# KNOWLEDGE, ATTITUDES AND PRACTISES OF PROFESSIONAL NURSES WORKING WITH PATIENTS WITH TUBERCULOSIS IN THE NELSON MANDELA BAY HEALTH DISTRICT

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## DEDICATION

This treatise is dedicated to

My beloved parents,

The late Grand-Father, Siyabonga Dina

for their unconditional love and

contribution to what and who I am today.

Above all for the gift of education and supporting me.

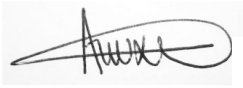
Thank you for teaching me to believe in myself, in God and in my dreams

To my handsome Son, Chulumanco.

With much love.

## Declaration

I, Avela Vuyolwethu Nxumalo, Student number 205009867, hereby declare that the above treatise “Knowledge, attitudes and practices of professional nurses working with patients with tuberculosis in the Nelson Mandela Health District” for the degree of Masters in Nursing, is my own work and has not previously been submitted for assessment or the completion of any postgraduate qualification to another University or for another qualification.

Signature: 

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## ABSTRACT

Tuberculosis (TB) is one of the major public health problems worldwide, and includes the development of drug resistant TB. Tuberculosis is reportedly the second most common infectious cause of death worldwide and thus a global threat. In 2014, 9.6 million people were estimated to have TB and 1.5 million people died of the disease worldwide. South Africa is one of the African countries with the highest burden of TB with 1% of the population of about 50 000 000 who develop the TB disease each year.

The research study explored and described the knowledge, attitudes and practices of professional nurses working with patients with TB in primary health care clinics in the Nelson Mandela Bay Health District (NMBHD). A quantitative, exploratory, descriptive and contextual research design was used to operationalise the research objectives. The target population comprised professional nurses in primary health care clinics. Consecutive sampling, a type of non-probability sampling, was used in this study. Descriptive data analysis was applied to analyse and describe the data using the data analysis software programme Statistica Version 11.

The majority of the participants (99%) had a high level of knowledge about the cause of TB as well as the question about contracting TB (94.9%). On the TB diagnostic tests: biopsy and sputum culture and sensitivity scored the lowest (22.2% and 36.4% respectively). Regarding the duration of TB treatment and the drug used to prevent TB most participants responded positively (97% and 91.9% respectively). Most of the participants had a positive attitude regarding TB (79.8%) confirming their willingness to wear masks although it makes them uncomfortable. Furthermore, most participants (99%) would like to be screened for TB if they have signs and symptoms suggestive of TB. The majority of participants (99%) responded positively to completing TB treatment if they were to be diagnosed with TB. The practices of professional nurses regarding TB were generally low (18.2%) in the areas of when to wear a mask, ventilation in the clinics and infection control.

The results are displayed graphically using bar graphs and tables. Recommendations to the NMBHD were made and also for nursing practice, education, and research. Ethical principles have been maintained throughout the study.

**KEY WORDS**: Tuberculosis, Knowledge, Attitudes, Practices, Professional nurses

## LIST OF ABBREVIATIONS

| | |
|---|---|
| **BCG** | Bacille Calmette Guerin vaccination |
| **CHW** | Community Health Worker |
| **DOT** | Direct Observed Therapy |
| **DR-TB** | Drug Resistance Tuberculosis |
| **DST** | Drug susceptibility Testing |
| **E** | Ethambutol |
| **FDC** | Fixed dose combination |
| **H** | Isoniazid |
| **HIV** | Human Immunodeficiency Virus |
| **IPT** | Isoniazid preventative therapy |
| **MDR-TB** | Multidrug Resistant Tuberculosis |
| **NGO** | Non-Governmental Organisation |
| **NMBHD** | Nelson Mandela Bay Health District |
| **PHC** | Primary Health Care |
| **R** | Rifampicin |
| **SANC** | South African Nursing Council |
| **TB** | Tuberculosis |
| **TST** | Tuberculin skin test |
| **WHO** | World health Organization |
| **XDR-TB** | Extensively Drug Resistant Tuberculosis |
| **Z** | Pyrazinamide |

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# CHAPTER ONE

# OVERVIEW OF THE STUDY

## 1.1. INTRODUCTION AND BACKGROUND

Tuberculosis (TB) is an infectious disease caused by an acid-fast bacillus, *Mycobacterium tuberculosis*. It is generally transmitted by the inhalation or ingestion of infected droplets and usually affects the lungs, although infection of multiple organ systems can occur (Mosby's Dictionary, 2009:1898). It is a curable disease that can be treated with a six-month course of antibiotics. Tuberculosis is an airborne disease which means it spreads from one person to another when a person with active TB coughs or sneezes, thus infecting those in the vicinity (WHO, 2015:1).

Tuberculosis as a disease of concern has been superseded by two main types of drug resistant TB, Multi Drug Resistant TB (MDR-TB) infection from 1990 onwards and extensively drug resistant TB (XDR-TB) infection in 2006 (Kanjee, Catterick, Moll, Amico & Friedland, 2011:336). A person with active TB disease has drug resistant TB (DR-TB) if the TB bacteria that the person is infected with, will not respond to, and are therefore resistant to, at least one of the main TB drugs (WHO: 2011, 3). DR-TB is insidious and progresses over weeks and months. As a result, patients often ignore the symptoms or accept them as symptoms related to daily stress, lack of sleep and from being overworked. DR-TB may also be associated with other serious disorders, such as HIV infection, alcoholism, renal failure, diabetes mellitus, cancer and drug abuse. The symptoms of DR-TB are the same as for normal TB (South African National Department of Health, 2013:33).

Multi drug resistant TB is defined as TB disease caused by a strain of *Mycobacterium tuberculosis* that is resistant, in vitro, to both Rifampicin and Isoniazid, with or without resistance to other drugs while extensively drug resistant TB refers to the resistance, in vitro, to Isoniazid and Rifampicin, any of the fluiquinolones and one or more of the second-line injectable drugs. MDR-TB is often suspected clinically when a patient has persistent positive smear microscopy or culture results, or when a patient fails to respond to treatment despite documented

good adherence (South African National Department of Health, 2013:65). Extensively drug resistant TB (XDR-TB) is a less common form of MDR TB in which TB bacteria have mutated enough to not only circumvent the two best antibiotics, Isoniazid (H) and Rifampicin (R) but additionally most of the alternative drugs used against MDR TB (Falzon, Mirzayev, Wares, Baena, Zignol, Linh, Weyer, Jaramillo, Floyd & Raviglione, 2015:157). Total drug resistant TB (DR-TB) is a TB strain that shows an in vitro resistance to all first-line and second-line drugs tested (Velayati, Farnia & Masjedi, 2013:233).

According to the World Health Organization (WHO) (WHO, 2015:5), TB is the second most common infectious cause of death and a global threat worldwide. In 2014, 9.6 million people were estimated to have TB and 1.5 million people died of the disease worldwide. WHO (2011:2) stated that TB is a major problem worldwide, which includes the development of MDR-TB. According to these authors, most cases of MDR-TB were found in China and India, followed by Russia with 9% (WHO,2011:2) India has a highest number of drug resistant TB patients as it is estimated that about 40% of the Indian population is infected with TB, partly due to poor disease management (WHO, 2011:3). Poor disease management in the context of the above authors refers to inadequate treatment, irregular drug supply, inappropriate regimens and poor patient compliance. Meanwhile China has the second largest TB epidemic (WHO, 11:3).

More than 40% of patients with TB in 2006 in China were discovered to have MDR-TB because they do not finish their course of treatment and they go back to the community and spread the resistant form of TB (WHO, 2011:2). In 2014, an estimated 480 000 new MDR-TB cases were reported worldwide, and an estimated 190 000 people died of MDR-TB (Falzon *et al.,* 2015:258).

South Africa is one of the African countries with the highest burden of TB with 1% of the population of about 50 000 000 who develop the TB disease each year. Out of the 500 000 cases in South Africa, it is estimated that about 330 000 (61%) people have TB while the remaining 170 000 are TB suspects (WHO, 2011:2). The first cases of XDR-TB were reported in 2006 in South Africa (WHO, 2011:2)

In the light of the high burden of TB in South Africa, healthcare workers (HCWs) in high TB prevalence areas are accidentally and unavoidably exposed to TB, due to

their constant interaction with patients with undiagnosed, untreated and potentially contagious TB in healthcare settings. In Kwazulu-Natal, South Africa, the incidence of TB among HCWs in public sector hospitals was higher than community-acquired TB (Bhebhe, Van Rooyen and Steinberg, 2014:599). Furthermore, professional nurses who are diabetic are at an increased risk of contracting TB because the risk of contracting TB is two to three times higher among people who have diabetes mellitus compared to people who do not have this condition (Ibrahim *et al.,* 2011: 4).

There are factors that have contributed to the rise of TB in Africa, including South Africa, such as poverty and rapid urbanization, the impact of Human Immunodeficiency Virus (HIV) and Acquired Immunodeficiency Syndrome (Aids) plus poor health infrastructure, poor infection control, poor TB programme management, including mismanagement of TB drug resistant cases (WHO, 2011:3) South African National Department Of Health, 2014:67). In response to the high burden of MDR-TB, the South African National Department of Health introduced a policy framework for decentralization of drug resistant TB care and treatment (South African National Department of Health, 2013:15).

According to this policy framework, there will be a number of decentralized DR-TB units in each of the nine provinces, depending on the need, but at least one unit per district will be required. Decentralized DR-TB units are units that are used to initiate treatment and monitor patients with MDR-TB (resistance to rifampicin and isoniazid) (South African National Department of Health, 2013:15).

These units may consist of whole hospitals, wards or sections of existing provincial, district or sub-district level hospitals. Patients diagnosed with MDR-TB who are smear microscopy positive will be hospitalized at the decentralized drug resistant TB units for up to eight weeks or until they become smear negative on two consecutive tests. These units will be responsible for the initiation and management of treatment of DR-TB patients in a defined geographical area, initially as in-patients but then, when appropriate, patients who are discharged (outpatients) can visit the unit on a daily basis to take their treatment. Most patients in South Africa with MDR-TB are co-infected with HIV and will need to commence treatment for both diseases in these decentralised drug resistant TB units (South African National Department

of Health, 2013:15). Once a patient's sputum smear microscopy is negative and they meet the criteria for outpatient treatment, they may receive treatment while living at home. Smear positive patients who refuse admission but are willing to receive medication should still be treated as outpatients (South African National Department of Health, 2013:15).

The primary health care clinics in the Nelson Mandela Bay are treating patients with MDR and they liaise with TB hospitals. The Department of Health's requirements for implementing the policy framework for decentralization of drug resistant TB were to train multi-disciplinary teams to have an adequate, effective mentorship and supervision, ensure there is a well-trained nurse, well ventilated rooms with Ultraviolet germicidal irradiation (UVGI) and extractor fans where possible (South African National Department of Health, 2013:15).

In 2011, due to the high numbers of drug resistant TB, the GeneXpert system was introduced in South Africa as a replacement for sputum smear microscopy for the diagnosis of pulmonary TB as well as drug resistant TB. GeneXpert uses a sputum sample and it gives TB results in less than 2 hours. It also detects the genetic mutations associated with resistance to the drug Rifampicin (R). However, microscopy culture and drug sensitivity are still required to monitor treatment progress and detect all other types of drug resistance (WHO, 2011:1).

The successful implementation of the TB policies and frameworks require sufficient knowledge, attitudes and practices regarding TB by health care workers, specifically professional nurses. However, in a study conducted by Ibrahim, Idris, Nguku, Waziri, Akhimien, Patrobas and Nsubuga (2011:3), it was found that TB treatment in Nigeria is affected by the poor knowledge of professional nurses on the disease and TB treatment protocols as well as the negative attitude of professional nurses towards patients with TB. The above authors showed that the ability of professional nurses to educate, counsel and even communicate with patients has a bearing on their knowledge of the disease and control strategies. The above authors also identified that the negative attitude of professional nurses towards TB patients was a key barrier to patients' adherence to treatment, their lack of knowledge on TB and its treatment, lack of communication skills by the professional nurses and their unfriendly attitude towards the patient.

A study conducted by Noe, Rafeala, Anselmo, Maixenchs, Sitole, Munguambe, Blanco, Le Souef and Gacia-Basteiro (2017:6) found that, in Southern Mozambique, professional nurses' knowledge regarding TB patient's characteristics, diagnosis and treatment were found to be poor. Seventy percent of the participants in the study agreed that there was a stigma associated with TB and a low practice competency of thirty-six per cent.

Similar findings were observed in a study done in KwaZulu-Natal by Naidoo, Esterhuizen, Nordstrom, Mohamed, Knight and Jinabhai (2011:4). This study discovered that the professional nurses' knowledge on TB management and programme monitoring before TB training and after the TB training were minimal. A further concern was that there is poor TB knowledge among the district managers.

## 1.2. PROBLEM STATEMENT

The researcher has worked as a professional nurse in a primary health care (PHC) clinic in the Nelson Mandela Bay Health District (NMBHD) for seven years. The researcher also worked in PHC during her community service year, specifically in the TB section of the clinic to which she was allocated. Due to a lack of supervision and assistance from the health care professionals at the clinic, the researcher worked almost exclusively with the community health worker (CHW). The CHW's are there to ensure that the patient with TB takes his or her prescribed medication.

When the researcher was moved to other speciality areas in the clinic, she noted that the patients with TB were not being treated by a professional nurse, only the CHW was assisting. The professional nurses indicated that they did not want to work in TB section of the clinic.

It is the opinion of the researcher, following observation, that some professional nurses appeared to lack knowledge about TB management. Many did not like wearing masks during patient care. Certain professional nurses expressed concern at being more at risk of contracting TB due to their pre-existing diseases such as asthma, diabetes and hepatitis B virus. It is a known fact that people with these diseases are more at risk of contracting TB (Centre for Disease Control and Prevention, 2016b:1). During this time the researcher noted that patients were sent home without treatment, due to the fact that the so-called "TB nurse" was not available. The researcher volunteered to return to the TB section of the clinic in

order to assist the patients. She also wondered if the practices noted at this clinic were isolated or uniform throughout the district.

Apparently the problems mentioned above are not limited to the clinic where the researcher worked. Whilst attending meetings at sub-district management level, plus meetings regarding TB treatment concerns with Non-governmental organisation (NGO's), similar issues were raised in relation to most of the clinics in the sub-district. Adequate knowledge and practice are required to ensure that professional nurses working with patients who have TB are able to ensure optimum treatment for this cadre of patients, particularly relating to minimising the risk of contracting TB when treating patients with TB.

Accordingly there appear to be gaps in terms of knowledge, attitudes and practices of professional nurses working with patients with TB in the sub-district in which the researcher is working. In response to these concerns, a research study is proposed to answer the question:

- What are the knowledge, attitudes and practices of professional nurses working with patients with TB in primary health care clinics in sub-district C, in the NMBHD?

## 1.3. THE PURPOSE OF THE STUDY

The purpose of the study was to determine the knowledge, attitudes and practices of professional nurses working with patients with TB in primary health care clinics in sub-district C, in the NMBHD and to provide recommendations to district management based on the results of the study.

## 1.4. OBJECTIVES OF THE STUDY

The objectives of this study were:

- To explore and describe the knowledge, attitudes and practices of professional nurses working with patients with TB in primary health care clinics in sub-district C, in the NMBHD.

## 1.5. CONCEPT CLARIFICATION

The theoretical meaning of the concepts needs to be clarified in order for other researchers to understand the context as related in this specific study (Polit & Beck, 2014:66). The concepts used in this study are defined and explained as applied throughout the study.

### 1.5.1. Attitude

Attitude is a predisposition or tendency to respond positively or negatively towards a certain idea, object, person or situation. Attitude influences an individual's choice of action and response to challenges (Oxford South African Concise Dictionary, 2010:647). In this study, attitude means the behaviour of professional nurses towards patients with TB.

### 1.5.2. Knowledge

Knowledge is the information and skills acquired through experience and or education (Oxford South African Concise Dictionary, 2010:647). Knowledge in this study is based on the information that professional nurses have about TB.

### 1.5.3. Practices

Practices can be described as the actual doing of something (Oxford South African Concise Dictionary, 2010:2230). In this study, practices relate to the professional nurses' way of showing their knowledge and skills in caring for patients with TB in primary health care clinics in Sub-district C in the NMBHD.

### 1.5.4. Professional nurse

The Nursing Act No. 33 of 2005 (2005:34) Section 30 defines a professional nurse as *"a person who is qualified and competent to independently practise comprehensive nursing in the manner and to the level prescribed and who is capable of assuming responsibility and accountability for such practice."* In this study, a professional nurse is a qualified nurse who is registered with the South African Nursing Council under the regulation R425 qualification, and has studied for the duration of four academic years at either a college for nursing or a university, and is working with patients in primary health care clinics in Sub-District C in the NMBHD.

## 1.6 RESEARCH DESIGN

A research design forms the blueprint of the study and determines the methodology used by the researcher to obtain sources of information, such as subjects, elements and units of analysis to collect and analyse the data, and to interpret the results (Brink, 2012:93). A quantitative, exploratory, descriptive and contextual survey was conducted among professional nurses working in primary health care clinics in sub-district C in the NMBHD to obtain the necessary data for the research. Chapter three will provide a more detailed description and application of this design to the study.

## 1.7 RESEARCH METHODOLOGY

The research method refers to the technique or the method used by the researcher to structure a study. The method outlines the scientific approach used to gather information, analyse data and describe findings related to the research question (Polit & Beck, 2014:16). The research method in this study includes the research population, sampling, data collection, pilot study, data analysis, reliability and validity which will be briefly described in this chapter. A more detailed description and application to the study will be outlined in Chapter Three.

