were pulmonary TB cases (WHO 2010:6).

The National Department of Health (2010:9-10) reports that Limpopo Province contributed 5.4% (22 112) of the total TB cases that were initiated on treatment in South Africa in 2010.
Pulmonary TB cases accounted for 83% of the total cases and extra pulmonary TB for 17% (National Department of Health, 2010:9-10). The mortality rate among TB patients in 2010 was 9.2% (842) in Limpopo. In 2010, Waterberg was the second district with the highest number of TB cases enrolled on treatment in Limpopo (715), behind Capricorn District where a total of 883 cases were notified (National Department of Health, 2010:12).

Although the treatment success rate in South Africa has increased from 62.9% in 2000 to 76.0% in 2009, the treatment success rate in Waterberg district is currently at 68.0% (National Department of Health, 2010:12). Furthermore, the non-compliance rate is high (13.2%), and consequently, TB mortality in Waterberg District is 8.4% (National Department of Health, 2010:13).

1.2 PROBLEM STATEMENT

Waterberg is the second district with the highest prevalence rate for TB in the Limpopo Province, contributing 20.5% (4 535) of the total TB cases enrolled for treatment in Limpopo province in 2010 (National Department of Health, 2010:12). Non-compliance to tuberculosis (TB) treatment has a direct impact on cure rates which are currently below 85% amongst patients in Waterberg district (National Department of Health, 2010:9-10).

Data from Department of Health regarding treatment outcomes reports that in Limpopo province in 2012 7.7% of the pulmonary TB patients were non-compliant to treatment. Waterberg district had the highest non-compliance rate (13.2%) for pulmonary TB patients amongst the five districts in the province (National Department of Health, 2010:9-10). Mokgoadi (2002:3) notes that non-compliance to TB treatment in Limpopo province resulted in poor social and economic outcomes for individuals, families and society.
It is from this perspective that the researcher conducted the study to determine patient-related factors and health-service factors responsible for non-compliance to pulmonary TB treatment among patients in public health institutions in Waterberg District.

1.3 Research purpose

The overall purpose of the study was to explore and describe the reasons why pulmonary TB patients were non-compliant to treatment in Waterberg District, Limpopo Province.

1.4 Research objectives

The specific objectives of this study are:

1. To determine the compliance patterns among TB patients in Waterberg district;

2. To assess the level of knowledge of TB patients in Waterberg District about TB treatment;

3. To identify the socio-cultural factors responsible for non-compliance with TB treatment among the TB patients;

4. To identify the health-related factors which may result in non-compliance to TB treatment among the respondents

1.5 SIGNIFICANCE OF THE STUDY

The study will contribute to the existing body of knowledge on compliance to TB treatment by providing insight into patient-related factors and health-service factors which result in non-compliance to TB treatment. The study will also contribute towards the development of strategies aimed at:

- Increasing compliance to TB treatment; and
- Decreasing the TB defaulter rates and patients lost to follow up.
- Improve the general outcomes of TB patients
Findings generated from this study will assist the Limpopo Provincial Department of Health and Waterberg District to review their tuberculosis case holding policy and to influence healthcare workers to display positive therapeutic behavior of such as adherence counseling, support and care for patients on TB treatment.

1.6 DEFINITION OF KEY CONCEPTS

1.6.1 Compliance

Compliance is the continuous, correct and uninterrupted taking of prescribed medication as directed by the healthcare professional (International Union Against TB and Lung Disease (IUATLD), 2010:12).

In this study, compliance will be defined as taking of tuberculosis medication daily at the right time, at a dosage in line with the TB treatment guidelines for about 8 months, with the correct diet and avoiding alcohol until the patient is declared cured by a health-care professional (Mokgoadi, 2002:18).

1.6.2 DOTS

DOTS is an internationally recognised strategy for delivering the basics of TB case-finding and cure. It is not simply a clinical approach to patients, but rather a management strategy for public health systems, including political commitment as well as case-detection through quality assured bacteriology, short-course chemotherapy, ensuring patient adherence to treatment, adequate drug supply and sound reporting and recording systems (WHO, 2006-2015:32).

1.6.3 DOTS supporter

A DOTS supporter is a community healthcare worker who is trained on TB management and directly observes a TB patient daily whenever the patient is taking the prescribed TB treatment, until she or he has completed the course of treatment (WHO, 2004:9).
The DOTS supporter also provides ongoing counseling on compliance to TB treatment and further advice on management of minor side effects at community level (WHO, 2004:9).

1.6.4 Factors

Factors are client or health-system related elements which contribute to a certain result (non-compliance to TB treatment) (WHO, 2004:27).

1.6.5 First-Line TB drugs

First-Line TB drugs are the drugs used in the treatment of susceptible TB (WHO, 2010:11) and for this study they will be Rifampicin, Isoniazid, Pyrazinamide, Ethambutol and Streptomycin, which are recommended by the Department of Health in South Africa in line with WHO recommendations (National Department of Health, 2009:36).

1.6.6 Non-Compliance

Non-compliance refers to the interruption of tuberculosis treatment or missing doses during the course of treatment (Swaziland Ministry of Health, 2006:49).

In this study non-compliance will be defined as not taking tuberculosis treatment daily for the prescribed duration in accordance with the TB treatment guidelines. This includes patients who miss any dose(s) of the TB treatment for whatever reason.

1.6.7 Patients

Patients are individuals diagnosed with pulmonary TB and who have been initiated on TB treatment for more than 2 months (Swaziland Ministry of Health, 2006:61). In this study patients are individuals aged 18-49, diagnosed with pulmonary TB, who have been initiated on TB treatment for 2 months or more.
1.6.8 Pulmonary TB

Pulmonary TB refers to tuberculosis involving only the lung parenchyma (WHO, 2010:24). Pulmonary TB cases are classified as smear-positive if sputum specimens are positive for acid-fast bacilli, smear-negative if sputum specimens are negative for acid-fast bacilli and smear not done if other diagnostic measures apart from smears were used (Swaziland Ministry of Health, 2006:22). The most common pulmonary TB in South Africa and Waterberg District is smear-positive TB (National Department of Health, 2010:5).

1.6.9 Second Line TB Drugs

These are drugs used in the treatment of resistant, non-susceptible TB or for non-compliant patients who have resumed TB treatment (National Department of Health, 2011:26). These drugs are not widely available in less-resourced countries, they are less effective and more toxic than first line drugs. They include ethionamide, kanamycin, capreomycin, amikacin, ofloxacin, moxifloxacin, levofloxacin, protonamide, cycloserine, terizidone, p-aminosalicylic acid, amoxicillin/clavulanate and clarithromycin (WHO, 2010:11).

In South Africa the second-line management of TB includes a combination of kanamycin, ofloxacin, ethionamide, terizidone or cycloserine and pyrazinamide for the 6-month intensive phase. This is followed by an 18 month continuation phase using ofloxacin, ethionamide, terizidone or cycloserine and pyrazinamide (National Department of Health, 2008:17).

1.6.10 Tuberculosis (TB)

Tuberculosis is an infectious disease caused by mycobacterium tuberculosis that is spread from an infected person through the air when he or she coughs, sneezes or talk. It can attack other parts of the body like the bones, kidneys and spine (IUATLD, 2010:5).
For this research, tuberculosis will refer to pulmonary tuberculosis (affecting the lungs) which has been diagnosed by a health provider who has initiated treatment for two months.

1.6.11 Waterberg District

Waterberg is one of the 5 districts of the Limpopo Province of South Africa. It consists of 6 sub-districts namely: Mogalakwena; Modimolle; Mokgoophong; Thabazimbi; Bela Bela; and Lephalale. The majority of its 614 139 people speak Northern Sotho and Sepedi (Waterberg District Municipality, 2011:1). TB is very prevalent in this District due to factors such as poverty, alcoholism and exposure to pollutants for miners who form a huge proportion of the employed population in the District (Waterberg District Municipality, 2011:1).

1.7 VALIDITY AND RELIABILITY

1.7.1 Validity

According to Campbell & Stanley (2006: 67), internal validity refers to how well a study was run (research design, operational definitions used, how variables were measured, what was or was not measured), and how confidently one can conclude that the observed effects were produced solely by the independent variable and not extraneous ones.

Internal validity was enhanced by using the cross sectional survey which is the most appropriate design for the study purpose and a data collection tool that was deemed objective and valid. A pre-test was initially administered and respondents who participated in the pre-test were not included in the study. Also, compliance to the study protocol was strictly observed and data collectors were individuals who were not exposed in the study area (Chani, 2010:54).
Campbell & Stanley (2006:67) indicate that external validity represents the extent to which a study's results can be generalised or applied to other people or settings. In this study external validity was enhanced by including respondents from various facilities in Waterberg to increase the possibility of generalising findings and ensuring equal inclusion of all ages in the 18-49 years range.

1.7.2 Reliability

According to Polit & Hungler (1997:467), reliability of a data collection instrument refers to the degree of consistency or dependability with which it measures the attribute it is designed to measure. To enhance reliability of the questionnaire, a pre-test of the tool was conducted. The pre-test identified areas of ambiguity in the questionnaire for example the questions on how far do you travel to collect your TB medicines (Km) and distance from nearest health care facility (Km) gave identical responses hence one of the questions was omitted. All other questions were clear and understandable to respondents.

1.8 ETHICAL CONSIDERATIONS

According to Stommel & Wills (2004:373), ethics is an academic discipline based in the philosophic and social sciences that is concerned with descriptive and prescriptive questions of morality.

The ethical principles as set out below were observed in this study.

1.8.1 Protecting the rights of the participants

1.8.1.1 Right to full disclosure and informed consent

Participants were given an informed consent form explaining the details of the study after adequate, truthful and accurate information (veracity) about the study was provided (Burns & Grove 2005:194).
For illiterate participants the consent form was read out to them in Sepedi (the local language). To indicate consent, illiterate participants were given a thumb print whilst literate participants were requested to sign the consent form as advised by Tshabalala (2007:50).

1.8.1.2 Right to autonomy

Participants were not pressured to participate in the study but participated voluntarily, thus exercising autonomy (Burns & Grove 2005:189).

1.8.1.3 Right not to be harmed in any manner (physically, psychologically or emotionally)

This study ensured that participants were protected from physical, psychological or emotional harm (Burns & Grove 2005:176).

1.8.2 Protecting the rights of the institution

Approval to conduct the study was obtained from the Higher Degree Committee of the Department of Health Studies, University of South Africa. Permission to conduct the study was granted by the Limpopo Department of Health and relevant District managers (Burns & Grove, 2005:193).

1.8.2.1 Scientific integrity of the research

To promote scientific integrity, information obtained from other publications as well as other sources was acknowledged in the references (Burns & Grove, 2005:193), results were not be fabricated, research materials and processes were not manipulated and data or results were not omitted when reporting the study findings (Macrina, 2005:1).
1.8.2.2 Relationship to society (Accountability)

This study was conducted in public and its findings will be reported in a full, open and timely fashion to the scientific community (Babbie & Mouton, 2005:521). Participants were informed before consenting to participate in the study that results of the study will be shared with the scientific community (Babbie & Mouton, 2005:522).

1.9 SCOPE AND LIMITATIONS OF THE STUDY

Measurement errors may occur in reporting issues around non-compliance to tuberculosis treatment due to the grant received by tuberculosis patients which on its own may affect compliance to treatment amongst patients, yet they will not openly give out such information (Mokgoadi, 2002:37). There is no reliable method for measuring compliance to TB treatment in primary health care clinics in South Africa (Nyambura, 2009:8). The scope of the study was limited to adults aged 18-49 years, hence views for children and the elderly were not captured (Nyambura, 2009:7).

Another limitation of the study was that the target population were patients who were receiving treatment for at least 2 months thus views for newly initiated TB patients were not captured (Abdul & Guluza, 2009:70). These inclusion and exclusion criteria restricted the population to which findings can be generalised (Burns & Grove, 2005:40).

Questions in the questionnaire were written in English but translated to Sepedi during data collection, which could result in inconsistency in the way the questionnaire was administered as some important facts, could be lost in the translation (Burns & Grove, 2005:402). The study cannot be entirely generalised due to the small non-probability sample that was used.
Additionally, a cross-sectional design may not yield rich data that can be extrapolated on a longitudinal study (Stommel & Wills, 2004: 391). More detail on the limitations will be discussed in detail in Chapter 3.
CHAPTER 2: LITERATURE REVIEW

2.1 DATA BASED LITERATURE

2.1.1 INTRODUCTION

This Chapter discusses the literature review conducted by the researcher in keeping with the aims of this study, namely to identify factors contributing to non-compliance to TB treatment in Waterberg District in Limpopo Province. The chapter reviews relevant literature from previous studies on factors associated with or contributing to TB treatment compliance or non-compliance. The scope of the literature review, therefore, is to synthesize evidence from textbooks, published and unpublished research, scientific reports and other credible sources of scientific work done globally, mainly on TB treatment compliance issues. Several sources were consulted, including medical and research textbooks, the latest relevant journals, WHO publications, district reports, the internet and several Department of Health (DoH) publications. Internet search engines used included google and yahoo.

2.1.2 TB STATUS IN SOUTH AFRICA

The TB epidemic in South Africa remains one of the major healthcare challenges as stated by the National Department of Health (2009:1) report. Data from the World Health Organisation (2005:13) reports that South Africa is among countries with the highest TB infection rates. In retrospect, the National Department of Health points out that approximately 60% of South Africans carry the TB bacilli in their bodies. As such, it was further indicated that the country ranks fourth out of twenty-two countries that are hardest hit by TB at the global level (WHO, 2005:19).

