

**CHALLENGES FACED BY HEALTH CARE WORKERS CARING FOR PATIENTS  
WITH TUBERCULOSIS AT TERTIARY 1 MILITARY HOSPITAL, THABATSHWANE,  
GAUTENG PROVINCE, SOUTH AFRICA.**

by

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## DECLARATION

“I declare that the mini-dissertation hereby submitted to the University of Limpopo, for the degree of Master of Public Health, **CHALLENGES FACED BY HEALTH CARE WORKERS CARING FOR PATIENTS WITH TUBERCULOSIS AT TERTIARY 1 MILITARY HOSPITAL, THABATSHWANE, GAUTENG PROVINCE, SOUTH AFRICA** has not previously been submitted by me for a degree at this university or any other university, that it is my work in design and in execution, and that all the material contained herein has been duly acknowledged”.

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**Date**

## DEDICATION

This dissertation is dedicated to the Almighty God for His grace, provision, and protection and for seeing me through this project; I can safely say through him all things are possible.

I would also like to dedicate this dissertation to the following people for seeing this degree realised through their continued courage and support.

My beloved mother, Mrs M.M. Maako for supporting me all the way until this dream is realised.

Miss R.M. Lesibe for encouraging me when I was in the verge of losing hope.

My supervisor Mr M.P. Kekana for all the interactions, guidance and support that ensured that, this degree materialised.

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## ABSTRACT

The purpose of this study was to investigate the challenges faced by health care workers caring for patients diagnosed with Tuberculosis at Tertiary 1 Military Hospital, Gauteng Province, South Africa.

The quantitative research study was conducted and data was collected from 56 respondents who participated in this study conducted at Tertiary 1 Military Hospital, Gauteng Province, South Africa.

Self-administered questionnaires were used to collect data from the respondents through a self-administered questionnaire. Data was then analysed using statistical STATISTICA 7, Software SPSS 23, as well as Microsoft Excel for presentation of tables and graphs. Respondents consisted of 59% females, compared to 41% of males. Majority of respondents (76.4%) were between the ages of 23-32. Respondents who were single were 66% compared to 32.1% married and 1.8% widowed.

The findings of this study indicates that the health care workers, work in challenging environment with a lack of resources and need to be supported, as they experience more negative than positive experiences whilst caring for patients diagnosed with TB, further, revealed that, the health care workers did not get support from management.

The analysis of the data has shown that management seemed not to understand fully what health care workers at grass-roots level are experiencing. Furthermore, findings of this research revealed that health care workers have never received any formal training on management of patients diagnosed with TB, wherein at times they have questions they have to ask their colleagues/friends, which at times they felt frustrated, the findings of this study furthermore revealed the lack of in-service training.

The study concluded that, the respondents fears contracting TB from patients diagnosed of TB: there is compromised TB infection control measures, such as failure to wear protective masks (N95), and lack of adequate resources was also revealed by several respondents.

The general findings of this research demonstrate that there should be adequate resources allocated to healthcare workers caring for TB, there should also be an initiatives to establish the health care worker's training regarding TB management and regular in-service training especially on TB management. This was also demonstrated in the study conducted by Chung et al, 2005, on the experiences of nurses while caring for Severe Acute Respiratory Syndrome (SARS) patients, the findings revealed a variety of emotions that were experienced, whereby, health care workers considered themselves vulnerable and at risk of contracting the disease themselves especially airborne diseases.

## DEFINITION OF TERMS

### **Health care workers**

Health care workers are people whose job it is to protect and improve the health of their communities, all people engaged in actions whose primary intent is to enhance health of their communities (WHO, 2006).

In this study health care workers will individuals that get in contact with TB patients, who provides preventative, curative, promotional, and rehabilitative health care services including to patients who currently faces challenges in their work environment.

It is proposed to also include other personnel working in healthcare facilities that may have contact with TB patients, or the infectious materials from TB patients. These personnel include all those persons who provide health services, such as doctors, nurses, clinical associates, physiotherapists, and occupational therapists.

### **Caring**

Is the process of providing what people need for their health and protection (South African Oxford Dictionary, 2002). In this study caring implies the tasks that health care workers are expected to undertake so as to provide to patients needs like love and support in order for them to appreciate and to give communities.

### **Challenge**

A challenge is defined as “a demanding task or situation” (South African Oxford Dictionary, 2002). A challenge in this study refers to a demanding task/situation health care worker currently faces in their work environment.

### **Patients**

A patient is a person who is receiving medical treatment, especially in a hospital (South African Oxford Dictionary, 2002). In this study, a patient is a person who has been diagnosed with TB and has been admitted at the study site for treatment and further management.

### **Tuberculosis**

Tuberculosis is an airborne infectious disease, caused by infection of a bacterium, called *Mycobacterium tuberculosis*, which is mostly found in the lungs and 70% known as Pulmonary Tuberculosis and in any part of the body 30% which is referred as extra-pulmonary tuberculosis (Heymann & Thuriaux, 2004). Tuberculosis is commonly spread from person to person by droplets nuclei from persons infected with tuberculosis during inhalation or during exhalation action such as coughing, sneezing, singing and as well as inhalation by the susceptible contact (Heymann et al, 2004).

**Sick bay**

A room or a building set aside for the treatment and accommodation of the sick and injured patients especially within the military base, ship, or school South African (Oxford Dictionary, 2002).

**Resources**

An economic or productive factor required to accomplish an activity, or as means to undertake an enterprise and achieve desired outcome, e.g. capital; Other resources include energy, information, expertise, management, and time, which can be mainly provides company or the institution for employees to render essential services, resources are regarded as essential need for employees to render service. The resources can also be defined as a service or other asset used to produce goods and services that meet human needs and wants (Mankiw, 2008).

## LIST OF ABBREVIATIONS

### Abbreviations

**1 MHREC** 1 Military Hospital Research Ethics Committee.

**AIDS** Acquired Immune Deficiency Syndrome.

**BCG** Bacillus Calmette –Guerin.

**ECG** Electrocardiography.

**HIV** Human Immunodeficiency Virus.

**PPE** Personal Protection Equipment.

**SARS** Severe Acute Respiratory Syndrome.

**SADC** Southern African Development and Economic Community.

**TB** Tuberculosis.

**TREC** Turfloop Research Ethics Committee

**UN** United Nations.

**WHO** World Health Organisation.

**AMHU** Area Military Health Unit.



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## CHAPTER 1

### INTRODUCTION

#### 1.1 INTRODUCTION AND BACKGROUND

Tuberculosis (TB) is an airborne infectious disease, caused by infection of a bacteria, called *Mycobacterium tuberculosis*, which is mostly found in the lungs and 70% known as Pulmonary Tuberculosis and in any part of the body 30% which is referred to as extra-pulmonary tuberculosis (Heymann & Thuriaux, 2004). Tuberculosis is commonly spread from person to person by droplets nuclei from persons infected with tuberculosis during inhalation or during exhalation such as coughing, sneezing, singing and as well as inhalation by the susceptible contact (Heymann et al, 2004). TB poses a threat to public health throughout the world especially to persons and health care workers who are every day in close contact with patients with active pulmonary tuberculosis (Mayo Clin Proc, 2011).

