

**THE EXPERIENCES OF ENROLLED NURSES CARING FOR MULTIDRUG-  
RESISTANT TUBERCULOSIS PATIENTS IN KWAZULU-NATAL**

by

SITHA DEVI ARJUN

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RESISTANT TUBERCULOSIS PATIENTS IN KWAZULU-NATAL**

by

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submitted in accordance with the requirements for the degree of

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UNIVERSITY OF SOUTH AFRICA

SUPERVISOR: MS M. C. MATLAKALA

JOINT SUPERVISOR: PROF T.R. MAVUNDLA

NOVEMBER 2011

## **DEDICATION**

To all nurses working in MDR-TB hospitals or wards. Your work does not go unnoticed.

## DECLARATION

I declare that **THE EXPERIENCES OF ENROLLED NURSES CARING FOR MULTIDRUG-RESISTANT TUBERCULOSIS PATIENTS IN KWAZULU-NATAL** is my own work and that all sources that I have used or quoted have been indicated and acknowledged by means of complete references.

A handwritten signature in black ink, appearing to read 'Sitha Devi Arjun', is written over a light blue rectangular background.

**SITHA DEVI ARJUN**

**NOVEMBER 2011**

**Student number: 3397-332-6**

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**ABSTRACT**

The purpose of this study was to explore and describe the personal experiences of enrolled nurses while caring for patients infected with multidrug-resistant tuberculosis (MDR-TB) in an urban tuberculosis hospital in KwaZulu-Natal province, South Africa. Generic qualitative research was conducted with a sample of purposively selected enrolled nurses who cared for MDR-TB patients. Data was collected through in-depth individual interviews and analysed using Colaizzi's (1978) method of data analysis. The research findings revealed six major themes: the working context, fear of contracting the disease, problems that have an impact on the quality of nursing care, nurses' perceptions of the patients, support structures and nurses' expressed needs. The findings of this study indicate that the nurses work in a challenging environment and need to be supported, as they experience more negative than positive feelings while caring for these patients.

**KEY CONCEPTS:** Enrolled nurse; experiences: multidrug-resistant tuberculosis; caring; patients

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## CHAPTER 1 INTRODUCTION TO THE STUDY

### 1.1 INTRODUCTION

Tuberculosis (TB) is an infectious, communicable disease caused by bacteria called mycobacterium tuberculosis that primarily affect the lung parenchyma. TB spreads from person to person by airborne transmission through talking, coughing, sneezing, laughing or singing (Smeltzer et al. 2008:644).

The Human Immunodeficiency Virus (HIV) fuels the TB epidemic in populations where there is an overlap between those infected with HIV and those infected with TB. Intense transmission of mycobacterium tuberculosis increases the pool of HIV-infected people who are exposed to and subsequently infected with it (World Health Organisation 2004:14).

TB is curable. Numerous controlled trials have shown that a six-month regimen of rifampicin and isoniazid, supplemented by pyrazinamide and streptomycin or ethambutol for the first two months, will provide a cure in more than 95% of cases if the medication regimen is adhered to (Ormerod 2005:19). However, if the medication regimen is not adhered to, drug resistance can develop. Primary drug resistance is resistance to one of the first-line anti-tuberculosis agents in people who have not had previous TB treatment, and secondary or acquired drug resistance is resistance to one or more anti-tuberculosis agents in patients undergoing therapy (Smeltzer et al. 2008:647).

When resistance to TB drugs is present, a patient is considered to suffer from multidrug-resistant tuberculosis (MDR-TB). MDR-TB is defined as TB caused by mycobacterium tuberculosis resistant in vitro to the effects of isoniazid and rifampicin (World Health Organisation 2006b:1). MDR-TB is a communicable disease and it occurs when its causative organism has developed resistance against first-line TB drugs. Patients with MDR-TB are highly infectious and the

nurses who work in close proximity with them when providing nursing care are at risk of contracting this drug-resistant disease. Cases of MDR-TB have been reported in KwaZulu-Natal. A study in Msinga sub-district of KwaZulu-Natal from January 2005 to March 2006 identified 221 cases of MDR-TB among 1539 patients (Naidoo et al. 2007:46).

In the absence of HIV infection, 10% of people infected with TB are expected to progress to active TB in their lifetime. Half of these individuals with active TB are likely to be smear-positive. Concomitant HIV infection increases the risk of reactivation TB and increases an individual's risk of progressing to active TB from latent disease to about 10% per year (Naidoo et al. 2007:47).

Healthcare practitioners are at a particularly high risk of TB infection because of frequent exposure to patients with infectious TB. Healthcare practitioners may themselves be immune-suppressed due to HIV infection and be at a higher risk of developing TB once infected (South Africa 2007:6). In 2004 the estimated prevalence of HIV in healthcare practitioners in South Africa was 15%, and in the KwaZulu-Natal population it was approximately 17% (Naidoo et al. 2007:47).

## **1.2 BACKGROUND TO THE STUDY**

Nurses have for the most part accepted the inherent risk that comes with their practice. However, recent years have prompted a new philosophy on the part of healthcare practitioners, including nurses, that places a high value on their own physical and psychological wellbeing (Joel 2006:605). MDR-TB has recently increased healthcare practitioners' awareness of workplace hazards. Working in a high-risk setting can lead to negative experiences for nurses, the consequences of which are impaired therapeutic relationships and compromised quality of nursing care.

The Department of Health of the Republic of South Africa (RSA) developed draft national infection prevention and control guidelines for TB, MDR-TB and extreme

drug-resistant TB (XDR-TB). These guidelines are intended to help healthcare managers and healthcare practitioners to minimise the risk of TB transmission in healthcare facilities and other facilities where the risk of transmission may be high due to a high prevalence of both diagnosed and undiagnosed TB, MDR-TB and XDR-TB (South Africa 2007:5). These guidelines underscore the importance of TB infection control in other facilities where large numbers of possible TB and HIV-infected individuals gather (South Africa 2007:5).

The national guidelines provide an overview of TB transmission in healthcare facilities. Infection prevention and control procedures are aimed at reducing the risk of TB transmission in healthcare facilities and protecting healthcare practitioners through voluntary counseling and testing. There are also initiatives to increase awareness of TB preventive action, and to emphasise the importance of TB infection control in drug rehabilitation centres, correctional institutions (prisons as well as other detention centres) and other facilities where large numbers of possible TB and HIV-infected individuals gather (South Africa 2007:6).

In a study conducted by Chung et al. (2005:512) on the experiences of nurses while caring for Severe Acute Respiratory Syndrome (SARS) patients, the findings revealed a variety of emotions that were experienced, where the nurses considered themselves vulnerable and at risk of contracting the disease themselves. They identified a sense of powerlessness as a core element of what they experienced while having to care for these patients. They feared the unknown. The literature indicated feelings of frustration when nurses did not follow the infection-control guidelines properly and fell victim to the disease. As a result of this, the nurses were unable to help their patients in a competent manner. The findings indicated that their feelings and attitudes changed as empathy was developed towards the patients (Chung et al. 2005:512).

In addition to the normal accidental transmission risks of contracting communicable diseases such as MDR-TB in healthcare institutions, healthcare practitioners are also at risk of being deliberately infected by patients. The

findings of a study by De Villiers and Ndou (2008:14-16) indicate that HIV-positive patients often tried to expose the nurses and their relatives to their stools, blood or secretions on purpose. As a consequence, nurses devised secret signs to inform each other about the HIV status of their patients, in order to make each other aware that they should take extra precautionary measures. The authors posit that nurses often distanced themselves from their patients and frequently refrained from touching their patients (De Villiers & Ndou 2008:16).

In a study conducted by Hansel et al. (2004:647) the findings indicated that respiratory isolation and the requirement of speaking through a mask can interrupt communication at a time when patients should be receiving new information.

Fear of infection is one of the factors contributing to the social stigmatisation of patients. This produces social isolation and leads to limited social support from the patient's families and the community, and inadequate nursing care (Vega et al. 2004:750). Hansel et al. (2004:643) indicate that TB patients are of the opinion that TB has influenced their social interactions. Commonly, TB patients reported having people "shy away" from them. Dodor (2008:144) posits that the use of isolation wards by most hospitals, and the observation that some doctors and nurses use masks and gloves when dealing with TB patients, can lead to stigmatisation of TB patients in the eyes of the community members. Fear of infection was identified as the main reason for the stigmatising attitudes and behaviours of both health professionals and community members towards those with TB.

A study by Smit (2005:22) involving nurses who cared for patients living with HIV and AIDS revealed that nurses expressed feelings of helplessness or powerlessness and experienced a sense of both physical and mental fatigue. This experience is attributed to the fact that providing care for patients in general, and patients suffering from HIV and AIDS in particular, was taxing. Nurses felt physically weary and were concerned about their experiences of emotional

exhaustion and stress. For many, dealing with the manner in which their patients responded to their own suffering and the process of dying as a result of HIV and AIDS was extremely emotionally draining.

The critical challenges faced in preventing nosocomial infection in healthcare facilities are prioritising financial and technical resources, and balancing the need to provide healthcare workers with a safe work environment against the need to provide competent and compassionate care to patients (Fenelly 1998:103). Employers must realise that the responsibility for maintaining a healthy workforce is a shared one with employees. It is the responsibility of the employer to ensure a safe and low-risk environment for healthcare practitioners in their workplace (Parsons 2004:1). In order to determine how best to establish good infection-control policies in healthcare settings in developing countries, it is first necessary to determine the extent of the impact of TB infection on healthcare practitioners (Eshun-Wilson et al. 2008: 17).

### **1.3 PROBLEM STATEMENT**

On 1 March 2007, an MDR-TB hospital was opened by the Department of Health of the Republic of South Africa (RSA) to serve the province of KwaZulu-Natal. In this hospital, the professional nurses are involved with managerial and administrative duties in addition to providing nursing care, while the enrolled nurses render direct nursing care only. This means that the enrolled nurses come into close contact with the patients all the time.

This researcher has been employed as a professional nurse in this MDR-TB hospital since it was opened, and has observed a deterioration in the nurses' morale since then. The nurses appear to be uncomfortable, fearful and insecure, and uninterested in working in this hospital. The nurses seem also to be uncertain about their future, as MDR-TB is a serious disease. An incident occurred at the Church of Scotland hospital in the sub-district of Msinga in KwaZulu-Natal, where four healthcare practitioners died from MDR-TB (KwaZulu-Natal Department of

Health 2009:7). This incident may have had a negative impact on the nurses' ability to render high-quality nursing care and maintain healthy therapeutic relationships with the MDR-TB patients (researcher's observation).

At the study site, it was observed that the national infection control guidelines were partly adhered to. All new healthcare practitioners received training on the national infection prevention and control guidelines on induction to the hospital. An annual screening programme for TB was available. Staff were investigated free of charge if they had had a cough for two weeks or more. They were encouraged to go for voluntary counselling and testing so that they knew their HIV status.

However, the hospital failed to apply the national guidelines strictly and this failure was perceived to increase the risk of staff members, including nurses, contracting MDR-TB. The hospital failed to designate a suitably qualified infection prevention and control coordinator to oversee the implementation of the guidelines, render in-service education and conduct regular inspections to ensure that infection-control measures were adhered to in all departments.

According to the draft national infection prevention and control guidelines (South Africa 2007:13), infection prevention and control measures are effective only if all staff members working in an institution understand the importance of the infection prevention and control policies and their role in implementing them. At the study site, staff members were insufficiently sensitised to the contents of the hospital's infection prevention and control policies. The lack of adequate in-service education on infection prevention and control measures resulted in insufficient adherence by staff members to standard precautionary measures.

In addition to the lack of coordination and training in this hospital, there was an inadequate supply of N95 respirators, which the nurses reported to be frequently out of stock. N95 respirators can protect healthcare workers from inhaling mycobacterium tuberculosis only if standard work practice and environmental

controls are in place (South Africa 2007:17). In a study conducted at a hospital in Thailand, healthcare practitioners appeared not to understand fully the prevention benefits of wearing N95 respiratory masks. The reasons provided for not wearing masks included discomfort, interference with the wearing of a nurse's cap and interference with cosmetics (Yanai et al. 2003:43).

According to the draft national infection prevention and control guidelines, it is important to recognise that if work practice or administrative controls are inadequate, environmental controls will not eliminate the risk of contracting the disease (South Africa 2007:15). One would expect that annual screening programmes for TB, such as X-ray examinations, would be conducted for staff members in such an environment; however, in practice X-ray facilities are unavailable at this hospital and staff members have to be transported to another hospital for X-ray screening. Furthermore, very often transport is unavailable.

Adherence to infection-control measures is important but not foolproof in halting the spread of communicable diseases such as TB in hospital settings. Staff at a special facility for treating patients with MDR-TB in Johannesburg wear protective masks and have access to an employee wellness clinic that is open daily. However, nurses occasionally contract TB despite adhering to these precautionary measures (Aids Care Watch 2007). Findings from various studies indicate that there are concerns about the low quality and sometimes infrequent availability of gloves, aprons, masks and incontinence aids, which increases the risk of accidental exposure to HIV (De Villiers & Ndou 2008:12; Smit 2005:22).

Nurses are the frontline workers in providing nursing care to patients and are often fearful when they have to nurse patients with communicable diseases, as they could contract the diseases themselves. Enrolled nurses at the study site work in close contact with MDR-TB patients as they provide nursing care. They work in this environment at the risk of contracting MDR-TB themselves. The research questions are therefore:

- How do enrolled nurses experience caring for patients with MDR-TB in an urban hospital in KwaZulu-Natal?
- How can enrolled nurses be supported during their care of MDR-TB patients?

#### **1.4. RESEARCH PURPOSE**

The purpose of this study was to explore and describe the personal experiences of enrolled nurses while caring for patients infected with MDR-TB in an urban TB hospital in KwaZulu-Natal province in South Africa.

#### **1.5 RESEARCH OBJECTIVES**

The objectives of this study were as follows:

- To explore and describe the personal experiences of enrolled nurses caring for MDR-TB patients.
- To identify the support systems for the enrolled nurses during their care of MDR-TB patients.

#### **1.6 THEORETICAL FOUNDATIONS OF THE STUDY**

An assumption is a basic principle that is accepted as being true based on logic or reason, but without proof or verification (Polit & Beck 2004:711). Sources of assumptions include universally accepted truths, theories, previous research and nursing practice. Assumptions are embedded in the philosophical base of the framework, study design and interpretation of findings. Assumptions influence the logic of the study, and their recognition leads to more rigorous study development (Burns & Grove 2005:39). The assumptions of this study are as follows:

### **1.6.1 Methodological assumptions**

The methodological assumption, or the assumption regarding research, is that the generic qualitative research supports narrative data collection, in order to capture the life-world of people from an emic or insider perspective.

### **1.6.2 Metatheoretical assumptions**

Metatheoretical assumptions are assumptions regarding reality underlying the study. The metatheoretical assumptions of this study are that:

- The presence of MDR-TB in the work environment will result in the people working in that environment being at a high-risk for infection.
- Caring for patients with MDR-TB has an influence on the enrolled nurse–patient relationship.
- The human being is viewed as an open system that interacts with both internal and external environmental forces and stressors (George 2011:347).

### **1.6.3 Theoretical assumptions**

Theoretical assumptions are assumptions concerning knowledge. The theoretical assumptions underlying this study are that:

- To understand people's experiences and the meaning that they assign to the experiences, it is necessary to generate narrative data.
- The provision of a supportive environment may improve the quality of nursing care.
- Caring consists of carative factors that result in the satisfaction of certain human needs.
- The transpersonal caring relationship involves the human-to-human connectedness occurring in a nurse–patient encounter.
- The ability to care for others is dependant upon one's ability to care for oneself.

## **1.7 SIGNIFICANCE OF THE STUDY**

The critical challenges faced in preventing nosocomial infection in healthcare facilities are prioritising financial and technical resources, and balancing the need to provide healthcare workers with a safe work environment against the need to provide competent and compassionate care to patients (Fennelly 1998:103).

The study will contribute to the understanding of the life-world of enrolled nurses who work in a high-risk environment for contracting MDR-TB. The research findings could be used by the nursing managers to develop strategies to minimise the risks to which nurses are exposed in MDR-TB hospitals in KwaZulu-Natal and develop a support system for the enrolled nurses. It is envisaged that this would ultimately lead to improved patient care. This study will furthermore contribute towards the knowledge base of the nursing profession by documenting the nurses' views on their working circumstances, their experiences in the workplace and the influence of such experiences on the therapeutic relationship with MDR-TB patients.

## **1.8 DEFINITIONS OF KEY CONCEPTS**

A concept is an abstraction based on observations of behaviours or characteristics. A conceptual definition presents the abstract or theoretical meaning of the concepts being studied (Polit & Beck 2004:31). The theoretical definitions used in this study are as follows:

### **1.8.1 Caring**

Watson (1988) as cited in Potter and Perry (2007:482) explains that caring comes from the Greek word *caritas*, which means to cherish, to appreciate and to give special attention. The caring process is a deliberate one that involves choice and action. In this study the emphasis of care is on the nurse–patient relationship during provision of nursing care to MDR-TB patients.

### **1.8.2 Enrolled nurse**

Enrolled nurse means a person who is registered as such in terms of section 31 of the Nursing Act 33 of 2005, and who is thus educated to practise basic nursing care in the manner and to the level as prescribed (South Africa 2005:25). The enrolled nurse in this study is the nurse who comes into direct contact with MDR-TB patients while providing nursing care.

### **1.8.3 Experience**

The term “experience” means knowledge or skill gained over time (Wordreference.com English Dictionary 2006). In this study, experience refers to the practical knowledge and skill derived from nursing MDR-TB patients.

### **1.8.4 Multidrug-resistant tuberculosis**

Multidrug-resistant tuberculosis is defined as TB caused by mycobacterium tuberculosis resistant in vitro to the effects of isoniazid and rifampicin (World Health Organisation 2006b:1). Drug resistance is caused by a genetic mutation that makes a drug ineffective against the mutant bacilli. An inadequate or poorly administered treatment regimen allows a drug-resistant strain to become the dominant strain in a patient infected with TB (World Health Organisation 2006b:4).

### **1.8.5 Patients**

The Oxford Advanced Learners Dictionary (1992:906) defines a patient as a person who is receiving medical treatment, especially in a hospital. In this study, a patient is a person who has been diagnosed with MDR-TB and has been admitted at the study site for treatment and further management.

## **1.9 RESEARCH METHODS**

This study was conducted by applying a generic qualitative method. Qualitative research provides an opportunity to create meaningful nursing knowledge based on an understanding of individuals' lives and experiences. It is essential to document these unique experiences and share them to explore and describe the human experience fully (Streubert Speziale & Carpenter 2003:335). According to Burns and Grove (2007:24-25) qualitative research is a suitable approach for conducting in-depth, contextual investigations aimed at gaining insight into the world and the personal experiences of a small sample of people. The research method is described in more detail in Chapter 3.

### **1.10 RESEARCH DESIGN**

The research design guides the researcher in planning and implementing the study in a way that is most likely to achieve the intended goal. It is a blueprint for conducting the study (Burns & Grove 2005:211). According to Polit and Beck (2008:765) a research design is the overall plan for addressing a research question, including specifications for enhancing the study's integrity.

An exploratory and descriptive design was used for this study. A descriptive design is used to gain more information about characteristics within a particular field of study. Its purpose is to provide a picture of a situation as it naturally happens (Burns & Grove 1999:192) Like descriptive research, exploratory research begins with a phenomenon of interest, but rather than simply observing and describing it, exploratory research investigates the full nature of the phenomenon, the manner in which it is manifested, and the other factors to which it is related (Polit & Beck 2004:20). Therefore an exploratory and descriptive design was the most appropriate for this study.

### **1.10.1 Population and sampling**

“Research population” refers to all elements (individuals, events or circumstances) that meet the sample criteria for inclusion in a study. It is sometimes referred to as the target population (Burns & Grove 2007:806). The research population for this research study was comprised of enrolled nurses who had more than six months' experience of working in an urban MDR-TB hospital in KwaZulu-Natal. Purposive sampling was used to select the enrolled nurses. Purposive sampling involves the conscious selection of certain participants or elements by the researcher for inclusion in the study (Burns & Grove 2007:350). The enrolled nurses were purposively selected to be included in this study as they were directly involved in providing nursing care to MDR-TB patients.

### **1.10.2 Setting**

The setting refers to the field where the research will be undertaken (Streubert & Carpenter 2003:27). For this study the setting was an urban hospital situated in Ethekewini health district north of Durban in KwaZulu-Natal. This hospital admits only MDR-TB and XDR-TB patients.

### **1.10.3 Data collection**

Data was collected by means of unstructured, in-depth interviews. The unstructured, in-depth interview was chosen because it was hoped that participants would respond freely to open-ended questions in narrative form, using their own words, and thus sharing their own perspectives with researchers. During the interview the researcher was able to ask probing questions so that participants could elaborate or clarify their responses. This resulted in gaining in-depth accounts about participants' lives and experiences (De Villiers & Van Der Wal 2004:243).

#### **1.10.4 Ethical considerations**

Permission to conduct the study was obtained from the hospital manager and nursing manager of the proposed hospital. A copy of the research proposal and a copy of the permission letter from the Higher Degrees Committee of the Department of Health Studies, UNISA were attached and sent along to request permission from the KwaZulu-Natal Department of Health. At the proposed hospital, permission was obtained from the operational managers to interview the enrolled nurses.

#### **1.10.5 Data analysis**

Data was analysed using Colaizzi's (1978:48) method of data analysis, which comprises the following seven steps:

1. Each research participant's verbatim transcript is read to acquire a sense of the whole.
2. Significant statements and phrases pertaining to the phenomenon being studied are extracted from each transcript.
3. Meanings are formulated from the significant statements.
4. Meanings are organised into themes, and themes evolve into theme clusters and eventually into theme categories.
5. These results are integrated into rich and exhaustive descriptions of the lived experience.
6. The essential structure of the phenomenon is formulated.
7. Validation is sought from the research participants to compare the researcher's descriptive results with their lived experiences. If necessary, the researcher's description is modified to achieve congruence with the lived experience of the research participants.