The disease rates are more than twice those recorded in other developing nations and 60% higher than those recorded in Europe (Fourie, 2006:91).
On a yearly basis, South Africa reports more than 400 000 cases of TB, yielding an incidence rate of more than 800/100 000 of the population (National Department of Health, 2010:17). This is a tremendous increase in the incidence from 301/100 000 population reported in 1990. According to the WHO (2011:39), a total of 400 391 TB cases were initiated on treatment in South Africa in 2010. Of these 354 241 were pulmonary TB cases. About 45% of the pulmonary TB cases were smear-positive (WHO, 2011:39).

Despite an increase in the proportion of new pulmonary smear-positive TB cases completing TB treatment, the treatment success rate in South Africa is currently at 76% which falls short of the WHO target of 85% (WHO, 2011:23). The non-compliance rate amongst new pulmonary smear-positive TB cases is 7%, and 12% of the pulmonary TB cases are not easily traced due to socio-economic challenges and are not evaluated during or after administration of treatment (WHO, 2011:23).

2.1.3 INITIATION INTO TB THERAPY

According to the National Department of Health (2000:12), all patients who present with any of the following symptoms are investigated for TB:

- Persistent cough for two weeks or more;
- Sputum production which may be blood stained;
- Shortness of breath and chest pains;
- Loss of both appetite and weight;
- Fatigue; and
- Night sweats and fever.

South Africa complies with the World Health Organisation (WHO) guidelines for diagnosing and treating tuberculosis. Two sputum specimens are collected from each TB suspect.
The first specimen is collected on the spot at the first encounter with the patient and the second specimen is collected early in the morning the following day. The patient’s personal particulars coupled with the date of dispatch of the specimens to the laboratory are captured in the TB suspect register also known as the TB-case identification register. Under normal circumstances, sputum results are available within 48 hours and TB treatment should be initiated as soon as positive sputum results are reported (National Department of Health, 2009:36).

In South Africa, TB treatment initiation is decentralised from hospitals and community health centres to primary health-care facilities. The benefit of this approach is to increase access to TB treatment and ensure timely initiation of smear-positive TB cases onto treatment (Tshabalala, 2007:21). Initiation of TB treatment in South Africa is offered by both doctors and nurses on all TB smear-positive patients (Tshabalala, 2007:25). According to the National Department of Health (2000:28), TB treatment is categorised into four regimens namely:

- Regimen I for new cases aged eight years and above;
- Regimen II for retreatment cases;
- Regimen III for children below eight years; and
- Regimen IV for MDR TB cases.

The standard treatment regimen for a new pulmonary TB case aged eight years and above includes four drugs, these being rifampicin, isoniazid, pyrazinamide and ethambutol, in the first 2 months known as the intensive phase. Following the intensive phase, a combination of two drugs, rifampicin and isoniazid, is given to patient for four months (National Department of Health, 2009:36). This makes the treatment duration for new cases six months. According to the National Department of Health (2009:37), the regimen for retreatment cases includes five drugs (rifampicin, isoniazid, pyrazinamide, ethambutol and streptomycin) in the first two months.
This is followed by a third month of the intensive phase consisting of four drugs, rifampicin, isoniazid, pyrazinamide and ethambutol. The three month intensive phase is then followed by a five-month continuation phase consisting of three drugs, rifampicin, isoniazid and ethambutol.

2.1.4 COMPLIANCE TO TB TREATMENT

Compliance to TB treatment refers to taking tuberculosis medication daily at the right time, in dosages in line with the TB treatment guidelines for 6 months until the patient is declared cured by a healthcare professional (Mokgoadi, 2002:18). The Free Dictionary (2010:2) defines compliance as the degree or extent to which a patient follows or completes a prescribed regimen of treatment. Gandhi (2010:2) states that compliance can be defined as the extent to which a patient’s behaviour coincides with medical advice. It captures the increasing complexity of TB chemotherapy by characterising patients as independent, intelligent and autonomous people who take active and voluntary roles in defining and pursuing goals for their medical treatment (Gandhi, 2010:2).

According to the WHO (2010:78), locally appropriate measures should be taken to identify and address physical, financial, social and cultural obstacles that can result in non-compliance to TB treatment. To ensure compliance to TB treatment, South Africa adopted the DOTS strategy in 1996 (National Department of Health, 2010:19). Components of this strategy directly linked to improving compliance to TB treatment include the direct observation of treatment (DOT) and ensuring an uninterrupted drug supply (WHO, 2011b:27).

According to Tshabalala (2007:29), DOT which involves observing the patient swallow the TB drugs is one of the main strategies for increasing compliance to TB treatment. The National TB Guidelines (2009:48) state that DOT should be provided to all TB patients throughout the treatment period and also that the approach to applying DOT should be flexible and suit the patient’s needs.
In South Africa, there are three types of DOT provided to TB patients, these include:

**Clinic-based DOT**: In this strategy TB patients residing close to health facilities are encouraged to be observed by facility staff on a daily basis when taking their treatment (National Department of Health, 2009:48). In this strategy, healthcare workers provide on-going care and counselling to patients about the benefits of compliance to TB treatment, however, the clinic DOT strategy is generally inaccessible, inconvenient, costly and unaffordable to the majority of clients due to geographical location and socio-economic challenges (National Department of Health, 2009:48).

**Workplace DOT**: involves the observation of treatment in the workplace to increase compliance to TB treatment for patients who have challenges in accessing health care facilities due to their busy work schedules (WHO, 2011b:62). The benefit of this strategy to employees is access to treatment support and avoids absenteeism which may have a detrimental outcome to patients’ economic status (National Department of Health, 2009:48).

**Community-based DOT** involves daily observation of the TB patient taking treatment at his or her home (WHO, 2011b: 62). According to the National Department of Health (2009:49), the community-based DOT contributes substantially to increasing compliance to TB treatment, because it is accessible to clients. (National Department of Health, 2009:49). The only challenge with this strategy is to define the level of accountability for its users, as trained support people are ideal in order to monitor and support patients in adherence to treatment and report to relevant health authorities as the need may arise (National Department of Health, 2009:49).
2.1.5 NON-COMPLIANCE LEVELS

Compliance to TB treatment is measured by evaluating the treatment success rate which should be above 85%. Non-compliance rate is defined as the proportion of TB patients who fail to follow instructions, particularly in administering TB medication as prescribed, a cause of a less than expected response to treatment (Free Dictionary 2010:2). This rate should be less than 5% (WHO, 2008:6). Non-compliance to TB treatment has a direct impact on cure rates, and currently data reports that the TB cure rate is 69% for South Africa (WHO, 2011:23).

This is far below the WHO target for cure rate which is 85%. Data on TB treatment outcomes indicates that in the year 2010, 7% of the pulmonary TB patients in South Africa were non-compliant to treatment (WHO, 2011:23). Waterberg District in Limpopo Province recorded the highest non-compliance rate of 13.2% for pulmonary TB patients of all the five districts in the province (National Department of Health, 2010:9-10).

Harrison (2001:76) indicates that non-compliance to treatment is the most important impediment to cure. Patients who do not comply with the prescribed treatment regimen are reported to have a higher probability of developing Acquired Drug Resistance (ADR). Gandhi (2010:5) states that non-compliance with TB treatment is a major problem that leads to treatment failure, relapses and emergence of drug resistance. This exposes both the patient and the community to grave danger. Although ADR rates are not currently reported in South Africa, the drug resistance rate is 6.9% in Limpopo Province (National Department of Health, 2010:12).

Non-compliance to TB treatment prolongs morbidity and community members become vulnerable to TB because clients/patients remain infectious for a much longer period than would be the case if they were compliant (Petrie, 2005:4).
The main contributing factor to non-compliance (Mothake, 2005:18) is the long-term treatment (usually six months) to intensively ‘clean up’ TB infection in the system. This view is supported by Noback and Corolla (2005:7). Pandit & Chowdary (2002:67) also concur with this view and further state that toxicity of TB drugs is one of the major reasons for non-compliance to TB treatment.

The benefits of compliance to TB therapy (Mhlophe, 2002:17) include total cure of the current infection and preventing new infection and the occurrence of multi-drug resistant TB. At a social level, compliance to TB treatment normally results in positive treatment outcomes which ultimately leads to peace of mind and freedom among patients and their family members (IUATLD, 2010:26). The IUATLD, (2010:27) also indicates that compliance to TB treatment enables health workers to focus on other primary health care priorities by reducing the burden on national TB programs. This ultimately leads to a reduction in TB morbidity and mortality (WHO, 2000:4; Petrie, 2005:4; IUATLD, 2010:90).

2.1.6 FACTORS AFFECTING COMPLIANCE TO TB TREATMENT

In the healthcare context, compliance refers to the extent to which patient behaviour coincides with medical advice (Glatthaar, 2003:118). A range of factors leading to TB treatment compliance or non-compliance by patients includes demographic, health-service, client-related, social and economic factors. Several authors (WHO, 2003:19; Shyrock, 2007:631) have explored some of the factors contributing to non-compliance, these being, age, educational status, family support, gender, marital status, access to health services, staff attitudes, patient-provider relationships, cultural beliefs, poverty and socio-economic status, patient knowledge on TB, stigma and discrimination and co-morbidities. These factors will be explored in this review.
2.1.6.1 Demographic factors

Chaulet (2003:23) states that demographic factors are likely to cause non-compliance to TB treatment. A study conducted by Estifanos & Bernt (2007:3) identifies demographic factors associated with non-compliance to TB treatment, which include the factors as set out below.

2.1.6.1.1 Age

Patients aged 25 years or older are more likely to be compliant compared to the other age groups (Estifanos & Bernt 2007:3). Although Volmink & Garner (2007:315) argue that there is no significant difference in the compliance patterns of patients of different ages, Shyrock (2007:632) concurs with Estifanos & Bernt (2007:3) that TB patients above 25 years old are more compliant to TB treatment than those below that age. Findings from a study conducted by Kaona, Tuba, Siziya & Sikaona (2004:68) state that age is not significantly associated with compliance to TB treatment.

2.1.6.1.2 Educational status

The study conducted by Malik & Ahmad (2009:17) indicates that with regard to educational status, 55% of non-compliant TB patients were illiterate, 35% had passed primary school, 7% had passed secondary school and 3% were higher education graduates. Chani (2010:25) states that in a study carried out in Thailand aimed at determining the patient factors predicting successful treatment, out of 1,241 patients studied, 81% with higher educational levels and knowledge of tuberculosis were successfully treated, the argument being that these factors are associated with better compliance to TB treatment and subsequently treatment success (Okanurak, Kitayaporn & Akarasewi, 2008:1162).
A study conducted by Gad et al. (1997: 244-250) indicates that patients with low educational levels can have a poor treatment outcome as they may not read or understand written instructions with regard to TB treatment.

2.1.6.1.3 Support by family

There has been no documented evidence that support by family significantly increases compliance to TB treatment. Volmink & Garner (2007:317) indicate that the difference in compliance between patients who are supported by their families and those who are not is not statistically significant.

2.1.6.1.4 Gender and marital status

Gender and marital status have also been explored and are strongly believed to have an influence on the degree of compliance to TB Treatment. From the study conducted by Malik & Ahmad (2009:16), out of 100 non-compliant TB patients surveyed, 63% were males and 37% were females. From the same study, out of the 100 non-compliant TB patients, 72% were married and 28% unmarried.

2.1.6.2 Perceived barriers to action

Perceived barriers to action as discussed in this review include health-service, client-related and social factors.

2.1.6.2.1 Health service factors

A study by the IUATLD (2002:12) states that factors affecting compliance to TB treatment include health service factors such as TB treatment duration, access to treatment, staff attitudes and patient-provider relationships.
i) TB treatment

Smetherman (2000:2) indicates that patients do not comply with treatment because tablets are taken for too long. According to Stanhope and Lancaster (2006:776), one of the biggest problems with compliance to TB treatment is the required lengthy therapy using multiple drug combinations. This on its own reduces patients’ compliance to treatment. Clark (2009:793) indicates that failure to comply with the prescribed TB therapy results in treatment failure and the development of drug resistance. A study conducted by Mokgoadi (2002:42) finds that TB treatment is still perceived by the majority of patients as long, agonising and cumbersome, and there are still some doubts as to whether the disease is curable.

ii) Access to TB treatment

Findings from a study conducted by Kaona et al. (2004:68) reflect that poor access to a health care facility may have an effect on compliance to TB treatment as healthcare services may be inaccessible to patients. It further states that TB patients residing in remote areas with poor road infrastructure may be unable to visit health care facilities to access any form of treatment.