Miller (2007) highlighted that when patients are diagnosed with TB, they will be isolated for the purpose of infection control and prevention. The isolation process is necessary while the patient remains infectious to maintain safety and to prevent possible further spread of disease. Miller (2007) further stated that infection control and protective masks are important but the initial psychological impact of their use is significant. Isolation creates problems for the client with difficulties around communication and financial problems and is recognised as an issue by staff and visiting times are restricted and children are not permitted to visit TB patients (Miller, 2007).

WHO (2007) estimated that globally 8.8 million people were infected with TB and 1.6 million people died of TB in 2005. In South Africa TB infection pandemic still presents a massive challenge, fuelled by the HIV infection with more than 70% of patients co-infected with both diseases. TB proves to be a leading cause of death in both males and females which makes it a major public health concern. The disease is responsible for 12 % of death among males and 10 % in females which means out of 505,803 people who died in South Africa in 2011, 12% were males and 10% were females (Statistics SA, 2014).

Health care workers believe that they have no extensive training in control measures and felt uncomfortable about adhering to precautions that are in place, most of the health care workers believe that masks provided are uncomfortable although legislation and policies prescribes that masks as a Personal Protection Equipment (PPE) must be used at all times for infection control and prevention of TB transmitted from patients to health care workers and from health care workers to patients. PPE use is viewed as an obstruction to the patients and healthcare worker's relationship (Miller, 2007). Some patients at the 1 Military hospital are too ill to care for themselves, which means that health care workers have to assist, supervise their treatment and care for them

holistically during their hospital stay. The study will therefore try to find out challenges that health care workers face whilst caring for these patients at the hospital.

## **1.2 RESEARCH PROBLEM**

1 Military Hospital in Gauteng Province, South Africa, among military facilities, has the highest number of patients admitted with TB, Therefore, health care workers have to assist them, supervise their treatment and care for them holistically during their hospital stay. That means health care workers have to come into close contact with the patients at all times, when rendering direct care, as patients will be admitted in hospital for a short period of 14 days or more to receive TB treatment. This therefore put the health care workers at 1 Military Hospital at high risk of contracting TB infection because of frequent exposure to patients with infectious TB.

Health care workers as they're frontline workers in providing care to patients are often fearful when they have provide care for patients with communicable diseases, as they could contract the TB. The researcher has been observed that there is deterioration in the health care worker's morale and caring for patients diagnosed with TB. The health care workers have reduced therapeutic relationships and compromised quality of caring for patients. This resulted in health care workers being unable to help their patients in a competent manner, as they have lost interest in caring for patient diagnosed of TB.

Furthermore, there is a significant increased staff turnover and absenteeism among health care workers at the study site, which affected the efficiency of health care services and caring for patient who are diagnosed with TB.

Health care workers turnover, absenteeism, grievances and highly stressful environment have greatly affected the efficiency of health care services and caring for patient who are diagnosed with TB at the study site. This study seeks to find out what are the challenges that these health care workers might be facing at 1 Military Hospital.

## **1.3 PURPOSE OF THE STUDY**

The purpose of this study was to investigate the challenges faced by health care workers caring for patients with Tuberculosis at Tertiary 1 Military Hospital, Gauteng Province, South Africa.

## **1.4 OBJECTIVES OF THE STUDY WERE:**

The objectives of the study were to:

- To establish the availability of resources allocated to health care workers caring for TB patients at 1 Military Hospital
- To establish health care worker's training regarding TB management at 1 Military Hospital.
- To establish the relationship between general satisfaction, responsibility, patient care, time pressure and staff relations, amongst health care workers.

## **1.5 RESEARCH QUESTIONS**

What are challenges faced by health care workers caring for patients with TB at Tertiary 1 Military Hospital Thaba-Tshwane, Gauteng Province, South Africa?

## **1.6 SIGNIFICANCE OF THE STUDY**

This study will contribute towards greater insight into the lives of the health care workers at 1 Military Hospital and their challenges faced when caring for TB patients, the environment and the therapeutic relationship with their patients and further highlight the professional support for health care workers caring for TB patients at 1 Military Hospital Thaba-Tshwane, Gauteng Province, South Africa.

The researcher will communicate the research findings and recommendations to the health care workers and the hospital management on completion of this study to assist policy makers regarding policy formation and developing measures regarding the treatment thereof and dealing with TB patients.

The study outcome will form the basis of education and training for healthcare workers in the TB working environment in relation to the stigma attached to TB, personal risk, and confidentiality.

## **1.7 CHAPTER OVERVIEW**

This research is divided into five chapters. Chapter 1 gives a brief introduction to the problems surrounding challenges faced by the health care workers caring for patients diagnosed with Tuberculosis at 1 Military Hospital Thaba-Tshwane, aim and objectives, as well as research question for the study.

Chapter 2 provides a comprehensive literature review that seeks to highlight what other authors have established in relation to the topic under investigation, as well as findings and recommendations.

Chapter 3 provides the methodology by looking at the research design, the study population, sampling and data collection which are applied in the study.

Chapter 4 provides results and discussions of the study, recommendations are provided in Chapter 5 including limitations and further study.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

This chapter contains the literature review on Tuberculosis (TB). A literature review is a written summary of the evidence on a research problem undertaken by a researcher to support the research problem. The purpose of the literature review is to familiarise the researcher with the scope of the field of study (Polit & Beck, 2008).

The process of reviewing the literature is undertaken to search and identify pertinent literature that would improve the understanding of the problem under study. Furthermore, the researcher consulted several sources, which includes medical textbooks, medicals and research journals; the researcher also consulted the WHO policy documents: Relevant sources were obtained from the library and the Internet to gather literature in relation to this study.

#### **2.2 FEAR OF INFECTION AND PROVISION OF PERSONAL PROTECTION EQUIPMENT.**

In a study conducted by Chung, Wong & Suen, 2005, on the experiences of health care workers while caring for Severe Acute Respiratory Syndrome (SARS) patients, the findings revealed a variety of emotions that were experienced by health care professionals, where the nurses felt vulnerable and at risk of contracting the disease themselves.

Furthermore there is a feeling of frustration when health care workers did not follow the infection control guidelines properly and fell victim to TB leading to them being unable to help their patients in a competent manner. The findings indicate that their feelings and attitude changed as empathy is developed towards the patients (Chung et al, 2005).

The critical challenges faced by health care workers in preventing nosocomial diseases in healthcare facilities are prioritising financial and technical resources and balancing the need to provide healthcare workers with a safe working environment against the need to provide competent and compassionate care to patients (Fenelly, 2008). The employers must realise that the responsibility for maintaining a healthy workforce is a shared with employees.

It is the responsibility of the employer to ensure that health care workers work in a safe and low-risk environment by providing PPEs so that health care workers can do their work effectively without concerns that they might contract infections (Parsons, 2004). Close contact with someone who has active TB in a high risk setting results in inhalation of airborne nuclei from the infected person that is proportional to the amount of time spent in the same air space, the proximity of the person and the degree of ventilation (Smeltzer, Bare, Hinkle & Cheever, 2008).



In order to determine how best to establish infection control policies in healthcare settings in developing countries, it is first important to determine the extent of the impact of TB infection on healthcare workers (Eshun, Wilson, Zeier, & Taljaard, 2008). Health care workers in laboratories that are carrying out mycobacterium tuberculosis culture procedures are also at high risk; other high risk settings include institutions such as jails, prisons, detention centres and drug rehabilitation centres (WHO, 2008a). The isolation wards in most hospitals and the observation that health care workers use masks and gloves when attending to TB patients, can lead to stigmatization of TB patients in the eyes of the community members (Dodor, 2008).