### 1.7.1. Research population

A population is the entire group of people or objects that is of interest to the researcher, in other words, that meets the criteria which the researcher wanted to use or elements who meet the sampling criteria (Burns & Grove, 2011:290). The research population for this study included professional nurses in sub-district C in the Nelson Mandela Bay Health District. There are a total of 17 clinics with 154 professional nurses. Chapter three describes the details (see 3.1.).

### 1.7.2. Sampling

The sampling method or sampling plan defines the selection process, and the sample defines the selected group of people (Burns & Grove, 2011:290). A population may be studied using either a census or selecting a sample (Australian Bureau of statistics, 2013).

Consecutive sampling, a type of non-probability sampling, was used in this study. Consecutive sampling is a sampling technique in which every participant meeting the criteria of inclusion is selected until the required sample size is achieved. It seeks

to include all accessible participants as part of the sample. When consecutive sampling is used, it is important for a study period to be long enough to achieve a broad, generalizable sample of participants (Polit and Beck, 2014:296).

In this study, consecutive sampling technique was considered to be the best method because the study included all professional nurses that met the inclusion criteria and were working in sub district C, in the NMBHD, during the months of February to May 2017. The sample size (population that met the inclusion criteria) comprised of 130 professional nurses. Consecutive sampling is considered to be better than convenience sampling in controlling sampling bias (Polit and Beck, 2014:296).

### 1.7.3. Data collection

Data collection is the way of selecting subjects and gathering data from these subjects. The data collection is specific to each study depending on the research design and measuring methods (Grove, Burns & Gray, 2013:523).

### 1.7.4. Pilot study

A pilot study is a small study conducted prior to the main study on a limited number of subjects from the population of the study. It investigates the feasibility of the study that the researcher proposes and detects the possible flaws of data collection instruments (Brink, 2012:166). The pilot study was carried out in one primary health care clinic in sub-district C in the Nelson Mandela Bay Health District.

### 1.7.5. Data analysis

Quantitative data analysis is the numeric representation and manipulation of observations using statistical techniques for the express purpose of describing and explaining the outcomes of research as they pertain to the hypothesis (Boswell & Cannon, 2007:269). Data analysis is considered as one of the important steps in research, where the questions are answered. In a quantitative study, statistical analysis is used for analysing the data (Grove *et al.*, 2013:534). The completed questionnaires were prepared and organised by the researcher for descriptive analysis.

## 1.8. RELIABILITY AND VALIDITY

The concepts of reliability and validity will be defined here. Comprehensive descriptions and application of these concepts are included in Chapter Three of the study**.**

### 1.8.1. Reliability

Reliability is the ability of an instrument to measure the attributes of a concept consistently. A reliable measure is one that can produce the same results if the behaviour is measured on a sample from the same population (LoBiondo-Wood & Haber, 2010:146). Reliability was ensured in this study.

### 1.8.2. Validity

Validity is an indication of how sound the study is. It also applies to both the design and the methods of the research. Validity in a data collection means that your findings truly represent the phenomenon (LoBiondo-Wood & Haber, 2010:147).

The quality of the research study is of utmost importance or research findings may be rendered worthless. Reliability and validity are two tools that are crucial for any research study.

## 1.9. ETHICAL CONSIDERATIONS

Ethical considerations in research serve as a guide to the researcher on how to conduct the study. The Belmont Report and the Nuremberg Code contain ethical principles and 16 guidelines to guide and assist researchers while they are conducting research studies. According to Brink (2012:33), researchers are guided by three fundamental ethical principles, namely: respect for persons, beneficence and justice. Informed consent and ethical considerations such as autonomy, beneficence, non-maleficence, privacy, anonymity and confidentiality are comprehensively discussed in Chapter Three with specific reference to this study.

## 1.10. DISSEMINATION OF RESULTS

The research findings, both positive and negative, have to be disseminated. The dissemination of the results in a report form is not enough to ensure that the findings are shared and changes are implemented, therefore interpersonal contact with the stakeholders is advised. Implementing several forms of dissemination of the results

will ensure that the research adds value and benefits the community (Bowling, 2009:177-179).

The research results will be disseminated by means of:

- A written research report.
- Holding a workshop with the managers of primary health care clinics in the Nelson Mandela Bay Health District.
- Writing a report to the Department of Health Eastern Cape.
- Meeting with TB co-ordinators to discuss the research findings.
- A copy to be kept at the Nelson Mandela University library.

## 1.11. DELINEATION OF THE STUDY

This research study comprises five chapters. The first chapter ends here, the other chapters include:

**Chapter Two: Literature Review**

The literature review provides the detailed description of Tuberculosis.

**Chapter Three: Research Methodology**

The research design and methods of the study will be discussed in this chapter.

**Chapter Four: Data analysis and discussion of the findings**

Data will be collected via a questionnaire and data analysis will be presented and discussed in this chapter.

**Chapter Five: Conclusions, limitations and recommendations**

Summary and conclusions, limitations of the study as well as recommendations for nursing practice, education and research are provided.

## 1.12. CHAPTER SUMMARY

This chapter highlighted the introduction and background of the research, the problem statement, purpose and the research objectives. A concept clarification was also given. The researcher used this chapter to introduce the design and methods of the research that were used to collect the data and address the reliability and validity as well as the ethical considerations of the study. Further, the dissemination

of results and delineation of the study were provided. The researcher believed that this study was of the utmost importance in identifying the knowledge, attitudes and practices of professional nurses regarding the treatment, support and care of patients with TB in primary health care clinics in sub-district C, in the NMBHD.

# CHAPTER TWO
# LITERATURE REVIEW

## 2.1 INTRODUCTION

The previous chapter presented a brief overview of the study. This chapter outlines a literature review and provides a background to the study. Burns and Grove (2011:92) describe a literature review as an organised written presentation of what has been published on a topic by scholars and includes a presentation of research conducted in the selected field of study.

In this chapter, the main objectives are to discuss TB as the second most common infectious cause of death, including TB as a disease, global epidemiology of TB, DR-TB, active TB testing algorithm for TB suspects, standard treatment regimen, TB preventative therapy, strategy and global plan to end TB, TB in South Africa, TB in professional nurses as well as knowledge, attitudes and practices of professional nurses towards TB. Finally, a summary of the chapter will be provided.

## 2.2. TUBERCULOSIS AS A DISEASE

Tuberculosis (TB) is a bacterial infection that affects the lungs and can start in other parts of the body. Tuberculosis is an infection caused by *Mycobacterium tuberculosis*, these types of bacteria affect the body directing their effects to the lungs, but it can start affecting the brain, kidneys, abdomen, bones, joints, lymph nodes and spine (South African National Department of Health, 2014:11). All causes of TB are passed from person to person via droplets; when someone with a TB infection coughs, sneezes or talks, small droplets of saliva are expelled into the air and can be inhaled by another person. Then the bacteria are transmitted via the lymphatic system and blood stream to the organs. Tuberculosis disease may cause signs and symptoms such as bad cough, chest pain, coughing up blood, fatigue, weight loss, loss of appetite, chills, fever and drenching night sweats. Although latent TB is possible, the bacteria are inactive in this form and the person is not contagious. It is therefore the active TB that is referred to as TB within this study (WHO, 2015:55). Different types of TB exist and are outlined in Table 2.1.

**Table 2.1: Types and symptoms of Tuberculosis (adapted from: South African National Department of Health, 2014:67).**

| TYPES | DESCRIPTION | FEATURES |
|---|---|---|
| **Extra-pulmonary TB** | Extra-pulmonary TB refers to TB involving organs other than the lungs. | It can present with non-specific symptoms such as unintentional weight loss (more than 1.5 kg in a month), night sweats and fever for more than 2 weeks. Other symptoms depend on the site and organ affected. |
| **TB lymphadenopathy** | It is an inflammation of lymph nodes. Patient may detect painless swollen lymph nodes in their neck, armpits as well as groin. | Large mediastinal lymph nodes can compress the airways leading to an audible wheeze or typical brassy cough. |
| **Miliary TB** | Miliary TB is a form of TB that is characterized by a wide dissemination into the human body and by the tiny size of the lesions (1-5mm). | The patient presents with a general deterioration in health and constitutional symptoms such as high fever, night sweats, weight loss and shortness of breath. |
| **TB of the spine** | TB of spine can affect any bone but most commonly affects the vertebral column. | Features include back pain, stiff back, reluctance to bend the back |
| **TB empyema** | This usually arises when a tuberculous cavity in the lung ruptures into the pleural space. | The physical signs are similar to a pleural effusion, but aspiration reveals thick pus. |
| **TB peritoneal effusion** | Peritoneal TB is the commonest type of abdominal TB, and includes the involvement of the gastro-intestinal tract and peritoneum. | Signs include: tachycardia, low blood pressure, pulsus paradoxus (fall in systolic pressure >10mHg on inspiration), raised jugular venous pressure, impalpable apex beat, distant heart sounds and a pericardial friction rub. |
| **Pleural effusion (usually single-sided)** | It is a build-up of fluid in the pleural space, an area between the layers of the tissue that line the lungs and chest cavity | Presentation is most often acute with a non-productive cough, chest pain, shortness of breath and high temperature |

The following are conditions associated with a higher risk of contracting TB (South African National Department of Health, 2015b:17):

- People with HIV: 50-60% of HIV positive people infected with TB will go on to develop active disease. The annual risk of TB in an HIV positive person is 10% (from recent infection and reactivation of latent TB) compared to a lifetime risk of 10% in a healthy individual. HIV positivity also increases the rate of relapse and re-infection as well as the proportion of smear-negative TB. This can cause delayed diagnosis and initiation of treatment resulting in poor treatment outcomes.
- People suffering from Diabetes Mellitus: the prevalence of TB is higher amongst persons with diabetes mellitus - the weak immune system associated with diabetes mellitus trebles the risk of developing TB amongst diabetics compared to the general population. Tuberculosis and other infections also complicate the management of blood sugar levels in diabetics.
- People who abuse alcohol and substances: high alcohol intake is associated with a three-fold risk of developing TB. Alcohol has a direct toxic effect on the immune system and the physical effects of alcohol abuse may impair the immune system. Excessive alcohol use is also associated with poor TB treatment adherence and a higher relapse rate.
- People who are malnourished or have silicosis: exposure to silica dust is a risk factor for the development of pulmonary tuberculosis.
- Certain workplace settings: Workplaces with a large migrant workforce, such as mining companies and environments such as health centres and hospitals that treat patients with the disease pose an increased risk of exposure to TB.

## 2.3. GLOBAL EPIDEMIOLOGY OF TUBERCULOSIS

In 2015, it was estimated that 1.8 million people died from TB across the globe, including 0.4 million among people with HIV (WHO, 2015:2). This means that TB is killing more people than Malaria or HIV. An estimated 480 000 people developed MDR-TB, and the report highlighted the need for the countries to move faster to prevent, detect and treat the disease if they are to meet their global target plan to end TB in 2016-2020 (WHO, 2015:4).

The WHO reported that the global TB burden is actually higher than it was previously estimated. In 2015, it was estimated that there were 10.5 million new TB cases worldwide. Six countries, namely India, Indonesia, China, Nigeria, Pakistan and South Africa, accounted for 60% of the global TB burden, with India alone accounting for 27% of the global case load. India continues to rank as the highest, with 2.8 million of the 10.4 million new TB cases globally that occurred in 2015, whereas China had 0.9 million TB cases in 2015. Unlike India, TB is no longer a major killer in China (WHO, 2015:20).

Tubercular disease is present in all regions of the world with a quarter of the estimated 9 million people who developed TB in 2013 living in the African region. Africa, specifically sub-Saharan Africa faces the worst TB epidemic. South Africa ranks as the sixth highest in generating new cases of TB worldwide and among the 22 highest TB burdened countries that contribute about 80% of the global cases of TB (Naidoo, Simbayi, Labadarios, Ntsepe, Bikitsha, Khan, Sewpaul, Moyo & Rehle, 2016:2).

## 2.4 DRUG RESISTANT TUBERCULOSIS (DR-TB)

Drug resistant TB (DR-TB) is defined as a disease caused by *mycobacterium tuberculosis* strains resistant to one or more anti-TB drugs e.g. MDR-TB, XDR-TB and TDR-TB. Multi-drug resistant TB (MDR-TB) is defined as TB disease caused by a strain of *Mycobacterium tuberculosis* that is resistant, in vitro, to both Rifampicin and Isoniazid, with or without resistance to other drugs, while extensively drug resistant TB (XDR-TB) refers to the resistance, in vitro, to Isoniazid and Rifampicin, any of the fluiquinolones and one or more of the second line injectable drugs (South African National Department of Health, 2013). Totally drug resistant TB (TDR-TB) is a TB strain that showed in vitro resistance to all first line and second line drugs tested. As a result, this form of the disease is more difficult to treat than ordinary TB and requires up to 2 years of multidrug treatment (Velayati, Farnia & Masjedi, 2013: 308).

## 2.5. ACTIVE TUBERCULOSIS TESTING ALGORITHM FOR TUBERCULOSIS SUSPECTS

According to the South African National Department of Health (2014:21), the standard testing algorithm for active TB includes the following:

- ✓ Sputum smear microscopy and Mycobacterial culture and phenotypic drug susceptibility testing (DST).
- ✓ Chest radiography
- ✓ Tuberculin Skin Test

These tests are described in the following paragraphs.

### 2.5.1. Sputum smear microscopy and Mycobacterial culture and phenotypic DST

In 2011, South Africa adopted the GeneXpert system for the diagnosis of drug resistant TB. This system uses a sputum sample and gives the results within two (2) hours after testing and detects the genetic mutations associated with resistance to the drug Rifampicin. However, microscopy cultures and drug sensitivity are still required to monitor treatment progress and to detect all other types of DR-TB (WHO, 2011:1).

### 2.5.2. Chest radiography

Chest radiography is an integral part of the TB diagnostic algorithm but is not specific for the diagnosis of pulmonary TB. A chest x-ray cannot provide a conclusive diagnosis on its own and should follow a microbiological test for TB disease. However, it is important to be aware that chest radiography has substantial limitations in the diagnosis of pulmonary TB (South African National Department of Health, 2014:22). The presence of infiltrates, lymph nodes or cavities is highly suggestive of TB. Chest x-rays are used in patients who cannot produce sputum for the Genexpert test or who have negative GeneXpert results and are HIV positive and where extra-pulmonary TB such as pleural effusion or miliary TB are suspected ( South African National Department of Health, 2015b:10).

### 2.5.3. Tuberculin Skin Test (TST)

The South African National Department of Health (2014:22) states that a skin test has limited value, especially where TB is common. The test shows hypersensitivity to protein of the bacillus as a result of either infection with *Mycobacterium tuberculosis* or induced by Bacille Calmette Guerin (BCG) vaccination. Skin test is one of the criteria used in the diagnosis of TB in children.

## 2.6 STANDARD TREATMENT REGIMEN

South African National Department of Health (2015b:11) states that early initiation of treatment by prescribing the correct dose in a specific time reduces patient morbidity and mortality as well as the spread of the disease. The main aim of TB treatment is as follows:

- Cure the TB patient
- Decrease the TB transmission to others
- Prevent DR-TB
- Prevent relapse
- Prevent TB deaths and complications, such as MDR-TB.

The standard TB treatment regimen has an intensive phase of two months and a continuation phase of four months. Intensive phase drugs (such as Isoniazid, Rifampicin, Pyrazinamide and Ethambutol i.e. in a fixed dose combination (FDC). kill the tubercle bacilli. In the continuation phase, two drugs (Isoniazid and Rifampicin) are used over a period of 4 months. The four drugs in the intensive phase convert infectious patients to less infectious, and approximately 10-14 days after starting the treatment the symptoms decrease. In addition, the last two drugs on continuation phase eliminate the remaining bacilli and prevent subsequent relapse (South African National Department of Health, 2015b:12).

Regimen 1 (New cases) for adults and children older than 8 years is summarised in Table 2.2 on the following page.

**Table. 2.2: Standardised treatment protocol with a FDC** (adapted from: South African National Department of Health, 2014:36).

**Drug doses, RHZE (R=150, H=75, Z400, E=275)**

| **Pre-treatment body weight** | **Intensive phase** | **Continuation phase** | **Continuation phase** |
|---|---|---|---|
| **Regimen 1** | **RHZE (150,75,400,275)** | **RH (150,75)** | **RH (300,150)** |
| **30- 37 kg** | **2 tablets** | **2 tablets** | |
| **38- 54 kg** | **3 tablets** | **3 tablets** | |
| **55- 70 kg** | **4 tablets** | | **2 tablets** |
| **70 kg and above** | **5 tablets** | | **2 tablets** |

**R- Rifampicin, H- Isoniazid, Z- pyrazinamide, E- Ethambutol**

## 2.7 TUBERCULOSIS PREVENTATIVE THERAPY

Latent TB refers to individuals infected by *Mycobacterium tuberculosis* but harbouring the organism in a latent state, followed by a slow replication to produce illness. The use of Isoniazid in HIV positive people is part of the TB prevention strategy to prevent the risk of TB and contribute to TB control (WHO, 2011:8). In a study done in South Africa amongst Tuberculin skin test (TST) positive infected adults, the incidence rate of TB or death were similar to those who received 6 months of Isoniazid preventive therapy (IPT) while there was no incidence cases among those who took 36 months Isoniazid preventive therapy, although the incidence of TB and death was reduced by 58%, meaning that all HIV patients should be put on INH to prevent TB (Golub, Pronyk, Mohapi, Thsabang, Moshabela, Struthers, Gray, Mclntyre, Chaisson & Martinson, 2009:635).