Erhabor, Aghanwa, Yusuph, Adebayo, Arogundande & Omidiora (2000:235) concur with Estifanos & Bernt (2007:3) in stating that the distance from the TB patient’s residence to the clinic has a direct relationship with the rate of compliance. The longer the distance, the poor the compliance to TB treatment. Erhabor et al. (2000:235) further state that compliance to TB treatment is found to be higher in those patients who live within 25km of the clinic compared to patients who live more than 25 km away.
In a study by Chani (2010:31), location of health outlet at 20km or more was found to cause an increase in non-compliance to TB treatment due to travelling constraints. The WHO (2010:23) states that 7% of TB patients were non-compliant to treatment in South Africa in 2009 due to several factors which among others include transport availability and proximity to healthcare sites.

iii) Staff attitudes

Negative staff attitudes have been associated with TB patients interrupting TB treatment (Chani, 2010:31). A study by Mokgoadi (2002:39) suggests that a preventative measure to decrease non-compliance to TB treatment is to improve the attitude of health-care workers dealing with TB patients.

iv) Patient-provider relationship

A number of studies have shown the importance of the relationship between healthcare workers and their patients as a contributor to treatment compliance or non-compliance (Chani, 2010:31). A South African study (Peltzer, Onya, Seoka, Tladi & Malima 2002:67) establishes that the quality of healthcare provider and patient communication, coupled with correct causative belief, is associated with TB treatment compliance. The provider-related factors that promote compliance include education and support to the patient in the form of accessibility to health services and the utilisation of DOT and effective communication between the patient and healthcare providers (Glatthaar, 2003:206).

2.1.6.2.2 Client-related factors

i) Cultural beliefs

Kobe (2006:32) states that non-compliance of most TB patients with prescribed treatment is caused, to a large extent, by cultural beliefs. Following that finding, the National Department of Health (2004:7) points out that traditional healers should work in collaboration with health professionals to prevent non-compliance
to prescribed TB treatment. Dyk (2001:126) supports this view by emphasising that no TB prevention programme can succeed in Africa without the input of traditional healers. The idea behind the orthodox view is that traditional healers are regarded as effective agents of change since they function like social counsellors.

They are regarded as guardians of the traditional code of morality and values. Adding to the same view, Dyk (2001:126) further indicates that approximately 80% of people in Africa rely on traditional medicine for most of their health needs. Overall, traditional healers are observed to have more influence in communities than health care professionals, hence the reason why it is beneficial to incorporate them into the treatment processes.

A study conducted by Tshabalala (2007:39), in Tintswalo, Limpopo Province, and a study by Edington (1997b:279-943) find that some patients believe that TB is a punishment for breaking sexual rules such as sleeping with a widow or abstinence. As such, healthcare workers find it difficult to convince patients to comply with TB treatment as required, because their beliefs make them non-compliant to treatment.

ii) Poverty and socioeconomic status

From an economic perspective the length of time and costs involved from TB diagnosis to subsequent treatment determines the degree of compliance and successful completion of the prescribed therapy. As a result, a proportion of patients, particularly the poor, may drop out completely at any stage of the process towards successful TB treatment (Kamolratanakul, 2009: 576). According to the WHO (2003:1), TB affects the most productive and economically active segment of the population and to a greater extent non-compliance to TB treatment is higher among lower social class group.
A study in India by Pandit et al. (2002:242), however does not find socio-economic status to be significantly associated with TB treatment compliance.

A study conducted by Tshabalala (2007:34) finds that poverty is a leading factor that results to TB patients' non-compliance to treatment. According Glatthaar (2003:207), the level of poverty influences compliance to TB treatment. Poor TB patients experience barriers to access for effective TB healthcare services, which can lead to non-compliance to treatment. Poverty is a barrier for patients to access services that improve health, such as food, water, sanitation and healthcare services (Glatthaar 2003:207). A study conducted by Malik & Ahmad (2009:17) indicates that 67% of non-compliant TB patients were of lower social class, 28% from the middle and 5% from higher classes.

iii) Knowledge of TB

Gad et al. (1997:244-250) states that compliance with TB treatment is significantly higher among patients who have a good knowledge of TB. Patients who know about the natural history of TB, its complications and the importance of complying with treatment exhibit improved compliance to TB treatment. Another study by Kaona et al. (2004:68) reveals that compliance with TB treatment is significantly higher among patients who have good knowledge about TB compared to patients who do not. In a similar study in India in 1992, the authors found that there was an association between the compliance behaviour of TB patients and their knowledge of specific aspects of the disease.

2.1.6.2.3 Social factors

i) Stigma and discrimination

Chani (2010:34) states that the presence or perceived presence of stigma and discrimination in a community may act as barriers to patients disclosing their disease to family or community members, who may provide much needed
psychosocial support to the patient (Eastwood & Hill, 2004:70). A study by Hodgson, Desclaux & Mukasa (2004:1281-1283) concludes that stigma and discrimination towards TB and HIV patients results in patients delaying seeking testing and treatment and thus poorer health outcomes.

ii) Co-morbidities

According to Chani (2010:35) while there is no doubt that HIV predisposes an individual to developing TB, there is no consensus on whether HIV is associated with poor TB treatment compliance (WHO, 2002:2). However, possibilities of increased pill burden if the patient is on Anti-Retroviral Treatment (ART), increases incidences of side effects and other co-morbid conditions which result from HIV, such as depression and dementia, and may increase the likelihood of poor compliance to TB treatment. A similar study conducted in Namibia in 2006 also revealed that patients who are receiving other treatments in addition to TB treatment are less compliant to TB treatment compared to patients who are only on TB treatment.

2.1.6.3 Perceived severity of ill-health condition

Factors discussed in this review with regard to perceived severity of ill-health condition, include patients not acknowledging the dangers of not completing TB treatment because of subsiding TB symptoms or feeling better.

2.1.6.3.1 Subsiding TB symptoms or feeling better

According to Chani (2010:28) patients might not see the need to continue with TB treatment when they are feeling better or well after taking the treatment for a while, usually 2 months out of the 6 months required treatment duration.
Chani (2010:28) also states that in a Nepal cross-sectional study of 130 compliant and 25 non-compliant TB patients, 48% of the latter were more likely to think that they could stop TB treatment once they were free of symptoms and feeling well, because they thought they were cured (Bam, Chand & Shrestha, 2005:51).

O'Boyle et al. (2002:307) & Kaona et al. (2004:68) state that studies conducted in Zambia and Malawi showed that non-compliance was associated with being free of symptoms and that patients' defaulting behaviour occurs when TB symptoms disappear and they feel well, usually after a few months of TB treatment, forgetting the dangers of not completing TB treatment.

2.1.7 MEASURING COMPLIANCE

According to the National Department of Health (2005:109), compliance is a very important tool used in the assessment of effectiveness and success of treatment. It helps in monitoring changes in health outcomes based on the recommended treatment regimen. However, there is no gold standard that exists for measuring treatment compliance. Several different direct and indirect indicators have been used with varying success (National Department of Health, 2005:109).

Direct measures of compliance include direct observation of medication taking, measuring levels of the drug or tracer compounds in body fluids, biological markers and monitoring clinic attendance (WHO, 2000:77). Direct observation of patients involves trained healthcare providers observing and recording the patient’s compliance. The frequently used indirect measures include self-report of medication taking, monitoring of clinic attendance and pills, computation of medication refill rate, physician assessment and electronic monitoring for expected therapeutic outcome (National Department of Health, 2005:110).
Compliance to TB treatment means following the recommended course of treatment by taking all the prescribed medication for the entire length of time necessary (IUATLD, 2010:27). According to the National Department of Health (2004:38), the public principal health priority of the National TB Control Programme (NTCP) is to cure smear-positive cases, while preventing the emergence of drug resistant ones.

The disease is effectively curable if patients are given and correctly take a complete an uninterrupted course of prescribed drug therapy. Any poor compliance measured by missing 5 doses or more per month of the prescribed medication, results in inadequate treatment as well as drug resistance (WHO, 2000:77). According to the National Department of Health (2004:63), tuberculosis is a complex disease that carries biological, social, economic, and cultural ramifications for the patient, hence non-compliance by patients is a key factor leading to treatment failure.

In order to measure compliance to TB treatment, the effectively implemented strategy recommended by the WHO is the Directly Observed Treatment (DOT) strategy. 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 interval of time and for the right duration (WHO, 2000:78).

According to the WHO (2011:27) in DOTS programmes, almost twice as many patients successfully complete their treatment as compared to those in non-DOTS programmes. The cure rates for TB patients in DOTS programmes are consistently high, even in countries which vary considerably in terms of culture, geography and socio-economic conditions. In South Africa, implementation of the DOTS programme resulted in cure rates rising up to over 70%.
Under the DOTS treatment approach, most patients can avoid costly hospital-based treatment and can be treated whilst staying at home (WHO, 2011:28).

2.2 THEORETICAL/CONCEPTUAL BASED LITERATURE

2.2.1 THEORETICAL FOUNDATION OF THE STUDY

2.2.1.1 Conceptual Framework

The Health Belief Model (HBM) was identified as the conceptual framework for this study. The HBM was developed in the early 1950s, for addressing problem behaviours that evoke health concerns which include examining compliance to TB treatment (Marriner & Raile, 2005:63).

Based on this model, the framework for this study was developed on the theory that personal beliefs influence health behaviour (Ali, 2002:31). This framework is based on selected components of the health belief model, namely perceived benefits of action, perceived barriers to action and perceived severity of ill health condition (Rosenstock, Strecher & Becker, 2004:5-24). Other constructs of the health belief model include perceived seriousness and perceived susceptibility. The study focused on the following concepts of the Health Belief Model as set out below.

2.2.1.1.1 Perceived seriousness or severity

The construct of perceived seriousness speaks to an individual's belief about the seriousness or severity of a disease (Rosenstock, Strecher & Becker, 2004:5-25). According to the United States Department of Health and Human Services (2000:213), while the perception of seriousness is often based on medical information and knowledge, it may also come from beliefs a person has about the difficulties a disease would create or the effects it would have on his or her life in general.

31
This study will determine the seriousness of failing to comply to TB treatment through evaluating participants' knowledge on what the consequences of not completing TB treatment are.

2.2.1.1.2 Perceived susceptibility

According to Marriner and Raile (2005:63) perceived susceptibility refers to a person's perception that a health problem is personally relevant or that the diagnosis of an illness is accurate. To determine perceived susceptibility in this study, participants will be asked whether they believe that they are suffering from TB and whether they believe that the diagnostic method used was accurate.

2.2.1.1.3 Perceived benefits

The construct of perceived benefits on the other hand is a person's opinion of the value or usefulness of a new behaviour in decreasing the risk of developing a disease (Ali, 2002:35). According to Turner, Hunt, DiBrezzo & Jones (2004:115-121), people tend to adopt healthier behaviours when they believe that the new behaviour will decrease their chances of developing a disease. In this study compliance may be attained if TB patients believe that they will gain health by taking the recommended treatment.

2.2.1.1.4 Perceived barriers

Perceived barriers refer to an individual's own evaluation of the obstacles in the way of him or her adopting a new behaviour. Of all the constructs, perceived barriers are the most significant in determining behaviour change (Rosenstock et al., 2004:5-25). The major constructs of perception are modified by other variables such as culture, education level, past experiences, skill and motivation.
These are individual characteristics that influence personal characteristics (Turner et al., 2004: 72). The study will identify barriers in complying to the recommended TB treatment.

The health belief model is relevant for this study, because the underlying concept is that health behaviour (non-compliance to TB treatment) is determined by personal beliefs or perceptions about a disease and strategies to decrease its occurrence (Ali, 2002:33).

**Figure 2.1 The Health Belief Model**

![Health Belief Model Diagram]

CHAPTER 3: RESEARCH DESIGN AND METHOD

3.1 RESEARCH PARADIGM

This was a quantitative study aimed at describing the variables and identifying the relationship among variables, these being non-compliance and social, cultural and health system related factors as advised by Hopkins (2000:27). Quantitative research was used to profile adult pulmonary TB patients by determining their behavioural intentions, attitudes and knowledge related to TB and to identify specific determinants which predicted non-compliance to treatment among these patients at a statistically significant level (Scott, 2002:12). The advantage of using this design was that it provided the researcher with a clearer picture of what to expect in her research (Hopkins, 2000:27).

3.2 AREA OF STUDY/LOCATION

The study was conducted in 12 primary health care facilities in Mogalakwena and Modimolle sub-districts, Waterberg District in the Limpopo province.

3.3 TARGET POPULATION, SAMPLE AND SAMPLING METHOD

3.3.1 Target population

There were only 215 clinic based TB patients aged 18-49 years who were recruited to participate in this study, they resided in Waterberg District. Since the population was not large, a total population study was done and there was no need for sampling.

3.3.2 The instrument

A Questionnaire was used for data collection from participants in this study. The questionnaire was divided into the following sections;
Section A: Demographic information;  
Section B: Socioeconomic variables;  
Section C: Client related factors;  
Section D: Health system related factors;  
Section E: Socioeconomic barriers; and  
Section F: Disease and medicine related barriers

3.3.3 Data-collection approach

Data collection was done using the interviewer administered questionnaire to study participants as they were queuing for TB services. Each participant was moved away from the other TB patients whilst the questionnaire was being administered. Although the questionnaire was in English, questions were asked in the local language in order to increase understanding of questions by the participants.

3.3.4 Data analysis

In this study, a statistician analysed the data using the Statistical Package for Social Sciences (SPSS) version 11.0 computer program. The Chi-square test was used to compare different proportions and the association between variables. The 5% level of significance was used as the cut off for statistical significance. Descriptive statistics of frequency distributions and measures of dispersion were used to describe study variables.