Data analysis will be described in detail in Chapter 3.

### **1.11 MEASURES TO ENSURE TRUSTWORTHINESS**

To enhance the trustworthiness of the research, the researcher used the criteria formulated by Lincoln and Guba (1985:290), who propose four alternative constructs that more accurately reflect the assumptions of the qualitative paradigm: credibility, transferability, dependability and confirmability. The trustworthiness criteria as outlined by Lincoln and Guba (1985:250) will be discussed in Chapter 3.

### **1.12 CONCLUSION**

This chapter presented the introduction, background to the study, research problem, purpose and significance of the study, definition of key concepts, metatheoretical foundations and the introduction to research design and methods. In the next chapter, the literature review will be discussed.

The structure of the dissertation is as follows:

Chapter 1: Introduction to the study

Chapter 2: Literature review

Chapter 3: Research design and methods

Chapter 4: Analysis, presentation and description of the research findings

Chapter 5: Conclusion and recommendations.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

This chapter contains the literature review on tuberculosis (TB) and multidrug-resistant tuberculosis (MDR-TB). A literature review is a written summary of the state of evidence on a research problem. The purpose of the review is to familiarise the researcher with the scope of the field of study (Polit & Beck 2008:137).

The process of reviewing the literature was undertaken to search for and identify pertinent literature that would add value to and improve the understanding of the phenomenon under study. Several sources were consulted, including medical textbooks, medical and research journals, and the World Health Organisation (WHO) policy documents. Sources were obtained from the library and the Internet.

The researcher acknowledges the fact that there are certain criticisms of the usefulness of a literature review in a qualitative study. However, the literature was reviewed to orientate the reader in relation to the context of the phenomenon. The literature focuses on TB and MDR-TB, and on their management.

#### **2.2 TUBERCULOSIS**

Tuberculosis (TB) is an infectious, communicable disease caused by bacteria called mycobacterium tuberculosis, which primarily affect the lung parenchyma. As a communicable disease, TB can be transmitted directly or indirectly from one person to another (Smeltzer et al. 2008:643; Van den Berg & Viljoen 2005:iii).

### **2.2.1 Incidence and prevalence of tuberculosis**

Tuberculosis remains a major cause of morbidity and mortality in many countries and is a significant public health problem worldwide due to its high incidence. Incidence refers to the number of new cases notified during one year, from midyear to midyear. The incidence of TB is obtained from notification data. In 2006, there were an estimated 9.2 million new cases of TB globally (139 per 100 000 population) including 4.1 million new smear-positive cases and 0.7 million HIV-positive cases. The statistics represent an increase compared to the 9.1 million cases that were recorded in 2005. The increase may be attributed to population growth (World Health Organisation 2008b:12).

South Africa is among the 22 high-burden countries, as defined by the WHO. These high-burden countries account for approximately 80% of the estimated number of new TB cases occurring worldwide each year (World Health Organisation 2008c:16).

The Africa region has the highest incidence rate per capita at 363 per 100 000 (World Health Organisation 2008b:12). The incidence of TB is high in comparison to the American region, where an estimated 39 cases per 100 000 has been recorded (World Health Organisation 2008b:16).

It is estimated that of all those who are infected with mycobacterium tuberculosis, about 5% will develop active TB disease within five years of primary infection; the other 95% will develop a latent infection that may later progress to cause disease, depending on the status of the immune system of the individual. The WHO estimates that, on average, one infectious source who does not receive treatment infects 20 others with mycobacterium tuberculosis over an average period of two years before death. Thus, a population of 100 000 people with 50 new cases of smear-positive TB occurring every year would produce 100 infectious cases in the population at any given time, leading to 1 000 new infections annually, that is, 1% of the population becoming infected every year (World Health Organisation 2008c:16-17).

TB accounts for 1.6 million deaths annually. The following are estimates from the WHO regions; the Africa region accounts for 639 000 deaths (83 per 100 000), the America region for 40 000 deaths (5 per 100 000), the Eastern Mediterranean for 107 000 deaths (20 per 100 000), the Europe region for 62 000 deaths (7 per 100 000), the South East Asian region for 514 000 deaths (30 per 100 000) and the Western Pacific for 291 000 deaths (17 per 100 000) (World Health Organisation 2008b:200). The high mortality in the Africa region could be linked to high rates of HIV infection, drug resistance and weak health services (World Health Organisation 2008b:40).

In the absence of infection with HIV and without anti-TB treatment, about 65% of cases who remain smear-positive will die, most within two years, while only 10–15% of cases who remain smear-negative are expected to die. Even with treatment, more than 10% of patients may die in settings where adherence to treatment is low or where rates of HIV infection or drug resistance are high. In places where treatment is good and HIV is absent, less than 2% of smear-positive patients die while on treatment (World Health Organisation 2008c:16-17).

### **2.2.2 Risk factors for tuberculosis**

HIV infection exacerbates the TB epidemic through its impact on susceptibility to mycobacterium tuberculosis infections and progression from infection to active disease. HIV infection increases the rate at which mycobacterium infections are acquired and increases the likelihood that people who are already infected will develop active TB disease. The impact of HIV has been greatest in the countries of southern and eastern Africa, where up to 40% of adults may be infected with HIV and where the incidence of TB has increased four to five-fold within 10 years (World Health Organisation 2008c:17).

People suffering from conditions such as diabetes mellitus, cancer, leukaemia or Hodgkin's disease are prone to lowered resistance against infections. Chronic illnesses of the kidney, liver and gastro-intestinal tract lead to a negative nitrogen

balance, which in turn leads to lowered resistance, since proteins are necessary for producing leucocytes and antibodies. Chronic neurological illnesses (related to taking medication over a long period) can also lower a person's resistance and make them susceptible to contracting TB (Van den Berg & Viljoen 2005:32).

People who have been in close contact with someone who has infectious TB, including healthcare practitioners with HIV-associated immunosuppression, are particularly vulnerable to developing TB disease if they become infected with mycobacterium tuberculosis as a result of the exposure (South Africa 2007:5). Healthcare practitioners are at a much higher risk of TB infection and disease than the general population, especially if they work in high-risk settings such as TB wards. Laboratories carrying out mycobacterium tuberculosis culture procedures are also high-risk areas. Other high-risk settings include institutions such as jails, prisons, detention centres and drug rehabilitation centres (World Health Organisation 2008c:73-74). Close contact with someone who has active TB in a high-risk setting result in inhalation of airborne nuclei from the infected person that is proportional to the amount of time spent in the same air space, the proximity of the person and the degree of ventilation (Smeltzer et al. 2008:643).

People receiving certain medical treatments such as cancer chemotherapy or transplant anti-rejection medication are at risk because corticosteroids suppress the inflammatory reaction as well as the cell-mediated immune response (Van den Berg & Viljoen 2005:32).

Very young children and the elderly are more susceptible to communicable diseases than adults. Young children are susceptible due to the immaturity of their immunological system, which negatively influences the ability of the lymphoid system to react to foreign antigens. The activity of the immune system of an elderly person usually slows down, causing the general resistance of the body to be lowered (Van den Berg & Viljoen 2005:33).

People who are diagnosed with alcohol abuse or are alcohol dependent are particularly at risk of TB disease. This risk increase might be explained by their specific social mixing patterns and living conditions, which lead to an increased risk of infection. These people may have compromised immunity as a result of the toxic effects of the alcohol or medical conditions caused by alcohol (World Health Organisation 2008c:87).

Poverty is associated with vulnerability to TB infection and the development of the disease because poor people are likely to live in crowded conditions. Overcrowding poses extensive economic barriers to access to health services due to opportunity and financial costs that are exacerbated by geographical and health system-related barriers to care seeking (Nhlema Simwaka et al. 2007:65). If patients with TB cannot access health services due to financial constraints, this could result in the patient being infectious for a longer period of time than necessary before receiving treatment and this increases the risk of transmission to close contacts.

### **2.2.3 Transmission and pathogenesis of tuberculosis**

The causative organism of TB is mycobacterium tuberculosis, which is an acid-fast aerobic rod that grows slowly and is sensitive to heat and ultraviolet light (Smeltzer et al. 2008:643). The tubercle bacillus has a capsule composed of waxes and fatty substances, which makes it more resistant to destruction than many other organisms (Crowley 2004:389).

The mode of transmission is by droplet infection. The spread of TB occurs when a source, such as a person with TB disease, produces mycobacterium tuberculosis when coughing and an exposed person inhales the droplet nuclei containing mycobacterium tuberculosis (South Africa 2007:7). The tuberculosis bacilli can live for up to six months in dust after having been coughed up. When the dust is disturbed, for example by sweeping with a broom, the wind blowing or children

playing, the infected dust is inhaled by the susceptible person (Van den Berg & Viljoen 2005:266).

Transmission generally occurs indoors, where droplet nuclei can stay in the air for a long time. An infected person releases droplet nuclei that are usually 1 to 5  $\mu\text{m}$  in diameter. Larger droplets settle, while smaller droplets remain suspended in the air and are inhaled by a susceptible person. The two main factors that determine an individual's risk of exposure are the concentration of droplet nuclei in contaminated air and the length of time over which the person breathes that air (Department of Health 2004:12).

Droplet nuclei may also be produced in the laboratory where aerosol-producing investigations such as sputum induction and bronchoscopy are conducted. Transmission also occurs through the manipulation of lesions, and the processing of tissues or secretions in the laboratory (Department of Health 2004:12).

#### **2.2.4 Pathological process of tuberculosis**

TB begins when a susceptible person inhales mycobacteria tuberculosis and becomes infected. The bacteria are transmitted through the airways to the alveoli, where they are deposited and begin to multiply. The body's immune system responds by initiating an inflammatory reaction. Phagocytes (macrophages and neutrophils) engulf many of the bacteria, and TB-specific lymphocytes destroy the bacilli and normal tissue. The tissue reaction results in the accumulation of exudates in the alveoli, causing bronchopneumonia. The initial infection usually occurs two to 10 weeks after exposure (Smeltzer et al. 2008:644).

Granulomas, which are new tissue masses of live and dead bacilli, are surrounded by macrophages, which form a protective wall. They are then transformed to a fibrous tissue mass, the central portion of which is called a Ghon tubercle. The material (bacteria and macrophages) becomes necrotic, forming a cheesy mass. This mass may become calcified and form a collagenous scar. At this point, the

bacteria become dormant and there is no further progression of active disease (Smeltzer et al. 2008:644). As soon as fibrosis sets in (sterilisation of lesions), recovery takes place. To a great extent the person's health depends on the formation of these lesions (Van den Berg & Viljoen 2005:270). The following are the different stages of TB:

- ***Latent TB***

People who are infected with the TB bacteria do not necessarily develop active TB because the body is able to fight the bacteria to stop them from growing. The bacteria become inactive, but they remain alive in the body and can become active later. This is called latent TB infection. People with latent TB infection have no symptoms of TB and don't feel sick. They do not spread TB to others but may develop TB later on (Unite against TB 2009:32). People with latent TB infection usually have positive tuberculin skin tests (International Council of Nurses (ICN) 2008:14).

- ***Active TB***

Active TB disease can either develop when a person is first exposed to the TB bacteria, especially if his or her immune system is weak, or it can develop as reactivation disease in people who have been previously infected (Unite against TB 2009:32). With active TB, the Ghon tubercle ulcerates, releasing the cheesy material into the bronchi. The bacteria then become airborne, resulting in further spread of the disease (Smeltzer et al. 2008:644).

- ***Chronic TB***

TB can become chronic when dormant tubercle bacilli persist in tissues after primary infection and start to multiply, often in response to a trigger such as a weakening of the immune system. Unless the process is arrested, it spreads slowly downwards to

the hilum of the lungs and later extends to adjacent lobes. The process may be prolonged and is characterised by long remissions when the disease is arrested, followed by periods of renewed activity (Smeltzer et al. 2008:644).

- ***HIV and TB***

HIV-infected individuals and others with impaired cell-mediated immunity are more at risk of contracting TB than other people with normal immunity (Department of Health 2004:12). HIV not only increases the risk of contracting TB, but also alters the clinical course of TB disease. The risk of mortality is high among co-infected patients, mainly due to late diagnosis and other opportunistic infections (Department of Health 2004:2). Globally, there were an estimated 709 000 new HIV-positive TB cases in 2006. The African region accounts for 85% of estimated cases (World Health Organisation 2008b:55).

Early diagnosis and effective treatment of TB among HIV-infected patients are critical for curing TB, minimising the negative effects of TB on the course of HIV and interrupting the transmission of mycobacterium tuberculosis to other persons in the community (Department of Health 2004:2).

### **2.2.5 Signs and symptoms of tuberculosis**

TB presents with a variety of symptoms. Persistent coughing for more than two weeks is the most common symptom of pulmonary TB. Early in the course of the illness, the cough may be nonproductive, but subsequently becomes productive. The cough may start out dry but later produces sputum or blood (haemoptysis). Therefore, any patient presenting with a cough of longer than three weeks' duration should be investigated for TB (Van den Berg & Viljoen 2005:272).

Chest pain is usually a sharp pleuritic pain although it may also present as a dull ache. Dyspnoea is a symptom that is caused by the pathology of the disease. Pyrexia may be intermittent or recurring. Anorexia and loss of weight is an important

early sign but in the progressive stage it may lead to emaciation. Night sweating is a result of the toxæmia that develops (Van den Berg & Viljoen 2005:272). A patient showing these signs and symptoms who is or was in contact with a person with infectious TB, is more likely to be suffering from TB (Department of Health 2004:15).

### **2.2.6 Diagnosis of tuberculosis**

A complete history, physical examination, tuberculin skin test, chest X-ray, acid-fast bacillus (AFB) smears and sputum culture are used to diagnose TB. If the person is infected with TB, the chest X-ray usually reveals lesions in the upper lobes of the lungs and the AFB smear contains mycobacteria (Smeltzer et al. 2008: 645).

Clinical screening by assessment of symptoms identifies TB suspects among patients attending health facilities. Good history taking is essential when people present with TB symptoms, in order to determine previous TB treatment, its length and the drugs used. During history taking, the patient may reveal contact with someone who suffered from TB disease. The nurse or doctor takes a full medical history including the duration of symptoms, other prevailing medical conditions, previous health-seeking behavior and the outcomes thereof (ICN 2008:62).

The tuberculin test measures the delayed hypersensitivity response to an injection of purified protein derivative by producing a local skin reaction within 48 to 72 hours of being injected into the skin of an infected person. The tuberculin skin test has great diagnostic value as a screening test for TB and can be done on a large scale in children younger than 16 years. A strong positive skin reaction indicates the presence of viable tubercle bacilli in the body. A variety of tuberculin tests are available but the Mantoux test is considered the most reliable (Van den Berg & Viljoen 2005: 275).

Radiography of the lungs is frequently performed for screening purposes. Chest radiography is useful to evaluate persons who have negative sputum smears in order to attempt to find evidence for pulmonary tuberculosis and to identify other

abnormalities that may be responsible for the symptoms. With regard to tuberculosis, radiographic examination is most useful when applied as part of a systematic approach in the evaluation of persons whose symptoms and/or findings suggest tuberculosis but who have negative sputum smears (WHO 2006a:22).

Sputum specimens are taken for microscopy (smear) for rapid diagnosis and culture. Smears are taken to check for acid-fast bacilli. Acid-fast bacteria have a waxy capsule, which is stained with difficulty by means of certain red dyes (Crowley 2004: 113). When sputum containing tubercle bacilli is stained with certain dyes and examined under the microscope, the bacilli look red. This is because they are acid-fast (they have kept the dye even after being washed with acid and alcohol) (WHO 2004:24). If acid-fast bacilli are seen on microscopy, the specimen should be cultured to confirm the identity of the bacilli (ICN 2008:27). Culture examination is more accurate than microscopy but it takes much longer to obtain results, usually about six weeks (WHO 2006a:22).

- **Early diagnosis of tuberculosis**

Early diagnosis and treatment of active TB is essential in controlling the disease and preventing its transmission. Recognising the signs, symptoms and risk factors associated with TB and ordering the correct tests ensure that as many potential cases are identified as early as possible in the course of the disease (ICN 2008: 62).

A staff member should be assigned to screen patients who complain of coughing for a prolonged period immediately after they arrive at the healthcare facility (South Africa 2007:10). Suspected cases should promptly be investigated by means of tuberculin skin tests for children and having specimens of sputum sent to laboratories for bacteriological and culture examination for adults. In addition, the weight of healthcare practitioners should be monitored on a regular basis. Those persons who present with a significant weight loss should be further examined (Van den Berg & Viljoen 2005:279).

Medical, laboratory and X-ray facilities must be available for the proper examination of patients and healthcare practitioners who work in high-risk environments for contracting TB. This is necessary to ensure that cases are traced and treated as a matter of priority. Routine radiology examinations of all citizens of the Republic of South Africa should be considered if the necessary facilities, funding and personnel can be made available (Van den Berg & Viljoen 2005: 280).

### **2.2.7 Management of tuberculosis**

Management of TB includes preventive measures that are intended to reduce the pool of infected persons and protect people against infection.

- **Public prevention strategies**

According to the South African national guidelines, public prevention strategies begin at birth. A single dose of the Bacillus Calmette-Guérin (BCG) vaccine should be given to all infants as soon as possible after birth. BCG is a vaccine that has the ability to stimulate the production of antibodies against TB (ICN 2008:9). Primary cell-mediated immunity is elicited by immunisation with the BCG vaccine. Nurses should educate community members on the importance of BCG immunisation and the early signs and symptoms of TB disease (Van den Berg & Viljoen 2005:280).

Patients suffering from TB who are in contact with children, such as teachers, should avoid working with children for a period of one month after treatment has commenced (Van den Berg & Viljoen 2005:280).

Living conditions in private dwellings and in various residential institutions can have an important impact on the transmission of TB. Factors that promote the spread of tuberculosis, such as overcrowding and unhygienic conditions, should be eliminated by improving socio-economic conditions. The general standard of

living must be improved by means of creating more jobs for people. In addition to this, measures should be implemented to upgrade housing. People living in informal settlements have to be assisted in building their houses so that cross-ventilation is prevented (Van den Berg & Viljoen 2005:279).

Aspects which lead to diminished immunity, such as stress, alcoholism and malnutrition, should be addressed through health education. A considerable stigma is attached to the disease and this may interfere with adherence to therapy. The provision of emotional support to patients may increase the likelihood of adherence to therapy. When patients feel stressed, they should seek support. This support could be organised in the form of support groups or one-to-one counselling by trained providers. Informal support can also be provided by physicians, nurses, Directly Observed Treatment Strategy (DOTS) supporters and family members (WHO 2006a:90). In a study conducted by Hansel et al. (2004:647) regarding patient and provider perspectives on the quality of life experienced by tuberculosis patients, the findings revealed that some alcoholic patients were so scared when first diagnosed that they stopped drinking. The bonds they developed with the clinic staff prevented them from resuming drinking and the behavioural changes extended beyond treatment.

While good nutrition increases the general resistance of a person, malnutrition may be linked to an increased risk for TB disease through immune deficiency caused by deficiencies in protein, energy, vitamins and minerals (WHO 2008c:86). Malnutrition renders the person susceptible to infections. Any shortage of vitamins also lowers the general resistance of a person (Van den Berg & Viljoen 2005:32). It is thus necessary to implement community feeding schemes, encourage breastfeeding and provide health education regarding good nutrition and a balanced diet. Healthcare practitioners, in collaboration with community members, can initiate the planting of communal vegetable gardens. Once members are ready, they can initiate their own vegetable gardens (Van den Berg & Viljoen 2005:279).

Effective community and patient involvement yields positive results, such as improved case finding and treatment outcomes, raised awareness concerning the nature of the disease and effective utilisation of the available treatment, which is often free of charge. To be successful, community and patient involvement should be designed and implemented with community members involved as equal partners (WHO 2008c:175).

Education about TB is important because having the necessary knowledge can safeguard community members and their families against the threat of TB infection. Such information will motivate those who are considered at risk to participate in TB screening programmes. Nurses are in a good position to educate people, given the broad contacts they have with clients most vulnerable to TB, such as those nurses working in schools with diverse immigrant populations and in emergency-room settings. Nurses caring for people with HIV infection and the elderly are also at risk. Avenues for the broad dissemination of health educational information on TB include the media, public health departments, school systems and occupational health offices (Ailinger et al. 2003:211).

- **Tuberculosis prevention in healthcare settings**

The three levels of TB infection control are workplace and administrative (managerial) control measures, environmental control measures and personal control measures (respiratory protection). Each level operates at a different point in the transmission process and is discussed as follows:

*Workplace and administrative control measures*

Workplace and administrative control measures have the greatest impact on preventing TB transmission. They serve as the first line of defense for preventing the spread of TB in healthcare settings. There are five components of good workplace and administrative control: an infection control plan, administrative support, training

of staff, education of patients, and co-ordination and communication with the TB control programme (WHO 2008c:74).

Each facility should have a written TB infection prevention and control plan with a designated infection prevention and control officer who is responsible for overseeing the implementation of infection-control measures. The plan should include screening of patients to identify persons with symptoms of TB disease, placing TB suspects and cases in separate waiting areas and sending patients for diagnostic investigations of TB. Staff should also be investigated for TB free of charge if they have had a cough for two weeks or longer. The infection-control plan should list designated staff members to be contacted to initiate confidential TB investigations. Each institution should establish a multidisciplinary infection prevention and control committee to monitor and evaluate the infection prevention and control plan (WHO 2008c:75).

All staff must understand the importance of infection prevention and control policies through training, and should receive instruction specific to their job category. Training should be conducted before staff members are initially assigned to their posts, and continuing education should be provided to all employees and volunteers annually (WHO 2008c:75). Training should cover the basic concepts of TB, including transmission, pathogenesis, signs and symptoms of TB, the risk of transmission to healthcare practitioners and other staff members, and measures by means of which they can protect themselves and patients against TB. The training should also cover the importance of the infection prevention and control plan and the responsibility of each staff member with regard to the implementation of the plan (South Africa 2007:14). Healthcare practitioners and other staff members must be reminded that they can develop TB, regardless of previous infection status or BCG vaccination (WHO 2008c:75).