## 2.8 STRATEGY AND GLOBAL PLAN TO END TUBERCULOSIS

In 2014 the World Health Assembly adopted the WHO's "Global strategy and targets for tuberculosis prevention, care and control after 2015". It is a 20 year strategy

aiming to end the global TB epidemic, called the “End TB Strategy” as well as a Global Plan to end TB. The target in this strategy to end TB is defined as an incidence rate of TB of less than 10 people per 100 000 population per year. The main target in the strategy is to reduce TB deaths by 95%, to cut new cases of TB by 95% between 2015 and 2035 and also to ensure that no family is burdened with catastrophic expenses due to TB (WHO, 2015:1).

The Global Plan (2016-2020) is produced by the “Stop TB partnership” that was established in 1998. Its aim is to realize the goal of eliminating TB as a public health problem and, ultimately, to obtain a world free of TB. Stop TB comprises a network of international organisations, countries, donors from the public and private sectors, governmental and non-governmental organisations and individuals who have expressed an interest in working together to achieve this goal. The “Stop TB partnership” set out the actions and resources that will be needed for the next five years to end the global TB epidemic by 2030 (WHO, 2015:1).

Three global targets were set and it was estimated that if these targets are achieved by 2025 then the goal to end TB will be met. The Global Plan therefore recommends that the targets should be achieved by 2020 or, at the latest, 2025. The Global Plan to stop TB started in 2001-2005. However, there have been three or more global plans that have failed to reach and treat enough TB patients to make a success of the plan. The question is, ‘what is going to change and why this Global plan is going to be any different?’ The answer is that more people may be treated successfully because shorter treatment plans and TB tests are being developed that are easier to adhere to. All these global endeavours will help to prevent people from dying of TB (WHO, 2015:1).

## 2.9 TUBERCULOSIS IN SOUTH AFRICA

South Africa, like many Sub-Saharan African countries, has witnessed an increase in TB cases over the past decade, largely attributable to co-infection with HIV. Tuberculosis is a high burden disease in South Africa and due to its easy transmission route and increased burden of DR-TB, it poses a threat to the population as well as to the professional nurses working with TB patients in a primary healthcare clinic/hospital. Tuberculosis control programmes have

recognised the significance of providing information, education and communication aimed at improving the knowledge about TB and influencing change in health care seeking behaviour among TB patients and the public (Naidoo *et al*., 2016:2). South Africa adopted the “Stop TB plan” in 2015 to guide TB control activities towards meeting the WHO’s targets by the end of 2035. The plan entails an ambitious drive to diagnose and successfully treat at least 90% of all notified TB cases (Heunis, Kigozi, Heinus, Chikobvu, Botha & van Rensburg, 2017:96).

In early 2015 South Africa launched a large-scale TB campaign; in 2016 the second phase of the campaign focused on the big cities, which accounts for 40% of the TB burden. In 2017, the final stage focused on provinces with a high TB burden, namely the Eastern Cape, Gauteng, Kwa-Zulu Natal and the Western Cape provinces. Presently the Eastern Cape, Kwa-Zulu Natal and the Western Cape have the highest incidence rate in the country. In the Eastern Cape, it has been shown that the Nelson Mandela Bay is one of the districts with a high incidence of TB with 938 new cases per 100 000 population and a cure rate of 72.2 in 2014 (Massyn, Peer, English, Padarath, Barron & Day, 2015/2016:181).

Engelbrecht, van Rensburg, Kigozi and van Rensburg (2016:3) argue that the dual burden of TB and HIV also severely impacts South African health care workers, with occupational exposure to TB being a major risk as the health care workers acquire TB more often than the general population. For example, an estimation of 81% of TB cases amongst health care workers are attributable to occupational exposure in health care facilities such as primary health care clinics and hospitals (Bhebhe, Van Rooyen & Steinberg, 2014:5). International and national policies recommend several simple and effective infection control measures aimed at reducing TB in health care facilities. The health care workers in South Africa, however, fail to implement appropriate infection control measures and a further concern is the inadequate provision of tissues and masks to coughing patients as a first line of defence in health facilities to prevent other patients and the health care workers being exposed to TB (Engelbrecht *et al.*, 2016:6).

## 2.10 TUBERCULOSIS IN PROFESSIONAL NURSES

A study done by the University of Stellenbosch on the knowledge, attitudes and practices regarding TB infection control among health science students in a TB endemic setting stated that there is a high rate of occupational TB disease reported in South Africa. Health care workers, including professional nurses, in South Africa are three times more likely to develop drug sensitive TB and six times more likely to contract drug resistant TB than the general population (van der Westhuizen, Kotze, Narotam, von Delft, Willems & Dramowski, 2015:2).

Kanjee *et al.,* (2011:335) revealed that 82% of workers reported reluctance to work in high risk areas as several staff members had died of confirmed MDR and XDR TB. In terms of actual practices, almost 70% reported that doors and windows were always open. However direct observations showed large discrepancies between departments with regards to this practice, with 35.5% of windows open in one department versus 99% in others. In another public TB specialised institution in Kwazulu Natal, 5.2% of patients who were admitted with Multi-Drug Resistant TB strains (MDR) and Extensive Drug Resistant TB strains (XDR) were healthcare workers (O'Donnell, Jarand & Loveday, 2010:519).

Kanjee *et al.,* (2011) and Bhebhe *et al.,* (2014) revealed that considerable work needs to be done to train and educate healthcare workers about the dangers of contracting tuberculosis in the workplace. This includes, but is not limited to, infection control with the aim of improving workers' knowledge, attitudes and practices regarding occupational exposure to TB.

## 2.11 KNOWLEDGE, ATTITUDES AND PRACTICES OF PROFESSIONAL NURSES TOWARDS PATIENTS WITH TUBERCULOSIS

A survey on knowledge and practices regarding pulmonary TB among private practitioners in India has shown that there were knowledge and practice gaps regarding the diagnosis and the management of TB among private practitioners (Basu, Sinha, Das, Roy, Biswas & Chattopadhyay, 2013: 407). For example, incomplete or inadequate treatment along with improper drug regimen was a common cause of drug resistance. All the above issues are vitally important aspects concerning the treatment of tuberculosis. Slightly above half (66.7%) of the private practitioners managed to name the recommended first line anti-TB drugs, while only

6.7% of the private practitioners knew the correct treatment regimens for each category. In suspected cases of TB, sputum examination was advised by 51.6% of the private practitioners as the primary tool of diagnosis. The appropriate prescription of TB drugs is the crucial part when treating TB (Basu *et al.,* 2013: 408).

In 2009, the Maluti Adventist rural district hospital in Lesotho had seven health care workers diagnosed with TB. The knowledge levels were high after the study was done apart from the knowledge regarding sputum collection. Eighty-nine percent (89%) or n= 116 out of 140 participants reported satisfactory knowledge on TB transmission, predisposing factors, prevention, diagnosis and treatment, meanwhile the majority (93.0%) of the staff reported positive attitudes towards TB while 36.4% reported inappropriate practices, for example poor administration of infection control practices (Bhebhe et, Van Rooyen & Steinberg, 2014:601).

Half of the 127 primary health care clinics in three (3) districts in South Africa did not have infection control committees and the majority of these clinics did not have a TB signs and symptoms screening tool (Engelbrecht *et al.*, 2016:10). Ten clinics had open windows, with a shortage of N95 mask respirators and surgical masks. The Centre for Disease Control (CDC) states that respirators protect health care workers and others from inhaled droplet nuclei while surgical masks reduce the number of droplets being exhaled into the air by person with infectious TB disease. Therefore, health care workers, including professional nurses, should wear N95 mask respirators while patients who are suspected of TB should wear masks (Engelbrecht *et al.*, 2016:10).

Akin, Gorak, Unsar, Mollaoglu, Ozdilli and Durna (2011:778) argue that the nursing and midwifery students in Turkey showed an insufficient knowledge especially regarding TB drugs and TB vaccination. The majority of students (79.3%) had a negative attitude as most students reported that they would hide the information should a family member be diagnosed with TB.

A study conducted by Noe, Riberio, Anselmo, Maixenchs, Sitole, Munguambe, Blanco, Le Souef and Garcia- Basteiro (2017:3) among health care workers in the South of Mozambique showed poor knowledge by 57.3% of the health care workers regarding a TB patient's characteristics, diagnosis and treatment. There was disagreement on attitudes regarding stigma and traditional medicine as well as

practice competencies which were poor as they obtained a score of 35.6%. About one third of health care workers in the study believed their actions did stigmatise TB patients, mentioning their use of personal protective equipment to perpetuate the stigma.

Knowledge and attitudes regarding tuberculosis were positive in most areas in the study done on hospital staff in rural areas of South Africa. Measures of TB infection control practice were consistent with good natural ventilation but inconsistent in terms of the use of respirators by staff (Kanjee *et al.,* 2011:336). In a study done in the Free State among hospital health care workers, knowledge scores were high with positive attitudes of 80.4% among the respondents, although the majority (74%) of the respondents were afraid to acquire TB at work. Their practices in TB scored generally high (72.9%), with observations revealing that the facility had open windows in all consulting rooms. The study addressed the gap by describing practices in primary health care facilities as the main entry point for TB patient care as the research mainly focused on the hospital setting (Engelbrecht *et al.*, 2016:8).

## 2.12 CHAPTER SUMMARY

Tuberculosis is the most common infectious disease in the world today and the burden of TB is high, including in South Africa. Generally, HIV increases the risk of active TB disease. Professional nurses are expected to teach people about the disease and its prevention, however knowledge, attitudes and practices among professional nurses seem to sometimes be lacking. Therefore, this study on knowledge, attitudes and practices of professional nurses working with patients with TB in primary health care clinics is necessary.

The next chapter will explain the method of the study including the research design, methods, and their reliability and validity. Ethical considerations of this study will also be described.

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.1 INTRODUCTION

Chapter Two focused on the discussion of literature reviewed for this study. This chapter will focus on describing the research design and methods used in this study. The research design and method is developed prior to commencing a study as it provides the framework within which the entire study is conducted.

## 3.2 OBJECTIVES OF THE STUDY

This research study has one objective, which is the following:

- To explore and describe the knowledge, attitudes and practices of professional nurses working with patients with TB in primary health care clinics in sub-district C, in the NMBHD.

## 3.3 RESEARCH METHODOLOGY

Research methodology refers to the principles and ideas on which researchers base their procedures and strategies (Holloway & Wheeler, 2010:4). The research methodology should include sufficient details to enable another researcher to replicate the investigation (Brink, 2012:199).

### 3.3.1 Research design

Brink (2012:96) defines a research design as a set of logical steps that the researcher uses to answer the research question. To maximise the validity of the research findings there is one research design considered to be most appropriate for every research question (Brink, 2012:96). Answering questions such as what do you want to study, how are you going to conduct the study, what procedures are you going to follow, what should and what should not be done are core elements of the research design (Kumar, 2014:122).

A research design also provides the researcher with a map guiding him/her during the research journey. It guides the researcher in the planning and implementation

of the study and forms an essential tool on which the credibility of the study depends (Kumar, 2014:122). A quantitative, exploratory, descriptive and contextual research design was used to conduct this study.

#### 3.3.1.1 Quantitative research design

Quantitative study designs are well structured, specific and have been tested for validity and reliability (Kumar, 2014:132). A quantitative research design is a means of testing objective theories by examining the relationship among variables, and these variables are measured using instruments that support statistical analysis (Creswell, 2009:4).

According to Holloway & Wheeler (2010:6) quantitative research attempts to increase objectivity, replicability, and generalising of findings, and are typically interested in prediction. Quantitative methods are frequently described as deductive in nature, in the sense that inferences from tests of statistical hypotheses lead to general inferences about characteristics of a population. Brink (2012:11) further describes quantitative research as being focused on a relatively small number of concepts that begins with preconceived ideas and how these concepts are interrelated. Quantitative research therefore focuses on gathering numerical data and generalising it across groups of people.

In this study, the researcher utilised a quantitative design to explore and describe the knowledge, attitudes and practises of professional nurses working with patients with TB as the appropriate design to answer the research question.

#### 3.3.1.2 Exploratory research design

Neuman (2011:38) describes exploratory research as research into a new topic, with the aim to develop a general understanding and refine ideas for future research. Kumar (2014:11) further describes exploratory research as undertaking a study with the objective of either exploring an area where little is known about the research topic, or of investigating the possibilities of conducting a particular study.

Exploratory research does not suggest a research topic but instead it improves the understanding of the problem and also the factors surrounding the problem, it also isolates the component of the problem that the researcher desires to study. The reason for the researcher doing exploratory research is to find understanding about

a topic and also to find which factors influence, affect, cause or relate to this topic. Also it helps the researcher to separate the components of the research problem that should be studied. Neuman (2011:38) states that exploratory research only adds focus to the study and rarely yields definite answers.

In this study, exploratory research is used to explore the knowledge, attitudes and practices of professional nurses working with patients with TB in primary health care clinics in sub-district C in the NMBHD. Generally, there is little information available on the knowledge, attitudes and practices of professional nurses working with TB patients in the Eastern Cape. Therefore, the researcher aims to look for new insight into this phenomenon by collecting data from the participants through questionnaires.

#### 3.3.1.3 Descriptive research design

The goal of descriptive research is to present a picture of the specific details of a situation (Neuman, 2011:38). Descriptive research examines a situation as it presents itself but does not involve changing or modifying the situation under investigation, nor does it intend to determine the relationship between the cause and effect of the situation.

Descriptive research is used in this study to describe the knowledge, attitudes and practices of professional nurses working with patients with TB in primary health care clinics in sub-district C in the NMBHD.

#### 3.3.1.4 Contextual research design

A survey is a data collection method used by the researcher to observe or measure the key variables in the research problem. This becomes part of the research design because it encompasses the specific strategies that will be used to get a response from the respondent (Anon. b., 2014).

According to Mouton (2012:133), contextual strategy is encountered where the focus of a study is on a specific event and the aim is to investigate a single case in an in-depth manner. In a contextual strategy, a phenomenon is studied because of its intrinsic and immediate contextual significance. Brink (2012:64) also states that in a contextual study the results and conclusions of the study are valid only in the context in which the research was performed.

The study was conducted within the context of selected clinics in the Nelson Mandela Bay Health District. The study was thus conducted in an environment that was familiar to the participants. The environment was neither changed nor manipulated in any way during the data collection process.

### 3.3.2 Research methods

A research method is the structure or procedure used by the researcher to gather and analyse data relevant to the research question. This section encompasses the description of the research population, sampling methods and techniques, data collection, data analysis as well as the strategies that will ensure validity and reliability of the research study.

#### 3.3.2.1 Research Population

The research population refers to the set of elements the researcher focuses on, and to which the results of the study can be generalised (Burns & Grove, 2011:290). Mouton (2012:134) further describes a population as a collection of objects, events or individuals having some common characteristic that the researcher is interested in studying. Therefore, the population is composed of all those individuals or objects that the researcher could potentially take measurements from (Scott & Mazhindu, 2014:13).

The population for this research study included all practising professional nurses in primary health care clinics in sub district C in the NMBHD who have completed a four year diploma or degree in nursing. There are three sub district in the NMBHD, sub districts A, B and C. In sub district C there are a total of 17 clinics with 154 professional nurses in sub district C, see table 3.1 below:

**Table 3.1: Numbers of professional nurses per primary health care clinic in sub-district C**

| SUB-DISTRICT C PRIMARY HEALTH CARE CLINICS (n=17) | NO. OF PROFESSIONAL NURSES (n=154) |
|---|---|
| Clinic A | 9 |
| Clinic B | 8 |
| Clinic C | 13 |
| Clinic D | 4 |
| Clinic E | 17 |
| Clinic F | 5 |
| Clinic G | 5 |
| Clinic H | 11 |
| Clinic I | 3 |
| Clinic J | 21 |
| Clinic K | 4 |
| Clinic L | 6 |
| Clinic M | 5 |
| Clinic N | 12 |
| Clinic O | 3 |
| Clinic P | 10(pilot study) |
| Clinic Q | 15 |

### 3.3.2.2 Sampling Methods

Burns and Grove (2011:721) refer to a sample as a sub-set of the population selected for a study. Sampling methods refer to the process of selecting a group of people, events or other elements that are representative of the population being studied.

In this study, the sample includes all professional nurses who meet the inclusion criteria, due to the decision to focus on one sub district in NMBHD. The decision to focus on one sub district was made based on constraints of time and resources as well as the scope of the degree which is a partial fulfilment of the requirements for the degree of Master of Nursing (Advanced Primary Health Care). When a sample includes the entire accessible population it is known as a census (Sim & Wright, 2002:112).

All professional nurses that met the above criteria and agreed to participate voluntarily in this research study were therefore included.

***Sampling***

Non-probability sampling, which was more feasible for the researcher was used in this study. When a non-probability sample is carefully chosen to reflect the target population, through the use of inclusion criteria and an adequate sample size, representativeness can be achieved (LoBiondo-Wood & Haber, 2010:226). Consecutive sampling, a type of non-probability sampling, was used in this study. This sampling type involves recruiting all of the people from an accessible population who meet the eligible criteria over a specific time interval or for a specific sample size (Polit and Beck, 2014:296).

In this study, the consecutive sampling technique was considered the best method to use because all professional nurses that met the inclusion criteria and work in sub district C, in the NMBHD during the month of February to May 2017 were to be included in the study. The researcher informed participants about the study and those who consent to be in the study were evaluated for eligibility if they meet the inclusion criteria and they were recruited for the study to avoid bias. Professional nurses that met the inclusion criteria and signed consent numbered 130 in total.