Fear of infections was identified as the main reason for the stigmatizing attitudes and behaviours of both health care workers and community members towards those with TB. HIV infection increases the rate at which mycobacterium infections are acquired and increases the likelihood that people who are already being infected will develop TB. HIV has the greatest impact in the countries of Southern and Eastern Africa, where up to 40% of adults are infected with HIV and where the incidence of TB has increased within 10 years (WHO, 2008b).

Health care workers are at a high risk of contracting TB infection because of frequent exposure to patients with infectious TB. Health care professionals may themselves be immune-suppressed due to HIV infection and be at a higher risk of developing TB once infected (South Africa, 2007). In 2004 the estimated prevalence of HIV in health care professionals in South Africa was 15%, and in the KwaZulu-Natal population it was approximately 17% (Naidoo, 2007).

People who have been in close contact with someone who has infectious TB, including health care workers with HIV and AIDS associated immunosuppression, are particularly vulnerable to developing TB, if they become infected with mycobacterium tuberculosis as a result of the exposure (South Africa, 2007).

When patients with TB cannot access health care services due to financial constraints, this could lead to the patient being infectious for a longer period of time than necessary before receiving treatment and this increases the risk of transmission to close contacts which furthermore lead to patient being admitted in the health care facility being taken care by health care professionals for a minimum of 14 days which poses high risk infection to health professionals (Nhlema, Simwaka, Salaniponi, Theobald, Squire & Kemp, 2007).

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

The lack of adequate in service education on infection prevention and control measures result in insufficient adherence by staff members to precautionary measures, there is an inadequate supply of N95 respirators, which the health care workers reports to be always out of stock in the institution. The N95 respirators can protect health care worker from inhaling TB only if standard work practice and environmental controls are in place (South Africa, 2007).

### **2.3 PATIENT BEHAVIOUR**

In normal accidental transmission risks of contracting communicable diseases such as TB in healthcare institutions, health care professionals are at risk of being deliberately infected by patients. The findings of a study indicate that HIV positive patients often try to expose health care professionals and their relatives to their stools, blood or secretions on purpose. As a consequence, health care professionals devised secret signs to inform each other about the HIV status of their patients, in order to make each other aware that they should take extra precautionary measures (De Villiers & Ndou, 2008).

Health care workers often distanced themselves from their patients and frequently refrained from touching their patients (De Villiers & Ndou 2008). Some patients skipped their medication or even absconded from hospital and this affects the patient's care outcomes. At times patients behaved unacceptably by being verbally abusive and disrespectful towards nurses, and some patients intentionally behaved in this manner just so that they could get discharged, therefore health care workers often distanced themselves from their patients and frequently refrained from touching their patients (ARJUN, 2011).

It was revealed that patients deliberately tried to infect health care workers especially nurses by leaving the sputum bottles open. This may have resulted in health care workers especially nurses not spending enough time with patients or intentionally neglecting patients, because working in a TB environment with inadequate infection-control measures leads to exposure to the risk of contracting the disease (ARJUN, 2011)

The health care workers expressed concern for their families and other community members that came into contact with the patients who were granted pass-outs. Although prior to the pass-out patients were given health education to prevent the spread of the disease, there was no guarantee that they would implement those measures since patients couldn't implement them whilst they were admitted. It was also a concern if they went to shopping centres and places where large numbers of people gather, such as social gatherings, and church, as there would be a risk to the community members of contracting the disease (ARJUN, 2011).

## **2.4 ENVIRONMENTAL CONTROL OF TUBERCULOSIS.**

The most important factors in the environmental controls includes ventilation, filtration and ultraviolet germicidal irradiation, ventilation relies on open doors and windows to bring in air from the outside, during ventilation fresh air enters a room, and dilutes the concentration of particles in the room air especially droplets nuclei that contains mycobacterium tuberculosis (WHO, 2008c).

The natural ventilation in the TB settings includes regular checking to ensure that doors and windows are always opened to enhance ventilation; natural ventilation considerably reduces the risk of spreading mycobacterium tuberculosis (WHO, 2008c).

It is significant that waiting areas and examination room's windows are opened to maximise natural ventilation and reduce the spread of TB. In warm climates, open air shelters with a roof to protect patients from fans may also assist in distributing the air. However, the use of ceiling fans is only justified if there is free air flow out from the room through open windows (WHO, 2008c).

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

Negative pressure ventilation is another method used to prevent contaminated air from flowing out of the room into areas in laboratories or healthcare facilities, by maintaining an air pressure difference between the two areas. Air is drawn into the room from areas and exhausted directly to the outside, removing and diluting any infectious particles. This may be the method of choice in some settings, depending on various factors that include climatic conditions and available resources (WHO, 2008c). If patients are requested to provide sputum specimens for TB; they must do so outside in the open air area, away from other people (WHO, 2008c).

Health care workers needs supports in their working environment, but often health care workers felt that management does not understand what it felt like to work in the TB wards. Management did have meetings with different categories of health care workers but health care workers indicated that they were too scared to verbalise their feelings and share their experiences. Health care workers, however, did indicate that they received support from their colleagues (Arjun, 2011).

There were times when patients were verbally and physically abusive, and it was during these times that they needed support but there was none from the management, neither was there a functional Employee Assistance Programme available at this institution. Health care workers therefore felt a lack of appreciation by management (Arjun, 2011).

Although health care workers put themselves at risk in the work environment, they did not receive any incentives and neither did they receive a danger allowance, health care workers furthermore indicates that by working in a high-risk environment they had certain needs. Their health needs to be protected. They need a fully functional occupational health clinic. Infection-control measures and safety measures need to be implemented and continually monitored. In-service education is needed so that they can provide quality patients care (Arjun, 2011).

## **2.5 TB MANAGEMENT POLICY AND TRAINING FOR HEALTH CARE WORKERS CARING TB PATIENTS.**

It is reported that in 2001 the tuberculosis case detection rate (new positive smear) was 48 %, and in 2011 was 69 % the highest was in 1997 which was 82 % which placing the third in the world (WHO, 2013). The WHO furthermore estimates that in 2011 there were more than 500,000 cases of active tuberculosis diseases in South Africa, of whom an estimated 330,000 cases also had HIV infection (WHO, 2013). Tuberculosis causes over 60000 deaths a year in South Africa a figure which is fuelled by the highest prevalence rates of HIV (Moloi, 2014).

All health care workers must understand the importance of infection prevention and control plans and policies through proper training, and they must receive clear instructions that are specific to their job category and description. The training must be conducted before the health care workers initially start on their posts, and continuous in-service and education must be provided to all health care workers caring TB patients annually (WHO, 2008c).

The training for health care workers caring for patient with TB must include the basic concepts of TB, the disease mode of transmission, pathogenesis, signs and symptoms of TB, the risk of transmission to all health care workers caring TB patients and measures they can use to protect themselves and patients against TB.

The training must also include the importance of the infection prevention and control, plan and policy as well as the responsibilities of all health care workers caring TB patients with regard to the implementation of the plan (South Africa, 2007). All health care workers caring TB patients must always be reminded that they can develop TB, regardless of previous infection status or BCG vaccination (WHO, 2008c).