Patients must be made aware of how to recognise the signs and symptoms of TB. Infected patients should receive instruction on how to protect others from exposure to TB by simple cough hygiene measures (South Africa 2007:14), personal hygiene,

good nutrition and medication compliance. Educational materials that are culturally and linguistically appropriate for the patient must be used (Department of Health 2004:43).

HIV fuels the TB epidemic in populations where there is an overlap between those infected with HIV and those infected with TB. Intense transmission of mycobacterium tuberculosis increases the pool of HIV-infected people exposed to, and subsequently infected with, TB (WHO 2004:14). Co-ordination and communication between HIV/AIDS and TB programmes must therefore be prioritised. Each facility without an integrated system that provides care for both TB and HIV should establish a referral mechanism for HIV patients suspected of having TB to be investigated in a TB diagnostic centre and commenced on treatment, if indicated. There must be a monitoring mechanism that provides feedback to the referring facility to evaluate both the linkage with TB diagnostic services and the appropriateness of referrals as indicated by the proportion of suspects actually confirmed as having TB disease (South Africa 2007:14).

#### *Environmental control measures*

Environmental controls include ventilation (natural and mechanical), filtration and ultraviolet germicidal irradiation. Controlled natural ventilation considerably reduces the risk of spreading mycobacterium tuberculosis. Designing waiting areas and examination rooms to maximise natural ventilation can significantly reduce the spread of TB. In warm climates, open-air shelters with a roof to protect patients from sun and rain are appropriate. Natural ventilation relies on open doors and windows to bring in air from the outside. When fresh air enters a room, it dilutes the concentration of particles in room air, such as droplet nuclei containing mycobacterium tuberculosis. Controlled ventilation includes checks to ensure that doors and windows are maintained in an open position that enhances ventilation. Fans may also assist in distributing the air. However, the use of ceiling fans is only justified if there is free air flow out from the room through open windows (WHO 2008c:75).

In small rooms with a limited number of patients or in other small, enclosed areas, room air cleaners with high-efficiency particulate air filters may be a useful alternative to mechanical ventilation that requires structural changes. These room air cleaners may be free standing or may be permanently attached to floors or ceilings to minimise tampering. Correct maintenance of the filter is essential (WHO 2008c:76).

Negative-pressure ventilation is another method used to prevent contaminated air from flowing out of the room into adjacent areas in laboratories or healthcare facilities, by maintaining an air pressure difference between the two areas. Air is drawn into the room from adjacent areas and exhausted directly to the outside, removing and diluting any infectious particles. This may be the method of choice in some settings, depending on various factors that include climatic conditions and available resources. The necessary equipment requires continued maintenance and the air exchange rate may be lower than that achieved by well-designed natural ventilation (WHO 2008c:76).

When patients provide sputum smear specimens for TB diagnosis, they should do so outside, in the open air, away from other people. When this is not possible because of climatic constraints, it should be done in an adequately ventilated booth and not in small rooms such as toilets or other enclosed areas (WHO 2008c:76).

*Mycobacterium tuberculosis* is killed if the organisms are exposed to sufficient ultraviolet germicidal irradiation. However, effectiveness depends on close contact with the ultraviolet light source and may be limited if humidity is high (over 60%) and where dust levels are high. Ultraviolet lights should be directed to the ceiling, accompanied with adequate air flow and must be regularly maintained. The major concerns about inadequately installed and maintained ultraviolet germicidal irradiation units have been reactions resulting from overexposure, such as acute and chronic skin and eye changes. For these reasons and because of the inability to assess for effectiveness in field conditions, ultraviolet germicidal irradiation is not

generally recommended as a method to disinfect room air in patient wards (WHO 2008c:76).

*Personal protective measures (respiratory protection)*

A face mask, such as a surgical mask made of cloth or paper, serves as a physical barrier between the mouth, nose and the environment. Use of face masks is not generally recommended for healthcare staff because they do not protect against TB transmission by aerosol. N95 masks are called particulate respirators because they filter particles, such as droplets of respiratory secretions emitted by a person infected with tuberculosis. A certified N95 (or greater) respirator is therefore the mask of choice (WHO 2008c:77).

The use of N95 masks is restricted to specific high-risk areas in hospitals and referral centres, such as rooms where spirometry or bronchoscopy is performed or specialised treatment centres for patients with MDR-TB. N95 respirators are expensive, require specialised equipment to ensure proper fit and are often unavailable in resource-limited settings. In the absence of standard workplace and environmental controls, respirators should not be relied upon to protect healthcare practitioners from inhaling mycobacterium tuberculosis (South Africa 2007:17).

- **Pharmacological treatment**

Treatment of TB includes pharmacological treatment. For the treatment of new cases of pulmonary TB, the WHO (2008c:39) recommends a standardised regimen consisting of two phases. The initial (intensive) phase uses four drugs (rifampicin, isoniazid, pyrazinamide and ethambutol) administered for two months. This initial intensive treatment phase is aimed at rapidly killing the tubercle bacilli. These four drugs are called first-line drugs as they are the most potent and best tolerated anti-TB drugs (WHO 2006a:42).

This is followed by a continuation phase with two drugs (rifampicin and isoniazid) for four months or, exceptionally, with two drugs (isoniazid and ethambutol) for six months when adherence to treatment with rifampicin cannot be ensured (WHO 2008c:39).

Rifampicin is a semi-synthetic broad-spectrum bactericidal antibiotic. Isoniazid is a synthetic, antitubercular agent which is bacteriostatic for semi-dormant bacilli and bactericidal against actively dividing mycobacteria. Pyrazinamide is an antimycobacterial agent, which may be bacteriostatic or bactericidal depending on its concentration and the susceptibility of the organism. It is effective against persisting tubercle bacilli within the acidic intracellular environment of the macrophages. All agents are readily absorbed following oral administration with wide distribution to most tissues and fluids, including cerebrospinal fluid. Pyrazinamide is metabolised primarily in the liver to the major active metabolite, pyrazinoic acid (MDR 2003:367).

Numerous clinical controlled trials have shown that a six-month regimen of rifampicin and isoniazid, supplemented by pyrazinamide and streptomycin or ethambutol for the first two months, will provide a cure in more than 95% of cases if the medication is taken correctly. Such a regimen also renders infectious cases non-infectious in two weeks. Each drug varies in its ability to kill tubercle bacilli (bactericidal ability), to deal with persistent organisms which are only occasionally metabolically active (sterilising ability) and to prevent the emergence of drug resistance (Ormerod 2005:19).

TB treatment in South Africa occurs by means of fixed-dose combination formulas. The use of fixed-dose combination treatment has several advantages over individual drugs. Prescription errors are likely to be less frequent as dosage recommendations are straightforward and adjustment of doses according to patients' weight is relatively easy. Compared with individual drugs, the number of tablets to be taken is fewer and patients cannot be selective in the choice of drugs to ingest, thus reducing non-compliance with the drug regimen and the potential for acquiring drug

resistance. The need for direct observation of treatment is therefore not obviated with the use of fixed-dose combination treatment (WHO 2008c:38).

Application of the Directly Observed Treatment Strategy (DOTS) is required to ensure treatment adherence. It helps reinforce patients' motivation to continue with their treatment and counters the tendency of some to interrupt the treatment. DOTS also ensures the accountability of healthcare practitioners to ensure that patients take their TB treatment and helps prevent the emergence of drug resistance. It is therefore important to note that DOTS is recommended for the entire period of treatment (Department of Health 2004:40).

In 2006, WHO launched the Stop TB Strategy. This strategy, which builds on and enhances DOTS, explicitly identifies the management of MDR-TB as a priority. The strategy recognises the need to provide care to all patients affected by TB, whether the disease is caused by drug-susceptible or drug-resistant TB bacilli, and the need to avoid jeopardising TB control efforts where drug-resistant TB is highly prevalent (WHO 2006a:ix).

### **2.3 MULTIDRUG-RESISTANT TUBERCULOSIS (MDR-TB)**

MDR-TB is defined as TB caused by mycobacterium tuberculosis resistant in vitro to the effects of isoniazid and rifampicin (WHO 2006a:1). Drug resistance is caused by a genetic mutation that makes a drug ineffective against the mutant bacilli. An inadequate or poorly administered treatment regimen allows a drug-resistant strain to become the dominant strain in a patient infected with TB. Ongoing transmission of established drug-resistant strains in a population is also a significant source of new drug-resistant cases (WHO 2006a:4).

The fourth report of the WHO/IUATLD (International Union Against Tuberculosis and Lung Disease) Global Project on Anti-Tuberculosis Drug Resistance Surveillance provides data, collected between 2002 and 2007, on the magnitude of drug resistance in 81 countries and two special administrative regions of China,

as well as the most up-to-date trends from 47 countries collected over a thirteen-year period (WHO 2008a:22).

The Global Project was initiated in 1994 in order to estimate the global burden of drug-resistant TB worldwide using standardised methodologies so that data could be compared across and within regions. The project was also begun to monitor trends in resistance, evaluate the performance of TB control programmes and to advise on drug regimens. The report is published every three years as most countries require between 12 and 18 months to complete a drug-resistance survey (WHO 2008a:88).

### **2.3.1 Global estimates of MDR-TB**

It is estimated that 489 139 cases of MDR-TB emerged in 2006, and the global proportion of resistance among all incident TB cases was 4.8%. China and India are estimated to carry 50% of the global burden, with the Russian Federation carrying a further 7%. An estimate of prevalence can be made by multiplying incidence by the average duration of the disease (WHO 2008a:91).

Several terms are used in the Global Project as follows:

- “New cases” are those patients who had never received TB treatment or who had received TB treatment for less than a month. In order to estimate the global and regional means of resistance and to examine the distribution of resistance within a region, data that had been collected since the beginning of the project were included and weighted by the population they represent to obtain the “population-weighted mean”.
- “Previously treated cases” refers to the presence of resistant isolates of mycobacterium tuberculosis in patients who in response to direct questioning, admit to having been treated for tuberculosis for one month or more or, in countries where adequate documentation is available, in a patient for whom there is evidence of such a history.

- “Combined cases” refers to drug resistance in the population surveyed, regardless of the occurrence or absence of prior treatment (WHO 2008a:91).

In the Africa region six countries have reported data since 2002, namely Côte d’Ivoire, Ethiopia, Madagascar, Rwanda, Senegal and the United Republic of Tanzania. Rwanda reported 3.9% MDR-TB among new cases. Senegal reported 2.1% among new cases but all other countries reported less than 2.0% MDR-TB. The population-weighted mean of MDR-TB cases is 5.8% among previously treated TB cases and 2.2% among combined cases (WHO 2008a:91). A lack of comprehensive national drug-resistance survey data from all countries in Africa is a barrier to understanding the magnitude of the prevalence and incidence of MDR-TB (Amor et al. 2008:1346). The prevalence of MDR-TB remains below the levels seen in Central Europe and parts of Latin America. However, in Africa, the tragically high HIV prevalence and limited funds and infrastructure dedicated to healthcare are serious factors (Amor et al. 2008:1351).

Studies conducted by the Medical Research Council National Tuberculosis Research Programme in three provinces of South Africa revealed a rate of approximately 1% MDR-TB in new TB cases, and 4% in previously treated cases. This translates to about 2 000 new cases of MDR tuberculosis in South Africa each year (Weyer 1999:6). Cases of MDR-TB have been reported in KwaZulu-Natal. The first population-based data on MDR-TB in KwaZulu-Natal in 1996 identified 2,1% of sputum culture-positive patients as having MDR-TB in a rural district. The World Health Organisation Global Project on Anti-tuberculosis Drug Resistant Surveillance between 1999 and 2002 reported that in 2001 in KwaZulu-Natal, mono-drug resistance in new TB patients was 4% and in previously treated patients was 8%, while MDR-TB in new TB patients was 2% and in previously treated patients was 8% (Naidoo et al. 2007:46).

In America ten countries have reported data since 2002, namely Peru, Guatemala, Argentina, Paraguay, Honduras, Costa Rica, Canada, Nicaragua,

Uruguay and Cuba. The population-weighted mean of MDR-TB based on all countries that have reported in the American regions is 2.2% among new cases of MDR-TB, 13.2% among previously treated TB cases and 4.0% among combined cases (WHO 2008a:94).

In the Eastern Mediterranean region, the following five countries have reported data since 2002: Lebanon, Jordan, Oman, Morocco and Yemen. The population-weighted mean of MDR-TB based on all countries that have reported in the Eastern Mediterranean is 2.0% among new cases of MDR-TB, 35.3% among previously treated TB cases and 5.4% among combined cases. Based on available information it is estimated that there were 25 475 incident MDR-TB cases in the region in 2006, with almost 60% of these cases estimated to be in Pakistan (WHO 2008a:96).

In the European region 32 countries have reported data since 2002. The population-weighted mean of MDR-TB based on all countries that have reported in Central and Western Europe is 9% among new MDR-TB cases, 7.7% among previously treated TB cases and 1.5% among combined cases. The proportion of MDR-TB was significantly higher in the Eastern European and Central Asian countries with the following population-weighted means: 10.0% MDR-TB among new cases, 37.7% among previously treated TB cases and 22.6% among combined cases (WHO 2008a:97).

In the South East Asian region six countries have reported data since 2002, namely India, Indonesia, Myanmar, Nepal, Sri Lanka and Thailand. India reported data from three districts and one state, and Indonesia reported data from one district. Mayurbhanj district in Orissa state in India, and Sri Lanka and Thailand reported less than 2.0% MDR-TB among new cases. The Ernakulam district in Kerala State, the Hoogli district in West Bengal State and the Gujarat State in India, the Mimika district of Papua province in Indonesia, and the country of Nepal reported between 2.0–3.0% MDR-TB among new cases. Myanmar reported 3.9% MDR-TB among new cases. The population-weighted mean of MDR-TB based on

all countries that have reported in the South East Asian region is 2.8% among new MDR-TB cases, 18.8% among previously treated TB cases and 6.3% among combined cases. Based on available information it is estimated that there were 149 615 incident MDR-TB cases in the region in 2006 with 74% of these cases estimated to be in India (WHO 2008a:101).

In the Western Pacific region the following countries and two special administrative regions have reported data since 2002, including data from one province, one special administrative region and two municipalities in China, the Philippines and Vietnam. Of the countries indicated, Fiji, Guam, New Caledonia, New Zealand, the Northern Mariana Islands, Singapore, the Solomon Islands and Vanuatu reported the fewest cases, namely between 0 and 3 cases of MDR-TB per year. Australia reported 12 cases in 2005 and Macao Special Administrative Region in China reported nine cases of MDR-TB. Hong Kong Special Administrative Region in China reported 41 MDR-TB cases in 2005 among all cases (or 1.2%), and Japan, through its sentinel survey, reported that 1.9% of all notified cases were MDR-TB. China, the Philippines and Vietnam reported higher proportions of drug resistance. The population-weighted mean of MDR-TB based on all countries that have reported in the Western Pacific region is 3.9% among new MDR-TB cases, 21.6% among previously treated TB cases and 6.7% among combined cases. Based on available information it is estimated that there were 152 694 incident MDR-TB cases in the region in 2006, with almost 85% of these cases estimated to be in China (WHO 2008a:105).

In the United States of America (USA), HIV-positive MDR-TB cases initially had a 100% mortality rate, but with greater awareness and earlier diagnosis, an improvement in initial survival rates of up to 50% has been reported. HIV-negative cases in the USA have had better response rates of between 56% and 69%. Nosocomial outbreaks, often in an HIV setting, are well documented in other countries as well as the USA. During an outbreak in Spain between 1991 and 1995, 47 of 48 patients infected died and during two outbreaks in London (Chelsea and Westminster Hospital, and St Thomas's Hospital) the mortality was over 50% in HIV-

positive patients (Omerod 2005:21). In South Africa, two-year case fatality rates are around 30% to 50% (Weyer 1999:6).

### **2.3.2 Risk factors for MDR-TB**

Some of the factors that have contributed to the number of cases of MDR-TB are delayed diagnosis, delayed determination of drug susceptibility (which may take several weeks), and the susceptibility of immunosuppressed individuals not only to acquiring MDR-TB but to rapid disease progression, which may result in rapid transmission of the disease to other immunocompromised patients (Solis et al. 2005:762).

Resistance of tuberculosis to antibiotics is described as a man-made amplification of spontaneous mutations in the genes of the tubercle bacilli. Subsequent transmission of resistant strains from an infectious individual to other persons leads to disease that is drug-resistant from the outset, a phenomenon known as primary resistance (Trangle et al. 2004:15).

Drug resistance is more common in people who do not take their TB medicine regularly or who experience malabsorption of anti-TB drugs despite strict adherence to the treatment regimen (Sharma & Mohan 2007:53). The misuse of antimicrobials in the form of incorrect dosages — overprescribing, extravagant prescribing and under-prescribing — is commonly reported in countries such as Tanzania and India. As a result of an improper spacing of dosing intervals, efficacious serum drug levels are probably not achieved, leading to reduced drug efficiency and generation of resistance (Atre & Mistry 2005:103). Treatment with a single drug due to irregular drug supply, inappropriate prescription or poor adherence to treatment suppresses the growth of susceptible strains to that particular drug but permits the multiplication of drug-resistant strains. This phenomenon is called acquired resistance (Trangle et al. 2004:15).

Experiences in the developing world have revealed that traditional healers who have no knowledge of pharmaceuticals, drug regulations or the side effects of modern drugs, still incorporate inappropriate drugs into their traditional therapy for clients with TB. Such practices may lead to adverse drug interactions or may cause side effects. This also promotes drug resistance. Perceiving no relief also affects the patient's psyche and makes him or her shop around for other treatments (Atre & Mistry 2005:103).

In Africa, other factors that might favour the development of MDR-TB include the availability of drugs on the open market and a private sector that delivers drugs to the population in an unregulated fashion (Amor et al. 2008:1345). Poor drug availability, the lack of clinical trials and provider inexperience have led to regimens commonly being incorrect or inadequate (Mukherjee et al. 2004:478).

Noncompliance to TB treatment could be due to poverty, gender discrimination or homelessness. Poor patients may have to cope with the economic demands of the illness by reducing expenditure on other items that are important for their health, such as food and water. Patients may also stop treatment because they cannot afford the range of costs associated with continuing treatment, even when treatment itself is provided free of charge (WHO 2005:24). In turn, poverty leads to undernutrition which reduces drug absorption, resulting in sub-therapeutic serum drug levels and non-response to drug therapy (Atre & Mistry 2005:101).

Gender issues are equally significant. A study in Russia reported "female gender" as a significant predictor of MDR-TB. In the Indian context, harassment by in-laws, a reduction in their marriage options, or dismissal from work as a result of being diagnosed with TB were reported as major barriers for women to come forward and get appropriate treatment. For men, being the head of the family and a fear of dismissal and social isolation were reported as major reasons for discontinuation of the treatment (Atre & Mistry 2005:101).

Increasing globalisation and population mobility will mean an increase in MDR-TB cases (Ormerod 2005:23). Migration to earn a livelihood may be associated with active transmission of drug-resistant strains (Atre & Mistry 2005:107). Illegal immigrants, in particular, are at risk for contracting and spreading MDR-TB. Tourism and modern transport systems can spread diseases quickly from one continent to another or from one region to another. Civil wars and guerrilla wars are the reason for thousands of people being displaced from their natural environment and being placed into refugee camps. Not only does stress lower the resistance of the people but being crowded together in circumstances like these also facilitates the quick spread of the disease (Van den Berg & Viljoen 2005:31).

### **2.3.3 Pathogenesis and the course of MDR-TB**

Primary drug resistance is resistance to one of the first-line anti-tuberculosis agents in people who have not had previous treatment, and secondary or acquired drug resistance is resistance to one or more anti-tuberculosis agents in patients undergoing therapy (Smeltzer et al. 2008:647).

A history of inadequate treatment, past treatment with only one drug, or a previous history of defaulting on treatment followed by a return of symptoms may be considered as reasonable suspicion that one is dealing with MDR-TB (ICN 2008:20). The improper management of MDR-TB can result in further drug resistance. Patients with MDR-TB frequently have advanced disease associated with thick-walled cavities and chronic lung lesions that can be difficult for antibiotics to penetrate; therefore, they are difficult to cure and pose a substantial threat to household contacts and to TB control efforts (Mukherjee et al. 2004:474).

### **2.3.4 Case-finding and diagnosis of MDR-TB**

Delay in the diagnosis of MDR-TB results in patients presenting with chronic disease, progressive parenchymal destruction, higher bacillary loads and continuing

transmission (Mukherjee et al. 2004:478). Effective case finding is therefore important.

A rational case-finding strategy includes accurate, timely diagnosis through quality-assured culture and drug-susceptibility testing. Programmatic strategies for the management of drug-resistant TB aim to identify patients and initiate adequate treatment for drug-resistant cases in a timely manner. Prompt identification of MDR-TB and initiation of treatment provide a better chance of a cure for patients, provide the best infection-control measures and prevent the acquisition of further resistance and progression to a chronic state of permanent lung damage (WHO 2006a:24).

The diagnosis of MDR-TB can only be made by showing in vitro resistance to isoniazid and rifampicin. MDR-TB is a laboratory diagnosis; it is only diagnosed by TB culture and susceptibility testing (Department of Health 2004:67).

In a study conducted in Peru it was found that conventional Drug Sensitivity Testing (DST) methods used by most programmes are time-consuming, often resulting in delays of up to three or four months, sometimes more. Susceptibility to first-line drugs can be determined by the Griess method in eight to 10 days after obtaining a positive culture (indirect method), or 21 to 28 days when applied to a smear-positive sputum sample (direct method). The rapid drug-sensitivity testing would reduce the opportunity for nosocomial transmission and the morbidity associated with delayed diagnosis of MDR-TB (Solis et al. 2005:760-764).