The inclusion criteria that was used in this study was simply that professional nurses who had at least one year working experience in primary health care clinics would be eligible to participate.

A list of clinics in the Nelson Mandela Bay Health District was obtained from the Department of Health. There are a total number of 67 clinics in the Nelson Mandela Bay Health District. The researcher used all the clinics in sub-district C in NMBHD. There are 17 clinics (see Table 3.1) in this sub district.

The NMBHD management office was approached for a list of all professional nurses working in the 17 clinics mentioned in Table 3.1 because the population size was limited, and in consultation with the statistician, the entire population was used as per the census method, described previously (Australian Bureau of Statistics, 2013).

### 3.3.3 Data Collection Instrument

According to Burns and Grove (2011:293), data collection instruments vary with each study and depend on the research design. Brink (2012:147) defines a questionnaire as a quick way of obtaining data from a large number of people, whilst Botma *et al.,* and colleagues (2010:131) define data collection as the gathering of information or facts collected during a research study.

Brink (2012:153) further states that questionnaires provide a quick way to obtain data from a large group of people. Questionnaires are cost efficient and are the easiest research instrument to test for validity and reliability (Brink, 2012:153).

Kumar (2014:183) identified two types of questions commonly used in social research. These are referred to as open-ended and closed-ended questions. In open-ended questions the participants can write down the response in his/her own words. Open ended questions also allow the participants to express themselves more freely. Brink (2012:155) further states that open- ended questions are not based on preconceived answers and are therefore more appropriate for qualitative studies. Although these questions may be easier to construct, they take longer to answer and are more difficult to code and analyse (Brink, 2012:155).

Closed-ended questions on the other hand have several advantages over open-ended questions. In closed-ended questions the answers are set out and the participants are expected to tick or select the most appropriate response. Closed-

ended questions allow the researcher to obtain the information needed and are easier to code and analyse (Kumar, 2014:183). In this study the researcher used closed-ended questions.

A structured self-administered questionnaire (appendix A) was the choice of data collection method as the researcher aimed to determine the knowledge, attitudes and practices of professional nurses working with patients with TB in primary health care clinics in sub-district C, in the NMBHD.

The questionnaire was in English and was divided into four sections, with the aim of determining the knowledge, attitudes and practices of professional nurses working with TB patients in the NMBHD. The outline of the questionnaire was as follows:

- Section A: Demographic data Profile
- Section B: Knowledge levels of professional nurses working with patients with TB.
- Section C: Attitudes of professional nurses working with patients with TB.
- Section D: Practices of professional nurses working with patients with TB.

### 3.3.4 Data Collection Method

The process of data collection includes acquiring participants and collecting the data needed for the study. After obtaining ethical clearance from the Nelson Mandela University (Ethics no. H16-HEA-NUR-033) (Appendix F) and the Eastern Cape Department of Health (Reference no, EC_2016RP88_873) (Appendix G), the researcher obtained permission from the District Manager of the NMBHD (Appendix H), as well as the Clinic managers of the primary health care clinics in Sub-district C by handing them letters requesting permission to conduct research as well as a participant letter (Appendix B) prior to conducting the study.

After permission was obtained, a telephonic meeting was held with the clinic managers in which the purpose of the study was explained; the researcher arranged a suitable date and time with each clinic manager per primary health care clinic to collect the data.

The researcher was the primary data collector. Participating professional nurses were asked to sign a consent form (Appendix C) prior to completion of the questionnaires. The researcher explained the purpose and objective of the study to

the professional nurses before distributing the questionnaires. The researcher was available for participants in case assistance was required during questionnaire completion. She sat in the clinic manager's office for the duration of the data collection per clinic, so she was available but not in the presence of the participants.

After completing the questionnaire, the participants were asked to hand in the completed questionnaires to the researcher in the manager's office. None of the professional nurses took the questionnaires home. The actual data collection process took place over a period of four months because the researcher had to go to all 17 clinics in order to obtain the requisite data.

### 3.3.5 Data Analysis

It is impractical to list each piece of collected data individually. The researcher therefore needed to find ways or methods to explore and organise raw data as well as to analyse and interpret the data in order to gather meaning from it. Data analysis is described by Brink (2012:170) as a method of organising raw data and displaying them in a fashion that will provide answers to research questions. It describes data in meaningful terms and includes categorising, ordering, manipulating and summarising data.

Kumar (2014:294) listed the following steps involved in processing quantitative data:

- Editing: This is the first step involved in processing the data to ensure that the data are clean and free from inconsistencies. It involves scrutinising the questionnaire for errors, gaps or incompleteness. Data can be edited in two ways. The researcher can examine all the answers to the same variable at a time, or examine all the responses given to all the questions by one respondent at a time. The latter provides a complete picture of the responses and assists the researcher to assess internal consistencies (Kumar, 2014:296). The researcher was responsible for editing the questionnaires.
- Coding: Once the data has been cleaned, the next step is to code the data. Coding of data is aimed at transforming the information into numerical values to facilitate easy analysis. In this study coding of data was performed by the researcher.
- The statistician transferred the encoded data onto a spread sheet in order to perform the statistical analysis.

Brink (2012:178) states that statistics are the most powerful tool to analyse quantitative data and that without statistics this data would merely be a chaotic mass of numbers. Kumar (2014:348) asserts the following core functions of statistics:

- Statistics plays an important role in describing data in a meaningful way;
- Statistics are further used by the researcher to determine whether there is a relationship between variables; and finally
- Statistics allows the researcher to quantify the magnitude of the relationship (Kumar, 2014:348).

Descriptive statistics are used to summarise and describe data in order to give the reader a visual presentation of data. Averages and percentages are examples of descriptive statistics (Burns & Grove, 2009:470). With the assistance of the statistician, the analysed data were displayed in the form of tables and graphs.

In this study the researcher, with the assistance of the statistician, used descriptive statistics to analyse and describe the data. Data analysis software programme Statistica Version 11 was used to analyse the data.

### 3.3.6 Pilot Study

In order for any research study to be successful, the researcher must have a thorough knowledge of the topic under investigation. The purpose of the pilot study was to evaluate whether the participants understood the questions, as well as to assess the validity and the reliability of the questionnaire in the context of the main study. Brink (2012:166) describes a pilot study as a preliminary study conducted by the researcher using a limited number of subjects to investigate the feasibility of the proposed study.

A pilot study is a practice run that is undertaken in order to identify any problems with the data collection method and the data collection instrument. The researcher needs to ensure that the pilot study is complete before the commencement of the real study so that he or she can check the feasibility of the techniques and determine the reliability and feasibility of the instrument. Doing a pilot study gives the researcher the opportunity to correct problems identified during the pilot study (Jooste, 2010:300).

The pilot study was performed in one primary health care clinic, Clinic P, in the

NMBHB, sub-district C (See Table 3.1). Ten professional nurses took 10 minutes to complete the questionnaires. No problems were detected and all questions were completed. The data collected were therefore included in the main study.

## 3.4 QUALITY OF THE RESEARCH

Before a study can be implemented the measurement instrument needs to be evaluated for validity and reliability. Through this step the researcher ensures that the data obtained is valid and reliable. Validity and reliability are important concepts in research as they enable the researcher to produce quality research (Brink, 2012:127).

An ideal data collection procedure is one that captures a construct in a way that is accurate, truthful and sensitive. The criteria for evaluating the quality of data obtained with structured instruments will be discussed (Polit & Beck, 2014:328). Research results are dependent on how valid and reliable they are. If the research method is considered valid and reliable, results will be viewed as being of high quality and standard. Validity and reliability will now be described.

### 3.4.1 Validity

The validity of an instrument is a determination of how well the instrument reflects the abstract concept being examined. Validity, like reliability, is not an all-or-nothing phenomenon; it is measured on a continuum. No instrument is completely valid. Thus, one determines the degree of validity of a measure rather than whether validity exists. Validity will vary from one sample to another and one situation to another; therefore validity testing evaluates the use of an instrument for a specific group or purpose, rather than the instrument itself (Burns & Grove, 2011:334).

Validity includes both external and internal validity. External validity refers to the degree to which the results of a study can be generalised to other people or settings (O'Dwyer & Bernauer, 2014:137). Brink (2012:213) defines internal validity as the extent to which the changes in the dependent variable can be attributed to the independent variable or whether the outcomes could have been caused by something else. Internal validity includes four broad categories but, in view of the relevance to the study, only content and face validity will be discussed.

**Content Validity:** Content validity always precedes the actual collection of data (Brink, 2012:166). With content validity, the researcher assesses how well the instrument represents all the components of the variable to be measured. Brink (2006:166) states that content validity is mainly used in developing questionnaires, interviews schedules or interview guides.

Content validity is concerned with how well the questions posed in the questionnaire cover the phenomenon under study. The researcher performed an in-depth literature review (Chapter 2) on the study topic before developing the questionnaire. The questionnaire was reviewed by the researcher's supervisor and the statistician to check whether the questionnaire adequately covered the research question.

**Face Validity:** According to (Brink, 2012:160), face validity is based on an intuitive judgement made by experts in the field. Face validity means that the instrument appears to measure what it is supposed to measure. Face validity is particularly useful in instrument development to determine readability and clarity of content (Brink, 2012:166).

The researcher gave the instrument to her supervisor who is an expert in the field of study to assess whether at face value the questionnaire captured the intended concept. The researcher ensured face validity by conducting a pilot study and getting participants feedback on how they perceived the questions. Furthermore the researcher also included the advice of the statistician to assist with formatting of the data collection instrument and layout of questions.

### 3.4.2 Reliability

Brink (2012:171) states that validity and reliability are closely related, and that it is pointless using an instrument that is not valid, no matter how reliable it may be. According to De Vos *et al.* (2014:172), in order to obtain valid and reliable data one must ensure, before implementing the study, that the planned measurement procedures and the measurement instruments have acceptable levels of reliability and validity. The concept of reliability of measures is critical in research because, if the measures are not reliable, the study cannot produce useful information.

Kumar (2014:380) further describes reliability as a research instrument that yields the same results, repeatedly, under similar conditions. The author further concurs that with higher reliability comes higher accuracy.

Brink (2012:216) also states that reliability is concerned with the consistency, stability and dependability of a measuring instrument, as well as the researcher's ability to collect and record data accurately. The researcher ensured reliability by comparing the results of the pilot study with those of the questionnaire used in the main study.

## 3.5 ETHICAL CONSIDERATIONS

The Belmont Report identifies respect for persons, beneficence and justice as the three basic ethical principles that can be applied to research studies involving humans (United States National Commission for the Protection of Human Subjects of Biomedical and Behavioural Research, 1978). The researcher applied these principles in the following manner:

### 3.5.1 Informed consent

A consent form (Appendix C) implies that all possible or adequate information on the goal of the investigation, the procedures which will be followed during the investigation, the possible advantages, disadvantages and dangers to which participants may be exposed as well as the credibility of the researcher, be rendered to potential subject or the legal representatives (De Vos *et al.*, 2014:117).

In this research study, the participants were informed about the proposed research, its purpose and its benefits. A written consent form (Appendix C) was signed by the participating individuals before commencement of the data collection. Individuals were not offered incentives or coerced to participate in this study.

### 3.5.2 Autonomy

Autonomy refers to an individual being able to make all decisions that affect his or her well-being, i.e. an individual has the right to decide what is or is not done to him or her (Burkhardt & Nathaniel, 2008:53). Autonomy refers to the human being's right to self- determination. This implies that a person has a right to choose and to make decisions, the respondents must therefore be included and involved in the process

of decision making during the research study. A respondent who is not capable of making a volitional choice or decision has the right to protection in this regard (Muller, 2009:178).

Autonomy of the participant was maintained by allowing the participant to make an informed decision to take part or not to take part in the study. In this study, the participants reserved the right to withdraw their participation from the study at any stage of the process. The participants were made aware of this right to autonomy.

### 3.5.3 Beneficence and Non-maleficence

The principle of beneficence and non-maleficence obligates the researcher to act in the benefit of others and therefore the researcher has to ensure that no harm comes to the participants (Burkhardt and Nathaniel, 2008:63). In this study, no participants were subjected to harm or exploitation. Participants were allowed to withdraw from the research project at any time. The details of the study were explained to the participants prior to signing the consent form. Privacy and confidentiality was maintained.

### 3.5.4 Privacy, Anonymity and Confidentiality

Privacy refers to the rights of any participant who agrees to participate in a study, to determine when and under what circumstances personal information will be shared or withheld from others (Burns & Grove, 2011:186). The researcher ensured participants' privacy through anonymity and confidentiality and the completion of the questionnaires was done in the tearoom, which provided a quiet space.

Anonymity exists when the subject's identity cannot be linked to the answered questionnaire. It means the participant has a right to anonymity and the right to assume that the data collected will be kept confidential (Burns & Grove, 2011:185). In this study anonymity was ensured by allocating a reference number to each questionnaire prior to handing it out and keeping the consent forms separately so as to not identify the participants. No names or any other identifying information were recorded on the questionnaires or data capture forms and there was no link between the answers obtained and the participants' identities. Additionally, no information that could link to the participant's identity was included in the research

report. The answered questionnaires are only made available to the researcher for research purposes.

Confidentiality refers to the researcher's method of managing the private information shared by the participants. The researcher has the responsibility of not sharing that information (Burns & Grove, 2011:186). The researcher prevented unauthorized access to the raw data of the study or to the participant's identities. Data was stored in a password protected computer and only the researcher, supervisor and the statistician had access to the data. All questionnaires as well as the data files will be kept in a locked cabinet for five years by the researcher for audit purposes only before being destroyed.

### 3.5.5 Justice

The principle of justice means that all human subjects should be treated fairly (Burns & Grove, 2011:188). The researcher ensured that fair and non-discriminatory selection of participants was ensured as participants were selected based on their experience and being fulltime employed, but not based on race or gender. Objective treatment of individuals who declined to participate or who withdrew from the study was given. The researcher was always respectful and courteous. No individual was forced or coerced to participate in the research study.

## 3.6 CHAPTER SUMMARY

In this chapter the researcher put methodological aspects pertaining to the study into perspective. The research design and method employed by the researcher has been unpacked in detail in order to justify the selected research design. Validity and reliability of the data collection instrument were explained. Ethical considerations that were maintained throughout the study were outlined. In the following chapter the results of the data collected will be discussed and analysed.

# CHAPTER 4

# DATA ANALYSIS AND DISCUSSION OF THE FINDINGS

## 4.1 INTRODUCTION

Chapter four will provide the analysis and discussion of the findings on the collected data from the professional nurses working with patients with TB in the Nelson Mandela Bay Health District.

This chapter will describe:

- ❖ The sample of professional nurses used in the study; and
- ❖ A discussion of all results obtained from the distribution of the self-administered questionnaires to professional nurses in primary health care clinics in the NMBHD.

The goal of this section is to address the following research objective:

- To explore and describe the knowledge, attitudes and practices of professional nurses working with patients with TB in primary health care clinics in sub-district C, in the NMBHD.

In order to address the above-mentioned objective, discussions will be presented following the sequence of the questionnaire and the presentation of findings. The findings of the study are displayed in both table and graph formats, and will be discussed in the light of current literature.

## 4.2 PROFESSIONAL NURSES USED

A population of one hundred and fifty-four professional nurses (n=154) working in primary health care clinics in sub-district C within the NMBHD were eligible to participate in the research study. One hundred and thirty professional nurses consented to take part in the study and questionnaires were distributed to them. A total of eighty-nine plus the ten questionnaires from the pilot study (primary health care clinic 13) were completed and returned by the participants, providing a response rate of 76.2% (n=99). The pilot study was included in the main study because the participants were all able to complete the questionnaire due to its clarity. Accordingly, the researcher did not have to amend the questionnaire. In

quantitative research, a response rate of 65% or more for the actual study is sufficient and is deemed acceptable to commence analysis (Polit & Beck, 2014:209; Rubin & Babbie, 2009:117). The findings are presented in this chapter in the sequence in which they appeared in the questionnaire:

- Section A: Demographic data profile
- Section B: Knowledge levels of professional nurses working with patients with TB.
- Section C: Attitudes of professional nurses working with patients with TB.
- Section D: Practices of professional nurses working with patients with TB.

The presentation of the results and discussion follows below.

## 4.3 SECTION A: DEMOGRAPHIC DATA PROFILE

The demographic profile of participants who took part in the research study will be elaborated upon in this section. The variables relating to socio-demographical data included the participants' Age, Gender and Years of service as a professional nurse and the level of education. These are discussed below.

### 4.3.1 Age

Of all the age groups, the majority 36.4 % (n=36) of the participants were in the age group of 31- 40 years, and a minority 2.0% (n=2) were between the ages of 60 years and above. The age distribution of the participants is indicated in Figure 4.1 below.