3.4 Ethical considerations related to data collection

Ethical considerations related to data collection in this study included the principle of respect for human dignity, principle of anonymity and confidentiality, principle of beneficence and the principle of justice.
i) Principle of respect for human dignity

The principle of respect for human dignity states that human beings have the right to be respected and the right to have their decisions respected (Polit & Beck, 2008: 88). Participants were given the opportunity to choose to participate in the study (Mouton, 2003:243). Privacy was enhanced by administering the questionnaire to one patient at a time away from other patients.

ii) Principle of anonymity and confidentiality

Study informants remained anonymous. The identities of all participants were kept secret. Codes were used instead of participants’ names and surnames as advised by Mouton (2003:243). To ensure confidentiality, all collected information was stored privately in a lockable cabinet in line with Babbie and Mouton’s (2002:521) advice.

iii) Principle of beneficence

The ethical principle of beneficence, holds that one should do good and, above all, do no harm (Burns & Grove 2005:190). This study ensured that participants were protected from psychological or emotional harm, by explaining the purpose of the study, exploring any fears and addressing them as advised by Babbie & Moutons (2002:521). There were no anticipated negative effects for the respondents, as the study was non-experimental.

iv) Principle of justice

This principle holds that each person should be treated fairly and should receive what he or she is due or owed (Burns & Grove 2005:189). All participants were treated fairly without discrimination and the researcher was guided by professional ethics as she is a registered nurse. The researcher also ensured that research ethics of upholding the participants’ rights were observed.
3.5 LIMITATIONS OF THE STUDY

The researcher identified the following limitations in the study:

- The findings could not be generalised to other parts of the country, as the sample was not large enough and was obtained using convenience sampling.
- No opinions were obtained from the health workers and treatment supervisors.
- The scope of the study was limited to adults (18-49 years), hence views for TB patients below 18 years were not captured.
- Data obtained through the cross-sectional study design may not be rich enough to be extrapolated on a longitudinal study.
- Resources to support research were inadequate since the researcher had to personally fund the study.
- There was limited time to conduct research.
- The researcher is not very experienced in conducting research.
CHAPTER 4: THE RESULTS

SECTION 1: DEMOGRAPHY

The demographic factors included age, gender, marital status, race, level of education and religion. Analysis was done for 212 respondents out of the 215 who were interviewed. The demographic factors are presented below.

4.1.1 Age in years (N=212)

The questionnaire categorised respondents into age groups. The age distribution is displayed in Figure 4.1 (below).

![Age distribution of patients (N=212)](image)

**Fig 1: Age distribution of all the respondents**

This graph shows that 14% of the study respondents were aged between 18-25 years, 22% were aged 26-33 years and 28% were between 34-41 years old. Respondents aged between 42-49 years were 25% and 11% were aged between 50-57 years. Only 2% of the respondents were aged between 58-65 years, whilst 4% were between 66-73 years old. Respondents aged >73 years were only 0.5%.
4.1.2 Gender (N=212)

Respondents were asked to state their gender. Of 212 respondents, 98 (46%) were males and 114 (54%) were females. This indicates that a higher proportion of the respondents were females. Cross tabulation of gender and compliance to TB treatment is shown in section 4.8.3.

Table 1: Respondents’ gender (N=212)

<table>
<thead>
<tr>
<th>Sex</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>98</td>
<td>46%</td>
</tr>
<tr>
<td>Female</td>
<td>114</td>
<td>54%</td>
</tr>
<tr>
<td>Total</td>
<td>212</td>
<td>100%</td>
</tr>
</tbody>
</table>

4.1.3 Marital status (N=212)

Each respondent was asked their marital status (single, married, living with partner, divorced, separated or widowed). Only 42 (20%) of the study participants reported to be married. A significant proportion, 91 (43%) of the respondents were single. Respondents living with a partner were 34 (16%) whilst 45 (21%) were either divorced, separated or widowed. Marital status and compliance to TB treatment is cross tabulated in section 4.8.4.

Table 2: Respondents’ marital status (N=212)

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>91</td>
<td>43%</td>
</tr>
<tr>
<td>Married</td>
<td>42</td>
<td>20%</td>
</tr>
<tr>
<td>Living with partner</td>
<td>34</td>
<td>16%</td>
</tr>
<tr>
<td>Divorced/Separated/Widowed</td>
<td>45</td>
<td>21%</td>
</tr>
<tr>
<td>Total</td>
<td>212</td>
<td>100%</td>
</tr>
</tbody>
</table>
4.1.4 Race (N=212)

Respondents were asked their race. The highest proportion of the study participants were black, 196 (92%) and most of them 112 (57%) were in the non-compliant group. Only 1 (0.5%) of the respondents was white whilst 15 (7%) were coloured. A higher proportion (12) 80% of the coloured respondents were in the compliant group. None of the study participants were Indian. Race and compliance to TB treatment is cross tabulated in section 4.8.5.

4.1.5 Highest level of education attained (N=212)

The respondents were asked the highest level of education they had attained. Fig. 2 (below) shows the majority, 58 (27%) of the respondents only attained secondary education level. Participants who had attained matric education level were 46 (22%). Thirty six (17%) of the respondents had a primary level education and 24 (11%) had no education at all. Cross tabulation of the level of education and compliance to TB treatment is presented in section 4.8.6.

![Highest level of education attained](image)

**Fig 2: Highest level of education attained**
4.1.6 Religion (N=212)

A total of 127 (60%) respondents reported they were of other religions. Eighty two (39%) were Christians. Christians were equally distributed in both the compliant and non-compliant groups. The religion practiced did not account for any significant difference between the two groups (P=0.243). Only 3 (1%) of the respondents were Muslims.

SECTION 2: SOCIOECONOMIC VARIABLES

Socioeconomic variables included employment status, income per month and availability of food whilst taking TB treatment.

4.2.1 Employment status of respondents (N=212)

Respondents were asked to indicate their employment status. One hundred and fifteen (54%) indicated that they were unemployed and 70 (33%) were employed. Twenty seven (13%) of the respondents were self-employed (see figure 1). Employment status and compliance to TB treatment is cross tabulated in section 4.8.7.

Fig 3: Respondents’ employment status (N=212)
4.2.2 Respondents’ income per month (N=212)

The highest number of respondents 121 (57%) reported having no income at all and a higher proportion of those respondents 70 (58%) were in the non-compliant group. Respondents with an income of R1000-R2000 per month were 33 (16%) whilst study participants with an income above R2000 per month were 55 (26%). Of these participants, a higher proportion 41 (75%) were in the compliant group. Only 3 (1%) of the respondents reported having an income of less than R1000 per month.

Fig 4: Respondents’ income per month

4.2.3 Availability of food whilst taking TB treatment

Eighty percent of the respondents reported that they always have food whilst taking TB treatment. A higher proportion 156 (92%) of these respondents were in the compliant group. Only 43 (20%) of the study participants reported that they do not always have food whilst taking TB treatment. Of these participants a higher proportion 31 (72%) were in the non-compliant group while only 12 (28%) were in the compliant group. None of the participants reported that they never have food. Availability of food and compliance to TB treatment is cross tabulated in section 4.8.8.
Table 3: Availability of food whilst taking TB treatment (N=212)

<table>
<thead>
<tr>
<th>Availability of food</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always available</td>
<td>169</td>
<td>80%</td>
</tr>
<tr>
<td>Not always available</td>
<td>43</td>
<td>20%</td>
</tr>
<tr>
<td>Never available</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td>212</td>
<td>100%</td>
</tr>
</tbody>
</table>

SECTION 3: CLIENT-RELATED FACTORS

Client-related factors which were assessed included the questions: "do you believe that you are suffering from TB?", "do you think that the TB diagnostic method used is accurate?" and statements like "TB can result in death if not treated" and "TB can be cured if TB treatment is taken daily for the correct treatment duration". Further questions such as "why is it important to take TB treatment for the prescribed duration?" and "are you currently receiving the disability grant and are you receiving any food packages?".

4.3.1 Do you believe that you are suffering from TB?

The respondents were asked whether they believed they were suffering from TB. One hundred and eighty five (87%) of the respondents reported that they believed that they were suffering from TB. A higher proportion of these respondents (89%) were in the compliant group. Study participants who reported that they do not believe that they are suffering from TB numbered 27 (13%). Of these participants only 11% were in the compliant group. A cross tabulation of whether respondents believed they were suffering from TB and compliance to TB treatment is shown in section 4.8.9.
Table 4: Respondents’ responses on whether they believe they are suffering from TB (N=212)

<table>
<thead>
<tr>
<th>Do you believe you are suffering from TB</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>185</td>
<td>87%</td>
</tr>
<tr>
<td>No</td>
<td>27</td>
<td>13%</td>
</tr>
<tr>
<td>Total</td>
<td>212</td>
<td>100%</td>
</tr>
</tbody>
</table>

4.3.2 Do you think that the TB diagnostic method used is accurate? (N=212)

Respondents were asked if they think that the TB diagnostic method used is accurate and 163 (77%) reported that they believed that it is. A higher proportion of those participants (81%) were in the compliant group. Only 49 (23%) study participants reported that they did not believe that the TB diagnostic method used was accurate and only 19% of those participants were in the compliant group. A cross tabulation of whether participants think the TB diagnostic method used was accurate and compliance to TB treatment is shown in section 4.8.10.

4.3.3 TB can result in death if not treated (N=212)

When asked whether they believed that TB can result in death if not treated, 204 (96%) reported that TB it can and 98% of those respondents were in the compliant group. Only 8 (4%) of the respondents said no, TB cannot result in death if not treated and only 2% of these were in the compliant group. A cross tabulation of whether respondents believed that TB can result in death if not treated and compliance to TB treatment is shown in section 4.8.11.
4.3.4 TB can be cured if TB treatment is taken daily for the correct treatment duration (6-8 months) N=212

There were 205 (97%) respondents who indicated that they believed that TB can be cured if treatment is taken daily for the correct treatment duration. Of these 205 patients, 97% were in the compliant group. Only 7 (3%) of the participants indicated that TB can still be cured even if treatment is not taken daily for the correct treatment duration. A cross tabulation of whether respondents believed that TB can be cured if treatment is taken daily for the correct duration and compliance to treatment is shown in section 4.8.12.

4.3.5 Why is it important to take TB treatment for the prescribed duration (6-8 months)? N=212

When respondents were asked why it is important to take TB treatment for the prescribed duration their responses were as follows; 153 (72%) indicated to prevent drug resistant TB, 208 (98%) stated that to be cured, whilst 165 (78%) of the respondents indicated to prevent the spread of TB. Participants who indicated that to prevent death were 186 (88%). Of the respondents who indicated to prevent drug resistant TB, a higher proportion (80%) were in the compliant group and 98% of the respondents who said they wanted to be cured were in the compliant group.

A high proportion (81%) of participants who indicated to prevent the spread of TB were in the compliant group and of the respondents who indicated to prevent death, 88% were in the compliant group. Participants’ reasons for taking TB treatment for the prescribed duration and compliance to TB treatment are cross tabulated in section 4.8.13.
Table 5: Respondents' reasons for taking TB treatment for the prescribed duration (N=212)

<table>
<thead>
<tr>
<th>Respondents' reasons for taking TB treatment for the prescribed duration</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>To prevent drug resistant TB</td>
<td>153</td>
<td>72%</td>
</tr>
<tr>
<td>To be cured</td>
<td>208</td>
<td>98%</td>
</tr>
<tr>
<td>To prevent the spread of TB</td>
<td>165</td>
<td>78%</td>
</tr>
<tr>
<td>To prevent death</td>
<td>186</td>
<td>88%</td>
</tr>
</tbody>
</table>

4.3.6 Are you currently receiving a disability grant (N=212)?

Respondents were asked whether they are receiving a disability grant. Seventy seven (36%) of the respondents indicated that they are receiving a disability grant whilst 135 (64%) reported that they are not receiving any grant. There was no significant difference between the compliant and non-compliant groups with respect to the disability grant question (P=0.229).

4.3.7 Are you receiving any food packages (N=212)?

When asked whether they were receiving any food packages, 205 (97%) indicated that they are not receiving any food packages whilst only 7 (3%) reported that they are. There was no significant difference in compliance between respondents who were receiving food packages and those who were not (P=0.0220).
SECTION 4: HEALTH SYSTEM RELATED FACTORS

4.4.1 How are the healthcare workers' attitudes in the clinic/facility of treatment (N=212)?

Respondents were asked about the health-care workers' attitudes in the facility of treatment. One hundred and fifty nine (75%) of the respondents reported that staff were friendly and 160 (75%) indicated that staff are also caring. Of the participants who said staff were caring, 78% were in the compliant group. Participants who indicated that staff were rude were 51 (24%) whilst 53 (25%) reported that staff are uncaring. Of the participants who said staff were rude, only 21% were in the compliant group. A cross tabulation of participants responses on health care worker attitudes and compliance to TB treatment is shown in section 4.8.14.
4.4.2 How much time do you spend in the clinic/facility for monthly refill of TB treatment (N=212)

When asked about the time they spend in the facility for monthly refill of TB treatment, 81 respondents (38%) indicated that they spend less than 1 hour whilst 76 (36%) reported that they spend 2-3 hours. A higher proportion (61%) of the respondents who spent less than 1 hour in the facility were in the compliant group. Of the respondents who spent 2-3 hours in the facility, only 53% were in the compliant group. There were 55 (26%) study participants who reported spending more than 3 hours in the facility. Of those participants, only 51% were in the compliant group. Time spent in the facility and compliance to TB treatment is cross tabulated in section 4.8.14.
Respondents' responses on time spent in the clinic/facility (N=212)

<table>
<thead>
<tr>
<th>Time Spent</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1 hour</td>
<td>38%</td>
</tr>
<tr>
<td>2-3 hours</td>
<td>36%</td>
</tr>
<tr>
<td>&gt;3 hours</td>
<td>26%</td>
</tr>
</tbody>
</table>

Fig 7: Respondents' responses to time spent in the facility/clinic

4.4.3 How far do you travel to collect your TB medicines (Km) N=212?

Respondents were asked how far they travel to collect TB medicines. Respondents who indicated that they travel less than 5 km were 59 (28%) whilst 73 (34%) reported travelling between 5 and 10 km. Of the participants who travel less than 5 km, 31 (35%) were in the compliant group. Fifty four (26%) of the respondents indicated travelling between 11 and 15 km whilst 26 (12%) reported travelling more than 15 km to collect their TB medicines. Only 8% of the participants who travelled more than 15 km were in the compliant group. The distance travelled by respondents to collect their TB medicines and compliance to TB treatment are cross tabulated in section 4.8.15.
Fig 8: Distance travelled by respondents to collect TB medicines

4.4.4 Do the operating times for the clinic/facility make it easy for you to receive treatment any time you need it (N=212)?