Workplace policy control measures, an infection control plan, training of all health care workers caring TB patients, education of patients, coordination and communication with the TB control programme have the greatest impact on preventing TB transmission (WHO, 2008). All TB facility must have clear written TB infection prevention and control plan and policy with an infection prevention and control officer responsible for infection prevention and control officer who is responsible for overseeing that all TB policies for infection control and plans are implemented and adhered to by health care workers for infection-control measures.

The plan for training of health care workers should include screening of patients to identify persons with symptoms of TB disease, placing TB suspects and cases in separate waiting areas and sending patients for diagnostic investigations of TB. Health care workers should also be screened for TB for free if they have had a cough for two weeks. Each institution must have well-established and well trained multidisciplinary infection prevention and control committee to monitor and evaluate the infection prevention, control plan and policy (WHO, 2008c).

## **2.6 LACK OF RESOURCES AT TB MANAGEMENT FACILITIES.**

There is strong evidence that most of health care institutions especially TB facilities in South Africa lacks essential equipment such as an ECG machine, and poor-quality supplies, for example N95 masks and quality gloves (Arjun, 2011). However, health care workers indicate that they have insufficient theoretical knowledge to provide quality care to these patients. Although policies and protocols were available, they were not consistently followed and implemented by healthcare workers, especially doctors. Although they experienced problems, at other times health care workers especially nurses felt very good when seeing patients who had been very ill on admission, regain their health and be discharged (Arjun, 2011).

In most of the TB management facilities there is an inadequate supply of N95 respirators, which the health care workers reports to be always out of stock in the institution. The N95 respirator is an essential PPE in the TB facility which protects health care worker from inhaling TB only if standard work practice and environmental controls are in place (South Africa, 2007).

The lack of provision of PPE e.g.N95, apron, gloves and goggles will lead to health care workers often distancing themselves from their patients and frequently refrained from touching their patients, with regard provision, it is revealed that sometimes there are no masks and aprons available in the most public sector hospital, at some stage the health care workers have to go on strike because there were no N95 masks available in the hospitals: Health care workers have to use one mask for a number of days, because the durability of the mask is not known to go to that level of functioning. There is also no hand wash basins and visors to be used when inserting drips (Arjun, 2011).

It is essential that a TB facility must have the basic requirements of infection control most health facilities have inadequate number of hand wash basins in the wards for health care workers to wash their hands. Hand washing is essential for reducing the spread of infection especially TB in hospitals and this is a simple infection control measure. Health care workers may themselves be immune suppressed due to HIV infection and may be at higher risk of developing TB (South Africa, 2007).

## **2.7 THE PSYCHOLOGICAL IMPACT OF TB TO HEALTHCARE WORKERS.**

The work related stress and trauma can negatively impact on performance and wellbeing of the healthcare workers, which could lead to absenteeism, low levels of productivity, employee dissatisfaction and eventually a high staff turnover.

Healthcare workers are particularly exposed to stress and trauma, and in conjunction with caring for TB patients or working with terminally ill TB patients, and especially young children, severely challenge the coping abilities of workers (Burr, 2006).

The high prevalence of TB in vulnerable communities poses a serious threat to healthcare systems and healthcare workers. The healthcare workers in South Africa work under difficult circumstances, which include stress and burnout due to a shortage of healthcare workers, an increase in the population, the high burden of diseases, specifically HIV and TB, as well as a general deterioration of the healthcare infrastructure ( Zungu, 2011)

## **2.8 THE RISKS OF EXPOSURE TO TB ON HEALTHCARE WORKERS**

The health care workers are always exposed to high risk settings as they come into close contact with the patients all the time, therefore it has been found that there is a higher prevalence of occupational TB especially working in poorly resourced settings with high prevalence of TB (Claassens, 2010).

The study indicated that health care workers are at a higher risk of infection than the people living in the community they work in as they come into close contact with the patients all the time. Therefore there is an urgent need to implement cost-effective and global infection control measures, specifically in middle and low-income countries (Claassens, 2010).

When health care workers first became aware of TB, healthcare workers reacted with fear and over-protectiveness and as a result, stringent infection control measures were implemented; however, with increasing knowledge of the disease and the mode of transmission and infection control measures, guidelines were established to ensure that healthcare workers and patients are adequately protected (Mulaudzi, 2011)

The transmission of TB to both patient and healthcare workers has been reported globally (Baussano, 2011). The risk of exposure might differ in terms of occupational grouping, work setting, local prevalence rates of TB, patient population and the effective TB control measures in place. The risk of TB exposure among healthcare workers is higher than the risk among the general population globally (Baussano, 2011).

The healthcare workers are often in direct contact with patients, including those with infectious diseases such as TB, which are some of the potentially life threatening challenges that healthcare workers face routinely. Furthermore, the emergence of multidrug-resistant TB in many developing countries poses new challenges,

not only to the healthcare system but also to healthcare workers (Niu, 2010). The WHO report of 2006 states that healthcare workers and other staff involved in caring and interacting with patients suffering from highly infectious diseases are at particularly high risk of infection because as they are frequently exposed to patients with infectious such as TB disease healthcare workers are at risk merely because they are part of the population; therefore, if the incidence and prevalence of TB is high in the general population, we should anticipate a similar incidence in TB infection for healthcare workers regarding both TB ( Tawfik, 2006).

## **2.9 SUMMARY**

This chapter reviewed literature on the challenges of health care workers while caring for TB patients and Severe Acute Respiratory Syndrome patients. Various views of these challenges and experiences were reviewed as stated by different authors. In the next chapter the research methodology will be discussed.

## **CHAPTER 3**

### **RESEARCH METHODOLOGY**

#### **3.1 INTRODUCTION.**

The previous chapter presented a literature review on TB disease, challenges and experiences of health care workers caring for TB patients and Severe Acute Respiratory Syndrome (SARS) patients. The aim of this chapter is to describe the research design, method and the material that were applied to explore and describe the challenges faced by the health care workers caring for TB patients at 1 Military Hospital Thaba-Tshwane, Gauteng Province, South Africa.

#### **3.2 RESEARCH DESIGN AND METHODOLOGY**

##### **3.2.1 RESEARCH DESIGN.**

In this study, a quantitative research design was adopted. Quantitative research uses a design method that organises in advance the research question and a detailed method of data collection and analysis (Robson, 2007). The data was collected through through a self-design questionnaire. Therefore the study method was proposed in order for the researcher to collect details of the health care provided by health care workers caring for TB patients at Tertiary 1 Military Hospital Thaba-Tshwane, Gauteng Province, South Africa.

##### **3.2.2 RESEARCH METHODOLOGY.**

A cross sectional descriptive statistics method was utilised to describe the challenges faced by health care workers caring for TB patients at 1 Military Hospital Thaba-Tshwane by using a questionnaire as rose from the belief that human phenomena and variables in human behaviour can be studied objectively (Parahoo, 2006). Quantitative research uses a design method that organises in advance the research question and a detailed method of data collection and analysis (Robson, 2007). Cross – Sectional studies entails the collection of data from a cross-section of the population, at a given point in time (Burns & Grooves, 2001). Therefore the study method was proposed in order for the researcher to collect details of the health care provided by health care workers caring for TB patients 1 Military Hospital Thaba-Tshwane, Gauteng Province, South Africa.