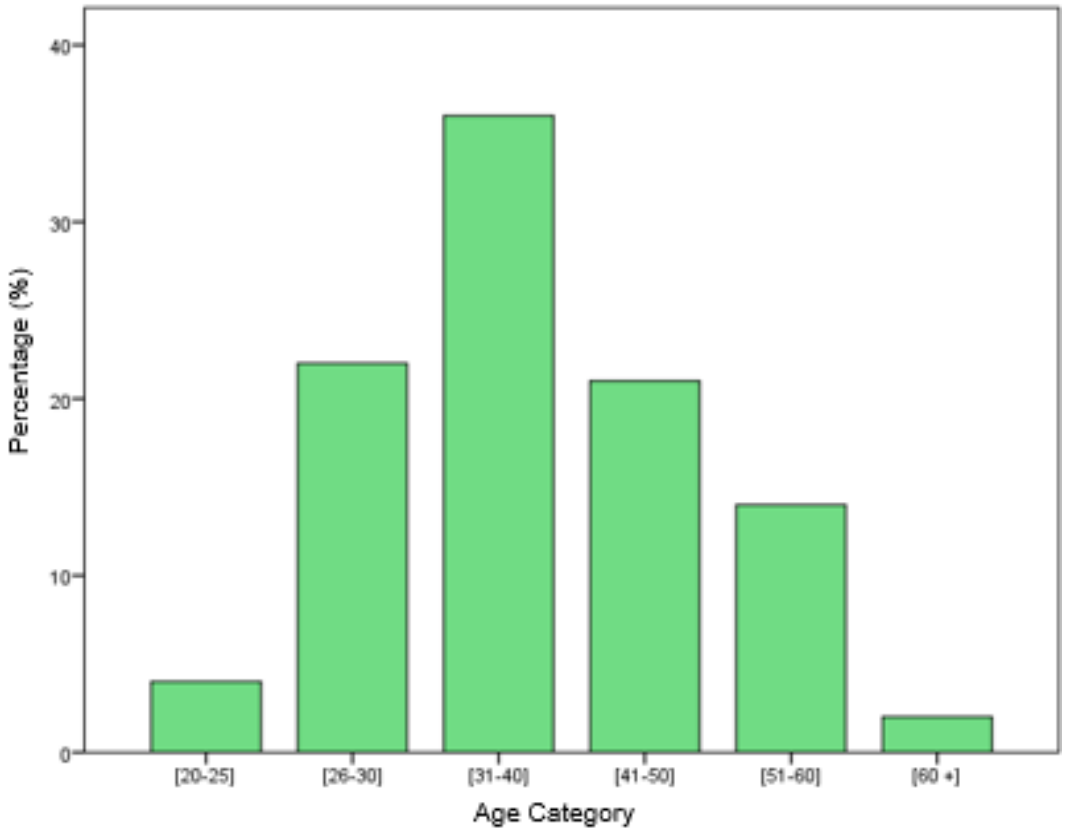


**Figure 4.1: Age category of professional nurses**

The target population participating in the research study varied in age. Participants had to select their age group in the self-administered questionnaire under the demographic data section. The South African Nursing Council's (SANC), national age statistics indicated that of the professional nurses, 27% were between the ages of 40 and 49 years; 30% were between 50 and 59 years; and 20% were 30-39 years of age (SANC, 2016). According to SANC, the minority of professional nurses were younger than 30 years old. The data suggests that professional nurses registered with the SANC are an ageing population. With the majority of participants in this study (36.4%) being between the ages of 31 and 40 years of age, the research findings are congruent with the statistics from the SANC (SANC, 2016).

The findings in this study, where the highest percentage of professional nurses are in the category of 31-40 years of age, can be partly attributed to the introduction of the bridging programme that allows nurses in the enrolled nurse category to further their studies to become part of the registered nurse category (SANC, 2016).

### 4.3.2. Gender

The majority of the participants studied (83.8% or n=83) consisted of females and a minority were male 16.2% (n=16) (see Figure 4.2).

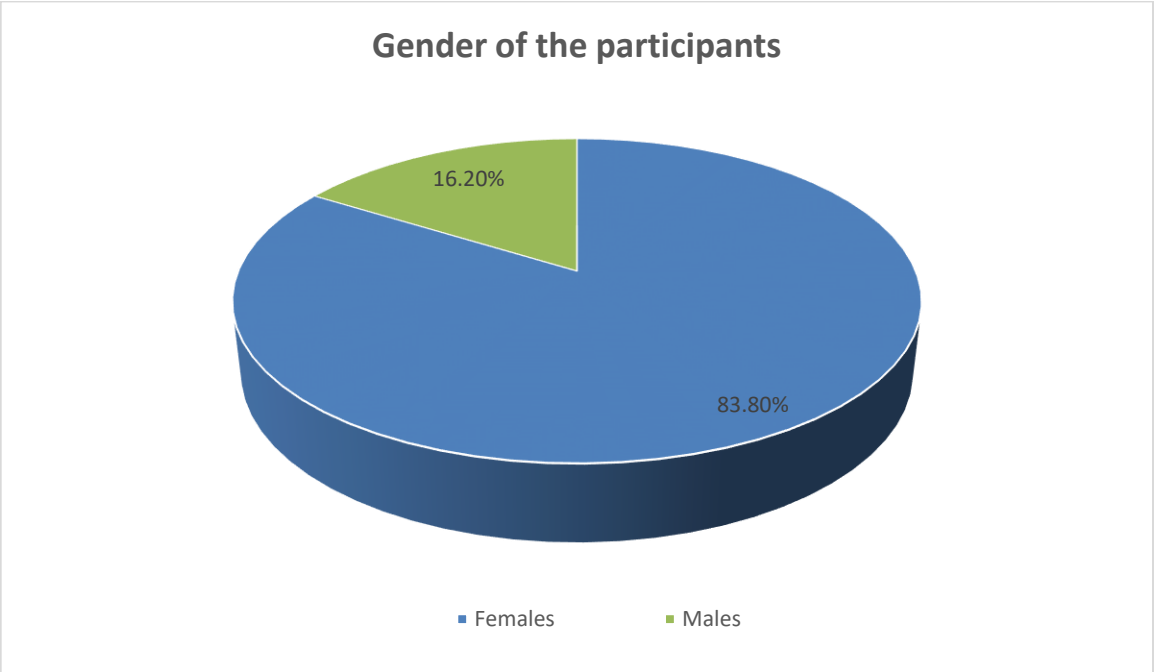


**Figure 4.2: Gender of participants**

In the Eastern Cape Province there are 13 017 female professional nurses and 1101 male professional nurses yielding a total of 14 118. The findings of this research study indicated that participants comprised 90% females and 10% males. The nursing profession is traditionally known for being a female-dominated profession and the demographic profile from this research study is congruent with statistics from the SANC (SANC, 2016).

Furthermore, these findings are congruent with the SANC's 2016 statistics which indicated a gender distribution of 90.56% (n=13 940), female registered nurses and 9.4% (n=1 4520), male registered nurses in the Eastern Cape Province, including the NMBHD (SANC, 2016).

Florence Nightingale considered nursing as a suitable job for women because it was an extension of their domestic roles and the social construction of what it means to be a nurse typically meant a caring and hardworking woman (Odzemir, Akansel and Tunk, 2008:154). In South Africa the nursing profession is a predominately female profession therefore this gender distribution could be expected. Research has,

however, shown that a gender imbalance in the nursing profession is not exclusive to South Africa. Male nurses account for a small percentage of all nurses globally. Literature indicates that male nurses account for only 6% in United States, 5% in Canada, 8% in Ireland and 10.2% in the United Kingdom (O'Lynn and Tranbarger, 2007:250).

### 4.3.3. Years of service

Figure 4.3 below presents the years of service that the participants had accumulated as professional nurses at the time the study was conducted.

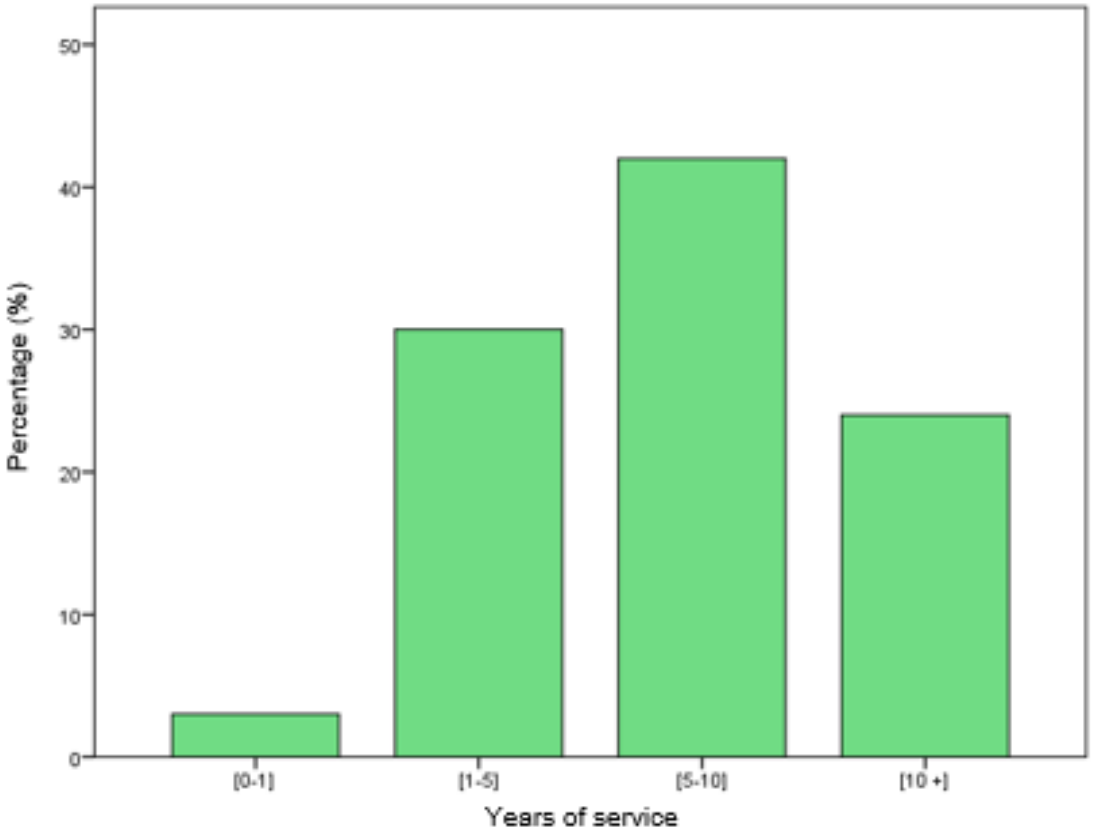


**Figure 4.3: Participant's years of service**

The data in this study illustrated that the majority of the participants, 42.4% (n=42), had worked for a period of 5-10 years, followed by 30.3% (n=30) of the participants who had worked for a period of 1-5 years. Only 3% (n=3) of the participants had worked in primary health care clinics for less than one year. Graan, Williams and Koen (2016:281) state that the greater the clinical exposure in all disciplines, such as communicable diseases and acute and chronic illnesses, the more confident and

knowledgeable the professional nurse becomes. Professional nurses with more clinical exposure learn to rely on past clinical experiences as a basis for clinical decision making at the point of care (Graan *et al.,* 2016:281).

### 4.3.4. Participants' level of education

Figure 4.4 (below) depicts the level of education of participants.

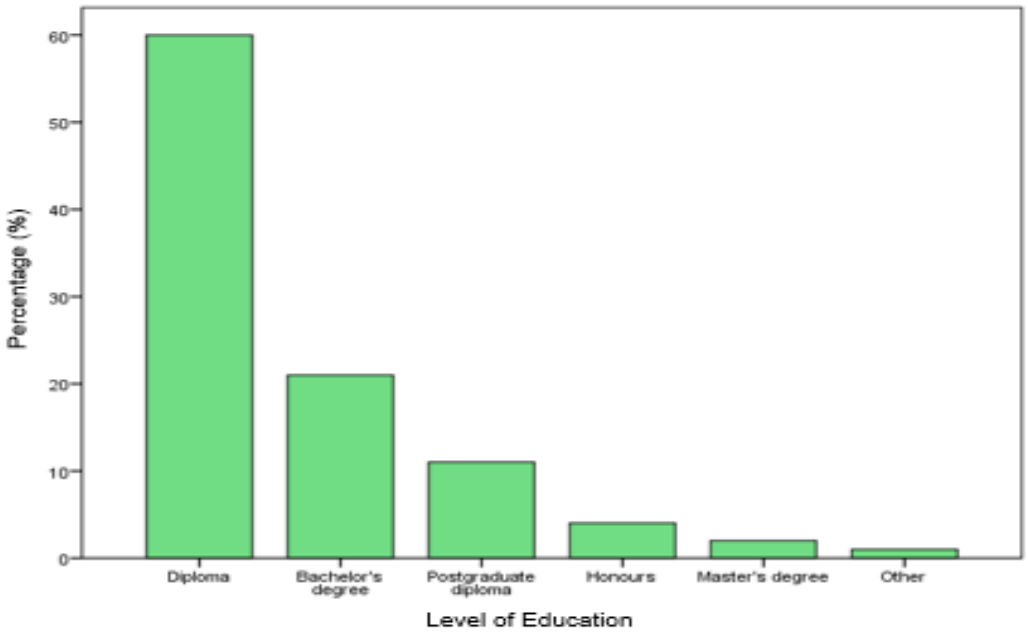


**Figure 4.4: Participants' level of education**

This question aimed at exploring the educational levels of professional nurses in primary health care clinics. The results showed that, of the ninety-nine participants, the majority or 60.6% (n=60) have a Diploma in Nursing; followed by 21.2% (n=21) being in possession of a Bachelor's degree in Nursing. There were 11.1% (n=11) participants in possession of a post-graduate diploma, 4.1% (n=5) with an Honours Degree, 2.0% (n=2) with a Master's degree while 1.0% (n=1) indicated other. Graan, Williams and Koen (2016:281) state that the greater the clinical exposure, plus post graduate studies, the more confident and knowledgeable the professional nurse becomes.

The findings and discussion of section B of the questionnaire regarding the knowledge of participants about TB will be presented in the following section.

## 4.4 SECTION B: KNOWLEDGE OF PROFESSIONAL NURSES WORKING WITH PATIENTS WITH TB

This section presents data collected from Section B of the self-administered questionnaire. Although this section comprised 7 items, Table 4.1 (below) indicates 16 items because the signs and symptoms of TB (the third item), and the tests used to diagnose TB (the fifth item), were divided into five and six items respectively. The questionnaire's knowledge items were scored as positive /negative. The findings are reported in the order that they were presented in the questionnaire. This section comprised seven multiple response questions where the participant had to select from a list of seven options. Participants answered a total of seven multiple choice questions regarding the professional nurses' knowledge about TB. Each positive response was given one mark and 0 marks were given for negative responses.

An overview of the participants' knowledge regarding the causes of TB, transmission, TB signs and symptoms, duration of treatment and drug used to prevent TB in South Africa is presented in Table 4.1 (below):

**Table 4.1: Knowledge of participants working with patients with TB**

| QUESTIONS ABOUT KNOWLEDGE OF TB | Positive | | Negative | |
|---|---|---|---|---|
| | n | % | n | % |
| B1. What do you think causes TB? | 98 | 99.0% | 1 | 1.0% |
| B2. How do you contract TB? | 94 | 94.9% | 5 | 5.1% |
| B3a. Signs and symptoms of TB (Cough) | 99 | 100.0% | 0 | 0.0% |
| B3b.Signs and symptoms of TB (Loss of weight) | 99 | 100.0% | 0 | 0.0% |
| B3c. Signs and symptoms of TB (Fever) | 33 | 33.3% | 66 | 66.7% |
| B3d. Signs and symptoms of TB (Loss of appetite) | 99 | 100.0% | 0 | 0.0% |
| B3e. Signs and symptoms of TB (Night sweats) | 99 | 100.0% | 0 | 0.0% |
| B4. What type of masks do you use when assisting patients with TB? | 84 | 84.8% | 15 | 15.2% |
| B5a.Tests used to diagnose TB (GeneXpert) | 93 | 94.9% | 5 | 5.1% |
| B5b. Tests used to diagnose TB (Chest x-ray) | 95 | 96.0% | 4 | 4.0% |
| B5c. Tests used to diagnose TB (Biopsy) | 22 | 22.2% | 77 | 77.8% |
| B5d. Tests used to diagnose TB (Culture) | 36 | 36.4% | 63 | 63.6% |
| B5e. Tests used to diagnose TB (Skin test) | 52 | 52.5% | 47 | 47.5% |
| B5f. Tests used to diagnose TB (Sputum for AFB) | 98 | 99.0% | 1 | 1.0% |
| B6. Duration of TB treatment? | 96 | 97.0% | 3 | 3.0% |
| B7. Drug used to prevent TB? | 91 | 91.9% | 8 | 8.1% |

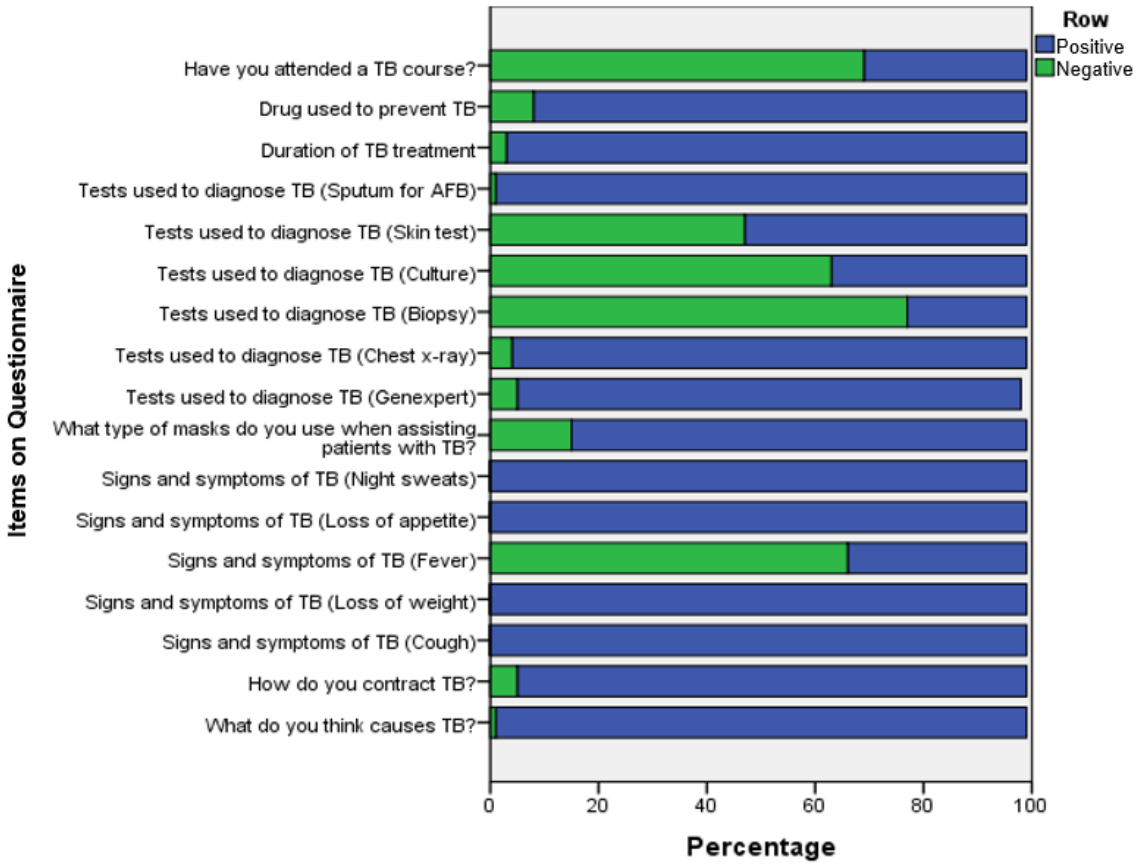


**Figure 4.5: Knowledge of participants working with patients with TB**

Table 4.1 shows the percentage of participant's responses to knowledge of participants working with patients with TB. The majority of the participants (99%) answered positively on the question about the cause of TB as well as the question about contraction of TB (94.9%). Most of the participants (84.8%) answered positive on the question about the type of mask that they should use when assisting patients with TB; this question tested the knowledge of professional nurses on the use of protective clothing. On the question regarding diagnostic tests: biopsy and sputum for culture and sensitivity scored the lowest on the diagnostic tests for tuberculosis (22.2% and 36.4% respectively). Regarding the duration of TB treatment and the drug used to prevent TB most participants responded positive (97% and 91.9% respectively).