Patients with MDR-TB face the prospect of lengthy and often unpleasant treatment as well as the real possibility of premature death. Therefore, counseling and emotional support are particularly important, much as in any other chronic life-threatening illness, for example malignancies or HIV-related diseases. Proper early counseling will also help to ensure good adherence to the treatment regimen and increase the likelihood of a successful outcome. Once the patient is

on treatment, further support will be required in order to maintain adherence and to help identify social and emotional problems early so that they may be addressed before they interfere with the treatment programme. If treatment has been unsuccessful and further therapy becomes futile, it becomes very important that the patient is not merely abandoned, but continues to receive sympathetic and palliative care from healthcare practitioners (South Africa 2007:19).

### **2.3.5 Management of MDR-TB**

The World Health Organisation (WHO) guidelines for the programmatic management of drug-resistant tuberculosis represent the best current knowledge in the management of drug-resistant TB and MDR-TB, and offer options for tailoring diagnosis and care to different epidemiological and programmatic conditions worldwide (WHO 2006b:X). These guidelines offer updated recommendations for TB control programmes and medical workers in middle- and low-income countries faced with drug-resistant forms of TB, especially MDR-TB. The guidelines aim to disseminate consistent, up-to-date recommendations for national TB control programmes and medical practitioners on the diagnosis and management of drug-resistant TB in a variety of geographical, political, economic and social settings.

The guidelines can be adapted to suit diverse local circumstances because they are structured around a flexible approach, combining a consistent core of principles and requirements with various alternatives that can be tailored to the specific local situation (WHO 2006b:1). The guidelines detail the recommended management protocols to enable national TB control programmes to access concessionally-priced, quality-assured, second-line antituberculosis drugs, and to introduce new standards for registering, monitoring and reporting the treatment outcomes of patients with drug-resistant TB. This uniform information management system will allow systematic, consistent data collection and analysis, which will play an important role in shaping future policies and recommendations (WHO 2006b:2).

Treating MDR-TB patients requires experience and special expertise, which are available at dedicated provincial MDR-TB treatment centres. MDR-TB referral centres are regarded as centres of expertise and therefore remain responsible overall for the treatment of MDR-TB patients even after discharge. These centres should be adequately staffed and equipped with appropriate infection-control interventions to prevent nosocomial spread of MDR-TB. Patients with MDR-TB should be admitted for at least the first six months or preferably until they have produced two consecutive monthly culture-negative sputa (South Africa 2007:17).

#### **2.3.5.1 Prevention of MDR-TB**

Healthcare providers can help prevent MDR-TB by diagnosing TB cases, following recommended treatment guidelines, monitoring patients' responses to treatment and making sure that TB therapy is adhered to and completed. The WHO strongly advocates the use of DOTS, which was and remains the most cost-effective approach to detecting and curing cases, and to preventing the onset and spread of drug resistance (WHO 2006a:vii).

The key actions for preventing and controlling drug-resistant TB include the use of recommended treatment regimens, a reliable supply of quality-assured first- and second-line anti-TB drugs, adherence to treatment by patients, and the proper provision of treatment by healthcare providers. A needs assessment must be conducted prior to implementation, in order to determine the capacity of TB control programmes to manage the drug-resistant TB prevention strategy (WHO 2006b:14).

#### **2.3.5.2 Treatment of MDR-TB**

There are several strategies for the delivery of MDR-TB treatment, including hospitalisation. Patients with MDR-TB are more likely to have experienced problems with non-adherence in the past. Adherence to MDR-TB therapy is particularly difficult because of its prolonged treatment regimens with larger

numbers of drugs that have more serious adverse effects (WHO 2006a:89). Thus MDR-TB patients are at increased risk of non-adherence to treatment. Adherence is an essential element to prevent the generation of pan-resistant strains with the potential for community-wide spread and virtually no possibility of a cure for the patients; therefore, hospitalisation is necessary initially.

The choice between hospitalised and ambulatory treatment depends on several factors in addition to the severity of the disease. Such factors include the availability of hospital beds, with adequate infection-control measures to prevent nosocomial transmission; the availability of trained personnel at hospitals and clinics to administer treatment and manage adverse drug reactions; the availability of a social support network to facilitate adherence to ambulatory treatment; and the presence of other clinical or social conditions in patients (WHO 2006a:9).

The National Tuberculosis Control Programme of the Department of Health developed a strategy in 2000 to treat patients with MDR-TB in South Africa. This policy recommended that MDR-TB treatment be provided as part of the National Tuberculosis Control Programme in areas where the DOTS strategy has been implemented successfully. Each of the nine provinces of South Africa currently provides MDR-TB treatment through the National Tuberculosis Control Programme structures (Department of Health 2004:67).

- ***Pharmacological treatment of MDR-TB***

A medical officer may choose a standardised approach or an individualised approach to treat MDR-TB. A standardised treatment regimen is when all patients in a defined group or category receive the same treatment regimen (WHO 2006b:38). The design of an individualised regimen differs from that of standardised treatment regimens in that it is based on an analysis of the resistance pattern of the infecting strain of the individual patient, in addition to the patient's treatment history and the prevailing resistance patterns in the community (WHO 2006b:44). In some countries

a standardised regimen for certain groups of patients may be more appropriate than an individualised regimen, while in others the converse may be best (WHO 2006a:9).

An appropriate treatment strategy consists of a rational method for designing the optimal treatment regimen, a patient-centred approach for delivering this regimen with direct observation, and a plan for monitoring and managing adverse drug reactions. Second-line drugs under proper case management conditions are required (WHO 2006a:9).

An MDR-TB regimen consists of two phases: the first phase is the period in which a combination of injectable and oral medication is used, and the second phase occurs after the injection has been stopped and only oral medications are continued. The recommended duration of treatment is guided by smear and culture conversion. Sputum smear and culture conversion is defined as two sets of consecutive negative smears and cultures taken 30 days apart (WHO 2006a:19).

The minimal recommendation is that treatment should last for at least 18 months after smear and culture conversion (WHO 2006a:41). Extension to 24 months may be indicated in patients defined as “chronic cases” with extensive pulmonary damage (WHO 2008c:47). The following groups of MDR-TB drugs, namely second-line drugs, are available:

#### *Injectable anti-TB agents*

Injectable anti-TB agents include kanamycin, amikacin, capreomycin and viomycin. An injection is given to every patient in whom susceptibility is documented or suspected (WHO 2006a:43).

#### *Fluoroquinolones*

This group of drugs is used if the strain is susceptible. Examples of drugs in this group are ciprofloxacin, ofloxacin, levofloxacin, moxifloxacin and gatifloxacin (WHO 2006a:43).

### *Oral bacteriostatic second-line anti-TB drugs*

Oral bacteriostatic second-line anti-TB agents include ethionamide, prothionamide, cycloserine, P-aminosalicylic acid and thioacetazone (WHO 2006a:43).

### *Anti-tuberculosis drugs with unclear efficacy*

This group of drugs includes clofazimine, amoxicillin, clavulanate, clarithromycin and linezolid. These drugs are not recommended by WHO for routine use in MDR-TB treatment because their contribution to the efficacy of multidrug regimens is unclear. However, they can be used in cases where adequate regimens are impossible to form with the medicines from the other groups indicated above (WHO 2006a:43).

### *Corticosteroid treatment*

The use of corticosteroids in MDR-TB patients can be beneficial in cases of severe respiratory insufficiency and central nervous system involvement (WHO 2006a:50).

### *Vitamins*

Vitamin B6 (pyridoxine) should also be given to all patients receiving cycloserine or terizidone to prevent adverse neurological effects. Vitamin (especially vitamin A) and mineral supplements can be given in areas where a high proportion of the patients have deficiencies. If minerals (zinc, iron, calcium, etc) are given, they should be administered at a different time from the fluoroquinolones, as they can interfere with the absorption of these drugs (WHO 2006a:50).

The duration of MDR-TB is not known but patients may receive treatment for more than 24 months. However, this may not lead to a cure but may rather contribute to the prolongation of the disease (WHO 2008c:88).

- **Non-pharmacological treatment**

Non-pharmacological treatment includes surgery and nutritional support.

### *Surgery*

The most common operative procedure in patients with pulmonary MDR-TB is surgical resection (taking out part of or the entire lung). Surgical resection has been shown to be effective and safe under appropriate surgical conditions. It is considered to be an adjunct to chemotherapy and appears to be beneficial for patients when skilled thoracic surgeons and excellent postoperative care are available. Surgery is not indicated in patients with extensive bilateral disease. Regardless of the specific procedure, surgery should be timed to offer the patient the best possibility of a cure with the lowest risk of morbidity. Thus surgery may be advised earlier in the course of the disease when the patient's risk of morbidity and mortality is lower and when the disease is still localised to one lung or one lung lobe. Generally, at least two months of therapy should be given before surgical resection to decrease the bacterial infection in the surrounding lung tissue (WHO 2006a:49).

Specialised centres in the USA have suggested that surgical resection under drug cover is an option in selected cases, particularly those with unilateral disease. The use of fluoroquinolones, particularly moxifloxacin and levofloxacin, in the drug regimen, has improved the survival rate in such patients. The long-term success rate increased from 56% to 75%, and the TB death rate fell from 22% to 12% as fluoroquinolones and surgery were used increasingly (Omerod 2005:22).

A study conducted by Pomerantz et al. (2001:448) revealed that during a 17-year period, 172 patients with MDR-TB underwent 180 pulmonary resections, that is, 98 lobectomies and 82 pneumectomies. All patients had a minimum of three months of chemotherapy before surgery. Ninety-one patients were culture-positive at the time of surgery; however, after surgery, only four patients remained culture-positive.

### *Nutritional support*

In addition to causing malnutrition, MDR-TB can be exacerbated by poor nutritional status, low body mass index and severe anaemia. Without nutritional support, patients can become enmeshed in a vicious cycle of malnutrition and disease, especially those already suffering from baseline hunger. The second-line drugs may

also further decrease the appetite, making adequate nutrition a greater challenge. Nutritional support can take the form of providing free staple foods, and, whenever possible, should include a source of protein (WHO 2006a:50).

- ***DOTS-Plus strategy***

DOTS-Plus for MDR-TB is a comprehensive management initiative, built upon the elements of the DOTS strategy. However, DOTS-Plus also takes into account specific issues such as the use of second-line anti-TB drugs. The goal of DOTS-Plus is to prevent further development and spread of MDR-TB. DOTS-Plus is not intended for universal application and is not required in all settings. The aim of implementing the DOTS-Plus strategy in selected areas with significant levels of MDR-TB is to combat an emerging epidemic. The underlying principle is that the first step in controlling MDR-TB is prevention by full implementation of DOTS. An effective DOTS-based TB control programme is a prerequisite for implementation of DOTS-Plus (WHO 2004:48).

Nurses working in primary healthcare settings are often the first to see people who present with symptoms and are thus able to identify and manage suspected TB and MDR-TB cases. Nurses working with individuals, families, communities and other services need to understand their role in controlling this preventable disease (ICN 2008:42). Because nurses work closely with patients and their families, they are well placed within communities to play a crucial role in providing a caring environment for all patients suffering from TB. This is essential to the success of TB control programmes, which need to offer good access to effective diagnostic and treatment facilities (ICN 2008:42).

Socioeconomic problems should be addressed to enable patients and their families to adhere to MDR-TB treatment. Enablers are goods or services that make it easier for patients to adhere to treatment, such as the provision of transportation vouchers and clothing. Incentives are goods or services that are used to encourage patients to adhere to therapy (WHO 2006a:90).

In relation to TB, nurses promote health in order to prevent people becoming vulnerable to the disease in the first place. They prevent illness by reducing transmission of TB in the community by finding and treating active cases, they restore health by ensuring that patients receive the treatment they need, and they alleviate suffering by organising support for patients according to their individual needs (ICN 2008:42).

### **2.3.5.3 Prevention of transmission**

The use of face masks in high-risk settings for drug-resistant TB is recommended for patients to reduce the risk of droplet nuclei generation and spread, particularly in high-prevalence HIV settings and where healthcare practitioners are suspected to be HIV-infected. Respiratory protection may be used as an interim measure while selected administrative and/or environmental control measures are awaiting implementation (WHO 2008c:77) (refer to section 2.2.7).

## **2.4 MANAGEMENT OF TB AND MDR-TB IN THE SOUTH AFRICAN CONTEXT**

It is of utmost importance that drug-resistant TB be prevented by rigorous adherence to the principles of the National Tuberculosis Control Programme, and by patiently and consistently building partnerships with patients, their families and communities to cure TB on the first attempt. The framework for managing MDR-TB includes sustained government commitment; accurate, timely diagnosis through quality-assured culture and drug susceptibility testing; appropriate treatment utilising second-line drugs under strict supervision; an uninterrupted supply of quality-assured second-line drugs; and a standardised recording and reporting system (South Africa 2007:2).

## **2.5 CONCLUSION**

The literature review presented in this chapter has included epidemiology, risk factors, pathogenesis, transmission, symptoms, diagnosis and management of TB and MDR-TB. In Chapter 3, the research design and methods will be described.

## **CHAPTER 3**

### **RESEARCH DESIGN AND METHODS**

#### **3.1 INTRODUCTION**

The previous chapter presented a literature review of TB and MDR-TB both globally and nationally. The aim of this chapter is to describe the research methods that were applied to explore and describe the experiences of the enrolled nurses while caring for MDR-TB patients.

#### **3.2 RESEARCH DESIGN**

According to Polit and Beck (2008:765), a research design is the overall plan for addressing a research question, including specifications for enhancing the study's integrity. This study was conducted by applying a generic qualitative design. Qualitative research provides an opportunity to derive meaningful nursing knowledge from an analysis of individuals' lives and experiences. It is essential to document these unique experiences and share them to explore and describe the human experience fully (Streubert Speziale & Carpenter 2003:335).

The aim of qualitative research is to obtain an in-depth understanding of human beings, their relationships, their experiences and their behaviours. This entails relating their actions, interactions and experiences to the ideas, values, beliefs and purposes that give rise to them. It also entails understanding the meanings that people attach to their everyday lives (De Villiers & Van der Wal 2004:238). In this study the researcher sought to uncover the personal experiences of enrolled nurses and the meanings that they attached to the events, processes and structures of their lives in an MDR-TB hospital.

The main concern in qualitative research is to understand social phenomena in terms of their specific context rather than to arrive at generalised research findings. The findings from a qualitative study are unique to that study and it is not

the intention of the researcher to generalise the findings to a larger population (Burns & Grove 2007:24-25). The sample is obtained from the accessible population and the findings are generalised first to the accessible population (the enrolled nurses) and then, more abstractly, to the target population (Burns & Grove 2005:342).

Qualitative research rests on a perspective according to which humans are perceived to be conscious, self-directed beings who are continuously constructing, developing and changing everyday interpretations of their worlds in order to make sense of their lives. They become immersed in the phenomenon under investigation and try to understand the lived experiences from the points of view of the research participants when data is collected through in-depth interviews. This allows the researcher to get close to the participants and attempt to understand their world from an emic perspective (an insider perspective) (De Villiers & Van der Wal 2004:238).

The qualitative researcher has an active part in the study and the findings from the study are influenced by the researcher's values and perceptions. This approach is therefore subjective (Burns & Grove 2007:24). Qualitative research requires the ability to move from a subjective ontology (intersubjective involvement in the research setting) to an objective epistemology (theoretical concepts and constructs that accurately reflect participants' worlds and experiences). Although qualitative researchers become part of the worlds and experiences of the research participants, and acknowledge the value of subjectivity in maintaining an emic perspective, they nevertheless take great care to maintain rigour and objectivity in order to enhance the trustworthiness of the research. This requires a cyclical process of intersubjective involvement in the research setting, and withdrawing to interpret what has been observed and the data that has been collected (De Villiers & Van der Wal 2004:247).

### **3.3 RESEARCH METHODS**

The research method refers to the research plan that was followed to answer the research question. The sections that follow will thus describe the research design, the population, the sample and sampling method, the data collection process and the data analysis.

An exploratory and descriptive approach was used for this study. A descriptive design is used to gain more information about characteristics within a particular field of study. Its purpose is to provide a picture of a situation as it naturally happens (Burns & Grove 1999:192). Like descriptive research, exploratory research begins with a phenomenon of interest, but rather than simply observing and describing it, exploratory research investigates the full nature of the phenomenon, the manner in which it is manifested, and the other factors to which it is related (Polit & Beck 2004:20). In this study the researcher sought to uncover the personal experiences of enrolled nurses and the meanings that they attached to the events, processes and structures of their lives in an MDR-TB hospital. Therefore, an exploratory and descriptive design was the most suitable for this study.

#### **3.3.1 Population and setting**

The research population refers to all the elements (individuals, events or circumstances) that meet the sample criteria for inclusion in a study. It is sometimes referred to as the target population (Burns & Grove 2007:806). The accessible population is the portion of the target population to which the researcher has reasonable access (Burns & Grove 2005:342). The accessible population for this research study comprised enrolled nurses working in an urban public MDR-TB hospital in KwaZulu-Natal where MDR-TB patients are cared for.

### 3.3.2 Sample and sampling method

A sample is a subset of the population that is selected for the study (Burns & Grove 2003:459). The sample consisted of enrolled nurses. A non-probability purposive sampling method was used to select the participants. Non-probability sampling is the selection of sampling units (e.g. participants) from a population using non-random procedures (Polit & Beck 2004:725). According to Burns and Grove (2007:350), not every element of the population has an opportunity to be included in the sample.

Purposive sampling involves selecting individuals for participation based on their particular knowledge of a phenomenon for the purpose of sharing that knowledge (Streubert Speziale & Carpenter 2003:67). According to Burns and Grove (2007:350), qualitative researchers use purposive sampling to select the specific participants, events or situations that they believe will provide them with the rich data needed to gain insight and discover new meaning in an area of study. In this study, the enrolled nurses provided direct nursing care to patients with MDR-TB; therefore, their experiences with these patients would provide information-rich data.

To be eligible for inclusion in the study, participants had to:

- have had at least six months' experience of working with MDR-TB patients;
- be enrolled with the South African Nursing Council as an enrolled nurse;
- and
- render direct patient care to MDR-TB patients at the selected hospital, on a daily basis.

With regard to sample size, the researcher adhered to the rule that the number of participants in a qualitative study is adequate when saturation of information is achieved in the study area. Saturation of data occurs when additional sampling provides no new information, that is, when no new themes or essences have

emerged from the participants and the data are repeated. It usually involves a small sample (Streubert Speziale & Carpenter 2003:68). Five enrolled nurses participated in this study.

The participants were recruited at the time of data collection. Initially eight participants were recruited, according to the inclusion criteria and availability for data collection; however, the interviews were conducted until data saturation was reached with five participants.

### **3.3.3. Data collection**

#### **3.3.3.1 Data collection method**

Data was collected through in-depth individual interviews. The research participants freely responded to open-ended questions in narrative form, using their own words, thus sharing their own perspectives with the researcher. Questions were not preplanned in a rigid manner. The questions were not asked in a predetermined sequence, but the researcher did ensure that all relevant topics were covered and that the research focus was kept in mind. The researcher also asked probing questions to guide participants to elaborate further upon their responses where additional information was required or where vague answers needed to be clarified. This resulted in gaining in-depth accounts about participants' experiences while caring for MDR-TB patients (De Villiers & Van der Wal 2004:243).

The in-depth interviews took place in an office that was situated away from the wards and that did not have a telephone. This was done to offer privacy and to protect against possible interruptions and this room was adequate for recording the interview.

### *Advantages and disadvantages of an in-depth interview*

According to several researchers (Burns & Grove 2005:397; Polit & Beck 2006:296) there are advantages to an in-depth, unstructured interview. Some of the advantages of the interviews, as reflected in the literature, were as follows:

- the interviews allowed the researcher to explore greater depth of meaning
- the response rate was guaranteed from availability of participants
- a more representative sample was obtained
- the information provided was assumed accurate
- non-verbal behaviour and mannerisms could be observed
- questions were clarified immediately if they were misunderstood.

On the other hand, the disadvantages of an interview were that:

- interviewing required more time from the interviewer than is the case with self-administered questionnaires
- arrangements for interviews were sometimes difficult
- sample size was limited
- there was inconsistency in data collection, with regard to the duration, from one participant to another, which became a limitation to the study (Burns & Grove 2005:397; Polit & Beck 2008:296).

#### **3.3.3.2 Data collection process**

The interviews were audio-recorded. The participants provided written consent to be included in the study. The interviews lasted approximately one hour at mutually acceptable times and dates. The interview started with an opening question: "*What is it like to render nursing care to patients who suffer from MDR-TB*". Probing questions were asked in order to encourage participants to explore further information. After each interview, the proceedings were transcribed

verbatim into a word processor. The transcripts were then printed for manual analysis.

### **3.3.3.3 Data management**

During data collection, the researcher had to handle large quantities of paper. Plans were made to code data and enter them into the computer using ATLAS.ti as soon as possible after data collection to help reduce the possibility of any loss or disorganisation of data (Burns & Grove 2005:438). In this study, the audio-recorded interviews were transcribed immediately after data collection. Computer software was utilised for efficient data storage and retrieval.

### **3.3.4 Data analysis**

Qualitative data analysis takes the form of words and the researcher works with individual responses and descriptive summaries. The purpose of the analysis is to organise the data into a meaningful interpretative framework or theory that describes the phenomenon studied (Burns & Grove 2007:25). Qualitative data analysis took place concurrently with data collection; therefore, the researcher attempted to gather, manage and interpret a growing bulk of data simultaneously. The researcher's goal was to obtain an authentic insight into the participants' experiences (Burns & Grove 2007:376). The data included the shared interpretations of the researcher and participants.

Data analysis began with listening to the recordings of the participants' verbal descriptions, followed by reading and rereading the verbatim transcriptions to come to an overall understanding of each participant's experience (Streubert Speziale & Carpenter 2003:69). In this study, the researcher commenced with the process of data analysis by reading and rereading the verbatim transcriptions in preparation for coding the data.