#### **3.3 STUDY SITE.**

The study was conducted at 1 Military Hospital Thaba-Tshwane, Gauteng Province, South Africa. The hospital was established in 1979 July 01 as level 3 hospital, the hospital is situated in Pretoria, the administrative Capital City of South Africa. It is located 4 km from Pretoria in Thaba-Tshwane. The institution has the following specialty units or wards: Adult Intensive Care Unit (ICU) and High Care, Neonatal ICU, Pediatrics, Casualty, Maternity, Medical, Surgical, Theatre and Orthopedics.



The bed occupancy is 29 per ward and the total bed occupancy of the hospital is 320 beds and offers the following services: taking care of in-patients in the wards, running out-patients clinics including the implementation of special programs such as tuberculosis and HIV and AIDS management. It also serves as a training centre for health care workers and students from different health institutions as an academic hospital.

1 Military Hospital provides medical health care for national servicemen, permanent force members and their dependents, and personnel of neighbouring armies most commonly SADC countries and UN members. Also treat and admit Presidents and deputy presidents, ministers of defence and deputy ministers of defence of neighbouring African countries.

### **3.4 POPULATION.**

Since the total numbers of health care workers caring directly for TB patients at 1 Military Hospital were 56, all of them were included in the study. The nurses, doctors, clinical associates, physiotherapists and occupational therapists were the targeted population in this study as they are directly involved on daily basis, caring for TB patients and working in a high risk environment for contracting TB in provision of health services and caring for patients with TB at 1 Military Hospital Thaba-Tshwane, Gauteng Province, South Africa.

Therefore, the study population comprised of 56 health care workers, whom were nurses (20), doctors (8), clinical associates (10), physiotherapists (8), and occupational therapists (10) who are directly caring for patients with TB at 1 Military Hospital Thaba-Tshwane, Gauteng Province, South Africa.

### **3.5 SAMPLING.**

Sampling refers to the researcher's process of selecting the samples from a population in order to obtain information regarding a phenomenon in a way that represents the population of interest (Brink, 2012). In this study the purposive sampling method was used to obtain the data from selected sample.

Unlike random studies, which deliberately include a diverse cross section of ages, backgrounds and cultures, the idea behind purposive sampling was to concentrate on people with particular characteristics who will better be able to assist with the relevant information in the research study (Palys, 2008).

#### **3.5.1 Sample size.**

In a quantitative research the size of the sample should be calculated at the design stage (Proctor & Lacey, 2010). The quantitative study researchers should select the largest sample possible size so that it is a representative of the target population (Polit & Beck, 2010). The sample size for the study was all 56 health care workers comprising

of nurses (20), doctors (8), clinical associates (10), physiotherapists (8), and occupational therapists (10).

### **3.6 INCLUSION CRITERIA.**

#### **3.6.1 Inclusion Criteria**

The study included all health care workers, comprised of nurses, doctors, clinical associates, physiotherapists, and occupational therapists.

#### **3.6.2 Exclusion Criteria**

Hospital employees who were not directly caring for patient with TB and who do not work in a high risk environment for contracting tuberculosis were excluded in the study.

### **3.7 DATA COLLECTION**

Data collection refers to the precise, systematic gathering of information relevant to the research purpose or the specific objectives, questions or hypothesis of the study (Burns & Grove, 2001). In this study data was collected on 15 October to 26 November 2016, using questionnaires developed by the researcher designed to cover all aspects and details of the health care provided by health care workers caring for TB patients. The total number 56 respondents were drawn from the hospital.

The researcher was personally responsible for the distribution and collection of all questionnaires. Due to the nature of shift work in a hospital setting the researcher allocated four hours every week to collect questionnaires from day staff and two hours for night staff. The target was an average of 7 questionnaires every week over eight week's period. Data were then captured electronically for the purpose of analysis and submitted to statistician.

The questionnaire was divided into sections namely: Section **A**, Demographic details, Section **B**, Availability of adequate resources allocated to health care workers, ventilation and protective masks, Section **C** Questions about training, managing TB by health care workers, Section **D** General job satisfaction and patient behaviour on managing TB by health care workers

### **3.8 PILOT STUDY**

The pilot study was conducted on a small sample of the population in the same manner as the main study, Therefore, the pilot study comprised of health care workers, whom were nurses, doctors, clinical associates, physiotherapists, and occupational therapists that are directly caring for patients with tuberculosis.

It gives the researcher the opportunity of checking if the respondents will understand the questions in the same way, if all questions are relevant and if all the instructions are clear. The pilot study gives the researcher the opportunity to check on whether the length and structure of the questionnaire are problematic (Parahoo, 2006). This is a small scale study conducted prior the main study on a limited number of subjects from

the population at hand (Brink, 2012). Its purpose was to investigate the feasibility of the proposed study and to detect possible flaws in the data collection instruments such as ambiguous instructions, inadequate time limits as well whether the variables defined by operational definitions are observable and measurable (Brink, 2012).

In this study a pilot study was conducted at a Sick Bay, (AMHU Mpumalanga), data was collected using questionnaires developed by the researcher designed to cover all aspects and details of the health care provided by health care workers caring for TB patients at 1 Military Hospital Thaba-Tshwane, Gauteng Province, South Africa, working in different department or section using a simplified language and instructions.

A closely monitoring and care were taken that the respondents in the pilot study at the Sick Bay,(AMHU Mpumalanga), were excluded from the main study and that details of the study were not passed on to the main study respondents.

### **3.9 DATA ANALYSIS**

The data was analysed using IBM SPSS version 23 with the help of the statistician. Both descriptive and inferential statistics were used to answer the objectives of the study, of the 56 questionnaires printed and distributed, 56 were returned (a respondents rate of 100%) of these, all 56 questionnaire were completed, thus 56 questionnaires were available for analysis. Quantitative data from the returned questionnaires were coded and entered into a Microsoft Excel spread sheet (Microsoft Office, 2010).

The statistical software IBM SPSS version 23 was used to analyse the generated data. Descriptive and inferential statistical analyses were employed. Data were also summarized using graphic presentations for the interpretation of findings. Statistics were based on percentages and frequencies.

### **3.10 RELIABILITY**

Reliability refers to the consistency of measures obtained in the use of particular instrument and is an indication of the extent of random error in the measurement method (Burns & Grove, 2001). Reliability of a questionnaire refers to its ability to yield the same data when it is re-administered under the same conditions but it is difficult to obtain a replication of the data you are dealing with people (Robson, 2007).

A pilot study was conducted to test for the reliability. Asking more than one person the same questions and obtaining the same answers ensured reliability. A questionnaire was used to obtain information from all the respondents to make sure that the same questions are asked. Reliability for quantitative research focused mainly on stability and consistency (Polit & Beck, 2010).

The stability of a questionnaire is the degree to which it produces similar results on being administered twice. As recommended the researcher will to do a stability test using the test-retest method on a small population.

The questionnaire was administered on two occasions, two weeks apart and the results compared. A reliability coefficient was calculated on two sets of data for each part of the questionnaire. Good reliability was indicated by a coefficient  $> 0.8$ , so the researcher achieved a liability of this level or greater. The 'test-retest' was included in the pilot study (Polit & Beck, 2010).

Whether or not questions measure the same concept was checked by an internal consistency check (Parahoo, 2006). The researcher used the split-half test to check internal consistency. The questionnaire was split into two equal halves and the data was checked for similarity (Parahoo, 2006).