When asked whether the operating times of the clinic/facility make it easy for respondents to receive treatment anytime they need it, 167 (79%) said yes and only 45 (21%) said no. A cross tabulation of whether the facility operating times make it easy for respondents to receive treatment anytime they need it and compliance to treatment is shown in section 4.8.16.

Table 6: Do clinic operating times make it easy for respondents to receive TB treatment (N=212)

<table>
<thead>
<tr>
<th>Do clinic operating times make it easy for respondents to receive TB treatment</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>167</td>
<td>79%</td>
</tr>
<tr>
<td>No</td>
<td>45</td>
<td>21%</td>
</tr>
<tr>
<td>Total</td>
<td>212</td>
<td>100%</td>
</tr>
</tbody>
</table>
4.4.5 How much does it cost for you to reach the clinic/facility from home (Rands) N=212?

Respondents were asked how much it costs them to reach the clinic. A high proportion 162 (76%) reported spending R10-R50 and of those participants, 74% were in the compliant group. Participants who indicated that they spend less than R10 were 31 (15%) whilst 19 (9%) reported spending more than R50. The cost for respondents to reach the clinic/facility from home and compliance to treatment are cross tabulated in section 4.8.17.

![Amount spent (R) by respondents to reach the clinic](image)

Fig 9: Amount spent (R) by respondents to reach the clinic

SECTION 5: SOCIO-CULTURAL BARRIERS

4.5.1 TB can be cured by using traditional medicines (N=212)

Respondents were asked whether they believed that TB can be cured using traditional medicines. Sixty eight (32%) believed that TB can be cured using traditional medicines and 144 (68%) did not believe that it can be cured using traditional medicines.
A cross tabulation of whether participants believed that TB can be cured by using traditional medicines and compliance to treatment is shown in section 4.8.18.

![Respondents' beliefs on traditional medicine](image)

Fig 10: Respondents' beliefs on traditional medicine

### 4.6 DETERMINING COMPLIANCE PATTERNS AMONG PULMONARY TB PATIENTS IN WATERBERG DISTRICT

To determine compliance patterns among pulmonary TB patients in Waterberg District, compliance patterns were assessed in relation to demographic, health-related as well as disease and medicine-related factors. To measure compliance, respondents were asked whether they had ever missed a dose of their TB treatment.

#### 4.6.1 Have you ever missed your dose(s) of TB drugs before (N=212)?

When respondents were asked whether they had ever missed a dose of TB drugs before, 62 (29%) reported to have missed a dose whilst 150 (71%) indicated that they have never missed a dose.
Respondents' responses on whether they missed a dose of TB drugs before (N=212)

Fig 11: Have you ever missed your dose(s) of TB drugs before?

4.6.2 Compliance patterns among pulmonary TB patients by age group (N=212)

Respondents aged 26-49 years were the most non-compliant. Twenty four percent of these participants had missed a dose of their TB drugs before. The most compliant respondents were aged 58-65 years. Of these participants only 5% had ever missed their TB drugs as shown in table 7 below.

Table 7: Compliance patterns by respondents' age group (N=212)

<table>
<thead>
<tr>
<th>Missed TB dose before</th>
<th>18-25 years</th>
<th>26-33 years</th>
<th>34-41 years</th>
<th>42-49 years</th>
<th>50-57 years</th>
<th>58-65 years</th>
<th>66-73 years</th>
<th>74+ years</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never missed TB dose</td>
<td>15%</td>
<td>21%</td>
<td>19%</td>
<td>26%</td>
<td>11%</td>
<td>1%</td>
<td>5%</td>
<td>1%</td>
<td>100%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total</th>
<th>100%</th>
</tr>
</thead>
</table>

52
4.6.3 Compliance patterns among pulmonary TB patients by gender (N=212)

Of the 150 respondents who reported to have never missed a dose of their TB drugs, 84 (56%) were females and only 66 (44%) were males. This is shown in table 8 below. Gender was not statistically associated with non-compliance to TB treatment (P=0.636).

Table 8: Compliance patterns by respondents’ gender (N=212)

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missed TB dose before</td>
<td>56%</td>
<td>44%</td>
<td>100%</td>
</tr>
<tr>
<td>Never missed TB dose</td>
<td>44%</td>
<td>56%</td>
<td>100%</td>
</tr>
</tbody>
</table>

4.6.4 Compliance patterns among pulmonary TB patients by marital status (N=212)

Forty seven (47%) of the single respondents had never missed a dose of their TB drugs. Of the married participants, 18% had never missed a dose of their TB treatment. Participants who reported to have never missed a dose of their TB treatment and were living with partner were 13% and those who are divorced, separated or widowed were 22%. This is shown in table 8 below. Marital status was however not statistically associated with non-compliance to TB treatment (P=0.506).
4.6.5 Compliance patterns among pulmonary TB patients by race (N=212)

Compliance to TB treatment was higher in black respondents since 73% of the black participants reported to have never missed a dose of their TB treatment. Of the coloured respondents, only 3% reported to have never missed a dose. There was only 1 white participant (n=1) who had never missed a dose of TB treatment, but because of the number being only 1, compliance was compared between the coloured and black participants. This is shown in table 10 below. Race was not statistically associated with non-compliance to TB treatment (P=0.112).

Table 10: Compliance patterns by respondents' race (N=212)

<table>
<thead>
<tr>
<th>Participants' race</th>
<th>Black</th>
<th>White</th>
<th>Coloured</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missed TB dose before</td>
<td>27%</td>
<td>0%</td>
<td>97%</td>
</tr>
<tr>
<td>Never missed TB dose before</td>
<td>73%</td>
<td>100%</td>
<td>3%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>
4.6.6 Compliance patterns among pulmonary TB patients by educational level (N=212)

Of the respondents who have matric, 17% had never missed a dose of their TB drugs before. Of the participants with a tertiary educational level, 19% had never missed a dose. Thirty one (31%) participants who had secondary education level had never missed a dose of their TB drugs and 14% of participants with no education at all had never missed a dose. These statistics are presented in table 11 below. However, education level was not statistically associated with non-compliance to TB treatment (P=0.168).

Table 11: Compliance patterns by respondents’ educational level (N=212)

<table>
<thead>
<tr>
<th>Missed TB dose before</th>
<th>No school</th>
<th>Primary</th>
<th>Secondary</th>
<th>Matric</th>
<th>Tertiary</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
<td>11%</td>
<td>18%</td>
<td>36%</td>
<td>30%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Never missed TB dose</td>
<td>14%</td>
<td>19%</td>
<td>31%</td>
<td>17%</td>
<td>19%</td>
<td>100%</td>
</tr>
</tbody>
</table>

4.6.7 Compliance patterns among pulmonary TB patients by employment status (N=212)

Twelve percent (12%) of the participants who are self-employed had never missed a dose of their TB drugs before. Of the participants who were unemployed, 56% had never missed a dose, whilst 32% of the employed participants reported to have never missed a dose. This is shown in Table 10. Employment status was however not statistically associated with non-compliance to TB treatment (P=0.670).
Table 12: Compliance patterns by respondents' employment status (N=212)

<table>
<thead>
<tr>
<th></th>
<th>Employed</th>
<th>Unemployed</th>
<th>Self employed</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missed TB dose before</td>
<td>36%</td>
<td>50%</td>
<td>15%</td>
<td>100%</td>
</tr>
<tr>
<td>Never missed TB dose</td>
<td>32%</td>
<td>56%</td>
<td>12%</td>
<td>100%</td>
</tr>
</tbody>
</table>

4.6.8 Compliance patterns among pulmonary TB patients by availability of food (N=212)

Participants who reported to have never missed a dose of their TB treatment were higher (83%) amongst those who indicated that food was always available compared to respondents who reported that food was not always available (18%). This is shown in table 13 below. Non-availability of food was associated with non-compliance to TB treatment (P=0.01).

Table 13: Compliance patterns by availability of food (N=212)

<table>
<thead>
<tr>
<th>Availability of food</th>
<th>Always available</th>
<th>Not always available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missed TB dose before</td>
<td>17%</td>
<td>82%</td>
</tr>
<tr>
<td>Never missed TB dose</td>
<td>83%</td>
<td>18%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>
4.6.9 Compliance patterns among pulmonary TB patients by whether they believe they are suffering from TB (N=212)

Of the respondents who believed that they were suffering from TB, 89% reported to have never missed a dose of their TB drugs before, whilst only 11% of the participants who did not believe that they were suffering from TB had never missed a dose. This is shown in table 14 below. Not believing that you are suffering from TB was not statistically associated with non-compliance to TB treatment (P=0.503).

Table 14: Compliance patterns by whether respondents believed that they are suffering from TB (N=212)

<table>
<thead>
<tr>
<th>Believed to be suffering from TB</th>
<th>Believed</th>
<th>Did not believe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missed TB dose before</td>
<td>11%</td>
<td>89%</td>
</tr>
<tr>
<td>Never missed TB dose</td>
<td>89%</td>
<td>11%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

4.6.10 Compliance patterns among pulmonary TB patients by whether respondents believe that the diagnostic method was accurate (N=212)

Of the respondents who believed that the diagnostic method used was accurate, 81% had never missed a dose of their TB drugs before, whilst only 19% of the participants who did not believe that the diagnostic method used was accurate had never missed a dose. This is shown in table 15 below. Statistically there was no significant difference in compliance between participants who believed and those who did not (P=0.684).
Table 15: Compliance patterns by whether respondents believed that the diagnostic method used was accurate (N=212)

<table>
<thead>
<tr>
<th>Believed diagnostic method used was accurate</th>
<th>Believed</th>
<th>Did not believe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missed TB dose before</td>
<td>9%</td>
<td>81%</td>
</tr>
<tr>
<td>Never missed TB dose</td>
<td>81%</td>
<td>19%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

4.6.11 Compliance patterns among pulmonary TB patients by whether respondents believed that TB can result to death if not treated (N=212)

Of the respondents who believed that TB can result in death if not treated, 98% had never missed a dose of their TB drugs before, whilst only 2% of the participants who did not believe that TB can result to death if not treated had never missed a dose. This is shown in table 16 below. Not believing that TB can result in death if not treated was statistically associated with non-compliance to TB treatment (P=0.04).

Table 16: Compliance patterns by whether respondents believed that TB can result in death if not treated (N=212)

<table>
<thead>
<tr>
<th>Believed that TB can result in death if not treated</th>
<th>Believed</th>
<th>Did not believe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missed TB dose before</td>
<td>2%</td>
<td>98%</td>
</tr>
<tr>
<td>Never missed TB dose</td>
<td>98%</td>
<td>2%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>
4.6.12 Compliance patterns among pulmonary TB patients by whether respondents believed that TB can be cured if treatment is taken daily for the correct duration (N=212)

Of the participants who believed that TB can be cured if treatment is taken daily for the correct duration, 97% had never missed a dose of their TB drugs before, whilst only 36% of the respondents who did not believe had never missed a dose. This is shown in table 17 below. Not believing that TB can be cured if treatment is taken daily for the correct duration was not statistically associated with non-compliance to TB treatment (P=0.451).

Table 17: Compliance patterns by whether respondents believed that TB can be cured if treatment is taken daily for the correct duration (N=212)

<table>
<thead>
<tr>
<th>Believed that TB can be cured if treatment is taken daily for the correct duration</th>
<th>Believed</th>
<th>Did not believe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missed TB dose before</td>
<td>3%</td>
<td>64%</td>
</tr>
<tr>
<td>Never missed TB dose</td>
<td>97%</td>
<td>36%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

4.6.13 Compliance patterns among pulmonary TB patients by participants' responses on why it is important to take TB treatment for the prescribed duration (N=212)

Of the respondents who indicated that it is important to take TB treatment for the prescribed duration in order to prevent drug resistance, 80% had never missed a dose of their TB treatment. Those participants who indicated that it is important to take TB treatment for the prescribed duration to be cured, 98% had never missed a dose of their TB treatment, whilst 81% of those who said to prevent the spread of TB, had never missed a dose of their TB treatment.
Of the participants who said to prevent death, 88% had never missed a dose. This is shown in table 18 below. This factor was not statistically associated with compliance or non-compliance to TB treatment (P=0.289).