Coding is a means of categorising. A code is a symbol or abbreviation used to classify words or phrases in the data. Through the selection of categories or codes, the researcher defined the domain of the study (Burns & Grove 2005:548). Data analysis required that the researcher dwell with or become immersed in the data. As the researcher became immersed in the data, significant statements were identified and extracted (Streubert Speziale & Carpenter 2003:69). In this study the researcher assigned labels to each text unit and coding occurred in accordance with the labels.

During data analysis, related concepts were grouped into categories, thus reducing them to a more manageable number. Once the numbers of concepts were reduced, the researcher was able to discover interrelationships between the categories and to develop a limited number of unifying themes. Each theme and its multiple layers of underlying, interrelated concepts were used to describe the phenomenon under study (De Villiers & Van der Wal 2004:238).

In this study, data was analysed using Colaizzi's (1978:48) methods which comprise the following seven steps:

1. Each research participant's verbatim transcript was read to acquire a sense of the whole.
2. Significant statements and phrases pertaining to the phenomenon being studied were extracted from each transcript.
3. Meanings were formulated from the significant statements.
4. Meanings were organised into themes, and themes evolved into theme clusters and eventually into theme categories.
5. These results were integrated into a rich and exhaustive description of the lived experience.
6. The essential structure of the phenomenon was uncovered.
7. Validation was sought from the research participants to compare the researcher's descriptive results with their lived experiences. The

researcher's description was modified as required to achieve congruence with the lived experience of the research participants.

Significant statements were extracted from the transcript. The underlying meaning of each significant statement was formulated and coded. The formulated meanings were sorted into categories, and the categories were organised into themes. Similar themes were organised into theme clusters and then into theme categories.

### **3.4 MEASURES TO ENSURE TRUSTWORTHINESS**

Marshall and Rossman (2006:201) observe that all research must respond to canons that stand as criteria against which the trustworthiness of the project can be evaluated. Lincoln and Guba (1985:290) propose that the trustworthiness of qualitative research is enhanced by ensuring its credibility, transferability, dependability and confirmability.

#### **3.4.1 Credibility**

Credibility refers to the extent to which those who read a research report can believe and accept the research findings to be true (Lincoln & Guba 1985:301). One of the best ways to establish credibility is through prolonged engagement with the subject matter. Prolonged engagement is essential for building trust and a rapport with the participants, which in turn makes it more likely that useful, accurate and rich information will be obtained (Polit & Beck 2004:430). In this study the researcher spent time with the participants to obtain a detailed account of their experiences. In addition to this, the researcher had worked with the enrolled nurses since the hospital opened. She was therefore familiar with the circumstances under which the enrolled nurses operated. Her experience in the research setting, in addition to her postgraduate training in research methodology, ensured that the principle of researcher expertise was maintained.

The researcher applied persistent observation during the course of this study. Persistent observation refers to the researcher's focus on the characteristics or aspects of a situation or a conversation that are relevant to the phenomena being studied (Polit & Beck 2008:542). Observations recorded as field notes added to the richness of data.

The researcher used the supervisor as a sounding board during peer debriefing. Peer debriefing involves sessions with peers to review and explore various aspects of the inquiry. Peer debriefing exposes researchers to the searching questions of others who are experienced in either the methods of naturalistic inquiry, the phenomenon being studied or both (Polit & Beck 2008:549-549). During the course of the research, the supervisor gave input on all aspects.

To confirm the credibility of the findings, member checking was used to assess whether the participants recognised the findings of the study to be true to their experiences (Lincoln & Guba 1985:314). The purpose of member checking was to have the participants validate that the reported findings represent their experiences (Streubert Speziale & Carpenter 2003:38). In this study the researcher met individually with the participants who participated in the interview and shared the product of analysis with them. The participants were asked whether the researcher's interpretations reflected their experiences and circumstances.

### **3.4.2 Dependability**

Dependability of qualitative data refers to the stability of data over time and over various conditions (Polit & Beck 2004:434). Dependability as a criterion is met once researchers have demonstrated the credibility of the findings (Streubert Speziale & Carpenter 2003:38). The transcribed interviews and data analysis process were scrutinised by an independent reviewer, namely the supervisor. The researcher and supervisor ensured that the empirical phase of the study was

conducted in accordance with the focus and boundaries set by the problem statement.

### **3.4.3 Transferability**

Transferability refers to the probability that the study findings have meaning to others in similar situations (Streubert Speziale & Carpenter 2003:39). The researcher enhanced the transferability of this research by providing thick descriptions of the phenomenon under scrutiny. This was possible because information-rich participants were included in the sample. Thick description refers to a rich and thorough description of the research setting and of observed transactions and processes (Polit & Beck 2008:202). Rich, detailed descriptions were used to capture occurrences observed and responses obtained, and to explain the context in which such occurrences and inputs unfolded (De Villiers & Van der Wal 2004:247).

In this study, the researcher involved a purposively selected sample and conducted in-depth interviews with them. The topic was covered in depth and breadth to ensure that the data obtained supported the provision of thick descriptions. By recording the data on audiotape, the researcher ensured that the participants' narratives were captured completely and in their original format.

### **3.4.4 Confirmability**

Confirmability is a criterion for which the researcher documented the findings to leave an audit trail, which was a recording of activities over time that another individual could follow. The objective was to illustrate as clearly as possible the evidence and thought processes that led to the conclusions. As a result, the study met the criterion of confirmability (Streubert Speziale & Carpenter 2003:38). In this study, an audit trail was established by keeping the interview transcripts, data reduction and analysis products, notes from member checks, materials relating to the researcher's intentions and dispositions, and drafts of the research report.

Bracketing was applied by the researcher. Bracketing refers to the process of identifying and holding in abeyance preconceived beliefs and opinions about the phenomenon under study. Researchers strive to bracket out the world and any presuppositions in an effort to confront the data in pure form (Polit & Beck 2008:228). Bracketing is the cognitive process of putting aside one's own beliefs, not making judgments about what one has observed or heard, and remaining open to data collection and analysis. Setting these judgments and beliefs aside meant that the researcher had to be constantly aware of what she believed and try to keep it separate from what was being shared by the participant. By conducting this self-disclosure, the researcher was able to remain cognisant of when data collection and analysis reflected her own personal beliefs rather than the informants' beliefs (Streubert Speziale & Carpenter 2003:22).

### **3.5 ETHICAL CONSIDERATIONS**

Ethical considerations were adhered to by obtaining ethical clearance from the academic institution, by requesting permission to conduct the study from the relevant authorities of the hospital and the KZN Department of Health, and by adhering to the ethical principles that guided the researcher. The fundamental ethical principles as outlined by Burns and Grove (2005:180-181) were adhered to, in order to protect the participants in this research.

#### **3.5.1 Protecting the rights of the participants**

**Respect:** The right to self-determination is based on the ethical principle of respect for persons. This principle holds that humans are autonomous and are able to control their own destiny. They should be treated as autonomous agents who have the freedom to conduct their lives as they choose without external controls. The researcher treated the respective participants as autonomous agents by informing them about the proposed study and allowing them to participate voluntarily (Burns & Grove 2005:181). Those participants who declined

to participate in this study or who withdrew from the study after agreeing to participate were treated in a nonprejudicial manner (Polit & Beck 2008:173-174).

The right to self-determination means that prospective participants have the right to decide voluntarily whether to participate in a study, without risking any penalty or prejudicial treatment. It also means that people have the right to ask questions, to refuse to give information or to withdraw from the study. A person's right to self-determination includes freedom from coercion of any type. Coercion involves explicit or implicit threats of penalties for failing to participate in a study or excessive rewards from agreeing to participate (Polit & Beck 2008:171-172).

The right to self-determination and the right to full disclosure are the two major elements on which informed consent is based. The principle of respect for human dignity requires full disclosure to enable people to make informed, voluntary decisions about their study participation. Full disclosure means that the researcher has fully described the nature of the study, the person's right to refuse participation, the researcher's responsibilities, and likely risks and benefits (Polit & Beck 2008:172).

Informed consent means that participants have adequate information regarding the research, are capable of comprehending the information and have the power of free choice, enabling them to consent to or decline participation voluntarily (Polit & Beck 2004:151). Prior to each interview, the researcher explained the purpose of the study and informed them of their right to withdraw at any point. The participants understood that their participation was voluntary. The purpose of recording the interviews on audiotape was explained and the participants were requested to sign a consent form (Annexure 1).

**Justice:** The right to fair treatment is based on the ethical principle of justice. This principle holds that each person should be treated fairly and should receive what he or she is due or owed. If the data collection requires appointments with the participants, the researcher should be on time for each appointment and

should terminate the data-collection process at the agreed time (Burns & Grove 2005:189-190). In this study the researcher kept all appointments and arrived on time. The participants showed a great deal of enthusiasm in participating in this research and were just glad to be included in the research study, which was to them something very important. They had never felt so important before. No promises of compensation were made.

With the principle of justice, the selection of study participants should be based on research requirements and not on vulnerability or the compromised position of certain people (Polit & Beck 2008:173-174). Relating one's personal experiences with MDR-TB patients can be a sensitive issue and this could have placed participants in a vulnerable situation as the researcher asked the probing questions to elicit the necessary data. In this study the researcher maintained the focus of the study by asking questions relevant and appropriate to the study, and when a participant wanted to talk about any other issue, this was done at the end of the interview. This allowed participants to verbalise their feelings and if they needed to be referred then they would be referred to the Employee Assistance Programme.

The participants were assured that their participation or information would not be used against them in any way. In qualitative research, the risk for exploitation may become especially acute because the psychological distance between researchers and participants typically declines as the study progresses. On the other hand, qualitative researchers typically are in a better position than quantitative researchers to do good, rather than just to avoid doing harm, because of the close relationships they often develop with participants (Polit & Beck 2008:171). All information provided by the participants was therefore treated as confidential and anonymity was maintained.

The development of friendships poses particular problems in qualitative research due to the typically long period of time for which the researcher is involved with participants. Should the researcher befriend some of the participants, information

might be acquired in the context of friendship rather than in the context of research (De Villiers & Van der Wal 2004:258). The researcher therefore maintained a professional relationship with the participants.

The right to fair treatment means that researchers treated participants equally. The selection of the participants for inclusion in the interview was solely through the inclusion criteria and objectives of the study rather than favouritism. The researcher demonstrated sensitivity to and respected the beliefs, habits and lifestyles of people from different backgrounds or cultures, such that the participants were given access to the researcher for any desired clarification, and were treated courteously and tactfully at all times (Polit & Beck 2008:173-174). In this study, no participant was coerced into participating in the study. The researcher demonstrated respect for all participants.

Research with humans involves intruding into personal lives. The researcher ensured that the research was not more intrusive than it needed to be and that the participants' privacy was maintained throughout the study (Polit & Beck 2008:174). Privacy is the right an individual has to determine the time, extent and general circumstances under which personal information will be shared with or withheld from others. Such information consists of one's attitudes, beliefs, behaviours, opinions and records (Burns & Grove 2005:186). During the conducting of the interviews the researcher only asked questions that were relevant to the research study, thereby ensuring that privacy was maintained.

Anonymity refers to the principle that the identity of an individual is kept secret, and confidentiality refers to the principle of information gathered from participants (Mouton 2004:244). Anonymity is the protection of participants in a study such that even the researcher cannot link individuals with the information provided (Polit & Beck 2004:711). Anonymity of participants was ensured by giving each participant a pseudonym. Confidentiality was maintained by replacing the names of the participants with pseudonyms.

The researcher kept a master list of the participants' names and their code numbers in a locked place. The master list of participants' names and code numbers was kept separate from the data collected, in order to protect participants' anonymity. Signed consent forms and authorisation documents were stapled to data collection tools, to prevent unauthorised persons from readily identifying the participants and their responses. Consent forms were stored with the master list of participants' names and code numbers. The interviews conducted with participants were audio taped and later transcribed so the participants' names were not mentioned on the tape. The data collected was entered into the computer with the use of code numbers for identification. The original data collection tools were locked in a secure place (Burns & Grove 2005:188-189). In this study, the anonymity of the participants was protected as all audio tapes, transcripts and notes were coded without the participants' names and kept at the nursing administration office in a locked cabinet. The identities of the participants were not revealed in the research report.

Participants have the right to expect that any data they provide will be kept in the strictest confidence (Polit & Beck 2004:714). Confidentiality is the protection of participants in a study such that the information provided is never publicly divulged (Polit & Beck 2004:714). Confidentiality is the researcher's management of private information shared by a participant that must not be shared with others without the authorisation of the participant (Burns & Grove 2005:188). It was explained to the participants prior to the interviews that the transcribed interviews would reflect their pseudonyms and not their correct names and that information would be shared with the supervisor and or other researchers examining the data to ensure the credibility of the study findings.

The participants were informed of the dissemination of the information, through presentation of the research findings at the relevant research conferences and subsequent publication of the findings in accredited journals.

**Beneficence:** The right to protection from discomfort and harm is based on the ethical principle of beneficence, which holds that one should do good and above all do no harm (Burns & Grove 2005:190). Beneficence imposes a duty on researchers to minimise harm and maximise benefits. Human research should be intended to produce benefits for participants themselves or for a situation (Polit & Beck 2008:170).

The researcher indicated that during the interview, if any issues surfaced that may have resulted in serious consequences, the welfare of the participants would be protected by ending the interview or providing follow-up counselling and referrals (Streubert Speziale & Carpenter 2003:314). In cases where the nature of the study involved creating a small amount of psychological discomfort, and the participants knew this ahead of time, any necessary debriefing or counselling would follow immediately after their participation (Leedy & Ormrod 2005:101).

The benefit–risk ratio is determined on the basis of maximised benefits and minimised risks (Burns & Grove 2005:192). The general guideline is that the degree of risk to be taken by those participating in the research should never exceed the potential humanitarian benefits of the knowledge to be gained. Thus, the selection of a significant topic that has the potential to improve patient care, is the first step in ensuring that research is ethical (Polit & Beck 2008:174).

An important benefit of research is the development and refinement of knowledge, which can affect the individual participant; however, this knowledge can have a forceful influence on a discipline. Researchers must assess the type, severity and number of risks the participant experiences or might experience by participating in a study. Research risks can be physical, emotional, social and economic in nature (Burns & Grove 2005:192). In the conducting of this study the participants faced minimal risks. Minimal risk is defined as risks anticipated as being no greater than those ordinarily encountered in daily life or during routine physical or psychological tests or procedures (Polit & Beck 2008:175).

The psychological consequences of participating in a study are usually subtle and thus require close attention and sensitivity. Participants may be asked questions about their personal views, weaknesses or fears. Such queries might lead people to reveal sensitive personal information. The point is not that researchers should refrain from asking questions but rather that they need to be aware of the nature of the intrusion on people's psyche (Polit & Beck 2008:170).

Researchers should proactively minimise emotional risks, by carefully attending to the nature of the interactions they have with participants. Researchers should always be gracious and polite, should phrase questions tactfully, and should be sensitive to cultural and linguistic diversity. Researchers can use strategies to communicate their respect and concern for participants' wellbeing (Polit & Beck 2008:175). Researchers can also demonstrate their interest in study participants by offering to share study findings with them once the data has been analysed.

The participants in this study faced psychological risks as they may have verbalised their experiences and possibly their actions. They may fear negative consequences. There will be minimal risks to the enrolled nurses. The benefits of this study are to generate research results that could be used to establish a physically and an emotionally safe working environment, and support programmes for enrolled nurses. Contemplating the risk experienced on a daily basis of contracting MDR-TB while providing nursing care to patients with MDR-TB was potentially emotionally disturbing for the participants, so the researcher conducted the interviews in a comfortable venue away from their work stations. The researcher avoided inflicting psychological harm by carefully phrasing questions and by providing debriefing sessions following the interview sessions. This gave participants an opportunity to ask questions and raise concerns and be referred to the hospital's Employee Assistance Programme if needed.

### **3.5.2 Protecting the rights of the institution**

A letter was written to the hospital manager and nursing manager to request permission to conduct the study. A copy of the research proposal and a copy of the permission letter from the Higher Degrees Committee of the Department of Health Studies, UNISA were attached and sent along to request permission from the Department of Health, KwaZulu-Natal. At the proposed hospital, permission was obtained from the operational managers to interview the enrolled nurses. The participants were interviewed at a time most suitable to them so as not to disrupt the routine of the ward. The hospital's name was not published. The research results were disseminated to the managers of the hospital.

### **3.5.3 Scientific integrity of the research**

The goal of research is to generate sound scientific knowledge, something which is possible only through the honest conduct, reporting and publication of studies (Burns & Grove 2005:203). The researcher strived to maintain objectivity and integrity in the conduct of scientific research (Mouton 2004:240).

The literature review was conducted prior to data collection. The purpose of the written literature review was to establish a context for the study (Burns & Grove 2005:110). Balanced discussions of the literature were therefore necessary to maintain objectivity. The content from sources was presented honestly, and was not distorted to support the selected problem. The researcher recognised her own opinions and was objective in presenting information. The defects of the study needs were addressed (Burns & Grove 2005:112).

Plagiarism is the appropriation of another person's ideas, processes, results or words without giving appropriate credit (Burns & Grove 2005:205). One of the key ethical principles of scientific publication is that one must acknowledge one's sources. The researcher referred to all sources that have been consulted, either directly (through a quote) or indirectly (Mouton 2001:241).

Each researcher is responsible for monitoring the integrity of his or her research protocols, results and publications. Therefore, there was no fabrication or distortion of data or results. Fabrication is the making up of results and recording or reporting them. Falsification involves manipulating research materials, equipment or processes, or changing or omitting data or results such that the research is not accurately represented in the research record. Peer reviewers have a key role in determining the quality of a manuscript and whether it is suitable for publication. They are considered experts in the field, and their role is to examine research for inconsistencies and inaccuracies (Burns & Grove 2005:205-206).

In this study, the content from sources was presented prior to a discussion relating to the content in order to avoid distortion of content and plagiarism. All sources were acknowledged and included in the list of sources, which was verified by the supervisor. The peer reviewer, namely the supervisor, will examine this study for inconsistencies and inaccuracies.

### **3.6 CONCLUSION**

This chapter described the research design, data collection and analysis, trustworthiness and ethical considerations. Chapter 4 discusses the research findings.

## **CHAPTER 4**

### **ANALYSIS, PRESENTATION AND DESCRIPTION OF THE RESEARCH FINDINGS**

#### **4.1 INTRODUCTION**

In the previous chapter the research problem, method and design were discussed. This chapter presents the research findings.

The purpose of this study was to explore and describe the personal experiences of enrolled nurses while caring for patients infected with multidrug-resistant tuberculosis (MDR-TB) in an urban TB hospital in KwaZulu-Natal province (KZN) of South Africa.

The objectives of the study were to answer the following research questions:

- How do enrolled nurses experience caring for patients with MDR-TB in an urban hospital in KZN?
- How can enrolled nurses be supported during their care of MDR-TB patients?

#### **4.2 DATA COLLECTION PROCESS**

Data was collected from five enrolled nurses working at the selected MDR-TB hospital in urban KwaZulu-Natal, through individual interviews. The participants were included in the interviews according to their eligibility criteria as explained in Chapter 3 of this study. The interview dates and times were arranged with the participants prior to data-collection dates. The interviews were conducted during lunch-hour breaks in order to avoid distracting the participants from their normal ward routine work. The participants provided written consent to be included in the study. Separate interviews with the five participants took place in a private office away from the main hospital, each lasting approximately one hour at mutually

acceptable dates and times. Confidentiality was maintained by replacing the names of the participants with pseudonyms.

Data was collected by means of audio-recorded, unstructured, in-depth interviews. The audio-recorded interviews were transcribed verbatim immediately after data collection. With regard to data management, MS Word was used for efficient data storage and retrieval.

- **Topic guide**

The researcher's central question was: "*What is it like to render nursing care to patients who suffer from MDR-TB?*" During the interview the researcher asked the following probing questions so that participants could elaborate or clarify their responses (Refer to Annexure E):

- Tell me more about your experiences with these patients.
- Tell me about the risks that you are exposed to in this hospital.
- What sort of support is available at this hospital for nurses?
- What are your needs with regard to caring for MDR-TB patients in this hospital?

Interviews were terminated when data saturation was reached, that is, when information was repeated and also when the participant indicated that there was nothing further that they wanted to say.

- **Typical challenges encountered during the interviews**

The following were two challenges that the researcher encountered during the interviews: firstly, her cell phone rang even though it was on silent; secondly, interview time constraints had an impact. The researcher had indicated that the interviews may take up to an hour. After indicating to a participant that the hour was up, there was more that the participant wanted to say, so she continued her

elaborations but then realised that she had exceeded the hour and she decided to discontinue the interview.

### **4.3 DATA ANALYSIS**

Data was analysed using Colaizzi's (1978:48) method of data analysis which comprises the following seven steps:

1. Each research participant's verbatim transcript was read to acquire a sense of the whole.
2. Significant statements and phrases pertaining to the phenomenon being studied were extracted from each transcript.
3. Meanings were formulated from the significant statements.
4. Meanings were organised into themes, and themes evolved into theme clusters and eventually into theme categories.
5. These results were integrated into rich and exhaustive descriptions of the lived experience.
6. The essential structure of the phenomenon was formulated.
7. Validation was sought from the research participants to compare the researcher's descriptive results with the participants' lived experiences. Where necessary, the researcher's description was modified to achieve congruence with the lived experience as expressed by the research participants.

The researcher moved to a phase of reading and rereading the transcripts to identify and highlight the participants' experiences with MDR-TB patients. The researcher then extracted significant phrases and statements from the transcripts that together formed the whole meaning of the experiences of caring for patients with MDR-TB. The researcher analysed each transcript to identify statements that told each participant's story of their lived experience. The statements were highlighted on each page and then entered into an MS Word document.