### **3.11 VALIDITY**

Validity is defined as the degree to which the instrument measures what is intended to measure (Polit & Beck, 2010). The questionnaire should adequately address all aspects of the issues being studied. To ensure validity in this study, a pilot study was conducted to ensure that research questions were preliminarily tested to measure what is designed to measure and also to check consistency in obtaining the required results which are reliable. Furthermore to ensure content validity of the instrument, the structured questionnaire was submitted to the supervisor and statistician for expert scrutiny regarding the relevance of each item.

A content validity test that there are enough relevant questions covering all aspects being studied and those irrelevant questions are not asked (Parahoo, 2006). The test is based on judgement as no objective methods exist. The questionnaire was submitted to such a panel to check that the questions reflected the concepts being studied and that the scope of the questions was adequate, in the manner proposed (Parahoo, 2006). Pre-testing of the questionnaire was done at Sick bay

### **3.12 BIAS**

Any influences that produce distortion in the results of the study or strongly favour the outcome of the particular findings of the research study were regarded as bias (Brink, Van der Walt & Van Rensburg, 2012). When personal views and preferences affects the data presented then the outcomes are considered to be biased.

In this study, questionnaires had similar instructions to the sampled population and all respondents to avoid bias and data received was regarded as anonymous and vital. The researcher ensured that the research respondents were independent and treated with respect so that they are protected from exploitation.

Respondents were not selected based on a desire to prove a specific research objective, the researcher ensured that the targeted population represented all health care workers that were directly involved on daily basis caring for TB patients and were working in a high risk environment, prone to contracting TB in provision of health services and caring for patients with tuberculosis. The researcher furthermore allowed

the respondents enough time to complete questionnaires and ensured that the results of the research were accurately recorded in literature

### **3.13 ETHICAL CONSIDERATIONS**

The ethical considerations took into account the revealing nature of the study, which required that voluntary, informed consent, using the consent form designed for this study, needed to be obtained from the respondents. Prior to administering the questionnaires, the aims and objectives of the study were clearly explained to the respondents and a written informed consent was obtained. Confidentiality and anonymity were ensured throughout the execution of the study as respondents were not required to disclose personal information on the questionnaire.

Provisions were made to have respondent's concerns relating to the study addressed and misconceptions corrected. Respondents were informed that their participation was voluntary and that they could withdraw from the study at any time if they wished to withdraw.

#### **3.13.1 Permission to conduct the study**

The ethical clearance was obtained from Turfloop Research and Ethics Committee, TREC/131/2016:PG (Appendix 3). The ethical considerations took into account the personal and revealing nature of the study.

The permission to conduct the study at 1 Military Hospital was obtained from the relevant authorities of the 1 Military Hospital Research Ethics Committee (1MHREC) and the Chief Executive Officer of 1 Military Hospital Thaba-Tshwane, Gauteng Province, South Africa, 1HM/302/6/02.09.2016 (Appendix 4).

#### **3.13.2 Confidentiality and anonymity**

Confidentiality is described as researcher's responsibility to prevent all data gathered during the study from being linked to individual respondents or disclosed (Brink et al, 2012). Confidentiality is very important; it is the responsibility of the researcher to keep information about the respondents confidential. The research did not link any respondents to the research results and therefore, confidentiality of the research respondents was protected.

Furthermore, self-administered questionnaires can potentially protect the anonymity and privacy of the respondents contributing to the confidentiality of the respondents. To ensure that confidentiality was protected the questionnaires were numbered, names, identity and addresses of the Respondents did not appear anywhere in the study.

#### **3.13.3 Informed consent**

Informed consent is the ethical principle of voluntary participation and protecting respondents from any harm (Babbie & Mouton, 2001). Prior to administering the questionnaires, the aims and objectives of the study were clearly explained to the participants and written informed consent was obtained (Appendix 2). The details of the

study were distributed amongst the respondents including the risks and benefits to ensure that they understand the study contents. Respondents were assured that the participation was voluntary and no penalties will be imposed to respondents who withdraws from the study at anytime and consent from respondents was obtained in writing.

#### **3.13.4 Principle of beneficence/Non-maleficence**

The respondents have a right to be protected from physical, emotional and psychological harm and if a research involves a potentially harmful intervention it may have to be abandoned or restarted to allow investigation in an ethical environment (Brink et al, 2012). The researcher explained all the benefits and possible harm that the study might cause to enable fair participation.

Therefore the research will promote good by giving the respondents knowledge on what are challenges faced by health care workers caring for patient with tuberculosis avoiding any type of harm. A written guarantee was given to the respondents that, the data collected will remain confidential and that only the researcher and the statistician employed by the University of Limpopo will have access.

#### **3.14 CONCLUSION**

This Chapter presented the research design which is the overall plan the researcher took into account when carrying out a research study.

Research methods; population, sample size and sampling technique; data collection; data analysis; ethical considerations as well as reliability and validity were presented explicitly. The next Chapter present results and interpretation.

## CHAPTER 4

### RESULTS

#### 4.1 INTRODUCTION

This chapter presents results analysis and interpretation. Results are presented in line with the objectives of the study, which were to:

- To establish the availability of resources allocated to health care workers caring for TB patients at 1 Military Hospital
- To establish health worker's training regarding TB management at 1 Military Hospital.
- To establish the relationship between general satisfaction, responsibility, patient care, time pressure and staff relations, among healthcare professionals.

Data was analyzed using STATISTICA 7 as well as Microsoft Excel for presentation of tables and graphs. Descriptive statistics and t-test have been used to analyze the first and second objectives. Objective three was analyzed using regression analysis to test for relationship between two or more variables, correlation analysis as well as descriptive and t-test score. Average was derived for each section i.e. resources, training and relationship. The results start with demographical information of respondents and thereafter results per each objective. The sample size used was 56 respondents and missing responses for individual questions were not included.

The reference point for analysis which describes the acceptable average point is 3. The questionnaire had four sections where in section B and C respondents were asked multiple choice structured questions where Never was coded as a "1"; No as "2"; Sometimes as "3"; Yes as "4" and Always as "5". When analyzing the data Never and the "No" percentages were added together as well as yes" and "always while sometimes" was regarded as neutral. Strongly disagree was coded as a "1"; disagree as "2"; uncertain as "3"; agree as "4" and strongly agree as "5". Strongly disagree and disagree percentages were combined as well as strongly agree and agree. Uncertain was regarded as undecided. Thus, if the average is less than 3 and the p-value is less than 0.05, then the results disagrees with evidence and if the mean is greater than 3 and, the p-value less than 0.05, then it agrees with evidence. If the results are less than reference point 3 and, the p-value is greater than 0.05 and disagree without evidence and if greater than 3 with the p- value is greater than 0.05 then it's agree without strong evidence. If the mean is equal 3 and the p- value is greater than 0.05 then the results are undecided or uncertain or neutral.