Table 18: Compliance patterns by participants’ responses on why it is important to take TB treatment for the prescribed duration (N=212)

<table>
<thead>
<tr>
<th>Importance of taking TB treatment for the prescribed duration</th>
<th>To prevent drug resistance</th>
<th>To be cured</th>
<th>To prevent the spread of TB</th>
<th>To prevent death</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missed TB dose before</td>
<td>20%</td>
<td>2%</td>
<td>19%</td>
<td>12%</td>
<td>100%</td>
</tr>
<tr>
<td>Never missed TB dose</td>
<td>80%</td>
<td>98%</td>
<td>81%</td>
<td>88%</td>
<td>100%</td>
</tr>
</tbody>
</table>

4.6.14 Compliance patterns among pulmonary TB patients by participants’ responses on healthcare workers’ attitudes at the clinic/facility of treatment (N=212)

Of the respondents who reported healthcare workers in the clinic or facility of treatment to be friendly, 77% had never missed a dose of their TB drugs before, 78% of those who reported healthcare workers to be caring had never missed a dose. Of the participants who indicated that healthcare workers were rude, 21% had never missed a dose whilst 22% of those who reported that healthcare workers were uncaring had never missed a dose. This is shown in table 19 below. Bad healthcare workers’ attitudes were statistically associated with non-compliance to TB treatment (P=0.021).
Table 19: Compliance patterns by participants’ responses to healthcare workers’ attitudes at the clinic/facility of treatment (N=212)

<table>
<thead>
<tr>
<th>Healthcare workers’ attitudes at facility of treatment</th>
<th>Friendly</th>
<th>Caring</th>
<th>Rude</th>
<th>Uncaring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missed TB dose before</td>
<td>23%</td>
<td>22%</td>
<td>79%</td>
<td>78%</td>
</tr>
<tr>
<td>Never missed TB dose</td>
<td>77%</td>
<td>78%</td>
<td>21%</td>
<td>22%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

4.6.15 Compliance patterns among pulmonary TB patients by participants’ responses on how much time was spent in the clinic/facility for monthly refill of TB treatment (N=212)

Of the respondents who spent <1 hour in the clinic or facility for monthly refill of TB treatment, 61% had never missed a dose of their TB drugs before, whilst 53% of those who spent between 2-3 hours had never missed a dose. Of the participants who spent >3 hours, only 51% had never missed a dose of their TB drugs before as shown in table 20 below. This factor was not statistically associated with compliance or non-compliance to TB treatment (P=0.265).

Table 20: Compliance patterns by participants’ responses on how much time is spent in the clinic/facility for monthly refill of TB treatment (N=212)

<table>
<thead>
<tr>
<th>Time spent in the clinic/facility for monthly refill of TB treatment</th>
<th>&lt;1 hour</th>
<th>2-3 hours</th>
<th>&gt;3 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missed TB dose before</td>
<td>39%</td>
<td>47%</td>
<td>49%</td>
</tr>
<tr>
<td>Never missed TB dose</td>
<td>61%</td>
<td>53%</td>
<td>51%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>
4.6.16 Compliance patterns among pulmonary TB patients by participants’ responses on the distance travelled to collect TB medicines (N=212)

Of the respondents who travelled <5km to collect their TB medicines, 35% had never missed a dose of their TB drugs before, whilst 33% of the participants who travelled 5-10km had never missed a dose. Of the respondents who travelled 11-15km, 23% had never missed a dose whilst of those who travelled >15km, 84% had never missed a dose. This is shown in table 21 below. Longer distance travelled to clinic to collect TB medicines was statistically associated with non-compliance to TB treatment (P=0.015).

Table 21: Compliance patterns by participants’ responses on the distance travelled to collect TB medicines (N=212)

<table>
<thead>
<tr>
<th>Distance travelled to collect TB medicines</th>
<th>&lt;5km</th>
<th>5-10km</th>
<th>11-15km</th>
<th>&gt;15km</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missed TB dose before</td>
<td>65%</td>
<td>67%</td>
<td>77%</td>
<td>92%</td>
</tr>
<tr>
<td>Never missed TB dose</td>
<td>35%</td>
<td>33%</td>
<td>23%</td>
<td>8%</td>
</tr>
</tbody>
</table>

4.6.17 Compliance patterns among pulmonary TB patients by participants’ responses on whether the clinic operating times make it easy to receive TB treatment anytime (N=212)

Of the participants who indicated that the operating times of the clinic make it easy for them to receive TB treatment anytime they need it, 88% never missed a dose of their TB drugs before. Of the respondents who reported that the clinic operating times do not make it easy for them to receive TB treatment anytime they need it, only 12% had never missed a dose. Clinic operating times were however not statistically associated with non-compliance to TB treatment (P=0.215).
Table 22: Compliance patterns by participants’ responses on whether the clinic operating times make it easy to receive TB treatment anytime (N=212)

<table>
<thead>
<tr>
<th>Clinic operating times make it easy to receive TB treatment anytime</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missed TB dose before</td>
<td>12%</td>
<td>89%</td>
</tr>
<tr>
<td>Never missed TB dose</td>
<td>88%</td>
<td>11%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

4.6.18 Compliance patterns among pulmonary TB patients by participants’ responses on the money spent (cost) to travel to the clinic for monthly refill of TB treatment (N=212)

Of the respondents who spend <R10 to travel to the clinic for monthly refill of TB treatment, 19% had never missed a dose of their TB drugs before, whilst of those who spent R10-R50, only 74% had never missed a dose. Of the respondents who reported spending >R50, 7% had never missed a dose, as shown in table 23 below. This factor was not statistically associated with compliance or non-compliance to TB treatment (P=0.408).

Table 23: Compliance patterns by participants’ responses on the money spent (cost) of travelling to the clinic for monthly refill of TB treatment (N=212)

<table>
<thead>
<tr>
<th>Money spent (cost) to travel to the clinic for monthly refill of TB treatment</th>
<th>&lt;R10</th>
<th>R10-R50</th>
<th>R50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missed TB dose before</td>
<td>81%</td>
<td>26%</td>
<td>93%</td>
</tr>
<tr>
<td>Never missed TB dose</td>
<td>19%</td>
<td>74%</td>
<td>7%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>
4.6.19 Compliance patterns among pulmonary TB patients by participants’ responses on whether TB can be cured by using traditional medicines (N=212)

Of the respondents who believed that TB can be cured using traditional medicines, 23% had never missed a dose of their TB treatment before, whilst of those who did not believe that TB can be cured using traditional medicines, 77% had never missed a dose, as shown in table 24 below. Believing that TB can be cured using traditional medicines was statistically associated with non-compliance to TB treatment (P=0.025).

Table 24: Compliance patterns by participants’ responses on whether TB can be cured by using traditional medicines (N=212)

<table>
<thead>
<tr>
<th>TB can be cured by using traditional medicines</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missed TB dose before</td>
<td>77%</td>
<td>23%</td>
</tr>
<tr>
<td>Never missed TB dose</td>
<td>23%</td>
<td>77%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

4.7 DETERMINING FACTORS CONTRIBUTING TO NON-COMPLIANCE TO TB TREATMENT (N=212)

To determine factors contributing to non-compliance to TB treatment, respondents were asked the reasons for missing doses of their TB treatment. Health, disease and medicine-related factors contributing to non-compliance to TB treatment were also assessed.
4.7.1 What was the reason(s) for missing your TB medication (N=212)

A total of 62 pulmonary TB patients indicated that they had missed their dose(s) of TB treatment. Of those who indicated they had, 19 (31%) reported that they felt better and as a result felt no need to continue taking their treatment. Fourteen (22%) missed their doses as a result of side effects whilst only 2 (3%) patients reported that they had been taking traditional medicines at the time and decided not to continue taking TB treatment. A total of 27 (44%) respondents highlighted other reasons and these included; lack of money to go to the clinic for TB treatment, long distance to the clinic and being out of the country for some time during their TB treatment.

4.7.2 Disease and medicine-related factors contributing to non-compliance to TB treatment (N=212)

Respondents were asked what are the reasons for not completing TB treatment and a higher proportion 174 (82%) indicated side effects of TB drugs as the main reason for not completing treatment. One hundred and twenty four (58%) indicated that TB treatment takes very long whilst 59 (28%) indicated too many pills to take as another reason for not completing treatment. Respondents who indicated the reason as TB can still be cured even if treatment is not completed were only 23 (11%).

Table 25: Respondents’ reasons for not completing TB treatment (N=212)

<table>
<thead>
<tr>
<th>Treatment takes very long to complete</th>
<th>Side effects of anti TB drugs</th>
<th>Too many pills to take daily</th>
<th>TB can still be cured even if treatment is not completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value  %</td>
<td>Value  %</td>
<td>Value  %</td>
<td>Value  %</td>
</tr>
<tr>
<td>Yes 124 58%</td>
<td>174 83%</td>
<td>59 28%</td>
<td>23 11%</td>
</tr>
<tr>
<td>No 88 42%</td>
<td>38 17%</td>
<td>153 72%</td>
<td>189 89%</td>
</tr>
<tr>
<td>Total 212 100%</td>
<td>212 100%</td>
<td>212 100%</td>
<td>212 100%</td>
</tr>
</tbody>
</table>
4.7.3 Non-compliance patterns by respondents' reasons for not completing TB treatment

4.7.3.1 Non-compliance patterns by participants’ response that TB treatment takes very long to complete (N=124)

A total of 124 respondents indicated the reason for not completing TB treatment is that it takes very long. Of the 124 respondents, 102 (82%) reported that they had missed a dose of their TB treatment before as shown in table 26 below. The feeling that TB treatment takes very long was associated with non-compliance to treatment (P=0.000).
Table 26: Have you ever missed your dose(s) of TB drugs before * Reasons for not completing TB treatment; treatment takes very long to complete (N=124)

<table>
<thead>
<tr>
<th></th>
<th>Reasons for not completing TB treatment: treatment takes very long to complete</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>yes</td>
</tr>
<tr>
<td>Have you ever missed your</td>
<td>yes Count</td>
</tr>
<tr>
<td>dose(s) of TB drugs before</td>
<td>Expected Count</td>
</tr>
<tr>
<td></td>
<td>% within Have you ever missed your dose(s) of TB drugs before</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
</tr>
<tr>
<td>no Count</td>
<td>73</td>
</tr>
<tr>
<td>Expected Count</td>
<td>87.7</td>
</tr>
<tr>
<td>% within Have you ever missed your dose(s) of TB drugs before</td>
<td>48.7%</td>
</tr>
<tr>
<td>% of Total</td>
<td>34.4%</td>
</tr>
<tr>
<td>Total Count</td>
<td>124</td>
</tr>
<tr>
<td>Expected Count</td>
<td>124.0</td>
</tr>
<tr>
<td>% within Have you ever missed your dose(s) of TB drugs before</td>
<td>58.5%</td>
</tr>
<tr>
<td>% of Total</td>
<td>58.5%</td>
</tr>
</tbody>
</table>

P=0.000
4.7.3.2 Non-compliance patterns by participants' reason for not completing TB treatment; side effects of anti-TB drugs (N=174)

Of the 174 participants who reported side effects of anti-TB drugs to be a reason for not completing treatment, 87% had missed a dose of their TB drugs before as shown in table 27 below. Side effects of anti-TB drugs were not statistically associated with non-compliance to TB treatment (P=0.220).

Table 27: Have you ever missed your dose(s) of TB drugs before * Reasons for not completing TB treatment- side effects of anti-TB drugs (N=174)

<table>
<thead>
<tr>
<th>Have you ever missed your dose(s) of TB drugs before</th>
<th>Reasons for not completing TB treatment- side effects of anti-TB drugs</th>
<th>yes</th>
<th>no</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
<td>Count</td>
<td>54</td>
<td>8</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>50.9</td>
<td>11.1</td>
<td>62.0</td>
</tr>
<tr>
<td></td>
<td>% within Have you ever missed your dose(s) of TB drugs before</td>
<td>87.1%</td>
<td>12.9%</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>25.5%</td>
<td>3.8%</td>
<td>29.2%</td>
</tr>
<tr>
<td>no</td>
<td>Count</td>
<td>120</td>
<td>30</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>123.1</td>
<td>26.9</td>
<td>150.0</td>
</tr>
<tr>
<td></td>
<td>% within Have you ever missed your dose(s) of TB drugs before</td>
<td>80.0%</td>
<td>20.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>56.6%</td>
<td>14.2%</td>
<td>70.8%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>174</td>
<td>38</td>
<td>212</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>174.0</td>
<td>38.0</td>
<td>212.0</td>
</tr>
<tr>
<td></td>
<td>% within Have you ever missed your dose(s) of TB drugs before</td>
<td>82.1%</td>
<td>17.9%</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>82.1%</td>
<td>17.9%</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>P=0.220</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.7.3.3 Non-compliance patterns by respondents who think that too many pills to take are a reason for not completing TB treatment (N=59)

A total of 59 respondents indicated that the issue regarding too many pills was responsible for not completing TB treatment. Of those participants, 39% reported to have missed a dose of their TB treatment before. This is shown in the table 28 below. Too many pills to take as a reason was statistically associated with non-compliance to TB treatment (P=0.023).