The following is an example of how significant statements were identified and distilled from an interview (transcript one, lines 26-33):

*“Personally to me, it’s just like nursing any other patient, but there is ah ah fear of getting this MDR-TB where we do render the nursing care that the patients need but I think because of fear, we don’t spend a lot of time with them, you know we do our stuff and yah, so, on that basis I mean it’s not so good for the patients because it’s not really the 100% (cell phone noise) nursing care because of fear of our life because we are only human beings. Yes; basically I think... that’s our fear that we not giving them 100% what we should be giving them because of this MDR and XDR-TB” (Refer to Table 4.1 below)*

**Table 4.1 Significant statements and formulated meanings**

<b>Significant statement</b>	<b>Formulated meaning</b>	<b>Theme</b>	<b>Category</b>
<i>“but there is ah ah fear of getting this MDR-TB”</i>	Nurses afraid of contracting MDR-TB	Fear of contracting the disease	Exposure to risks
<i>“because of fear, we don’t spend a lot of time with them”</i>	Less time spent with the patients		Contact with the patients

In this stage of analysis Colaizzi (1978:48) recommends that the researcher attempts to formulate more general statements or meanings for each significant statement from the transcripts. Each significant statement relating to the description of the experiences of enrolled nurses caring for patients in an MDR-TB hospital was studied very carefully to get a sense of its meaning. Formulated meanings were developed, taking into account the statement preceding and following each significant statement. Once the researcher had formulated meanings for all the significant statements, the researcher then began arranging the formulated meanings into theme clusters.

#### 4.4 DATA FINDINGS

Six major themes emerged from the findings of this study and categories were formulated. Refer to Table 4.2.

**Table 4.2 Themes and categories**

<b>Themes</b>	<b>Categories</b>	<b>Meaning units</b>
<b>Theme 1</b> The working context	<b>Category 1.1:</b> Physical environment  <b>Category 1.2:</b> Lack of positive practice environment	Facilities are not available
<b>Theme 2</b> Fear of contracting the disease	<b>Category 2.1:</b> Exposure to risks  <b>Category 2.2:</b> Contact with the patients  <b>Category 2.3:</b> Spread of the disease	Poor protection and infection-control measures  Nurses afraid of contracting MDR-TB Less time spent with the patients Injuries from violent patients and needle sticks  Patients discharged prematurely or allowed pass-outs while still having active TB

<p><b>Theme 3</b> Problems impacting on the quality of nursing care</p>	<p><b>Category 3.1:</b> Adherence to treatment</p> <p><b>Category 3.2:</b> Types and conditions of patients</p> <p><b>Category 3.3:</b> Lack of equipment and supplies</p> <p><b>Category 3.4:</b> Insufficient knowledge</p>	<p>Patients not available to take treatment</p> <p>Side effects of drugs affect the patients</p> <p>Not providing complete nursing care</p> <p>Skills in management of side effects of drugs needed</p> <p>Lack of training in psychiatry</p>
<p><b>Theme 4</b> Nurses' perceptions of the patients</p>	<p><b>Category 4.1:</b> Nurses attitudes towards patients</p> <p><b>Category 4.2:</b> Feelings and emotions about the experiences</p> <p><b>Category 4.3:</b> Power distribution between patients and nurses</p>	<p>Therapeutic relationships between nurses and the patients</p>
<p><b>Theme 5</b> Support structures</p>	<p><b>Category 5.1:</b> Support from management</p> <p><b>Category 5.2:</b> Counselling for staff</p> <p><b>Category 5.3:</b> Appreciation of staff</p>	<p>Management to recognise the nurses working in the unit</p> <p>Nurses need debriefing and counselling sessions</p> <p>Allowances /incentives needed for working in the unit</p>
<p><b>Theme 6</b> Nurses' expressed needs</p>	<p><b>Category 6.1:</b> Protection</p> <p><b>Category 6.2:</b> In-service education</p>	<p>Safety and infection-control measures</p> <p>Training and knowledge needed in the assessment and management of MDR-TB patients</p>

## 4.5 INTERPRETATION OF DATA

After extensive analysis and reflection, six major themes emerged from this study. These themes are described and illuminated by narrative comments from the participants in this discussion. A discussion of the findings follows the presentation of each theme, as it is asserted that integrating the findings and the discussion is an appropriate method for encapsulating the essence of the phenomenon under investigation. Existing literature was used to support or reject the findings.

### **Theme 1: The working context**

It is important that the work environment should enhance productivity (Booyens 2008:299). In this work environment involving nursing patients with MDR-TB, it was important to note what the physical environment contained and how the nurses viewed the environment in which they worked. From the working context it was revealed that the facilities were not available or were inadequate if available. The physical layout of the ward and the lack of a positive practice environment were highlighted as the categories under the working context.

#### **Category 1.1: Physical environment**

With regard to the physical environment, the internal layout of the ward was not considered suitable. The bacteria concentration was indicated to be high, especially in the mornings, and in order for the participants to go to the duty room to put on N95 masks when they arrived at work, they had to walk past the patients before getting to the duty room where the masks are kept, thereby inhaling the bacteria and exposing themselves to infection before putting on masks.

*“when you go into the wards you have to via the patients of which it's not right they are indoors so much “*

Participants indicated that the environment was not conducive to protection from infection, as there were insufficient numbers of handwash basins and fans, including extractor fans. The tea lounge was considered unsuitable for resting as it was

sparsely furnished with old furniture, the doors could not close properly and a window was broken. The nurses' tea lounge was also unsuitable as there was no hydroboil. The following comments were made by some participants in relation to the physical environment of the ward.

*"we only have (laugh) wooden table or metal table there (tea lounge) and we didn't even have ah umm a hydroboil for our tea, we had to walk a distance to get water from the patients' hydroboil to make tea then we had a kettle somebody stole the kettle then we don't even have a microwave in our tea lounge where we have to walk to the matron's tea lounge to use the microwave because our tea lounge doesn't have a microwave. The door doesn't close the one window is broken there is nothing much in there it's just the wooden chairs the table yah it's not a conducive place to have a rest"*

*"We asked for that ... more conducive tea lounge for resting where it's not at all, it's not a resting place to have our tea, a resting place where we can sit on nice chairs and stuff we don't have"*

The participants' description of their physical environment concurs with the findings of the study by Smit (2005:26), who stated that nurses were concerned with their occupational environment as a whole and voiced concern about the deterioration of the hospital infrastructure.

### **Category 1.2: Lack of positive practice environment**

The participants indicated the lack of a positive practice environment, as most of their experiences were negative. Establishing a positive practice environment involves strengthening and supporting the employees in the workplace, which in turn has a positive impact on patient-care outcomes in a cost-effective manner. The wards did not have good ventilation systems and it was explained that there was an insufficient number of handwash basins in the wards.

*"but in terms of where we say we want we don't get like if okay for the past from the time the hospital is opened we've been saying we need handwash basins, a simple infection-control thing that is really important but they don't have it there is only one ward that does have a handwash basin but the rest of the wards we don't have a simple thing like that"*

*"We asked for that um fans more fans I think in the wards, they didn't get that ..."*

The participants said that they had more negative experiences than positive experiences in their workplace. Due to the number of challenges that the participants

were faced with regarding the working context, most of their thoughts were negative instead of being positive. However, it was revealed that they felt optimistic that as the years went by the environment would become more conducive to their work, which would result in a positive practice environment. One of the major challenges cited was the budget constraints. Some participants mentioned the following:

*“Yes, so we still got to get to the point where we in a comfort zone you know where we going to have positive thoughts and positive things so that’s lots of negative feelings that are happening in the hospital as I’m saying so many problems but I’m sure we going as the years go by we going to get to a point you know were we will have everything we want, but so far everything is about the budget. There’s not much positive things I can think about”*

*“by having a negative thought it’s going to affect every part of you at work you want to have positive thoughts all the time and if anything negative then it’s going to affect our ways in hospital.”*

*“So far, yah, say 70% negative [experiences] and 30% positive [experiences]”*

The participants’ description of the lack of a positive practice environment supports the findings from a study by Chung et al. (2004:514) and Smit (2004:26) where the findings indicated more negative than positive perceptions and experiences in the workplace.

## **Theme 2: Fear of contracting the disease**

Fear of contracting the disease is discussed with regard to the categories of exposure to risks, contact with patients and the spread of the disease. It was revealed that being in close contact with patients infected with MDR-TB while providing nursing care could result in the nurses contracting MDR-TB.

### **Category 2.1: Exposure to risks**

Poor protection and inadequate infection-control measures gave rise to exposure to risks. The findings indicated that nurses were at an increased risk of accidental exposure to HIV from needlestick injuries. At times patients would experience side effects from medication and become violent, thereby increasing the risk of the nurses being assaulted by the patients. Some narratives revealed the following:

*“And HIV as well that’s everywhere. Yah, ‘cos we giving them injections every single day and can get needlestick injuries so these patients are sick and tired of injections so when we give them the injections they are either jumpy or something. Those are the few risks basically the risks we are exposed to every day.”*

*“we are scared but sometimes when we give the injections to a patient giving injections is painful the patient jumps so you can be pricked by a needle and get it as we are scared”*

*“hm...Just MDR/XDR TB and where violent streaks from the patients because of the cycloserine and terizidone. Those are the risks”*

The participants indicated that they were extra careful when a patient was very ill as the risk of accidental exposure to bodily fluids was high; therefore, additional masks, gloves and aprons were used. The participants’ descriptions of accidental exposure concur with a study by De Villiers and Ndou (2008:12) where the findings indicate that the gloves were very often torn; therefore, nurses had to put on extra gloves for protection. One participant indicated the following:

*“Well I had an ill patients I’ll give my heart away to that patient...I don’t fear for my life at that time because emotionally you see them in that state so I use double masks and double gloves and double aprons and all this and then I’m with them all the time make them comfortable make sure that everything is normal so that’s there I don’t be scared so personally I give them lots of nursing care”*

It was also indicated that infection-control measures were not adhered to by the patients, such as leaving the sputum mugs open. Poor protection related to unavailability of aprons and masks was also highlighted. A participant stated the following:

*“immediately when I was giving medication this sputum mug was opened yooo, the way I was cross I was mad I told that patient ‘who do you want to contract your MDR-TB, you want me to get infected of your MDR-TB that’s why you opened the sputum ‘cos when I get into the ward in the morning I opened the door that sputum of yours that sputum bottle of yours was closed, now you opened it’... I decided to leave the patient”*

The participants stated that although N95 masks were provided for them, they were uncertain whether it was effective to use them and if the masks would protect them from contracting the disease. In some instances it was indicated that when nurses had flu, it was difficult to keep the mask on due to a running nose. The removal of the mask would then increase the risk of exposure to MDR-TB.

The participants' description of the N95 masks concurs with the findings of the study by Smit (2004:26), that stated that nurses did not fully understand the prevention benefits of wearing N95 masks.

### **Category 2.2: Contact with the patients**

The findings indicated that the nurses were afraid of contracting MDR-TB and thus less time was spent with the patients. Fear was described by the participants as a core element of feeling during their contacts with the MDR-TB patients. They indicated that they were afraid of contracting MDR-TB; they feared the patients, especially when patients threatened them; they feared sustaining needlestick injuries which could result in them being infected with HIV/AIDS; and they also feared that their family members would contract MDR-TB from them after they had been in contact with the patients. The participants stated the following:

*“but there is ah ah fear of getting this MDR-TB ... some nurses now I mean who got TB in our institution I think about five nurses who contracted TB but not MDR but some positive things because they risking their lives and coming to work every day... but there is nothing positive”*

*“that's when he said 'you wont give me my medication, nobody will touch me' then he took a big brick to throw on me and the sister that was there and then we did that then we phoned the security... he said that he is going to phone his family to wait for me outside. So every day for the next seven days it was fear for me coming to work”*

*“before you go and greet your kid is to take off your uniform and go to the bathroom because you came in close you scared that your kid might get the infection since you working in in such an area, yah.”*

*“Ehh in myself I feel scared 'cos really you cannot run away from it 'cos even the masks that the protective clothes that we are using more especially the mask they are not 100% safe”*

The findings indicated that the participants spent less time with the patients. They admitted to behaving unethically at times because they were afraid of constant contact with the patients which could result in them contracting the disease; therefore, they tended to neglect these patients and did not provide the total nursing care that the patients were entitled to.

### Category 2.3 Spread of the disease

The participants indicated their concern about the continuous spreading of MDR-TB by patients who were granted pass-outs for various reasons. It was indicated that some patients were discharged prematurely or were allowed pass-outs while they still had active TB or positive smears. According to the MDR-TB guidelines, only patients with negative smear results may be given pass-outs; however, it was revealed that the doctors at this hospital did give pass-outs for patients who had positive smear results. This would put the patients' families and the community at risk of contracting the disease. A participant indicated that:

*"when it comes to containing of this MDR and XDR it's not good you know we send these patients out there we give them masks, but they not using the masks and go wherever they going they just spreading and the doctor says no he says I'm only going to give patients who are negative pass-outs but some patients are positive he gives them so they are not containing this disease they just sending the patients out there"*

Some participants expressed concern about their families and the community members going out shopping and coming into contact with MDR-TB patients with positive smears who had been granted pass-outs. Should infectious patients come into contact with other people, there is a high risk of spreading the disease. The following narrative illustrates this point:

*"I think this is not good at all because our families are at risk because we don't know where our family is in the shopping centre somewhere and these patients with their XDR and MDR in the shopping centres coughing in there it's not good at all now we are trying to do containment but you sending them back out there why admit them then?"*

It was explained that some of the patients wanted to infect the nurses deliberately, especially those patients who leave sputum mugs open and those who refuse treatment. However, on a positive note, some patients expressed concern for the nurses, especially when they were not using masks and came into the ward. The patients would then remind the nurses to put their masks on during interaction with them so as not to infect the nurses. The participants revealed the following:

*"but what is nice is that these patients they understand. I think the counselling that they get from from KGV yeh it makes them to accept it because sometimes it happens that you forget to wear a mask when you go near them the patients they remind us that 'nurse put your mask on' because now you can contract TB. I remember there was a patient who is a teacher she wanted*

*to come to the duty room to ask something, she actually asked that 'nurses put your mask on because I'm I'm coming to ask you something so I don't want to infect you' so with that they make us to feel free to wear a mask because whatever whatever we doing if you are feeding the patient we wear masks and they don't complain about it"*

*"Sometimes they make jokes about them they wearing like ducks mouth and stuff so it's kind of like a change for us at the same time 'cos when you sometimes when you forget them and you going inside the ward like make fun of like 'where's your duck?'"*

### **Theme 3: Problems impacting on the quality of nursing care**

When patients are admitted to hospital, quality care must be provided to them to promote recovery. There were, however, problems that had an impact on the quality of care provided to patients. The categories related to the quality of nursing care provided included adherence to treatment, types and conditions of patients, lack of equipment and supplies, and in-service education. At times the provision of nursing care was affected when there was a shortage of staff.

*"the problem is that there is a shortage of staff so we don't ehh give the nursing care the way we want to... Yah, we work together helping each other like ehh work in work we are allocated that we are doing this but when you finish you go and help the other one"*

#### **Category 3.1: Adherence to treatment**

It was indicated that patients were admitted to hospital to receive medication and care to cure the disease. However, patients did not adhere to the health education given to them regarding medication for MDR-TB. Patients are educated not to consume alcohol when they take their MDR-TB medication, as the alcohol interacts with the medication and the medication is then ineffective in the patient's body, which can lead to further resistance. It was revealed that the patients did take their medication but they continued engaging in other activities that they should not have been involved with, such as smoking, which could affect patient care outcomes. Some narratives indicated the following:

*"how selfish people can be 'cos this thing equals if they taking their medication their alcohol and medication and the medication it don't work, it can also spreading the MDR around 'cos the meds won't be working on them because the fact that they consuming alcohol most of the time and the tablets won't be doing their their work that it supposed to be doing in the body 'cos they busy consuming alcohol"*

*"...they'll be going outside they'll be smoking which they not allowed to smoke but what can we do?"*

*"You go to a ward now let's say the male wards you'll only see five or six patients they all outside (cell phone noise), well playing cards and smoking (laugh) and sitting in the sun"*

*"especially they are breadwinners especially the males so they have that frustration they want to go home they that they lose concentration with regards to wanting to take their medication so it's very difficult at times"*

It was revealed that some of the patients were not available in the wards during medication times, and thus skipped their medications. It was revealed that some patients even absconded, because they were afraid of the injections.

### **Category 3.2: Types and conditions of patients**

The participants indicated that most of the patients were in a stable condition; they were ambulant and could take care of themselves. The patients, however, frequently smoked, consumed alcohol and became verbally abusive towards the nurses. The findings indicated that the majority of the patients were arrogant, rude and disrespectful.

*"well most of our patients are in a stable condition we generally don't get bedfast patients and when we do get bedfast patients we there, at the bedside doing our nursing care..they do their own stuff and they take the hospital as their home because they here for so long..."*

*"In my ward. Well we had a very ah bad behaved patient where he was a professional, a principal, and he was behaving very badly, we had to get a disciplinary discharge because he was drinking every day and using vulgar language being vulgar to the nurses as well that's on night duty"*

*"and they [the patients] are very arrogant; and we actually fear for them because some of them because of the medication as well their mindset they not equivalent to a normal (laugh)...normal people"*

*"so there's not much respect now because they here for so long they don't really respect us as another setting or hospital setting where the patients come and go"*

*"but you know there's sometimes where they just absolutely rude...they don't listen to us... and where they go a lot out on pass-out they come back drunk into the ward".*

*"Some they are rude, some they are... they are big some, some ehh ...I don't know they treat us as if we are animals they can fight"*

It was indicated that some of the patients disrespected not only the nurses but also the security personnel of the hospital. Some patients got frustrated as they had to be hospitalised for a long time.

*“mmmm now they they are in hospital so although they are they are getting paid but they they feel like they should be at work they are missing that, so that’s why they don’t like to stay in the hospital for long, yah”*

Nurses expressed disgust at some of the patients’ behaviour as they would engage in sexual relations with patients of the opposite sex on the hospital premises. This was in direct conflict with the behaviour expected of patients.

*“It’s disgusting you know disgusting. Having boyfriends inside the hospital premises with the other patients, having sex inside the hospital premises, drinking inside the hospital premises those all are it’s disgusting. Patients don’t do that and I don’t know what’s was it they taking in this hospital but the things they do in this hospital they disgusting”*

It was explained that some patients became familiar with the nurses during their long hospitalisation and would miss the nurses when they were not on duty. These patients would even recognise the nurses after being discharged from hospital.

The conditions experienced by the patients were explained in relation to the types of patients nursed in the wards. The participants indicated that when patients experienced side effects from medication, they sometimes presented with psychotic and aggressive behaviour. It was revealed that one patient had become violent and had broken the windows in the ward.

*“I had this one patient in Ward 1 which was psychotic who was taking cycloserine but it was stopped but she was aggressive she was touching all the other patients and saying that the people around her are talking about her and saying all all funny things about other patients as well and also the patients were becoming angry and were going to hit her and aggressive as well so those type of things also happens most of the time when they take cycloserine most of the time and the patients some being psychotic when they take cycloserine”*

*“Yes, there was another patient that bust all the windows yah because he was on cycloserine...and this patient carried on outside one he was busting everything bust all the windows the...Well there’s not much difference because there’s some patients that react to cycloserine and some react to terizidone ah same”*

On the other hand, it was revealed that some patients intentionally misbehaved so that they could get discharged. It was indicated that patients were aware of

disciplinary discharge and used it to their advantage. Several methods were used by the patients which could lead to them being discharged, such as not taking medication or engaging in fights or verbal abuse with staff and other patients. The participants indicated the following:

*"It's difficult for the patients also the doctors 'cos some of them they tend to just want to abnormal behaviour so that they'll just go be discharged, disciplinary discharge"*

*"Abnormal behaviour they'll just wanna go out on pass-out not being granted. At times they won't take their medication they just want the doctor to get fed up with them so that they'll get discharged"*

*"At times they'll fight with other patients; at times they'll exchange words with the nurses or the hospital staff, yes...At times they do become physical ... at times "*

The findings revealed that nurses had to be vigilant and observant of patients as patients would not directly approach the nurses when something was wrong. It was only when the nurses were observant that they could identify that something was wrong with the patient. However, it was indicated that at times some patients appeared lazy and wanted to rest and sleep, and did not want to change their clothes.

*"It's different per person the patient some of them you find that they just wanna sit quiet, they just withdraw themselves from other people and some of them find them wandering around actually when you actually go and ask them 'what's the matter?' they actually come up with something they don't directly just come and say nurse "I got a problem" they display this behaviour to you that you will just know that something's wrong with this patient or else they just don't wanna eat at all"*

It was further indicated that a patient would be admitted in an unhealthy condition but on discharge the patient would be looking well. It was revealed that some patients did listen to the nurses and took responsibility for their own health. When this happened, the nurses would regard this as a positive experience and they would feel good.

*"Mmm...You see a patient coming in very very sick and with them going home well then start again then start again walking about that makes that really gives me a positive feeling that no I'm doing my job"*

*"Positive experiences to see a person when they come on admission in being not well being quite ill and to getting discharged really ...that's a great thing "*

*"It makes me feel good that there are patients who listen when you talk to them and there are patients who care about their life and who know what they really want ... It makes me feel very good. "*

### **Category 3.3: Lack of equipment and supplies**

The findings indicated a lack of essential equipment in the hospital. Some equipment was received but could not be used due to a lack of in-service training from the company representatives on maintenance of the equipment.

*"we don't have the equipment, we don't have the ECG machine where we can just check "*

*"we didn't have HB meters and GM meters but now we do have but, the thing the problem is are the BP machines yes yah we we really do need people from those companies that supplied us the equipment to come over and explain to us how they want us to clean the equipment, how must we store the equipment and also how we must service it and how often it must be serviced because we can't let it get broken because of a lack of knowledge how to use them yah so we need in-service like that"*

With regard to supplies, it was revealed that sometimes there were no masks and aprons available in the whole hospital. Participants expressed their need for infection prevention and control measures to be in place. It was revealed that at some stage the nurses had had to go on strike because there were no N95 masks available. The participants expressed their concern over having to use one mask for a number of days, because the durability of the mask is not known to go to that level of functioning. There were also no handwash basins and visors to be used when inserting drips.