A discussion about the knowledge of participants is provided in the section below.

### 4.4.1 Discussion of the knowledge of professional nurses working with patients with TB

The items that scored the lowest were as follows: Fever as one of the signs and symptoms of TB (33.3%) followed by the following diagnostic tests for TB, namely: Biopsy (22.2%), sputum culture and sensitivity (36.4%) and skin test (52.5%). These findings on the lack of knowledge regarding fever as a symptom of TB were similar to the findings in a study conducted in the Free State province of South Africa, by Bhebhe, van Rooyen and Steinburg (2014:597) where only 53.5% (n=53) of the participants considered fever as one of the signs and symptoms of TB. Participants were asked about the cause of TB and the majority of participants (99%) answered the question positively. Montagna, Napoli and Pasquarella (2014:960) had similar findings where 94.9% of participants were aware that TB is an infectious disease caused by the mycobacterium TB.

The findings of this study suggest that the participants did not know that sputum culture and sensitivity is one of the diagnostic tests for TB (63.6%). These findings are congruent with those of Bhebhe *et al.* (2014:575), where the majority of the participants (77%) did not know that sputum culture and sensitivity is one of the diagnostic tests for TB. The items that scored the highest percentage in the above study are: TB test geneXpert (94.9%) and the drug used to prevent TB (91.9%) as well as cough, loss of weight, loss of appetite and night sweat as signs and symptoms of TB which scored 100%.

The finding regarding the knowledge gaps is similar to the report of a study conducted by Akin, Gorak, Unsar, Mollaoglu, Ozdilli and Durna (2011:778) in which approximately 78.5% of participants aged 17-34, 30% were nursing students of which the majority were female. Participants displayed poor knowledge even after academic training about TB, particularly on TB drugs and vaccination. The lack of knowledge found in this study on certain aspects of TB may be attributed to the fact that the majority (69.7%) of participants did not attend TB courses.

Section C of the questionnaire regarding the attitudes of participants working with patients with TB will be outlined in the following sections.

## 4.5 SECTION C: ATTITUDES OF PROFESSIONAL NURSES WORKING WITH PATIENTS WITH TB

This section presents data collected from Section C of the self-administered questionnaire. It comprises 7 items which measured the professional nurses' attitudes towards TB.

The scoring patterns for items 1 to seven are presented in Table 4.2 and Figure 4.6 below.

**Table 4.2: Attitudes of participants working with patients with TB**

| QUESTIONS ABOUT THE ATTITUDES OF TOWARDS TB | Positive | | Negative | |
|---|---|---|---|---|
| | n | % | n | % |
| C1. Are you willing to open windows in the TB section of the clinic regardless of weather conditions? | 99 | 100.0% | 0 | 0.0% |
| C2. Would you use a mask even though it makes you feel uncomfortable? | 79 | 79.8% | 20 | 20.2% |
| C3. Are you willing to teach co-workers on TB prevention? | 55 | 55.6% | 44 | 44.4% |
| C4. Would you like to be screened for TB if you have suggestive symptoms? | 98 | 99.0% | 1 | 1.0% |
| C5. If you were diagnosed with TB, are you willing to complete treatment? | 98 | 99.0% | 1 | 1.0% |
| C6. If you have a condition that makes you vulnerable to TB, are you prepared to change work environment to a less risky area? | 95 | 96.0% | 4 | 4.0% |
| C7. Will you be embarrassed if you may contract TB? | 69 | 69.7% | 30 | 30.3% |

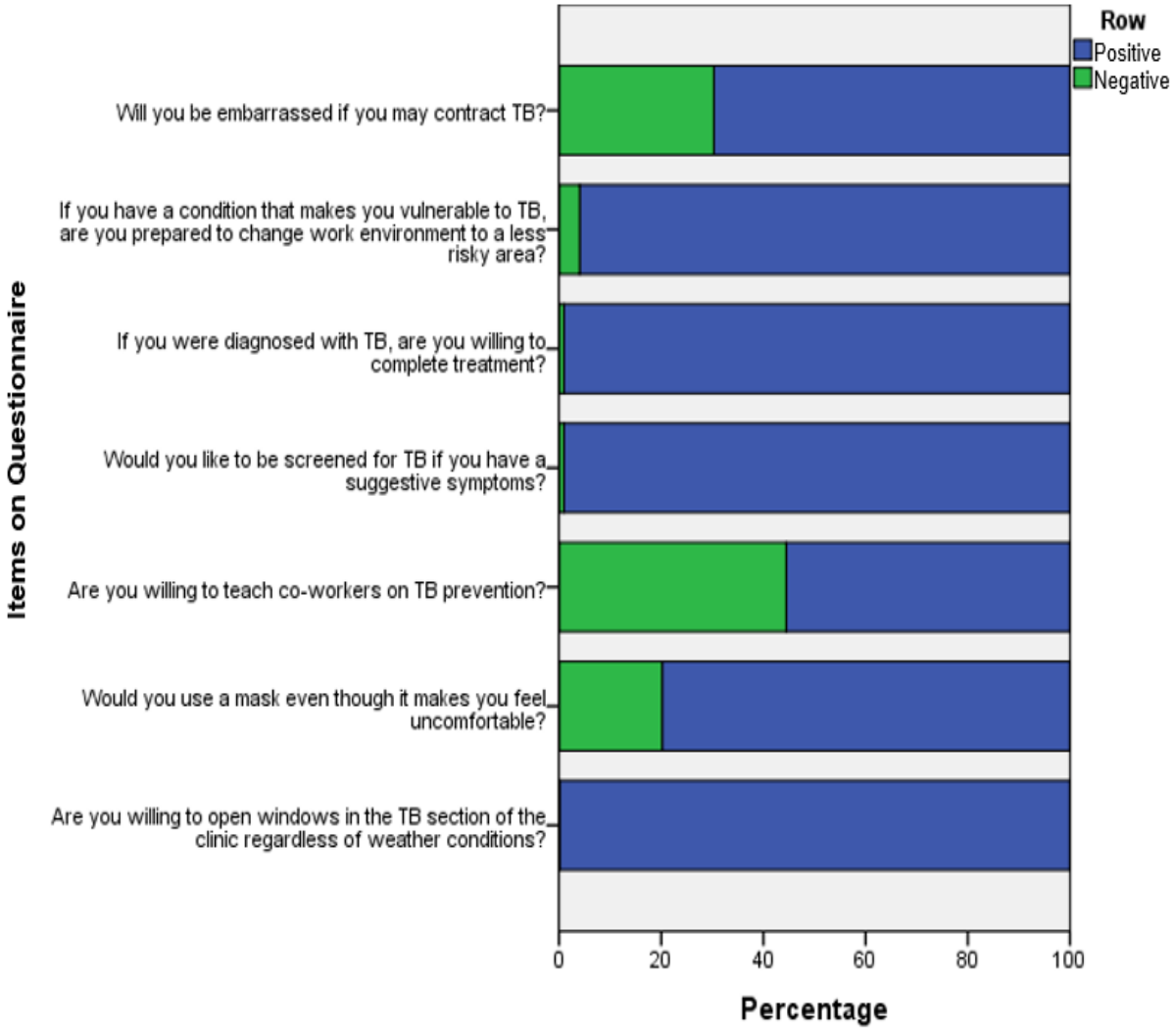


**Figure 4.6: Attitudes of participants working with patients with TB**

Data from Table 4.2 and Figure 4.6 shows that the attitude of participants working with patients with TB was generally positive. The majority of the participants indicated their willingness to open windows in the TB section of the clinic regardless of the weather conditions (100%). The researcher's concern was that most of the clinics did not have cross ventilation in the TB rooms as per the Centre for Disease Control and Prevention (CDC) recommendation (Centre for Disease Control and Prevention, 2016:7). The CDC report further indicates that in primary health clinic settings, waiting rooms, shelter dormitories, or other rooms in which people congregate should have an operable window, door, or skylight that is kept open as often as possible. Fans can be used to help distribute the air, provided there is cross ventilation (Centre for Disease Control and Prevention, 2016:7).

Participants had a positive response, 79.8% (n= 79) confirming their willingness to wear masks although it makes them uncomfortable. Furthermore, most participants, 99% (n=98) would like to be screened for TB if they have signs and symptoms suggestive of TB. The majority of participants, 99% (n=98) responded positive to completing TB treatment if they were to be diagnosed with TB. Furthermore, the majority of participants, 96% (n=95) were prepared to change their work environment to a less risky area in the event of having a pre-existing condition which renders them more vulnerable than most people to contacting TB. Regarding the question related to teaching co-workers on prevention of TB the, 55.6% (n=55) replied in the affirmative. Lastly, negative responses were noted where the majority of participants, 69.7% (n=69) indicated that they would be embarrassed if they were to contract TB.

The findings regarding the attitudes of participants towards TB will be discussed as follows.

### 4.5.1 Discussion of the attitudes of professional nurses working with patients with TB

The attitudes of participants towards TB were generally positive, as presented in Table 4.2. The majority of participants (100%) had a positive response on the opening of windows in the TB section of the clinic regardless of the weather conditions, to allow air entry to throughout the clinic to prevent the spread of TB. These findings are consistent with Kanjee *et al.* (2011:335) in their survey of knowledge, attitudes and practices in hospital staff. The majority of participants in the above-mentioned study reported that they were comfortable with opening of doors and windows. In this study, 78.8% of participants responded positive on the use of a mask even though it makes them uncomfortable. The majority of the participants were also willing to be screened for TB as well as being willing to complete their TB treatment if diagnosed with TB.

However, the majority of the participants indicated that they would feel embarrassed if they contracted TB. In a study done by Noe, Rafaela, Ribeiro, Anselmo, Maixenchs, Sitole, Munguambe, Blanco, le Souef and García-Basteiro (2017:17) seventy per cent of professional nurses indicated that there was a stigma associated with having a diagnosis of TB. Some participants in the above-mentioned study

(48.2%) believed that the stigma regarding TB still exists. These findings are similar to those of the study conducted by Akin *et al.* (2011:779), to investigate the knowledge of and attitudes towards TB of Turkish nursing and midwifery students. The attitude of nursing and midwifery students towards TB reported negative with 79.3% stating that they would hide the fact if one of their family members were to be diagnosed with TB. A further 85.8% were afraid to work in the units in which patients with TB were being treated. Only 5.9% of the participants were willing to care for patients with TB. According to TB proof (TB proof, 2015:np), there is considerable stigma associated with TB. Prevailing TB stigma is a major contributor to diagnostic delay and treatment interruption in South Africa. Although TB-related stigma is well documented, insufficient interventions have been provided to limit stigma (TB proof, 2015:np).

A discussion about the practices of participants working with patients with TB (section D of the questionnaire) is given in the section below.

## 4.6 SECTION D: PRACTICES OF PROFESSIONAL NURSES WORKING WITH PATIENTS WITH TB

The final section of the questionnaire presents an interpretation and discussion of the results of analysis on participants' practices related to TB. It comprised of 8 items which measured practices of participants towards TB. Table 4.3 and Figure 4.6 below show the results.

**Table 4.3: Practices of participants working with patients with TB**

| QUESTIONS ON PRACTICES TOWARDS TB | Positive | | Negative | |
|---|---|---|---|---|
| | N | % | n | % |
| D1. Do you wear protective masks when working with TB patients? | 8 | 8.1% | 91 | 91.9% |
| D2. When do you need to wear a mask? | 18 | 18.2% | 81 | 81.8% |
| D3. Do you open windows for adequate ventilation regardless of the weather conditions? | 38 | 38.4% | 61 | 61.6% |
| D4. Is there an air entry through the door and the windows in your TB section? | 95 | 96.0% | 4 | 4.0% |
| D5. Do you separate your TB patients in your institution? | 27 | 27.3% | 72 | 72.7% |
| D6. Do you wash hands after helping patients with TB at the end of patient list? | 68 | 68.7% | 31 | 31.3% |
| D7. What is the correct coughing technique? | 78 | 78.8% | 21 | 21.2% |
| D8. Have you attended a TB course? | 30 | 30.3% | 69 | 69.7% |

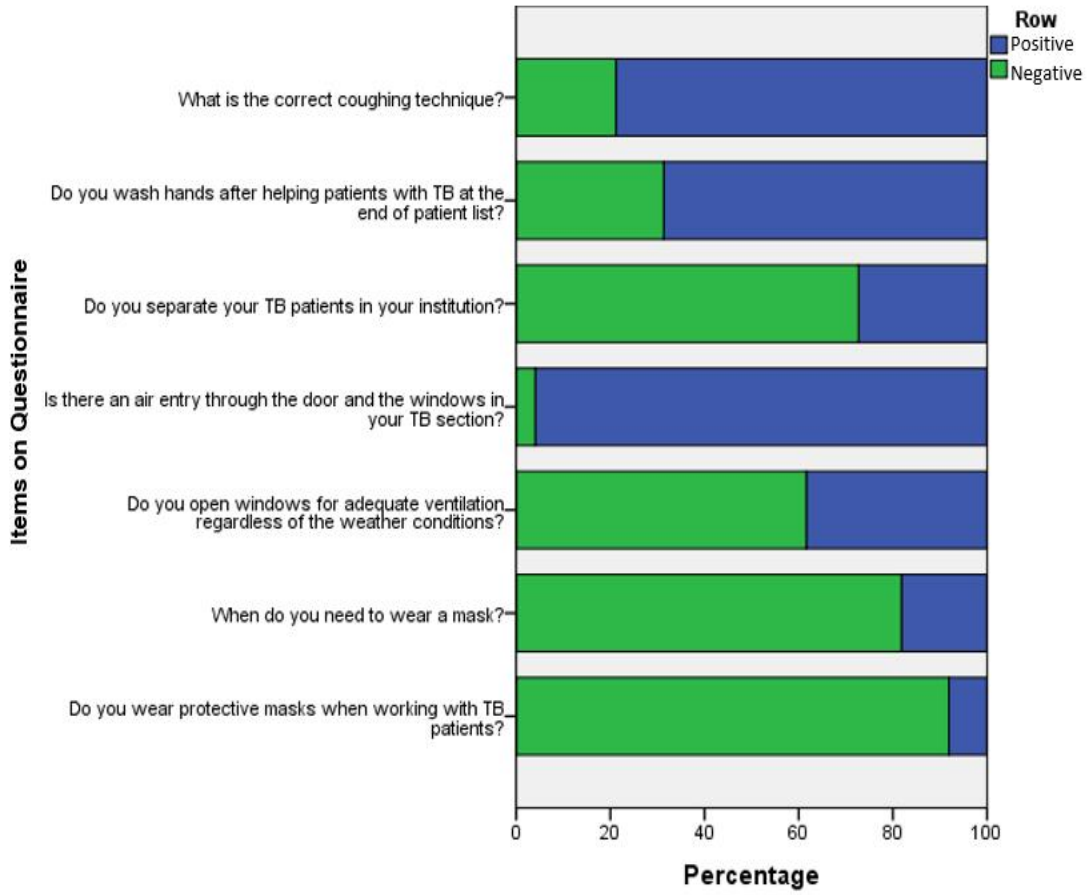


**Figure 4.7: Practices of participants working with patients with TB**

As depicted in Table 4.3 and Figure 4.7, the administrative practices towards TB were low. The participants answered positive to the importance of air entry through the door and the windows in the TB section, 96% (n=95), as well as the correct coughing technique 78.8% (n=78). The majority of the participants answered negative on the following questions: wearing of protective clothing by professional nurses when working with patients with TB 91.9% (n=91), when do they need to wear masks, with 81.8% (n= 81) of participants answered negatively, these findings were congruent with those of Behnaz, Mohammadzade, Mousavi-e-roknabadi and Modammadzedeh (2014: 84) where 60% of final year medical students reported that they only use a surgical mask and only when they had contact with a patient who has a disease which is contagious. Separation of patients with TB (72.7%), participants who did not attend TB course (69.7%) followed the number of participants who open windows for adequate ventilation regardless of the weather conditions (61.6%)

A discussion of these findings follows in the next section.