**Table 28: Have you ever missed your dose(s) of TB drugs before * reasons for not completing TB treatment- too many pills to take daily (N=59)**

<table>
<thead>
<tr>
<th>Have you ever missed your dose(s) of TB drugs before</th>
<th>Reasons for not completing TB treatment- too many pills to take daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>yes Count</td>
<td>yes</td>
</tr>
<tr>
<td>Expected Count</td>
<td>24</td>
</tr>
<tr>
<td>% within Have you ever missed your dose(s) of TB drugs before</td>
<td>38.7%</td>
</tr>
<tr>
<td>% of Total</td>
<td>11.3%</td>
</tr>
<tr>
<td>no Count</td>
<td>35</td>
</tr>
<tr>
<td>Expected Count</td>
<td>41.7</td>
</tr>
<tr>
<td>% within Have you ever missed your dose(s) of TB drugs before</td>
<td>23.3%</td>
</tr>
<tr>
<td>% of Total</td>
<td>16.5%</td>
</tr>
</tbody>
</table>

Total Count                                       | 59  | 163 | 222  |
Expected Count                                     | 59.0 | 153.0 | 212.0 |
% within Have you ever missed your dose(s) of TB drugs before | 27.6% | 72.2% | 100.0% |

% of Total                                         | 27.8% | 72.2% | 100.0% |

P=0.023
4.7.3.4 Non-compliance patterns by respondents who think that TB can be cured even if treatment is not completed as a reason for not completing TB treatment (N=23)

Of the 23 respondents who indicated that TB can still be cured even if treatment is not completed, 16% reported that they have missed a dose of their TB treatment before, as shown in Table 29 below. Believing that TB can still be cured even if treatment is not completed was not statistically associated with non-compliance to TB treatment (P=0.112).

Table 29: Have you ever missed your dose(s) of TB drugs before * reasons for not completing TB treatment; TB can still be cured even if treatment is not completed (N=23)

<table>
<thead>
<tr>
<th>Reasons for not completing TB treatment; TB can still be cured even if treatment is not completed</th>
<th>yes</th>
<th>no</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you ever missed your dose(s) of TB drugs before</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>10</td>
<td>52</td>
<td>62</td>
</tr>
<tr>
<td>Expected Count</td>
<td>6.7</td>
<td>55.3</td>
<td>62.0</td>
</tr>
<tr>
<td>% within Have you ever missed your dose(s) of TB drugs before</td>
<td>16.1%</td>
<td>83.9%</td>
<td>100.0%</td>
</tr>
<tr>
<td>% of Total</td>
<td>4.7%</td>
<td>24.5%</td>
<td>29.2%</td>
</tr>
<tr>
<td>no</td>
<td>13</td>
<td>137</td>
<td>150</td>
</tr>
<tr>
<td>Expected Count</td>
<td>16.3</td>
<td>133.7</td>
<td>150.0</td>
</tr>
<tr>
<td>% within Have you ever missed your dose(s) of TB drugs before</td>
<td>8.7%</td>
<td>91.3%</td>
<td>100.0%</td>
</tr>
<tr>
<td>% of Total</td>
<td>6.1%</td>
<td>64.0%</td>
<td>70.8%</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>189</td>
<td>212</td>
</tr>
<tr>
<td>Expected Count</td>
<td>23.0</td>
<td>189.0</td>
<td>212.0</td>
</tr>
<tr>
<td>% within Have you ever missed your dose(s) of TB drugs before</td>
<td>10.8%</td>
<td>89.2%</td>
<td>100.0%</td>
</tr>
<tr>
<td>% of Total</td>
<td>10.8%</td>
<td>89.2%</td>
<td>100.0%</td>
</tr>
<tr>
<td>P=0.112</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 30: A summary of factors contributing to non-compliance to TB treatment amongst pulmonary TB patients

| Client-related factors | 1. Non-availability of food whilst taking TB treatment  
2. Not believing that TB can result in death if not treated |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Socio-cultural factors</td>
<td>1. Belief in traditional medicines for curing TB</td>
</tr>
</tbody>
</table>
| Health service related factors | 1. Bad healthcare worker attitudes  
2. Long distance to the clinic/facility of treatment |
| Disease and medicine-related factors | 1. TB treatment duration- treatment takes too long  
2. Pill burden- too many pills to take daily |

4.8 IN YOUR OPINION, WHAT COULD MAKE PATIENTS COMPLETE THEIR TB TREATMENT (N=212)

A total of 116 participants responded to the question on what could make patients complete their TB treatment. A higher proportion 44 (38%) indicated that support from family members could make them complete their treatment. Eighteen (16%) of the respondents indicated that on-going education on dangers of not completing TB treatment should be given to TB patients. Only 4 (3%) participants stated that TB patients should not be discriminated against. This is shown in table 31 below.
Table 31: Respondents’ opinions on strategies to enhance compliance to TB treatment (N=116)

<table>
<thead>
<tr>
<th>What could make patients complete their TB treatment</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support from family members</td>
<td>23</td>
<td>20%</td>
</tr>
<tr>
<td>Drug holiday (on weekends)</td>
<td>8</td>
<td>7%</td>
</tr>
<tr>
<td>On-going education on dangers of non-compliance to TB treatment</td>
<td>18</td>
<td>16%</td>
</tr>
<tr>
<td>Clinics should open on weekends for TB drug refills</td>
<td>17</td>
<td>15%</td>
</tr>
<tr>
<td>Avoid discrimination</td>
<td>4</td>
<td>3%</td>
</tr>
<tr>
<td>Healthcare workers attitudes towards TB patients should change</td>
<td>21</td>
<td>18%</td>
</tr>
<tr>
<td>Effective management of side effects</td>
<td>12</td>
<td>10%</td>
</tr>
<tr>
<td>Provision of food parcels for TB patients</td>
<td>13</td>
<td>11%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>116</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

4.9 CONCLUSION

This chapter focused on presenting the research findings as data analysis and interpretation. The study revealed that the majority of the respondents were non-compliant to TB treatment because of non-availability of food whilst taking TB treatment, not believing that TB can result in death if not treated, belief in traditional medicines for curing TB, bad healthcare worker attitudes, long distances to the clinic/facility of treatment and lengthy TB treatment duration.

The next chapter will discuss these findings and conclusions and make recommendations based on them.
CHAPTER 5: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter presents a discussion, the conclusion and recommendations made by the researcher. The discussion will focus on the research objectives of the study and compare the research findings with existing literature.

5.2 AGES OF RESPONDENTS

Although majority of the respondents were in the 34-41 age category, participants in the 42-49 years category were more compliant (26%) to TB treatment compared to the 34-41 age category (19%). There was no statistical significance indicating a relationship between age and compliance to TB treatment (P=0.471). These findings are consistent with a study conducted by Modise (2011:51) in the Free State in which age was also not associated with non-compliance to TB treatment.

5.3 RESPONDENTS’ GENDER

Compliance to TB treatment was higher in females (56%) compared to males (44%). Statistically gender was not associated with non-compliance to TB treatment (P=0.636). A study conducted by Kaona, Tuba, Siziya and Sikaona (2004:68) in Zambia and another study by Erhabor et al. (2000:235) in Nigeria got similar findings that gender is not statistically associated with non-compliance to TB treatment.

5.4 MARITAL STATUS OF RESPONDENTS

In this study, compliance was higher amongst single participants (47%) compared to those who are married (18%) and participants who are divorced, separated or widowed (22%). Marital status was also not statistically associated
with non-compliance to TB treatment (P=0.506). This finding was consistent with the study conducted in Zambia by Kaona, Tuba, Siziya and Sikaona (2004:68) in which marital status was also not associated with non-compliance to TB treatment.

5.5 RESPONDENTS' RACE

Black participants were more compliant (73%) compared to coloured participants (3%). Statistically race was not associated with non-compliance to TB treatment (P=0.112). Studies conducted in South Africa in the past regarding non-compliance to TB treatment have not investigated whether race is associated with non-compliance to TB treatment.

5.6 EDUCATIONAL STATUS OF RESPONDENTS

Respondents who had secondary level education were most compliant (31%) compared to participants with no schooling (14%). Statistically educational level was not associated with non-compliance to TB treatment (P=0.186). This is contradictory to findings from a study by Gad et al. (1997:244-250) in which low educational levels were associated with non-compliance to TB treatment.

5.7 EMPLOYMENT STATUS OF RESPONDENTS

Respondents who were unemployed were most compliant to TB treatment (56%) compared to self-employed respondents (12%). There was no statistical association between employment status and non-compliance to TB treatment (P=0.670). This is different from findings in a study conducted by Mishra et al. (2005:1134-1139) in Nepal in which non-compliance to TB treatment was significantly associated with unemployment.
5.8 PARTICIPANTS’ REASONS FOR MISSING A DOSE (S) OF THEIR TB TREATMENT

Length of treatment: The most common reason cited by 29% of the patients for missing TB treatment was the extended period (6-8 months) for completing the recommended TB treatment.

Pill burden: According to 18% of the respondents, the pill burden was the reason for missing TB treatment; as many as 5 tablets are normally ingested by a TB patient on a daily basis. This number increases for patients who are taking other medications for chronic illnesses such as HIV.

Distance to the clinic/facility of treatment: 13% indicated that the long distance to the clinic was the reason for poor compliance to TB treatment. This finding is similar to a report from a study by Malik & Ahmad (2009:70-75) which reported that 93% of the non-compliant TB patients had a long distance to travel before accessing care (n=100). In the current study, the most non-compliant participants were residing more than 20km from the TB control clinic (30%).

Only 5% of the local residents were non-compliant to TB treatment; indicating that there were other deterrents to compliance to TB treatment than the distance from the health care facility.

Negative attitudes of health care providers: 19% of the respondents revealed that negative attitudes of health care workers were a deterrent to accessing TB treatment; hence they were non-compliant to the treatment.

Alternate method of care: 11% of the participants indicated that they had missed a dose of their TB treatment because they were using traditional medicines which were perceived to be a complimentary drug to treat TB.
Non availability of food: about 10% of the respondents were of the opinion that food played a pivotal role in complementing TB drugs; when there was food shortage they failed to comply with TB treatment. These reasons should be considered seriously since they were reported by the patients and must be addressed appropriately in order to improve compliance to TB treatment.

5.9 ASSESSING THE LEVEL OF TB TREATMENT KNOWLEDGE AMONG PULMONARY TB PATIENTS

5.9.1 Do you believe that you are suffering from TB?

Patient knowledge about the disease and its treatment enhance treatment compliance to treatment (Mainga 2008:87). Compliance was higher in participants (87%) who believed they were suffering from TB compared to participants who did not believe (11%). Not believing that you are suffering from TB was not statistically associated with non-compliance to TB treatment (P=0.503). This was similar to findings by Motlanke (2005:65) in a qualitative study conducted in Limpopo which found that 'denial' or not believing that you are suffering from TB is not associated with non-compliance to TB treatment.

5.9.2 Do you believe that the TB diagnostic method used was accurate?

Compliance was higher in patients who believed that the TB diagnostic method used is accurate (81%) compared to patients who did not believe (19%). Not believing that the TB diagnostic method used was accurate was not associated with non-compliance to TB treatment (P=0.684). A study by Tshabalala (2007:84) conducted in Tembisa also found that patient's perceptions about the disease and its diagnosis is not associated with non-compliance to TB treatment.
5.9.3 TB can result to death if not treated

Compliance was higher among patients who knew that TB can result in death if not treated (98%) compared to patients who were not aware that TB can result to death if not treated (2%). Not believing that TB can result to death if not treated was statistically associated with non-compliance to TB treatment (P=0.04). A study by Gad et al (1997:244-250) also confirmed that lack of patients knowledge about TB treatment was associated with non-compliance to TB treatment.

5.9.4 TB can be cured if treatment is taken daily for the correct duration

Compliance was higher (97%) among patients who knew that TB can be cured if TB treatment is taken daily for the correct treatment duration, compared to patients who did not know (36%). Not believing that TB can be cured if treatment is taken daily for the correct treatment duration was not associated with non-compliance to TB treatment (P=0.451). This is in line with findings from a study by Chani (2010:87) in Namibia, which stated that patients who did not believe that TB treatment should be taken for the correct duration were likely to be non-compliant to TB treatment.

5.9.5 Patients' knowledge on why it is important to take TB treatment for the prescribed duration

Compliance was higher amongst patients who indicated that it is important to take TB treatment for the prescribed duration in order to be cured (98%) compared to those who reported that is important to take TB treatment for the prescribed duration to prevent drug resistance (80%). This factor was not statistically associated with non-compliance to TB treatment (P=0.289).
5.10 FACTORS CONTRIBUTING TO NON-COMPLIANCE TO TB TREATMENT

TB treatment non-compliance is recognised as one of the major challenges in achieving TB control (Chani 2010: 84). Factors contributing to non-compliance to TB treatment discussed in this study include client related, health service related, sociocultural as well as disease and medicine related factors.

5.10.1 Client-related factors

Non-availability of food whilst taking TB treatment was associated with non-compliance to TB treatment (P=0.01). This is in line with findings from a study conducted by Chani (2010:85) in which he states that non-availability of food for patients on TB treatment contributes to non-compliance to treatment. Another client-related factor associated with non-compliance to TB treatment in this study was not believing that TB can result in death if left untreated (P=0.04). This is consistent with findings from a study conducted by Mainga (2008:81), which states that patients' lack of understanding of TB treatment is associated with non-compliance to treatment.