*"At one point there was no mask so we had to go on strike for a day or whatever half the day we didn't have masks (laugh) so we quite happy that that has changed and now masks are freely available to us ... So we quite happy with that 'cos I don't think a mask should be used one mask for three days. I don't think it's fair on us because don't know how strong the mask is in the first place"*

In a study by De Villiers and Ndou (2008:12) the findings revealed that although the masks and gloves were available, they were often torn and of poor quality. This study also revealed the gloves and aprons were of poor quality and often tore all the time.

### Category 3.4: Insufficient knowledge

Participants acknowledged their lack of training in psychiatry, lack of knowledge of drugs for MDR-TB and lack of knowledge of side effects of drugs, which resulted in feelings of uncertainty. The cause of the uncertainty was the lack of knowledge on MDR-TB, on the quality and reliability of the N95 masks, on nursing a patient who may be XDR-TB, on how to handle a psychotic patient, on how to plan for the future, on the need for promeals and also on how to handle a patient who is experiencing side effects from medication. The participants indicated that they were uncertain about how to differentiate between MDR-TB and XDR-TB patients.

*“this (MDR-TB) is something that we all don’t understand about, we all got questions”*

*“Yah and we all in the learning process ‘cos we all new in the institution so I won’t say somebody who knows more than the other you know we all still learning ‘cos we all still new in this environment. So it’s the first time working in MDR and XDR institution”*

*“Sometimes it happens that the patient came in with an MDR patient only to find out that as time goes on the patient is now XDR”*

*“When a patient is psychotic it’s hard to handle them especially if you don’t know how to handle them you weren’t told how to handle them it’s quite hard ‘cos you also think of what if she turns around and hits me or hurts me what am I gonna do”*

The participants expressed concern about doctors not managing certain patients correctly, and indicated that they would lose trust in these doctors who did not follow protocol or policies.

*“doctor says no. He says I’m only going to give patients who are negative pass-outs but some patients are positive he gives them so they are not containing this disease they just sending the patients out there. So he says one thing but he’s doing another thing”*

*“I don’t even think the doctors know really about the TB (laugh). No, I don’t think that they know therefore maybe they don’t have meetings with us. So they don’t know what to say themselves. Yah and some... okay, these doctors are good but they so knowledgeable about the medication they giving for the MDR/XDR that sometimes the other medication the other patients have other ailments they don’t always you know order the right medication sometime. Maybe I’m saying too much now.”*

A participant expressed uncertainty about whether she should be taking supplements or not, and also about the type of supplement needed. The participant

indicated that one patient was a nurse who contracted the disease from patients and is now a patient herself. Concern was also expressed about uncertainty over how to manage a patient who is psychotic.

*"It's easy to get it (MDR-TB) 'cos sometimes you get into the ward not taking any supplements that can boost our immune system of which it is very difficult for us 'cos most of us we don't know whether we should take which supplement exact for us, that which we can boost our immune"*

#### **Theme 4: Nurses' perceptions of the patients**

Nurses come into close contact with patients as they provide nursing care. Their perceptions of their patients can either enhance or affect the nursing care provided to these patients.

##### **Category 4.1: Nurses' attitudes towards patients**

The participants indicated that they had positive attitudes while nursing these patients. It was indicated that more nursing care would be given to patients who were very ill. It was also revealed that while it was a challenge to provide nursing care in this hospital, nursing MDR-TB patients was like nursing any other patient.

*"It affects it in a positive way where giving the patient more care and no we doing something wrong you know but we want to cover up and give them more care and make them more comfortable in that sense but nothing in a negative way besides doing more for them 'cos we know there's nothing you know they going to die and that's what's happening most of the time"*

*"Nursing care that we provide for the ill patients ehh patients they have needs especially emotional needs when they sick they think that nobody cares for them that is where we start with regards to ehh keeping them informed about their illness but also not giving false hope but always being there for them make sure that they eat and make sure that they always clean make sure that we maintain the dignity all times...yah"*

The findings indicated that it could be very difficult at times, as the patients would become frustrated with being hospitalised for a long time. The participants felt pity for the patients at times and allowed them to do as they pleased, especially with regard to granting pass-outs, as this appealed to the emotional side of nurses. Although patients had to receive injections daily which were very painful, this was something that could not be helped.

*“we do let them do you know what they want to do sometimes because ... we feel sorry for them “*

*“Thinking about the emotional side of the patient okay because they miss their families...Yah, they go buy groceries for their families or collect the grant and give it to the families but I thought the grant was only for them but because they are not working I thought give them a chance so that their families can get some sustenance in life now because of that they have to go out on pass-out “*

*“Yah, you know when you give them medication, they moan about the medication, they moan about the injection site, the pains and stuff which you can't help you have to give them the medication and you have to give them their medication as well so obviously you can't you yourself you can't do anything about that you have to give it to them”*

Participants understood that patients were admitted for a long time, and tended to be lenient towards them. The participants expressed feelings of empathy towards the patients due to the length of stay of the patients in hospital. Sometimes they initiated contact with the patients' relatives when they noticed that the relatives had not visited the patients.

*“to be in a hospital for nine months, to be getting injections every day, to be taking so much of tablets and to be away from your family it's really emotional strain on them so, on that sense we do have a soft spot for them...The back gates are wide open so they go out that way so on that sense we have a soft spot where we let them do certain things”*

*“if they (relatives) don't come in after the patient's been admitted like for almost a week we try and call them again because on admission we phone for all the patients and then if they don't come for almost a week not coming then we phone back to them we just find out really what's the problem why can't they come and see the family member”*

The participants revealed that they empathised with patients when the side effects of medication caused the patients complications, such as loss of sight or hearing. They also empathised with the children of the patients who contract the disease from their parents.

With regard to interaction with the patients, it was indicated that some patients were respectful towards the nurses; however, at times patients displayed rude behaviour but the nurses continued with their duties in a professional manner.

*“but we do respect them [the patients], we have to but we do...but the rest of my patients our patients they really they good patients they respect us down there and ah we don't have any problems with them”*

Participants displayed ethical behaviour when providing nursing care to the patients and indicated that although they are at risk of contracting MDR-TB, they were committed to providing the best nursing care that they could provide.

*“There is nothing we can do that is our job and we have to risk our lives because we took this oath to work here and care for them so but we care”*

*“For the day we do have TV, we do have also ehh health education sessions in our wards whereby we collect them and they actually we discuss whatever that we need to discuss with them like personal hygiene, how to prevent infection control and also the way they adhering to themselves outside while they in hospital all those kind of things “*

The findings indicated that the MDR-TB patients were stigmatised by other healthcare practitioners. When patients went for their clinic appointments at different hospitals, these patients were seen last and certain procedures were not performed for MDR-TB patients.

*“By the healthcare by the healthcare professionals the doctors where like example your dental patients now they you going to suffer whole day with the dental problem till the evening because they only extract for the MDR/XDR in the evening. “*

*“I think it was some kind of a scope and they didn't do the scope because he was MDR. They sent him back here.”*

*“It's quite emotional because as a nurse now you know that this ailment the patient is suffering from can be treated but what do we do if the doctor does not want to transfer them out so we don't have the equipment, we don't have the ECG machine where we can just check and there is nothing of that sort and doctor won't send them out so emotionally you know what kind of nursing care are we giving we are killing these patients because we know what's wrong with them but we not doing anything you know or medically the doctors will need to order that because we can only do so much...yah...so that's how we really feel sorry for the patients because they stigmatised because of this.”*

#### **Category 4.2: Feelings and emotions**

The participants explained various feelings and emotions that they experienced while caring for MDR-TB patients. Participants described feelings of acceptance. Nursing MDR-TB patients was now seen as part of the job. At first participants had expressed fear when nursing MDR-TB patients, but they had accepted the fact that they were with the patients all the time. Many patients had side effects when taking medication such as cycloserine, so if they behaved irrationally the participants accepted that the behaviour was not the patient's normal behaviour

but was due to side effects of the medication. After working for a long time at the hospital, they had got used to the environment.

Participants described feelings of frustration, in relation to the waiting period to go for the annual chest X-ray due to the lack of transport to another hospital that had an X-ray facility. They were frustrated with inadequate infection-control measures, especially the handwash basins. Another participant described feelings of frustration when it came to giving patients health education. The following were narrated:

*"I had to go with my own vehicle because I was actually tired of telling them that I need to go for my X-rays and then finally I said you know what give me the letter and on my day off I will go on my own to get it done yah and that's what I did"*

*"when we tell if if you must explain to them as how it's healthy 'cos if it's spreads to other members of the family it won't be nice 'cos this in infection is on its own nobody would like to get it so it's hard to stress and make them understand as well 'cos of the things that they do"*

Participants described feelings of hopelessness. Participants felt hopeless when they gave medication to the patient but no sputum conversion took place. The fruits of their labour could not be seen although they were doing their jobs.

*"if you check the patients who do that and then you check of how the results are going then you see no change, it's like your job is not being done at the end of the day 'cos we try we give them medication but there is no you see there's no change when it comes to the results changing. The patient has been here for about six months but so they still positive"*

A nurse expressed hopelessness when patients absconded because the patients would return in an ill condition due to them not taking their medication as prescribed.

*"Eh, I mean like (laugh) and the nursing turns down like for instance when the patient has absconded and then she comes back, she's weak and ill can you imagine you have wasted so much time 'cos they stay in hospital for plus minus six months, you have been caring for this patient, by four months she will see herself as she's strong she can just abscond, she run away from hospital treatment by the time she comes she'll be weak and ill by that time you think about your work that you have done all the way all the four months and the patient when she comes, she comes and dies 'cos she'll be weak and you have to start afresh and retreat the patient that is the bad experience I don't like with these people these MDR people because they come here and die of which it pains to us although the patient has been absconded but it pains to us 'cos we've done so much and you have been seeing this patient getting better and better"*

Some participants displayed feelings of anger towards the patients. One reason for the anger was that even though patients were informed that they should stop

consuming alcohol because it interacts with the medication, they continued to consume it.

*“Ah it makes really really makes me really makes me angry ‘cos ... if they taking their medication their alcohol and medication and the medication it don’t work, it can also spreading the MDR “*

*“You know the things it actually do make me angry. It’s like these patients here they don’t they don’t care about their health you know the things they do the patients are disgusting”*

It was revealed that the nurses displayed feelings of being under stress. Participants also described feelings of shock when patients were physically abusive towards other patients. Stressful emotions seemed to manifest especially when a patient experienced side effects, as the medication would be stopped..

*“Well stressful for them just as it’s stressful for us but this thing that you wanted is the best like to know how the side effects came about”*

It was also stated that there was a ward where most of the deaths occurred. If a patient was very ill then the participants were not afraid to provide nursing care and would perform their duties in the way in which they were trained.

*“Well, the wards that I worked in...yah .there were. So far I worked in this one ward were there were quite a few deaths but that is the only ward where most of the deaths take place...Yah. (laugh) but that is the only ward where most of the deaths take place”*

*“Well I had an ill patients I’ll give my heart away to that patient...I don’t fear for my life at that time because emotionally you see them in that state so I use double masks and double gloves and double aprons and all this and then I’m with them all the time make them comfortable make sure that everything is normal so that’s there I don’t be scared so personally I give them lots of nursing care”*

### **Category 4.3: Power distribution between patients and nurses**

Enrolled nurses described feelings of powerlessness because what they were facing was unknown and they were unable to help their patients in a competent manner. Feelings of powerlessness occurred when patients did not follow instructions and displayed inappropriate behaviour. Patients appeared to have a

great deal of authority over nurses. The following were expressed by the participants in their narratives:

*“they’ll be going outside they’ll be smoking which they not allowed to smoke but what can we do?”*

*“but when ward same patient who had a problem with the doctor they wanted to slap the doctor I think he slapped the doctor or he wanted to slap the doctor and he was discharged the next day”*

Participants indicated that because the patients stay in hospital for a long time, the patients would tell them what to do. It was revealed that even the reactions of management towards these patients was different, which gave the patients a sense of power over the nurses, but not over the doctors. For instance, a case was mentioned where a patient was violent and abusive towards a doctor and was discharged; however, if the same behaviour was shown towards nurses, nothing was done.

*“and because these patients are here on a long-term basis they actually have more say than we have. So if we say you know what we need to do our routine and stuff and we need the fans on. They tell us ‘no you can’t put the fan on because it’s too cold’”*

*“that whatever they do I mean they always say patients are right so they know that. Whatever they say goes”*

## **Theme 5: Support structures**

Nurses provide emotional support to their patients. In turn, nurses also require support from both management and their peers.

### **Category 5.1: Support from management**

Participants indicated that they did get support from management, but only at certain times.

*“Well some of them do give us some support they talk to us sometimes I think there is only one or two (cellphone noise) that is really you know supportive “*

*"Well, they ask us are we happy or are we okay? You know, if there's anything we need or if there is anything we want to talk about there are some of them that do one or two of them that are very good and are we okay in the situation? Do we need any help? You know they ask us on a daily basis like but... there are few that worry about the wellbeing of the nurses. Yah"*

*"Okay the one good thing that they do have that's so far in all the hospitals okay the hospitals that I work at this hospital I am working at they do have separate meetings for each category. That is very good thing because no hospital has that and we are able to view our opinions or ask questions if we need to know anything"*

Participants indicated that the senior management did not understand what it felt like to work in the wards. It was revealed that meetings were held for different categories of nurses, where people were able to express their opinions or ask questions; however, management still did not understand as they were mostly not involved in patient care.

*"our OM's don't do that much they normally in the duty room doing the paperwork and stuff so on that grounds they don't do that much they don't do that much. It's just that mostly the EN and sisters that do much. I don't know they hardly with the patients... most of the nursing care is done either by the EN and the SPN"*

Contrary to this, other participants indicated that they were too scared to verbalise their feelings at meetings as they were too scared of the senior management.

*"No, no you just scared to open your mouth; this is what they telling you and then go"*

Participants stated that they received support from colleagues. They provide in-service training for each other and they assist each other when they are short-staffed. It was indicated that on a collegial level, the participants taught each other waste disposal, prevention of cross-infection and the importance of handwashing.

*"The staff members we also ehh we do infection control 'cos this is a communicable disease so it's quite important for the staff to just know especially of the infection control ehh, protocols of medication all those kind of stuff"*

Participants expressed a feeling of inadequate support from management even though they were risking their lives when at work. The lack of adequate staff put pressure on nurses to complete their tasks.

### **Category 5.2: Counselling for staff**

The findings indicated that nurses needed debriefing and counselling sessions while caring for MDR-TB patients. It was revealed that when incidents occurred with psychotic or confused patients who became physically abusive, no support was given to the affected participants, as stated by one participant:

*“because this is a really dangerous situation as well (cellphone noise) nobody is taking heed to the fact that we are risking our lives...Management didn't help me in any way they didn't give me any emotional support or anything of that sort or tell me to take a day of. I had to work the same night... (laugh) and the time I'm working now I cried the whole night nobody gave me anything”*

The findings indicated that personal psychological needs were not considered and attended to. Emotional needs of staff are not considered or attended to. There was an Employee Assistant Programme available in the government sector, but it was unavailable at this institution.

### **Category 5.3: Appreciation of staff**

Nurses expressed a need to feel appreciated by management and the need for incentives. Incentives included the celebration of Nurses' Day, a Christmas party, a danger allowance or even benefiting from the Occupation Specific Dispensation. The following were mentioned by the participants:

*“Ah no like a simple thing, like a day like a Nurses' Day where they to appreciate us they gave us something example like a tea party. That is an incentive. That's a small things like that”*

*“we work you know given the opportunity where the super didn't give us something don't say 'thank your'll, your'll doing a good job' you know we we I know something like that... where they thank us for the things that we doing because we risking our lives every day and coming to work and there's not a day that they have a meeting to say 'your'll are doing a good job”*

*“so if we do have nurses that do a wonderful job but we don't get any praise for it and then where we have something called a Nurses' Day but our hospital didn't even give us one cup of tea or a biscuit or anything to say we appreciate you, you know I mean those little things gives you positive motivation to carry on working”*

*“but we are aware that we are at risk in so much that we would like to have ahh danger allowance because we know some of the staff they do get infected of TB so that will be great if we are working knowing that we are getting danger allowance”*

## Theme 6: Nurses expressed needs

The participants indicated that they worked in a high-risk environment. Due to their exposure to MDR-TB, there were certain needs that needed to be attended to.

### Category 6.1: Protection

Participants expressed a need for protection from infection and also from the patients. Infection prevention and control measures, and health and safety measures were required to protect themselves. The participants expressed the need for protective clothing and prophylactic tests such as X-ray screening. It was indicated that even when X-rays were sometimes taken, there was a delay in provision of results from investigations, which made the nurses unsettled about their safety.

*"We need that kind of an environment where there is good ventilation and I think when it comes to our uniforms as well I think that we actually need ah some other form of clothing like example like in theatres setting where they actually have gowns that they need to use when they come in because we using these uniforms and we taking it home ... even those shoes that muftis that fit onto the shoes. I think that will make us you know want to be more in the wards were we know we protected because mmm we are only human"*

*"and up till today they didn't give me the results of the X-rays and their norm is, that only if you get a call from the sister then you know that something's wrong but if nobody phones you about the X-ray and then you okay it's fine"*

*"For me I see it as quite a quite a challenge 'cos most of the time in nursing you also have to think about yourself and think of them as well 'cos whenever you go to them you have to protect yourself although sometimes they don't understand the the importance of us wearing the masks especially which you wear all the time"*

*"and what I don't like is the protective clothes that are not enough"*

The participants expressed the need for periodic assessments in the form of X-ray screenings and the need for the results to be communicated to them. They indicated that having X-rays only is inadequate, and that sputum needs to be taken as well, and also indicated a need for immune boosters and a flu vaccine.

*"but she (Occupational Health and Safety nurse) should have called me that everything is fine but I had to go and do a follow-up... so on that sense and then they don't encourage us to do (cellphone noise) sputums, they don't even there is not even a protocol anywhere that I have read. The only protocol I know of is uh the X-rays but they don't even you know protocol to say staff must give sputums there's nothing of that sort. And I think one more thing the TB institutions where we working should do for us is actually give us, because we don't get danger allowance so okay we just getting our salary, you know we need it to do"*

*other things so I think every morning by right they should gives us like you know a Centrum or something where every morning a nurse comes to work and take the multivitamins which the hospital does provides where you know so it's something that the staff clinic should provide but they don't do all that and even when it comes to flu vaccine they just give us so that I don't want to lie, but when it comes to the TB stuff you know every time they don't have a car to send us for X-rays, they don't call us back and tell us what's happening ....nothing of that sort, so on there part I don't think they doing their work properly"*

It was revealed that staff are not treated for simple ailments at the institution because there is no revenue service where they can pay for the treatment received. The staff clinic was said to assess the staff only once a year, and even then, sometimes there was no transport to the clinic as it is outside the hospital.

Participants stated that they have inadequate personal protective equipment provided, as what is available to them is of poor quality. Although there is personal protective equipment for nurses, occasionally staff did contract TB.

### **Category 6.2: In-service education**

The findings indicated that training and knowledge were needed in the assessment and management of MDR-TB patients. Participants indicated that they needed more information on how to nurse these patients effectively, and they needed effective communication, as when they were on night duty they didn't receive feedback or the latest information. They expressed a need to have more meetings with doctors to gain knowledge about the latest developments in MDR-TB treatment, to be sent for bridging courses, and to receive more in-service training on how to manage side effects, such as those exhibited by psychotic patients. The following were narrated by the participants:

*"and in fact you know they talking about doctors I think that staff we have the right where doctors actually have meetings with the staff where they give us any feedback on any new research done on MDR/XDR (cellphone noise) about the masks and stuff but nothing of that sort has been done where there's any new developments of this"*

*"like the categories like I'll talk about myself, I will like to go to do the to be a registered nurse to have more knowledge in nursing so that will like to have"*

*"problem I think what should be done is that nurses nurses who work in the MDR in the MDR institution should also be trained and be told about most of the side effects of the medication and also at least be trained on how to handle when the patients when the patient becomes aggressive and then they start having these psych psychotic aggressiveness and all those things"*

*then I think by that as well we mean and be able to manage the patients when they get into that stage 'cos it's not that all but you know some of the patients do become aggressive when they become psychotic and we will learn how and it becomes hard to to control them"*

*"In the wards in the wards we do get in-service but sometimes we don't get much on MDR like on MDR that's on MDR or MDR on its own or as a whole no we don't. I think on that as well we also do need much of in-service and much information when it comes to that as well 'cos as much as we know about MDR and XDR but I think there's a lot of things that we also need to learn then maybe we don't know about that we need to know"*

*"Whereby psychological training I mean like whereby you can be skilled and trained to see all the patients 'cos sometimes you can find out that the patient they are not right psychologically"*

*"Yah. I prefer something regular (laugh) yah to encourage even to even encourage us like 'cos FOSA is an MDR and XDR specialised stepdown. I think we should be more trained to be able to answer all the questions as we are specialised; underline the word specialised we should be able to understand everything so sometimes it happens that the patients can ask you not even the patient the relatives, even people in the streets they would ask you then you say (laugh) to answer them 'cos you also don't know what is going to happen and I think that's not right 'cos we as the source they must get something right from"*

## **4.6 DISCUSSION OF THE RESULTS**

### **Theme 1: THE WORKING CONTEXT**

Participants indicated that the physical environment in the wards was not conducive to preventing the spread of infection. The ventilation was not good and there were no extractor fans available to remove the MDR-TB bacilli out of the wards all the time. This is of vital importance as patients cough a lot, which results in a high concentration of MDR-TB bacilli in the wards. In effect, nurses are in constant contact with the MDR-TB bacilli while they provide nursing care to the patients, and this poses a risk for them.

There was an inadequate number of handwash basins in the wards for nurses to wash their hands. Handwashing is essential for reducing the spread of infection in hospitals and this is a simple infection-control measure. Healthcare practitioners may themselves be immune-suppressed due to HIV infection and be at higher risk of developing TB (South Africa 2007:6).

The tea lounge was not considered suitable for use by nurses. Providing a room with chairs and tables where nurses can sit during their meal breaks is not considered enough. Nurses are working in a high-risk environment so they expected a room more suited to their needs, with comfortable chairs to rest on, and essential kitchen appliances such as a Hydroboil and a microwave. Having a comfortable tea lounge could lead to a more positive mindset among the staff, good collegial relationships and improved productivity.