### 4.6.1 Discussion of the practices of professional nurses towards TB

From the findings of this study, the knowledge levels towards practices of professional nurses towards TB were generally low. The majority of participants in this study indicated that they do not wear masks when working with patients with TB, and that they use a mask only when working with patients with MDR TB. These findings are congruent with those of Kanjee *et al.* (2011:335) who found that the majority of the participants use the respirator/mask when in a room with a TB case/suspect while less than 70% claimed that they often or routinely wear their protective masks.

Participants were asked whether they opened windows for adequate ventilation regardless of the weather conditions and whether there is an air entry in the TB section of their clinic. The majority of participants answered negative on this statement. This illustrates that the professional nurses in this study were misinformed about the prevention of TB or, perhaps, there is no provision made for air entry in their clinics. World health organisation (2009:7) states that lack of ventilation or low ventilation rates are associated with increased infection rates and airborne diseases.

The National Department of Health, in the draft National Infection Prevention and Control Policy for TB, MDRTB and XDRTB (South African National Department of Health, 2012:22), states that ventilation is the movement of air throughout the building so that it is replaced by air from outside. Natural ventilation relies on open doors and windows. There should be adequate numbers of windows and doors opened to the outside to allow good ventilation. Windows on opposite sides of the room allow good cross-ventilation. Controlled natural ventilation implies that measures are in place to ensure that windows and doors stay open. Open windows on opposite sides of the room offer the most effective natural ventilation. Assisted ventilation using propeller fans positioned on the ceiling, desk, floor or mounted in the windows is an inexpensive way to improve natural ventilation. Good natural ventilation plays an important role in preventing TB, particularly in waiting areas, examination rooms and sputum collection areas of healthcare facilities.

In this study, participants were asked if they separate patients with TB from the other patients. The majority of participants indicated that they do not separate patients

with TB from other patients. However, the Infection Control Policy for TB, MDRTB and XDRTB (2012:23) indicates that patients with TB who are potentially infectious should be isolated from other patients so that non-infected persons are not exposed to the infectious droplet nuclei that those with TB generate. Patients who attend clinics and who have positive sputum smear results, and are thus infectious, should be isolated or separated from patients who do not have TB. The most effective means to reduce the risk of transmission of *Mycobacterium tuberculosis* in clinic settings is to manage patients with TB.

## 4.7 CHAPTER SUMMARY

The data analysis and interpretation of the results were presented. The data was extracted from 99 professional nurses working in primary health care clinics in sub-district C in the Nelson Mandela Bay Health District. Data were depicted in bar graphs, pie charts and tables. A summary of the findings was also discussed. Generally, knowledge about TB and practices towards TB were good, but scores for most practices towards TB were low.

Chapter Five discusses in detail the conclusions, limitations and recommendations of the study.

# CHAPTER 5

# CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

## 5.1 INTRODUCTION

Chapter four presented and discussed the findings from the analysis of data. This chapter will provide the summary of the study and discuss its identified limitations as well as the recommendations for the Nelson Mandela Bay Health District, nursing practice, nursing education and nursing research.

## 5.2 SUMMARY OF FINDINGS

The study emanated from the researcher's observations as a practicing professional nurse in a primary health care clinic where the other professional nurses did not want to work with patients with TB. It was therefore considered necessary to find out what the knowledge, attitude and practices of professional nurses working with patients with TB are.

The study had to respond to the research question, namely:

- What are the knowledge, attitudes and practices of professional nurses working with patients with TB in primary health care clinics in sub district C, in the Nelson Mandela Bay Health District?

The purpose of the study was to determine the knowledge, attitudes and practices of professional nurses working with patients with TB in primary health care clinics in the Nelson Mandela Bay Health District. Based on the findings recommendations were made for NMBHD, nursing practice, nursing education and nursing research.

The study adopted a quantitative approach, with an explorative, descriptive and contextual design. The participants totalled 130 and all worked in the sampled group of sub district C in NMBHD. The participants and institutions were sampled using a consecutive sampling method. Participants of this study had to meet the inclusion criteria which was as follows:

- Had to have at least one year working experience in primary health care clinics.

Self-administered questionnaires were used to gather the information on knowledge, attitudes and practices of professional nurses working with patients with TB in the Nelson Mandela Bay Health District. The questionnaire was divided into four sections. Section A measured the Demographic data profile, section B sought to measure knowledge levels of professional nurses working with patients with TB, section C sought to measure attitudes of professional nurses working with patients with TB and section D sought to measure practices of professional nurses working with patients with TB. The manner in which the questionnaires were constructed assisted the researcher to meet the objectives of this study.

The objective of the study was:

- To explore and describe the knowledge, attitudes and practices of professional nurses working with patients with TB in primary health care clinics in sub-district C, in the NMBHD.

Data collected from the participants were captured by the researcher on a Microsoft Excel spread sheet. The data was reduced and analysed with the help of the statistician using data analysis software programme Statistica Version 11 to analyse the data. After data analysis, the findings of this research study revealed a generally high level of knowledge among professional nurses working with patients with TB in NMBHD. According to the data analysed, certain conclusions can be deduced that will be elaborated on in this section. Results reflected that participants knew most of the signs and symptoms of TB as well as the cause of TB. However, the results of this research study also revealed that some participants do not have sufficient knowledge regarding certain signs and symptoms of TB and the tests used to diagnose TB. The majority of participants indicated never having attended a TB course, which could explain their lack of sufficient knowledge regarding specifics of the disease.

Generally, attitudes of professional nurses towards TB were positive. Of the participants, some said they are willing to be screened for TB if they have suggestive symptoms of TB. Most participants were willing to open windows, even in inclement weather conditions. The majority of participants also indicated that if there is a condition that makes them more vulnerable to contracting TB, they would be prepared to change their work environment to a less risky area. Positive attitudes

were also noted where participants indicated a willingness to complete TB treatment should they be diagnosed with TB. However, some negative attitudes were evident as certain participants revealed their reticence to teach their co-workers. There were also participants who indicated that they would be embarrassed if they contracted TB. This appears to indicate that stigmatisation of TB still exists. Findings in the study done by Aftab, Chaudhry and Farooq (2013:1) stated that TB is a physical problem that not only damages the health of patients but also excludes him or her from social circles, particularly where meeting with family, relatives, friends, colleagues, co-workers and neighbours is concerned.

The practices of professional nurses in this study towards TB showed that some improvement is required. The wearing of a protective masks, separating patients with TB from those attending the clinic for other complaints, in the waiting areas, and ensuring adequate ventilation by opening windows and doors to optimise air flow, regardless of the weather conditions, were not generally well adhered to.

Based on the findings of the study, the researcher considers it appropriate to conclude that the study was a success because all the set objectives were met. It will therefore be possible to make certain pertinent recommendations to the district office management of NMBHD, as well as for nursing practice, nursing education and research to further the findings of the study. However the study was not without its own limitations that could have affected the quality of this study. The following section will discuss the limitations.

## 5.3 LIMITATIONS OF THE STUDY

The following limitations of the study were identified:

- The study was conducted in the NMBHD but included only sub-district C clinics. The sample size was 154 professional nurses from all seventeen clinics and, therefore, generalizability cannot be assumed. However, the statistician indicated that the sample size of 99 participants was adequate for the results to be interpreted as statistically valid. For the scope of the study, the sample size was validated.

- Using a self-administered questionnaire could have posed a bias regarding the findings, specifically regarding the professional nurses' practices towards TB, since they might be inclined to answer more positively than what occurs in actual practice. Therefore, an observational study could have been more meaningful to observe the actual practices of professional nurses, rather than the self-reported data.

## 5.4 RECOMMENDATIONS

This section aims to highlight recommendations for NMBHD, plus recommendations relating to nursing practise, nursing education and nursing research.

### 5.4.1 Recommendations to the NMBHD

The following recommendations are proposed for the NMBHD. The NMBHD management should:

- Make provision to offer courses on subject matter relevant to TB and infection control for professional nurses, and other categories of staff as required, in order to ensure that all staff in PHC clinics remain up to date with information pertaining to the disease.
- Provide relevant information for all PHC clinics to ensure that staff remains well informed about TB, plus health and safety issues related thereto.
- Ensure that facility managers are aware of the need to have sufficient face masks available in their facilities, especially in the waiting areas for those patients who are coughing. Patients who are coughing should all wear a mask regardless of whether they have been tested for TB or not.
- Ensure that all staff is aware of how to wear the N95 respirator mask correctly (South African National Department of Health, 2015:53). The professional nurses should also instruct the patients in the clinic on how to use masks, to encourage the use of respiratory protection.
- Consider using posters in all the clinics which state something like: 'TB affects us all- lets work together to defeat the disease' could be used, and buttons that are pinned to the clothing stating something like "I am wearing my mask, are you"? will remind everyone of the importance of

wearing their masks and that we are all fighting TB together. Australian government comcare (2010:79) developed a wellness programme for professional nurses as an intervention in preventing chronic illnesses such as high blood pressure and diabetes mellitus. The campaigns and giving health education about weight loss as well as diet using posters and pamphlets had a positive effect on health and wellbeing of the patients, which shows that such campaigns are effective and it can also work in TB. The researcher is of the opinion that such a positive approach would work well in the clinics.

- Ensure that the waiting rooms, shelter dormitories, or other rooms in which people congregate all have operable windows, doors, or a skylight that is kept open throughout the day, as well as fans to help with air distribution. It should be noted that fans can only be used in areas where there is sufficient air flow/cross ventilation.
- During sputum collection, the patient has to cough which will result in the movement of droplets which spread TB. Infection risk can be minimised by ensuring that such practice is contained in a safe area, away from the clinic. (CDC, 2016:7).
- Ensure that TB patients should have their own waiting area especially MDR patients. Each clinic should have isolation rooms (Airborne infection isolation rooms) which are designated for isolation of patients with suspected TB, for their safety and the safety of the others (CDC, 2016:7).
- Utilise staff that have completed the Honours or Master's degree in Nursing (advanced PHC) to educate their colleagues regarding treatment care and support for patients with TB. Additionally, infection control and health and safety practices should be shared with colleagues. Nanayakkara and Choi (2017:7) highlight the importance of educational programmes and in-service training for professional nurses around the world.

### 5.4.2 Recommendations relating to Nursing Practice

The following recommendations relating to nursing practice are made from the research study:

- According to Polit and Beck (2014:31), the use of best practice guidelines is a method of distilling evidence into a manageable form intended for professional nurses. Variances in practice are minimized using best practice guidelines, which provide clinical guidance when rendering patient care. It is thus recommended that guidelines for TB be optimally used to ensure that professional nurses practice consistently regarding the treatment, care and support of patients with TB, particularly at PHC clinic level.
- The guidelines that were formulated by the National Department of Health should always be used for the management of patients with TB. Workshops and courses on the following topics should be considered, since a deficiency in knowledge and practice was noted by the researcher regarding these aspects: hand-washing, protective masks, importance of ventilation and separation of TB patients from the general patient population.
- Professional nurses need to be educated regarding the signs and spread of TB in waiting areas, particularly in the clinic settings in the NMBHD.
- The sub district clinical facilitator should be tasked to perform assessment rounds at each clinic to observe whether the professional nurses are implementing the guidelines and to guide them where necessary. The professional nurses would then have the opportunity to ask the educator questions if there is uncertainty about any practices about TB, plus XDRTB or MDRTB.
- Organize refresher courses and/or awareness promotion workshops about the cause of TB, transmission and prevention. This could improve the professional nurses' attitudes towards patients with TB and reduce stigmatisation.

### 5.4.3 Recommendations relating to Nursing Education

The following recommendations are proposed for nursing education:

- The Nelson Mandela Bay Health District manager should ensure that updated TB guidelines are given to all clinics, and that professional nurses are taught how to use the guidelines optimally to ensure consistency in treatment care and support for patients with TB throughout the district.
- In-service education should be done quarterly by an infection control co-ordinator from the Nelson Mandela Bay Health District at each sub district in order to explain infection control practices, particularly related to the correct use of masks, thus ensuring a more positive attitude and practice regarding the use of masks as a mechanism of infection control.
- Health education for professional nurses regarding promotion of health and prevention of spread of TB, with an added focus on support, care and treatment for patients with TB should be provided at all clinics.
- Institution of a journal club in each sub district to encourage staff to read updated articles and guidelines regarding treatment, care and support of TB would be a positive addition to the education of professional nurses in the district. The journal club could generate enthusiasm from staff to provide optimal comprehensive care for patients with TB, and could even have Continuous Professional Development (CPD) points added, which will add incentive for staff to participate.
- It is recommended that the clinics have TB pamphlets and posters, written in the various local languages, to provide education to patients and their families about TB.

### 5.4.4 Recommendations relating to Nursing Research

The following recommendations are proposed for nursing research:

- The study was limited to professional nurses in one sub-district in the Nelson Mandela Bay Health District. It is advisable to replicate the study or a similar study throughout the district, which would then allow for generalisation of the study.
- It would also be advisable to conduct a research study which includes medical doctors, enrolled nurses, community health care workers as well

as auxiliary workers, regarding their knowledge, attitudes and practices relating to TB, because they are all working with patients at the primary health care clinics.

## 5.5 CHAPTER SUMMARY

The research study explored and described the knowledge, attitudes and practices of professional nurses working with patients with TB in primary health care clinics in sub-district C in the NMBHD. The findings of the study will be distributed to the NMBHD where the study was conducted, in order to make the professional nurses aware of the findings, and of what they should do to improve their knowledge, attitudes and practices when caring for patients with TB in primary health care clinics. There is a need for further development of nursing practices regarding TB, such as infection control and the separation of patients with TB, further education in terms of TB guidelines as well as research to further explore and describe knowledge, attitudes and practices of professional nurses and other health care practitioners regarding TB.

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## Appendix A

**Questionnaire of professional nurses working with patients with TB**

**Date:……./2017**

*Please answer all the questions below.*

**Section A: Demographic Data Profile**

**1. Age category**

☐ 20-25 ☐ 26-30 ☐ 31 – 40 ☐41-50 ☐51-60 ☐ 60 and above

**2. Gender**

☐ Female ☐ Male

**3. Years of service**

☐ 0-1 ☐ 2-5 ☐ 6-9 ☐ 10 and more

**4. Level of education**

☐ Diploma ☐ Bachelor's degree ☐ Postgraduate diploma ☐ Honours

☐ Master's degree ☐
Other:…….

**Section B: Knowledge levels of professional nurses working with patients with TB**

*Choose the correct answer or answers with (X) on the box.*

**1. What do you think causes TB?**

☐ Sexual contact ☐ sharing of utensils ☐ Mycobacterium tuberculosis

☐ Blood contact ☐ I don't know

**2. How do you contract TB?**

☐ Hand shaking ☐ Direct contact ☐ Airborne ☐ Kissing ☐

Others:……..……

**3. What are the signs and symptoms of TB? Mark all that you think is correct.**

☐ Cough more than/equal to two weeks ☐ Loss of weight ☐ Fever ☐ headache

☐ Back pain ☐ loss of appetite ☐ night sweats

**4. What types of masks do you use when assisting patients with TB?**

☐ Surgical mask ☐ N95 Mask ☐ Disposable medical mask ☐N99 surgical face mask

**5. Which of the following are tests used to diagnose TB?**

☐ Genexpert ☐ Chest x-ray ☐ Biopsy ☐ Urine test ☐ Culture and sensitivity sputum test

☐ Skin test ☐sputum for AFB

**6. For how long should the patient take treatment for normal TB?**

☐ 6 months ☐ 8 months ☐ 12 months ☐ 24months

**7. Which drug is used to prevent TB in South Africa?**

☐ RHZE (Rifafour) ☐ INH (Isoniazid) ☐ Streptomycin ☐ PZA (Pyrazinamide)

☐ Ethambutol

**<u>Section C: Attitudes of professional nurses working with patients with TB</u>**

*Mark appropriate box with an (x)*

**1. Are you willing to open windows in the TB section of the clinic for adequate ventilation and sunlight regardless of weather conditions?**

| | |
|---|---|
| **Yes** | |
| **No** | |
| **Not sure** | |

**2. Would you use a mask even though it makes you feel uncomfortable?**

| | |
|---|---|
| **Yes** | |
| **No** | |
| **Sometimes** | |

**3. Are you willing to teach co-workers on TB prevention?**

| | |
|---|---|
| **Yes** | |

| | |
|---|---|
| **No** | |
| **Not sure** | |

**4. Would you like to be screened for TB if you have suggestive symptoms?**

| | |
|---|---|
| **Yes** | |
| **No** | |
| **Not sure** | |

**5. If you were diagnosed with TB, are you willing to complete the treatment?**

| | |
|---|---|
| **Yes** | |
| **No** | |
| **Not sure** | |

**6. If you have a condition that makes you vulnerable to TB e.g. HIV or diabetes are you prepared to change work environment to a less risky area?**

| | |
|---|---|
| **Yes** | |
| **No** | |
| **Not sure** | |

**7. Will you be embarrassed if you may contract TB?**

| | |
|---|---|
| **Yes** | |
| **No** | |
| **Not sure** | |

**<u>Section D: Practices of professional nurses working with patients with TB</u>**

*Please mark the answer on the box.*

**1. Do you wear protective masks when working with patients with TB?**

☐ Always ☐ Often ☐ Sometimes ☐ Never

**2. When do you need to wear a mask?**

☐ When I suspect that a patient has TB ☐ Throughout my consultation time
☐ When I consult a MDR TB patient

**3. Do you open windows for adequate ventilation regardless of the weather conditions?**

☐ Always ☐ Often ☐ Sometimes ☐ Never

**3. Is there an air entry through the door and the windows in your TB section?**

☐ Yes ☐ No

**4. Do you separate your TB patients in your institution?**

☐ Always ☐ Sometimes ☐ Only MDR patients ☐ Never

**5. Do you wash hands after helping patients with TB at the end of patient list?**

☐ Always ☐ Often ☐ Sometimes ☐ Never

**6. Which one is the correct coughing technique?**

☐ Putting your hand into your mouth when coughing ☐ Cover your mouth with clothes ☐ Cover your mouth with the corner of your elbow ☐ cough away for people without covering your mouth.