## 4.2 DEMOGRAPHIC

**Table 4. 1: Demographic information of the Respondents**

| Category                                           | Variable               | Frequency | %           |
|----------------------------------------------------|------------------------|-----------|-------------|
| Gender                                             | Male                   | 23        | 41%         |
|                                                    | Female                 | 33        | 59%         |
|                                                    | <b>Total</b>           | <b>56</b> | <b>100%</b> |
| Age                                                | 23-27                  | 21        | 38.2%       |
|                                                    | 28-32                  | 21        | 38.2%       |
|                                                    | 33-37                  | 7         | 12.7%       |
|                                                    | 38-42                  | 6         | 10.9%       |
|                                                    | <b>Total</b>           | <b>55</b> | <b>100%</b> |
| Marital status                                     | Single                 | 37        | 66.1%       |
|                                                    | Married                | 18        | 32.1%       |
|                                                    | Widowed                | 1         | 1.8%        |
|                                                    | <b>Total</b>           | <b>56</b> | <b>100%</b> |
| Education level                                    | Doctor                 | 8         | 14.3%       |
|                                                    | Nurse                  | 20        | 35.7%       |
|                                                    | Clinical associates    | 10        | 17.9%       |
|                                                    | Occupational therapist | 11        | 19.6%       |
|                                                    | Physiotherapist        | 7         | 12.5%       |
|                                                    | <b>Total</b>           | <b>56</b> | <b>100%</b> |
| Experience (Years) since graduated                 | 1 -2 years             | 26        | 46.4%       |
|                                                    | 3 -4 years             | 13        | 23.2%       |
|                                                    | 5 -6 years             | 7         | 12.5%       |
|                                                    | 7-8 years              | 2         | 3.6%        |
|                                                    | 9 and above            | 8         | 14.3%       |
|                                                    | <b>Total</b>           | <b>56</b> | <b>100%</b> |
| Years of experience of working in the TB unit/ward | 1-3 years              | 38        | 70.4%       |
|                                                    | 4-6 years              | 12        | 22.2%       |
|                                                    | 7-9 years              | 2         | 3.7%        |
|                                                    | 10+                    | 2         | 3.7%        |
|                                                    | <b>Total</b>           | <b>54</b> | <b>100%</b> |



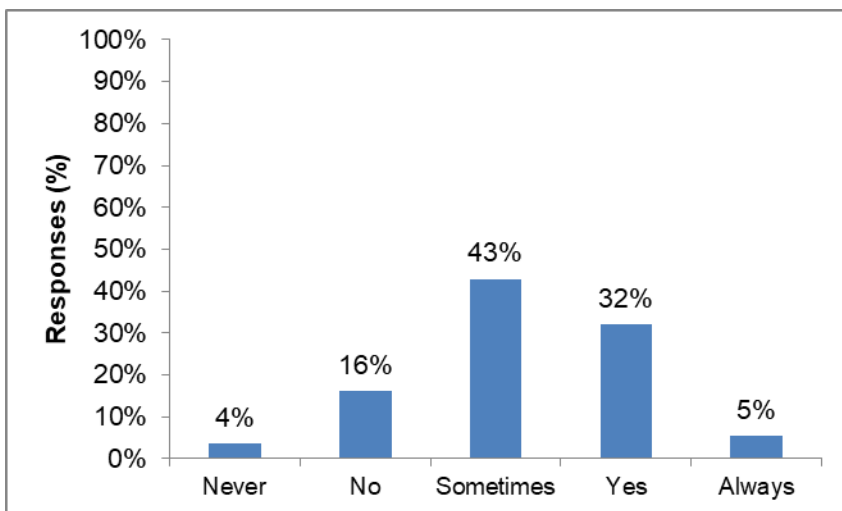
**Table 4.1 Depicts demographical information of respondents.**

Respondents consisted of 59% female compared to 41% of males. Majority of respondents (76.4%) were between the ages of 23-32 and those who were single (66%) made up the most compared to 32.1% married and 1.8% widowed. The highest percent of respondents were nurses (35.7%) compared to occupational therapists (19.9%). The highest experience since graduate is between 1-4 years with 69.6% while the highest experienced health care workers working in the TB unit/ward were between 1-6 years represented by 82.6% of the respondents.

**4.3. OBJECTIVE 1: TO ESTABLISH THE AVAILABILITY OF RESOURCES ALLOCATED TO HEALTHCARE WORKERS CARING FOR TB PATIENTS AT THE HOSPITAL AT 1 MILITARY HOSPITAL**

To be relevant with this objective, respondents were asked the following questions where they had to respond “Always, Yes, Sometimes, No and Never. The hospital provides respondents masks to all personnel at all times (N95 or N100). How often do you use N95 or N100 mask? I experience frustration at my work due to limited resources; I always do quarterly screening for TB at my workplace to check if I contracted TB; I always do quarterly chest X-ray at my workplace to check if I contracted TB; Chest X-ray are taken quarterly to me which indicated no findings of consistent TB disease; Cross is ventilation implemented in the wards/clinic at my unit/ward and windows are always opened in my unit /ward.

**4.3.1 The Hospital provides us with masks to all personnel at all times (N95 or N100)**



**Figure 4. 1: Provision of masks to personnel at all times**

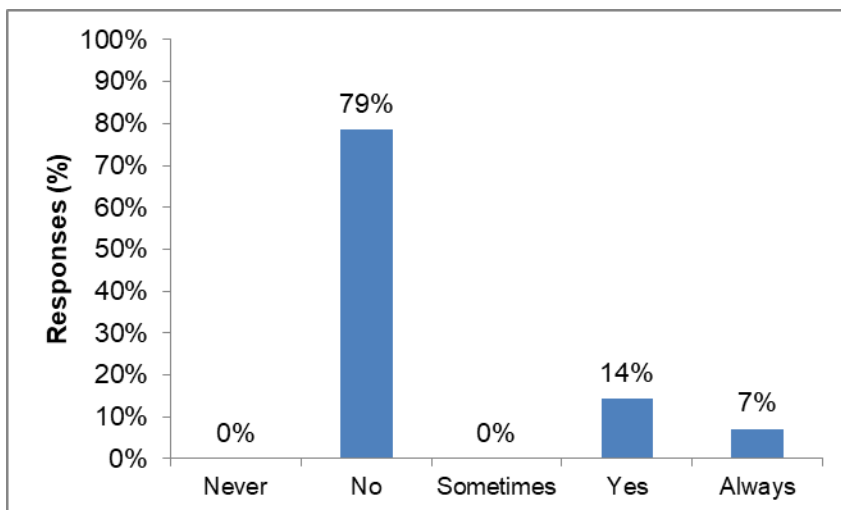
Figure 4.1 Depicts results regarding provision of masks to personnel at all times. Results shows that participants (43%) indicated that the hospital provides masks to all personnel (N95 or N100), which happens sometimes, 16% responded by No, which means, the hospital does not provide masks, although 32% responded Yes and 5% indicated that the hospital always provides masks, whereas 4% responded with never.

**Table 4. 2 T test results**

|                    |          |
|--------------------|----------|
| Mean               | 3.196429 |
| Standard deviation | 0.902917 |
| N (Sample size)    | 56       |
| Standard error     | 0.120657 |
| -95% Confidence    | 2.9546   |
| +95% Confidence    | 3.4382   |
| t-value            | 1.628    |
| Degrees of freedom | 55.0000  |
| P value            | 0.1092   |

The t-test results in Table 4.2 shows a mean responses of 3.19 which is just above the reference point of 3 indicating that majority of Respondents indicated that the Hospital sometimes provides masks to all personnel at all times (N95 or N100). There is no significant difference between Respondent responses since t-value is less than expected and p- value = 0.109 is greater than 0.05%.