5.10.2 Health service related factors

Health care worker attitudes and accessibility issues (distance and cost of getting to the health facility) have been shown in other studies to be important factors affecting TB treatment compliance (Chani 2010:84). This is because health worker attitudes, such as being unfriendly to patients, tend to deter patients from seeking treatment or coming to collect medicines once they are finished (Chani 2012:84). In this study, negative attitudes of health care workers were associated with non-compliance to TB treatment (P=0.021). This is consistent with findings from the study conducted by Malik & Ahmad (2009:70-75) which found that health care worker attitudes in the clinic where patients receive their TB treatment is associated with non-compliance to TB treatment.
Distance travelled by TB patients to the clinic for treatment was associated with non-compliance to TB treatment \((P=0.015)\). This is in line with other studies which also found that the further the clinic was from the patient the greater the probability that the patient would be non-compliant to TB treatment (Bam et al., 2005:54; Jaiswal et al., 2003:625).

### 5.10.3 Disease and medicine-related factors

Reasons that were significantly associated with non-compliance to TB treatment in this study were that TB treatment takes very long to complete \((P=0.000)\) and the pill burden or too many pills to take \((P=0.023)\). This is in line with findings from a study conducted by Motlanke (2005:70) which found that patients who believed that TB treatment takes very long were more likely to be non-compliant to treatment because they reported that they get tired of the treatment and end up not taking it as prescribed.

### 5.10.4 Socio-cultural factors

Socio-cultural factors will cover patients’ beliefs in traditional medicines and components of the health belief model. Belief in traditional medicine for curing TB was associated with non-compliance to TB treatment \((P=0.025)\). This is consistent with findings from other studies conducted in South Africa which state that patients beliefs and use of traditional medicine during TB treatment are associated with non-compliance to treatment (Tshabalala, 2007:85; Motlanke, 2005:70).
5.10.5 Health belief model components

Concepts of the health belief model that were used as a theoretical foundation for the study were: perceived susceptibility; perceived benefits of action; and perceived barriers to action. This study has shown that respondents who were knowledgeable on the perceived benefits of action were more compliant to TB treatment, that is, knowledge about the importance of taking TB treatment for the prescribed duration in order for the patient to be cured.

Factors related to perceived barriers to action which were significantly associated with non-compliance to TB treatment in this study are: TB treatment takes very long to complete; and the pill burden. Factors related to perceived susceptibility were not associated with non-compliance to TB treatment in this study.

5.11 WHAT COULD MAKE PATIENTS COMPLETE THEIR TB TREATMENT?

There were several responses from the patients when they were asked their opinion on what could be done to help TB patients increase their compliance to TB treatment. One hundred and sixteen participants responded to this question and 96 did not respond. Twenty three (20%) of the respondents wanted support from family members followed by twenty one (18%) who stated that healthcare workers attitudes towards TB patients should change. Eighteen (16%) wanted ongoing education on the dangers of not completing TB treatment whilst seventeen (15%) indicated that TB clinics should be opened on weekends for patients to refill their TB drugs.

Thirteen (11%) wanted food parcels for TB patients whilst twelve (10%) indicated that they wanted proper treatment of side effects to make them complete their TB treatment. Other responses were that TB patients should have a drug holiday on weekends and TB patients should not be discriminated against.
The patient responses reinforced the need to bargain for family support, provide ongoing education to TB patients and change in healthcare worker attitudes. It was also interesting to note that patients feel that side effects should be treated or managed better.

5.12 CONCLUSIONS

Non-compliance to TB treatment amongst pulmonary TB patients in Waterberg District, Limpopo, South Africa is associated with non-availability of food whilst taking TB treatment, not believing that TB can result in death if not treated, beliefs in traditional medicines for curing TB, bad health-care worker attitudes, long distance to the clinic/facility of treatment, feeling that TB treatment takes too long and the pill burden (too many pills to take daily).

5.13 RECOMMENDATIONS

Based on the findings, the researcher makes the following recommendations for practice and future research.

5.13.1 Practice

In order to prevent non-compliance to TB treatment in Waterberg district, Limpopo, South Africa and elsewhere, the researcher recommends that:

- Health education should be intensified within the communities, focusing on all the TB patients be intensified, particularly at the beginning of treatment, with reinforcement at each visit using the local language. This intensification should be comprehensive to include duration of treatment, possible side effects and how to deal with them, consequences of not completing TB treatment and the dangers of using traditional medicines during TB treatment.
• Traditional health practitioners should be educated on TB and be involved in TB control through private-public partnerships and by motivating them not to mislead the community by claiming that they can cure TB.

• The Direct Observation of Treatment (DOT) should be strengthened to ensure that all pulmonary TB patients are observed and supported throughout the treatment duration.

• Income-generating activities should be initiated to improve food provision for patients on TB treatment. Also TB patients should be linked to social services and community programmes that provide food.

• To improve healthcare worker attitudes, workers should be trained in customer care and care of carers programmes should be available for them to de-stress and cope better with the increasing number of TB patients seen on a daily basis.

• Nurses in mobile teams should be trained on Basic TB management to enable them to refill TB drugs for patients as part of their outreach services.

5.13.2 Recommendations for further research studies

• This study should be repeated involving a larger sample and comparing districts in order to identify similarities and differences in the factors which contributes to non-compliance to TB treatment.

• Further research is needed to identify and compare non-compliance to TB treatment for men and women in Waterberg District.
- A qualitative study on the reasons for non-compliance in the same district, should be conducted with respondents describing their lived experience as TB patients.
LIST OF REFERENCES


Mokgoadi, B. 2002. *Knowledge, Beliefs and Feelings about tuberculosis among hospitalised patients at Dr Machupe Mphailele Memorial Hospital in the Limpopo Province of South Africa*. Polokwane: University of Limpopo.


Annexure 1: Questionnaire

Individual patient’s questionnaire number:  
Date of interview: ________________________________

Instructions: Please tick in the appropriate box

SECTION A: DEMOGRAPHIC INFORMATION

A.1 Age in years: (18-25) ....... 1. (26-33) ....... 2 (34-41) ....... 3 (42-49) ....... 4 (50-55) ....... 5 (58-65) ....... 6 (>73) ....... 8

A.2 Gender: Male ....... 1 Female ....... 2

A.3 Marital status
   Single .................................... 1
   Married ................................... 2
   Living with partner .................... 3
   Divorced/separated/widowed .......... 4

A.4 Race
   Black ...................................... 1
   White ...................................... 2
   Coloured .................................... 3
   Indian ...................................... 4

A.5 What is your highest level of education?
   No school .................................. 1
   Primary .................................... 2
   Secondary ................................. 3
   Matric .................................... 4
   Tertiary .................................... 5

A.6 Religion:
   Christian ................. 1
   Muslim ....................... 2
   Other ....................... 3

SECTION B: SOCIO-ECONOMIC VARIABLES

B.1 Employment status:
   Employed ............................... 1
   Unemployed ............................. 2
   Self employed ........................... 3
B.2 What is your income per month?
- None ........................................ 1
- R <1000 ..................................... 2
- R1000-2000 ................................ 3
- R >2000 ................................... 4

B.3 Availability of food whilst taking TB treatment:
- Always available to take with medicines......1
- Not always available .................2
- Never available............................3

SECTION C: CLIENT-RELATED FACTORS

C.1 Do you believe that you are suffering from TB?  
- Yes.....[ ] No.........2

C.2 Do you think that the TB diagnostic method used is accurate?  
- Yes..[ ] No...[ ]

C.3 TB can result in death if not treated  
- Yes.....1[ ] No.......2[ ]

C.4 TB can be cured if TB treatment is taken daily for the correct treatment duration (6-8 months)  
- Yes...1[ ] No....2[ ]

C.5 Why is it important to take TB treatment for the prescribed duration (6-8 months)? (Tick all that applies)
- To prevent drug resistant TB  
  - Yes... 1[ ] No...2[ ]
- To be cured  
  - Yes... 1[ ] No....2[ ]
- To prevent the spread of TB  
  - Yes.....1[ ] No....2[ ]
- To prevent death  
  - Yes.....1[ ] No....2[ ]
- Other (specify)...........................................................................................

C.6 Are you currently receiving the disability grant?  
- Yes.......1[ ] No...2[ ]

C.7 Are you receiving any food package?  
- Yes.......1[ ] No...2[ ]
SECTION D: HEALTH SYSTEM RELATED FACTORS

D.1 How are the health care workers’ attitudes in the clinic/facility of treatment? (Tick all that applies)

- Friendly
  - Yes...1
  - No....2
- Caring
  - Yes...1
  - No....2
- Rude
  - Yes...1
  - No....2
- Uncaring
  - Yes...1
  - No....2

D.2 How much time do you spend in the clinic/facility for monthly refill of TB treatment?
- <1 hour........................................................... 1
- 2-3 hours......................................................... 2
- >3 hours........................................................... 3

D.3 How much distance do you travel to collect your TB medicines (Km)?
- (<5)..... 1
- (5-10).....2
- (11-15).....3
- (>15)......4

D.4 Do the operating times for the clinic/facility make it easy for you to receive treatment any time you need it?
- Yes....1
- No....2

D.5 How much does it cost for you to reach the clinic/facility from home (Rands)?
- <R10.....1
- R10 – R50.............2
- >R50......................3

SECTION E: SOCIO-CULTURAL BARRIERS

E.1 TB can be cured by using traditional medicines?
- Yes.....1
- No....2

SECTION F: DISEASE AND MEDICINE-RELATED BARRIERS

F.1 What are the reasons for not completing TB treatment? (Tick all that applies)

- Treatment takes very long to complete
  - Yes...1
  - No...2
- Side effects of anti-TB drugs
  - Yes...1
  - No...2
- Too many pills to take daily
  - Yes...1
  - No...2
- TB can still be cured even if treatment is not completed
  - Yes...1
  - No...2
- Other (specify).................................................................................................
F.2 Have you ever missed your dose(s) of TB drugs before?  Yes... 1  No..... 2

F.3 If yes, what was the reason(s) for missing your TB drugs?

........................................................................................................................................
........................................................................................................................................

F.4 In your opinion, what could make patients complete their TB treatment?

........................................................................................................................................
........................................................................................................................................

Thank you for your time and cooperation.
Annexure 2: Patient consent form

STUDY TITLE: FACTORS CONTRIBUTING TO NON-COMPLIANCE TO PULMONARY TUBERCULOSIS TREATMENT AMONG PATIENTS IN WATERBERG DISTRICT LIMPOPO PROVINCE

Investigator: Cindy Dladla

Dear Sir/ Madam,

I am conducting a study to identify factors contributing to patients not taking their TB medicines correctly. The findings of the study will be used to improve TB patient care management and thus reduce further spread of TB in the community. The study and its procedures have been approved by the Limpopo Department of Health as well as the Unisa ethics committee. A trained interviewer will administer a questionnaire in order to collect data and it should take about 30 minutes to complete.

There are no foreseeable risks associated with the interview and you can contact me on the following cell phone number, 079 601 8467 if you have any further questions after the interview. Your participation in this study is voluntary. I therefore request you to assist with answering the questions included in this questionnaire. Please note that any information which may identify you will be kept strictly confidential and your responses will in no way lead to any adverse effect on you and no medical care will be withheld from you because of the responses you may provide.

If you agree to this interview, you may sign below but if you do not agree, you can let me know at this point and I will not proceed with the interview.

Signature/ Thumb print of respondent..............................................................
Date...............................................................................................
Dear Sir/Madam,

5 San Antonio
Vaalboom road
Glen Marais, Kempton Park

16th March 2012

Limpopo Department of Health
Polokwane

Dear Sir/Madam,

RE: REQUEST TO CONDUCT A STUDY ON FACTORS CONTRIBUTING TO NON COMPLIANCE TO TB TREATMENT AMONGST PULMONARY TB PATIENTS IN WATERBERG DISTRICT IN FULFILLMENT OF THE REQUIREMENTS FOR THE MASTER OF PUBLIC HEALTH DEGREE

I would like to request for permission to conduct the above mentioned study in Waterberg district in fulfillment of the requirements for the Master of Public Health degree which I am currently doing with the University of South Africa (UNISA).

Attached is the study protocol which has been approved by the UNISA health studies research and ethics committee.

Your consideration of this request will be highly appreciated.

Kind regards

Cindy N. Dladla
079 601 8467
cindydladla@gmail.com
Greetings,

Re: Permission to conduct the study titled: Factors contributing to non compliance to pulmonary tuberculosis treatment among patients in Waterberg District Limpopo Province.

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

Your cooperation will be highly appreciated.

Head of Department

Date

2012/04/24
UNIVERSITY OF SOUTH AFRICA,
Health Studies Higher Degrees Committee
(HSHDC)
College of Human Sciences
ETHICAL CLEARANCE CERTIFICATE

Date of meeting: 13 October 2011
Project No: 4494-299-0

Project Title: Factors contributing to non compliance to pulmonary tuberculosis treatment among patients in Waterberg District, Limpopo Province

Researcher: Cindy Nolung’selele Dladla

Degree: Masters in Public Health

Supervisor: Dr IS Ziyane
Qualification: D Lit et Phil
Joint Supervisor: 

DECISION OF COMMITTEE

Approved √ Conditionally Approved

Prof E Potgieter
CHAIRPERSON: HEALTH STUDIES HIGHER DEGREES COMMITTEE

Prof MC Bezuidenhout
ACADEMIC CHAIRPERSON: DEPARTMENT OF HEALTH STUDIES

PLEASE QUOTE THE PROJECT NUMBER IN ALL ENQUIRIES