The findings indicated that in some ways nursing an MDR-TB patient was the same as nursing any other patient. The majority of the patients was in a stable condition and did not require constant nursing care. However, they did smoke and consume alcohol. When they consumed alcohol, their behaviour would change as the alcohol interacted with the medication and the patients would become agitated, aggressive and violent at times.

## **Theme 2: FEAR OF CONTRACTING THE DISEASE**

Participants expressed concern about the risk of contracting MDR-TB and HIV from needlestick injuries. Sharps containers were provided for the disposal of sharps but patients were not always compliant in receiving the injections. Because they received injections daily, the sites used for administering injections became painful. Although consent was obtained prior to administering the injections and health education was provided, patients would jump, thereby increasing the risk of accidental exposure for the nurses. Patients would experience side effects from the medication and present with violent streaks that could occur at any time, even at the time of giving the injections. Personal protective equipment was provided such as gloves and aprons, but they were of inferior quality and nurses had to use more than was required to ensure their safety. N95 masks were provided but there was no proven efficacy of the masks. At this hospital, fit testing was not done. Fit testing is done to ensure that the N95 masks fit properly but the fit test kits are expensive to purchase and the tests

require specialised equipment to conduct them to ensure a proper fit (South Africa 2007:17).

Working in a TB environment with inadequate infection-control measures leads to exposure to the risk of contracting the disease. It was revealed that patients deliberately tried to infect nurses by leaving the sputum mugs open. This may have resulted in nurses not spending enough time with patients or intentionally neglecting patients.

Nurses were afraid of contracting MDR-TB and thus spent less time than expected with the patients. Concern was raised about the spread of MDR-TB by patients being granted pass-outs and being prematurely discharged. The participants expressed concern for their families and other community members that came into contact with the patients who were granted pass-outs. Although prior to the pass-out patients were given health education to prevent the spread of the disease, there was no guarantee that they would implement those measures. It was also a concern if they went to shopping centres and places where large numbers of people gather, such as social gatherings, church, and so on, as there would be a risk to the community members of contracting the disease.

### **Theme 3: PROBLEMS IMPACTING ON THE QUALITY OF NURSING CARE**

The findings revealed that patients were hospitalised for a long period of time and that they consequently became too comfortable ordering the nurses around in the hospital. The patients were described as arrogant and disrespectful to the nurses, they consumed alcohol and other substances, they smoked dagga, they engaged in unacceptable behaviour like having sex on the hospital property, and they deliberately tried to infect the nurses with MDR-TB. However, positive experiences with the patients were also highlighted by the nurses.

It was indicated that at times patients experienced side effects from medication and became psychotic and aggressive but at other times patients intentionally misbehaved so that they could be discharged. Nurses had to be particularly observant of patients as some patients would only indicate that something was affecting their care or the healing process if they were asked about it by the nurse. Because patients were hospitalised for a long time, the nurses got to know them, so if patients displayed odd behaviour, such as withdrawal or depression, it could be identified and attended to. However, there were patients who took responsibility for their health and upon discharge from the institution; the nurses felt a sense of fulfillment or accomplishment when seeing an ill patient on admission being discharged as a well individual.

There was a lack of essential equipment and supplies which were needed to provide quality nursing care to patients. Participants acknowledged that they had insufficient knowledge about the management of patients with MDR-TB and were uncertain about taking supplements to prevent themselves from contracting the disease. Theoretical knowledge was seen as necessary to provide effective nursing care to patients. Despite their practical knowledge and ability to learn through trial and error, the work environment was a challenge for the nurses as they could not correlate theory with practice, as their theoretical knowledge was insufficient.

#### **Theme 4: NURSES' PERCEPTIONS OF THE PATIENTS**

Some nurses indicated they were empathetic towards patients due to the long hospitalisation period and some indicated that patients were respectful towards them. At times they pitied the patients, for example when the patients received injections and when they experienced social problems.

Participants understood that patients were admitted for a long time, and tended to be lenient towards them. The nursing care provided was at the same level as in other wards, although at times there was a shortage of staff. The participants

worked together in getting the work done when there was a shortage of staff. Although at times patients displayed rude behaviour, nursing care was provided in a professional manner.

Participants displayed ethical behaviour when providing nursing care to the patients; however, some of them acknowledged that at times they exhibited unethical behaviour due to a fear of constant contact with the patients which may result in them contracting the disease. Participants described having feelings of frustration when patients did not adhere to the health education given to them, and having feelings of hopelessness when after receiving medication and treatment for months; their patients' sputa would not convert to being negative. Sputum culture conversion is a useful and appropriate interim indicator of treatment outcome in patients with MDR-TB. In a study by Holtz et al (2006: 650) the findings revealed that most patients with MDR-TB achieved sputum culture conversion within twelve weeks of starting treatment. However, in this study there were patients whose sputa did not convert to negative and there were patients who had MDR-TB and had converted to XDR-TB.

Nurses experienced anger when patients continued to consume alcohol while knowing the contra-indications for MDR-TB treatment. They experienced stress when patients experienced the side effects of medication, shock at seeing patients being physically abusive, and powerlessness when patients would order them around.

The participants' description of experiencing a variety of feelings concurs with a study by Chung et al. (2005:514) where the findings indicated that participants also experienced a variety of emotions when nursing patients with Severe Acute Respiratory Syndrome, and not knowing what they were facing.

**Theme 5: SUPPORT STRUCTURES**

The findings indicated that the participants did not get support at times from management. The participants stated that nursing management seemed not to understand fully what the nurses at grass-roots level were experiencing. Nurses were working in a challenging environment with a lack of human, physical and material resources. At times patients had become physically abusive towards nurses and had threatened them, and they needed some sort of support from management, which they did not receive. However, they did receive and give support to their colleagues.

In a study by Oosthuizen and Ehlers (2008:32) the findings revealed that the South African nurses were appreciated, recognised and rewarded in other countries for their contributions, and employers realised that nurses in South Africa provided quality care to their patients under very difficult circumstances with limited human and material resources.

**Theme 6: NURSES' EXPRESSED NEEDS**

Participants indicated various unmet needs, which included adequate protection for themselves. Nurses had to go to another hospital to have their X-ray screenings done and the results were not conveyed to them. Comprehensive periodic health assessments needed to be conducted for them. There was a need for a revenue department so that they could pay for the services that they accessed, as due to the fact that there was no revenue service available, nurses were not attended to for minor ailments. The efficacy of the N95 respirator was questioned as there was no proven efficacy study done and participants did indicate that a few of their colleagues had contracted TB.

Participants expressed a need for more in-service education to obtain theoretical knowledge and to provide quality nursing care to patients. Training and knowledge were needed in the assessment and management of MDR-TB patients.

In a study by Oosthuizen and Ehlers (2008:28) the findings revealed that the working conditions, lack of resources and perceived lack of managerial support were reasons why nurses left South Africa to work abroad.

#### **4.7 CONCLUSION**

In this chapter the data was collected from five enrolled nurses and analysed using Colaizzi's method of data analysis. Six major themes emerged from this study: the working context, fear of contracting the disease, problems impacting on the quality of nursing care, nurses' perceptions of the patients, support structures and nurses' expressed needs. In the next chapter the conclusions and recommendations will be presented.

## **CHAPTER 5**

### **CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 INTRODUCTION**

This chapter presents the conclusions, limitations and recommendations.

The aim of this chapter is to provide concluding remarks. The purpose of this study was to explore and describe the personal experiences of enrolled nurses while caring for patients infected with MDR-TB in an urban TB hospital in KwaZulu-Natal province in South Africa. The objectives of the study were also to identify support systems for the enrolled nurses during their care of MDR-TB patients.

#### **5.2 RESEARCH DESIGN AND METHOD**

A generic qualitative research approach was adopted. According to Burns and Grove (2007:24-25), qualitative research is a suitable approach for conducting in-depth, contextual investigations aimed at gaining insight into the world and personal experiences of a small sample of people. The target population was enrolled nurses working at an MDR-TB hospital in KwaZulu-Natal. The researcher used non-probability purposive sampling. Five enrolled nurses participated in this study.

An exploratory and descriptive design was used for this study. A descriptive design was used to gain more information about characteristics within a particular field of study. Its purpose is to provide a picture of a situation as it naturally happens (Burns & Grove 1999:192). The data collection method used was unstructured, in-depth interviews. Data was transcribed, analysed and coded into themes.

### **5.3 CONCLUSIONS**

This study described the lived experiences of five enrolled nurses who had worked at the MDR-TB hospital for over two years. All the participants were women.

Themes that emerged from the study were as follows:

#### **Theme 1: THE WORKING CONTEXT**

Work practice and administrative control measures have the greatest impact on preventing TB transmission within settings. Since it is not possible to eliminate all exposure, environmental control measures must be added to reduce the concentration of droplet nuclei in the air (South Africa 2007:9). From the enrolled nurses' perspective, the physical environment was considered to be inadequate. The structure of the wards was unsuitable as nurses had to walk past the patients before reaching the duty room to put on N95 masks. This resulted in them being exposed to the risk of inhaling the bacteria. There were insufficient numbers of fans and handwash basins. Participants indicated that they could not rest comfortably in the tea lounge due to the lack of adequate and suitable furniture and appliances. Participants indicated that their work experiences are more negative than positive. However, they were optimistic that the working context would improve over time.

#### **Theme 2: FEAR OF CONTRACTING THE DISEASE**

Participants indicated that they were afraid of patients who sometimes became violent and verbally abusive. They were at an increased risk of accidental exposure to body fluids due to gloves and aprons being of poor quality, and this therefore increased their risk of being infected with MDR-TB and HIV. Some of the patients intentionally wanted to expose the nurses to MDR-TB by leaving the sputum mugs open. This may have contributed to nurses spending less time with patients and sometimes neglecting them. Participants also expressed concern

about the wider community contracting MDR-TB from patients who went on pass-outs and who were sometimes prematurely discharged. This could result in poor containment of the disease and the subsequent spread of MDR-TB.

### **Theme 3: PROBLEMS IMPACTING ON THE QUALITY OF NURSING CARE**

There were problems that affected the nursing care provided to patients with MDR-TB. Although patients were given their medication, they continued to consume alcohol and smoke. Some patients skipped their medication or even absconded from hospital. This affects the patient care outcomes. At times patients behaved unacceptably by being verbally abusive and disrespectful towards nurses, and some patients intentionally behaved in this manner just so that they could get discharged.

There was a lack of essential equipment such as an ECG machine, and poor-quality supplies, for example N95 masks and torn gloves. However, participants also indicated that they had insufficient theoretical knowledge to provide quality nursing care to these patients. Although policies and protocols were available, they were not consistently followed and implemented by healthcare practitioners, especially doctors. Although they experienced problems, at other times nurses felt very good when seeing patients who had been very ill on admission, regain their health and be discharged.

### **Theme 4: NURSES' PERCEPTIONS OF THE PATIENTS**

Participants indicated that much of the time nursing patients with MDR-TB was just like nursing any other patient. The principles in providing nursing care to patients had to be maintained. Participants did feel sorry for patients as they were hospitalised for a long time and had to receive injections on a daily basis, which was very painful. This led them to allow patients to do whatever they pleased, even to the extent of granting pass-outs to the patients. Participants empathised with patients who did not receive visitors, or when they experienced side effects

of medication, or complications such as hearing impairment, and even when they were stigmatised by other healthcare practitioners at other hospitals.

Participants did experience negative feelings while nursing patients with MDR-TB and working in this challenging environment. Participants expressed feelings of fear, frustration, hopelessness, anger, shock and powerlessness but still maintained their professional behaviour.

### **Theme 5: SUPPORT STRUCTURES**

Participants also indicated that they needed to be supported in their work environment. It was only at times that management supported them but often participants felt that management did not understand what it felt like to work in the wards. Management did have meetings with different categories of nurses but participants indicated that they were too scared to verbalise their feelings and share their experiences. Participants, however, did indicate that they received support from their colleagues.

There were times when patients were verbally and physically abusive and it was during these times that they needed support but there was none; neither was there a functional Employee Assistance Programme available at this institution. Participants therefore felt a lack of appreciation by management. Although they put themselves at risk in the work environment, they did not receive incentives such as a celebration on Nurses' Day, and neither did they receive a danger allowance.

### **Theme 6: NURSES' EXPRESSED NEEDS**

Participants indicated that by working in a high-risk environment they had certain needs. Their health needed to be protected. A fully functional occupational health clinic was necessary. Infection-control measures and safety measures need to be implemented and continually monitored. In-service education was needed so that they could provide quality nursing care to the patients.

## **5.4 GENERAL CONCLUSIONS**

It seemed that participants experienced a variety of emotions while nursing patients with MDR-TB, and these emotions and feelings were either positive or negative. The physical institutional environment was considered inadequate. Therefore, the nurses needed to be supported in the work environment. Although they did receive support at times from management, it was considered insufficient; however, they did receive valuable continuous support from their colleagues.

## **5.5 RECOMMENDATIONS**

Based on the findings of this study, the following recommendations are made in order to enable nurses to remain committed to providing high-quality nursing care. The recommendations are referred to the National Department of health, Kwa Zulu Natal, the management and human resources department of the hospital that took part in this study, the South African Nursing Council and also the nursing staff in general.

### **5.5.1 Nursing practice**

The researcher recommends that the employer should:

- Ensure environmental controls are in place, such as installing fans or extractors.
- Implement infection prevention and control measures by installing adequate handwash basins in all the wards.
- Design policies and rules of the institution, and enforce implementation of such policies consistently by all staff members.
- Purchase good-quality personal protective equipment such as gloves, masks and aprons.

### **5.5.2 Education**

With regard to nursing education, the following are the recommendations:

- Procure the necessary equipment such as an electrocardiogram machine and train staff in how to use the equipment.
- Regular in-service training and updates should be provided for all staff, including security guards.
- Regular meetings should be held with staff members on patient care and management.
- Health education should be given to patients, visitors and their relatives to prevent the spread of MDR-TB.
- Regular updates should be given and workshops should be facilitated on the latest information about the management of TB and MDR-TB.

### **5.5.3 Safety and security**

With regard to safety and security, the recommendations are to:

- Motivate for a danger allowance for staff.
- Provide adequate incentives and appreciation measures.
- Ensure a constant supply of quality personal protective equipment such as N95 masks, gloves and aprons of good quality, and visors.
- Provide a safe and secure environment for staff, patients, visitors and relatives.
- Provide an effective Employee Assistance Practitioner Programme for staff.

### **5.5.4 Research**

Further research is recommended on the following:

- The reason why patients with MDR-TB try to expose nurses to MDR-TB.
- Factors affecting the behaviour of patients infected with MDR-TB.
- Patient perceptions of being diagnosed with MDR-TB.
- Management or leadership styles when nursing patients with MDR-TB.

## **5.6 CONTRIBUTIONS OF THE STUDY**

This study will contribute towards greater insight into the lives of enrolled nurses and their experiences of working in an MDR-TB environment and the therapeutic relationship with their patients. The researcher will communicate the research findings and recommendations to the healthcare institution's management on completion of this study.

## **5.7 LIMITATIONS OF THE STUDY**

The limitations of this study were as follows:

- The study focused on an MDR-TB hospital in KwaZulu-Natal, and therefore the findings cannot be generalised. However, in a qualitative study generalisability is not intended (Streubert Speziale & Carpenter 2003:39).
- Only enrolled nurses participated in this study. If other categories of nurses had been included, it could have led to different data findings.
- The sample size was small. Only five participants were included in the study.
- Only one category of nurses was included in this study. If a larger sample or a different category of staff was used it could have led to different results.

## **5.8 CONCLUDING REMARKS**

This chapter concluded the study, described its limitations and made recommendations for improved practice and future research. The study was conducted to explore and describe the experiences of enrolled nurses caring for MDR-TB patients in KwaZulu-Natal and to develop strategies to support them during their care of MDR-TB patients.

In-depth interviews were conducted in order to enable a small sample of enrolled nurses to verbalise their experiences. The study focused on the lived experiences of the enrolled nurses caring for MDR-TB patients. Data was subjected to qualitative data analysis. The findings indicated that the enrolled nurses experienced positive and negative emotions and feelings while caring for MDR-TB patients.

The findings can be used to support nurses in their working environment. The researcher is of the opinion that the results of this study can be used at hospitals that admit MDR-TB patients and recommends that future MDR-TB hospitals should employ supportive structures when opening other MDR-TB centres in the country. The findings should influence the policies and training implications for healthcare practitioners in the management of MDR-TB in KwaZulu-Natal.

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**ANNEXURE A**



**UNIVERSITY OF SOUTH AFRICA  
Health Studies Research & Ethics Committee  
(HSREC)  
Faculty of Human Sciences  
CLEARANCE CERTIFICATE**

Date of meeting: 2 December 2010

Project No: 3379-332-6

Project Title: The experiences of nurses caring for multi drug resistant tuberculosis patients in KwaZulu Natal

Researcher: Sitha Devi Arjun

Supervisor/Promoter: Ms MC Matlakala

Joint Supervisor/Joint Promoter: Prof TR Mavundla

Department: Health Studies

Degree: Masters of Arts (Health Studies)

**DECISION OF COMMITTEE**

**Approved**



**Conditionally Approved**



A handwritten signature in black ink, appearing to read "TR Mavundla".

**Prof TR Mavundla  
RESEARCH COORDINATOR**

A handwritten signature in black ink, appearing to read "MC Bezuidenhout".

**Prof MC Bezuidenhout  
ACADEMIC CHAIRPERSON: DEPARTMENT OF HEALTH STUDIES**

**PLEASE QUOTE THE PROJECT NUMBER IN ALL ENQUIRES**

**ANNEXURE B**

**HEALTH**  
KwaZulu-Natal

**Health Research & Knowledge Management sub-component**  
10 – 103 Natalia Building, 330 Langalibalele Street  
Private Bag x9051  
Pietermaritzburg  
3200  
Tel.: 033 – 3953189  
Fax.: 033 – 394 3782  
Email.: [hrkm@kznhealth.gov.za](mailto:hrkm@kznhealth.gov.za)  
[www.kznhealth.gov.za](http://www.kznhealth.gov.za)

**Reference : HRKM201/10**  
**Enquiries : Mr X. Xaba**  
**Telephone : 033 – 395 2805**

13 December 2010

Dear Ms SD Arjun

**Subject: Approval of a Research Proposal**

1. The research proposal titled '**The experiences of nurses caring for Multi-Drug Resistant Tuberculosis (MDR-TB) patients in KZN**' was reviewed by the KwaZulu-Natal Department of Health.

The proposal is hereby **approved** for research to be undertaken at FOSA TB hospital.

2. You are requested to take note of the following:
  - a. Make the necessary arrangement with the identified facility before commencing with your research project.
  - b. Provide an interim progress report and final report (electronic and hard copies) when your research is complete.
3. Your final report must be posted to **HEALTH RESEARCH AND KNOWLEDGE MANAGEMENT, 10-102, PRIVATE BAG X9051, PIETERMARITZBURG, 3200** and e-mail an electronic copy to [hrkm@kznhealth.gov.za](mailto:hrkm@kznhealth.gov.za)

For any additional information please contact Mrs G Khumalo on 033-3953189.

Yours Sincerely

  
Mrs E. Snyman

Interim Chairperson, Health Research Committee

KwaZulu-Natal Department of Health

Date: 13/01/2011

**ANNEXURE C****Letter seeking consent from the Institution**

I, Ms S.D Arjun, would like to be granted permission to collect data on the research topic: **The experiences of nurses caring for multi-drug resistant tuberculosis patients in KwaZulu Natal**. Data will be collected from enrolled nurses who are providing nursing care to MDR-TB patients. The study and its procedures have been approved by the University of South Africa (UNISA).

The study will contribute to the understanding of the life-world of enrolled nurses who work in a high risk environment for contracting MDR-TB. The research findings could be used by the nursing managers to develop strategies to minimise the risks which nurses are exposed to in MDR-TB hospitals in KwaZulu Natal and develop a support system for the enrolled nurses. It is envisaged that this would ultimately lead to improved patient care. This study furthermore will contribute towards the knowledge base of the nursing profession by documenting the nurses' views on their working circumstances, their experiences in the workplace and the influence of such experiences on the therapeutic relationship with MDR-TB patients.

\_\_\_\_\_  
Researcher's signature

\_\_\_\_\_  
Date

Contact number: \_\_\_\_\_

**ANNEXURE D**

## Consent form

I am a student studying with the University of South Africa (UNISA). I am carrying out a research study entitled: The experiences of nurses caring for multidrug resistant tuberculosis patients in KwaZulu Natal. The study is undertaken towards the fulfillment of the requirements for the degree Masters of Art (Health Studies). The purpose of this qualitative research is to explore and describe your personal experiences while caring for patients infected with MDR-TB.

Data for the study will be collected through individual interviews that may last approximately 60 minutes. The interview will be conducted in a place and time most convenient to you. Your participation to the study is voluntary. The interview will be tape recorded and transcribed verbatim. The researcher will handle all information collected with the utmost confidentiality and your participation will remain anonymous and no names will appear on the final report. You have a right to withdraw from the study at any given time without having to give an explanation. Your withdrawal from the study will have no repercussions.

Your participation is important in this research study as the results could be used to establish a physically and an emotionally safe working environment, and support programmes for nurses who work in health care settings where they are at risk of contracting communicable diseases such as MDR-TB.

Thank you

I accept participation.

Participant signature: \_\_\_\_\_

Date: \_\_\_\_\_

Researcher signature: \_\_\_\_\_

Date: \_\_\_\_\_

## **ANNEXURE E**

Topic guide

Central question

*“What is it like to render nursing care to patients who suffer from MDR-TB?”*

Probing questions

- Tell me more about your experiences with these patients.
- Tell me about the risks that you are exposed to in this hospital.
- What sort of support is available at this hospital for nurses?
- What are your needs with regard to caring for MDR-TB patients in this hospital?