**7. Have you ever attended a TB course?**

☐ Yes ☐ No

***Thank you for participating in this survey.***

**Appendix B**

**Letter to the Participant**

NELSON MANDELA UNIVERSITY

**03 Lungelo Mlandu Street**
**Walmer Link**
**Port Elizabeth**
**6070**
**Date: 4/10/2016**

Dear Participant

I am currently conducting a research study on knowledge, attitudes and practices of professional nurses working with patients with tuberculosis as a partial fulfilment of the requirements for my degree, to Masters in Research in the Faculty of Health Sciences at the Nelson Mandela University. You have been selected as part of the sample of professional nurses working at primary health care clinics in the Nelson Mandela Bay district. By participating in this research you will assist the researcher to gather information about the knowledge, attitudes and practices of professional nurses working with patients with tuberculosis. This will improve the treatment, support and care of patients with tuberculosis.

The research will be conducted under the supervision of Prof. M. Williams and co-supervisors Dr, W ten Ham-Baloyi and Ms K Gerber at the Department of Nursing Science in the Nelson Mandela University in Port Elizabeth. I have received permission from the NMU Research Ethics Committee (Human) and the Department of Health to conduct the study.

This research will be confidential, which means that the researcher will not reveal/ share any personal information. Your identity will not be revealed at any time. Participation in this study is entirely voluntary. There are no foreseeable risks to the person who participate in this research study. You may withdraw at any stage from the study. Your contribution will be valuable in conducting this study, and you will be requested to complete a questionnaire. If you have any questions about the study or concerns about the participation, please contact me and the supervisor.

Miss A Nxumalo: 0733262986(cell) email: s205009867@nmmu.ac.za

Prof. Williams: 041 504 2962 (work) email: Maggie.williams@mandela.ac.za

Kind Regards

Researcher

Signature……

**Appendix C**

**Consent Form**

NELSON MANDELA UNIVERSITY

• **PO Box 77000 • Nelson Mandela University**

• **Port Elizabeth • 6031 · South Africa** • www.nmu. ac.za

**NELSON MANDELA UNIVERSITY**
**INFORMATION AND INFORMED CONSENT FORM**

| **RESEARCHER'S DETAILS** | |
|---|---|
| **Title of the research project** | Knowledge, attitudes and practices of professional nurses working with patients with TB in the Nelson Mandela Bay Health District. |
| **Reference number** | **H16-HEA-NUR-033** |
| **Principal investigator** | Avela Vuyolwethu Nxumalo |
| **Address** | 03 Lungelo Mlandu Street, Walmer |
| **Postal Code** | 6070 |
| **Contact telephone number (private numbers not advisable)** | 0413672287 |

| **A. DECLARATION BY OR ON BEHALF OF PARTICIPANT** | | **Initial** |
|---|---|---|
| **I, the participant and the undersigned** | (full name and surname) | |
| **ID number** | | |

| | | |
|---|---|---|
| **OR** | | |
| **I, in my capacity as** | | |
| **of the participant** | | |
| **ID number** | | |
| **Address (of participant)** | | |

| **A.1 HEREBY CONFIRM AS FOLLOWS**: | | **Initial** |
|---|---|---|
| **I, the (parent/guardian of the) participant, was invited to participate in the above-mentioned research project** | | |
| **that is being undertaken by** | Avela Vuyolwethu Nxumalo | |
| **From** | The Nursing Science Department | |
| **of the Nelson Mandela University.** | | |

| THE FOLLOWING ASPECTS HAVE BEEN EXPLAINED TO ME, THE (PARENT/GUARDIAN) OF PARTICIPANT: | | | | | Initial |
|---|---|---|---|---|---|
| 2.1 | **Aim:** | The aim of the study is to determine the knowledge, attitudes and practices of professional nurses working in primary health care clinics regarding treatment, care and support for patients with TB and make recommendations regarding findings of the study to the management in the Nelson Mandela Bay Health District. | | | |
| 2.2 | **Procedures:** | I understand that I will be asked to complete a questionnaire on my knowledge, attitudes and practices of tuberculosis. | | | |
| 2.3 | **Risks:** | No physical harm will come to the participants and they do not have to answer questions with which they do not feel comfortable | | | |
| 2.4 | **Possible benefits:** | As a result of my participation in this study it would assist the researcher to make recommendations on future TB training programmes. | | | |
| 2.5 | **Confidentiality:** | My identity will not be revealed in any discussion, description or scientific publications by the researcher. | | | |
| 2.6 | **Access to findings:** | Any new information or benefit that develops during the course of the study will be shared as follows: a compiled report submitted to NMMU and the institution where research will take place | | | |
| 2.6 | **Voluntary participation / refusal / discontinuation:** | My participation is voluntary | **YES** | **NO** | |
| | | My decision whether or not to participate will in no way affect my present or future care / employment / lifestyle | **TRUE** | **FALSE** | |

| 3. THE INFORMATION ABOVE WAS EXPLAINED TO ME/THE PARTICIPANT BY: | | | | | | | | Initial |
|---|---|---|---|---|---|---|---|---|
| Avela Vuyolwethu Nxumalo | | | | | | | | |
| In | **Afrikaans** | | **English** | | **Xhosa** | | **Other** | |

| | | |
|---|---|---|
| and I am in command of this language, **or** it was satisfactorily translated to me by | | |
| I was given the opportunity to ask questions and all these questions were answered satisfactorily. | | |

| | | |
|---|---|---|
| **4.** | No pressure was exerted on me to consent to participation and I understand that I may withdraw at any stage without penalisation. | |

| | | |
|---|---|---|
| **5.** | Participation in this study will not result in any additional cost to myself. | |

| **A.2 I HEREBY VOLUNTARILY CONSENT TO MY CHILD PARTICIPATING IN THE ABOVE-MENTIONED PROJECT**: | | |
|---|---|---|
| Signed/confirmed at | On | 20 |
| Signature or right thumb print of participant | Signature of witness: | |
| | Full name of witness: | |

## APPENDIX D

## Letter of permission to Bisho Department of Health Research Ethics Committee

**Date: 14 November 2016**

Department of Health

Research Ethics committee

Private Bag X0038

Bisho

5605

**REQUEST FOR PERMISSION TO CONDUCT RESEARCH IN PRIMARY HEALTH CARE CLINICS IN THE NELSON MANDELA BAY DISTRICT**

Dear Sir/ Madam

My name is Avela Nxumalo, and I am a Master's degree student at the Nelson Mandela University in Port Elizabeth. This is a research masters study and the title of my research is: Knowledge, attitudes and practices of professional nurses working with tuberculosis patients in the Nelson Mandela Bay Health District**.** This project will be conducted under the supervision of Prof M. Williams, Dr W ten Ham-Baloyi and Mrs K Gerber.

I am hereby seeking consent to approach the primary health care clinics in sub district C of the Nelson Mandela Bay Health District, where I intend to conduct this research. The objectives of the study are as follows:

- To explore and describe the knowledge, attitudes and practices of professional nurses working with patients with TB in primary health care clinics in sub-district C, in the NMBHD.

The research design is a quantitative survey that will be descriptive, exploratory and contextual. The research population will include professional nurses working in sub district C of the Nelson Mandela Bay Health District. The entire population of professional nurses in the purposively chosen sub district will be used for this study. A questionnaire will be distributed to the participants. I will ensure that ethical considerations protecting the participants are maintained throughout the study. The Belmont Report of April 18, 1979 will be the basis of the ethical considerations of the study. Based on the findings of the study recommendations will be made to the Department of Health and district management.

I am hereby seeking your consent to address professional nurses at their clinics, and provide them with structured questionnaires to fill in. I undertake to provide the Nelson Mandela Bay Health District with a full research report. Attached herewith is the University's ethics number, proposal, consent Form and letters to the District Manager and professional nurses (participants).

If you require further information please do not hesitate to contact me on cell no: 0733262986, email address: avelanxumalo@gmail.com

Thank you for your time and consideration in this matter.

Kind regards

**Avela Nxumalo**

## Appendix E

## Letter to Nelson Mandela Bay Health District Manager

NELSON MANDELA UNIVERSITY

**Date: 15 November 2016**

To: The District Manager
Nelson Mandela Health District
Walton's Building
Cunningham road
Port Elizabeth
6001

Dear Mrs. Botha

### Permission to do research

I am currently enrolled for a Master's degree in Primary health care at the Nelson Mandela University. I have to complete a research treatise as part of the requirements of the course, and the title of my research is "knowledge, attitudes and practices of professional nurses working with patients with TB. It will take approximately 10 minutes for participants to complete the questionnaire.

It is envisaged that the study would yield valuable findings on knowledge, attitudes and practices of professional nurses working with patients with TB in the Nelson Mandela health district and recommendations will be made for the future tuberculosis training. Attached to this letter is the letter from our Faculty Research Committee, Department of health permission letter and the research proposal document.

I appeal for your kind assistance in the following areas:

a) Requesting permission to conduct research with professional nurses working in the clinics of sub district C, Nelson Mandela Bay health district.

b) Requesting your kind assistance with clinic managers to act as gatekeeper to the research population. This entails facilitating contact with the clinic managers who could provide access to potential research participants.

The research study involves completing self-administered questionnaires on knowledge, attitudes and practices of professional nurses working with patients with TB in the Nelson Mandela Health district. The research study has been approved by the Faculty of Health Sciences Post graduate research committee which also granted Ethical approval for its execution. The reference number is **H16-HEA-NUR-033.**

The study will conform to the ethical guidelines and requirements of the University, and will uphold the confidentiality and privacy of the research participants. Upon your approval and the permission to conduct the proposed study, it would be greatly appreciated if you could facilitate contact with the relevant clinics.

My research supervisors are Prof. M Williams, Dr. W ten Ham-Baloyi and Mrs K Gerber, lecturers in the Department of Nursing Sciences, School of Clinical Care Sciences at Nelson Mandela Unuversity. Any questions regarding the study can be directed to the student in person at 0733262986.

Your kind assistance is appreciated.

Yours sincerely

_____

Miss. Avela Nxumalo Prof. M Williams

_____

Primary health care Masters Student Research supervisor

_____

## ACCEPTANCE LETTERS

## Appendix F

## Acceptance letter From Faculty Postgraduate Studies Committee (FPGSC)

Nelson Mandela Metropolitan University

for tomorrow

**Copies to:**
**Supervisor: Dr M Williams**
**Co-supervisor: Ms K Gerber**

**Summerstrand South**

**Faculty of Health Sciences**

Tel. +27 (0)41 504 2956 Fax. +27 (0)41 504 9324
Marilyn.Afrikaner@nmmu.ac.za

**Student number: 205009867**

**Contact person: Ms M Afrikaner**

11 November 2016

Ms A Nxumalo

3 Lungelo Mlandu Street

Walmer

Port Elizabeth

6070

**FINAL RESEARCH/PROJECT PROPOSAL:**
**QUALIFICATION: MCUR ADVANCED PRIMARY HEALTH CARE COURSEWORK**
**TITLE: KNOWLEDGE, ATTITUDES AND PRACTICES OF PROFESSIONAL NURSES WORKING WITH TUBERCULOSIS PATIENTS IN THE NELSON MANDELA BAY HEALTH DISTRICT**

Please be advised that your final research project was approved by the Faculty Postgraduate Studies Committee (FPGSC) subject to the following amendments/recommendations being made to the satisfaction of your Supervisor/s:

**COMMENTS/RECOMMENDATIONS:**

1. Add abbreviation TB in brackets after Tuberculosis in the abstract. Last sentence of abstract – word/words missing.
2. Be consistent with the acronym NMBHD and NMHD.
3. Editing – Table of Contents not as in the proposal,
4. Page 2 last paragraph, line 3 – remove "Where" at start of the sentence and maybe start with
   "According to the policy framework….."
5. Purpose of the study – last sentence "regarding" should read "based on the results of the study".
6. Repetition in the Sampling method.
7. Questionnaire needs to be corrected.
8. No work and time schedule included.
9. Letters should be dated.
10. Use NMMU email address in the participant letter.
11. Consent form in Xhosa – will translation be checked?
12. Reference list needs to be corrected.
13. REC-H form
    Name of student should be included on page 1 of the REC-H form Remove "Specify here, if "other".

    1 n) "concern" should be "consent"

    1 o) Why not 154 as stated in the proposal?

Please be informed that this is a summary of deliberations that you must discuss with your Supervisor/s.

FPGSC grants ethics approval. The ethics clearance reference number is **H16-HEA-NUR-033** and is valid for three years.

We wish you well with the project.

Kind regards,

**Ms M Afrikaner**
**Faculty Postgraduate Studies Committee (FPGSC) Secretariat**
**Faculty Administration**
**Faculty of Health Sciences**

## Appendix G
## Acceptance letter from the Eastern Department of Health

Eastern Cape Department of Health


Enquir1es: Madoda Xokwe Tel No: 040 608 0830

Date: 18 November 2016 Fax No:
e-mail address: madoda.xokw@echealth.gov.za

043 642 1409


Dear Ms. A. Nxumalo

**Re: Knowledge, Attitudes and Practices of Professional Nurses Working With Patients with Tuberculosis in the Nelson Mandela Bay Health District (EC_2016RP8_873)**

The Department of Health would like to inform you that your application for conducting a research on the abovementioned topic has been approved based on the following conditions:

1. During your study, you will follow the submitted protocol with ethical approval and can only deviate from it after having a written approval from the Department of Health in writing.
2. You are advised to ensure, observe and respect the rights and culture of your research participants and maintain confidentiality of their identities and shall remove or not collect any information which can be used to link the participants.
3. The Department of Health expects you to provide a progress on your study every 3 months (from date you received this letter) in writing.
4. At the end of your study, you will be expected to send a full written report with your findings and implementable recommendations to the Epidemiological Research & Surveillance Management. You may be invited to the department to come and present your research findings with your implementable recommendations.
5. Your results on the Eastern Cape will not be presented anywhere unless you have shared them with the Department of Health as indicated above.

Your compliance in this regard will be highly appreciated.

SECRETARIAT: EASTERN CAPE HEALTH RESEARCH COMMITTEE

## Appendix H

## Acceptance letter from the NMBHD Manager


Province of the

EASTERN CAPE

HEALTH

Office of the Clinical Governance Manager
Nelson Mandela Bay Health District
Private Bag X 28000,
Greenacres,
Port Elizabeth.
6057.
REPUBLIC OF SOUTH AFRICA

Enquiries : Dr L P MAYEKISO our Reference: NXUMALO/RESEARCH/2017
Telephone : 041-391-8173 Your Reference: Facsimile : 041-391-8133 Date: 12 JANUARY 2017
E-mail : Mbasa.mayekiso@gmail.com


Ms A Nxumalo
3 Lungelo Mlandu Street
Walmer

PORT ELIZABETH
6001

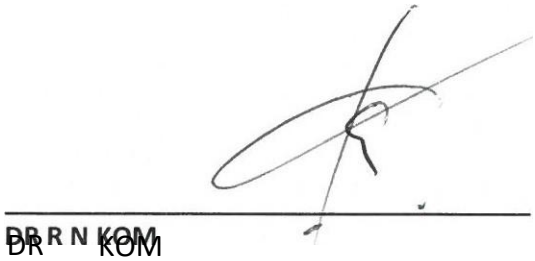
REQUEST FOR PERMISSION TO PERFORM RESEARCH TO "ASSESS THE KNOWLEDGE, ATTITUDES AND PRACTICES OF PROFESSIONAL NURSES WORKING WITH PATIENTS WITH TUBERCULOSIS IN THE NMBHD. "

In response to your application for permission to conduct the above research study at facilities within the Nelson Mandela Bay Health District (NMBHD), permission is hereby granted with the following proviso:

There should be no negative impact on existing health service delivery operations and all required data should be collected by the Researcher or a designated fieldworker (whose name should be forwarded to the relevant Sub District Coordinator prior to data collection). The Sub District
Coordinator, Mrs Michelle Koll — Sub District C — 060 563 1225, should be contacted before your visit and this letter is to be presented when visiting the facilities.

The Nelson Mandela Bay Health District, as the research site, will expect a copy of the final research report when the study is completed. If the duration of the research period is required to be extended, the NMBHD should be informed accordingly.

We would like to take this opportunity to wish you well for your research study.



DR R N KOM

DR KOM

ACTING CLINICAL GOVERNANCE MANAGER - NMBHD