**4.3.2 How often do you use N95 or N100 Masks?**



**Figure 4. 2: The usage of N95 or N100 Masks by personnel**

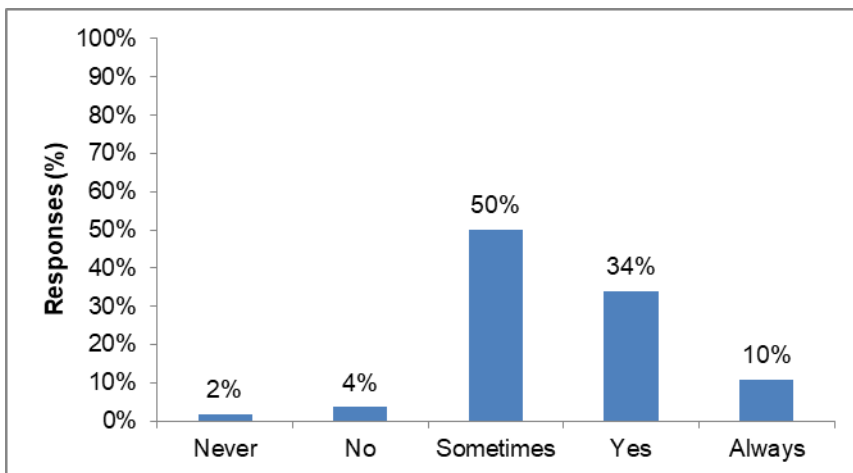
Usage results in Figure 4.2 shows that majority of respondents (79%) indicated that they do not often use N95 or N100 mask although 21% do use it often.

**Table 4.3 t - test results**

|                    |          |
|--------------------|----------|
| Mean               | 2.5      |
| Standard deviation | 0.990867 |
| N (Sample size)    | 56       |
| Standard error     | 0.13241  |
| -95% Confidence    | 2.2346   |
| +95% Confidence    | 2.7654   |
| t-value            | -3.7761  |
| Degrees of freedom | 55.0000  |
| P value            | 0.0004   |

According to results Table 4.3 shows a mean response of 2.5 which is below a reference point of 3 indicating that majority of respondents indicated that they do not often use N95 or N100 mask. Thus, there is a significant difference between respondent's responses which implies enough evidence to conclude that respondents do not use N95 or N100 mask often. This is due to that the t-value is greater than expected and p-value = 0.0004 less than 0.05%.

**4.3.3 I experience frustration at my work due to limited resources.**



**Figure 4.3: Frustration experienced at workplace by personnel due to limited resources**

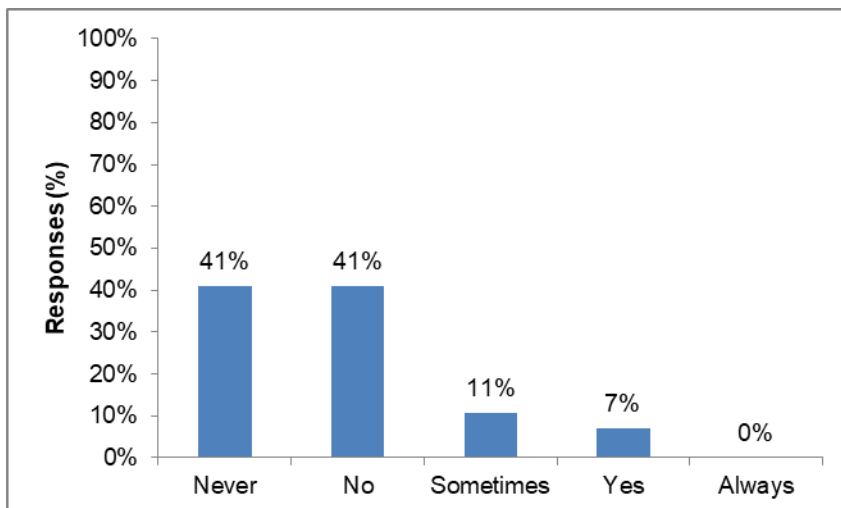
Figure 4.3 results show that 50% of the respondents sometimes experience frustration at work due to limited resources with 34% indicating that they certainly do and 11% indicating always.

**Table 4. 4 T test results: I experience frustration at my work due to limited resources.**

|                    |          |
|--------------------|----------|
| Mean               | 3.482143 |
| Standard deviation | 0.808839 |
| N (Sample size)    | 56       |
| Standard error     | 0.108086 |
| -95% Confidence    | 3.2655   |
| +95% Confidence    | 3.6988   |
| t-value            | 4.4607   |
| Degrees of freedom | 55.0000  |
| P value            | 0.0000   |

The t-test results in Table 4.4 shows mean responses of 3.5 which are above a reference point of 3 indicating that majority of respondents indicated that they do experience frustration at work due to limited resources. The p-value is 0.0000 < 0.05 implying that the difference in response is significant.

**4.3.4 I always do quarterly screening for TB at my workplace to check if I contracted TB.**



**Figure 4. 4: Quarterly screening for TB at my workplace**

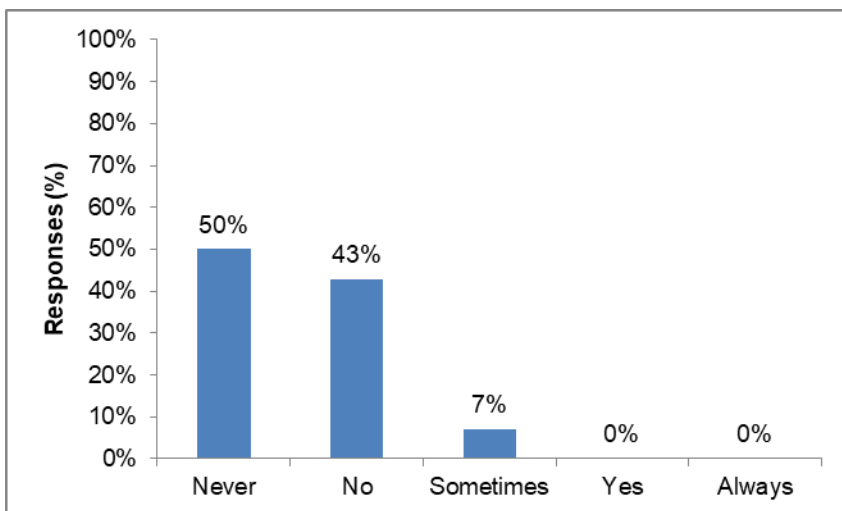
Majority of respondents (82%) in Figure 4.4 indicated that they do not do quarterly screening always for TB at workplace to check if they contracted TB although 11% indicated that the latter is sometimes done and only 7% said it is done.

**Table 4. 5 I always do quarterly screening for TB at my workplace to check if I contracted TB.**

|                    |          |
|--------------------|----------|
| Mean               | 1.839286 |
| Standard deviation | 0.889878 |
| N (Sample size)    | 56       |
| Standard error     | 0.118915 |
| -95% Confidence    | 1.6010   |
| +95% Confidence    | 2.0776   |
| t-value            | -9.7609  |
| Degrees of freedom | 55.0000  |
| P value            | 0.0000   |

The t-test results according to Table 4.5 shows mean responses of 1.8 which significantly differ to the reference point of 3 indicating that majority of respondents indicated that they do not always do quarterly screening for TB. The t-value greater than expected and p-value = 0.000 less than 0.05%.

**4.3.5 I always do quarterly chest X-ray at my workplace to check if I contracted TB?**



**Figure 4. 5: Quarterly chest X-ray at my workplace**

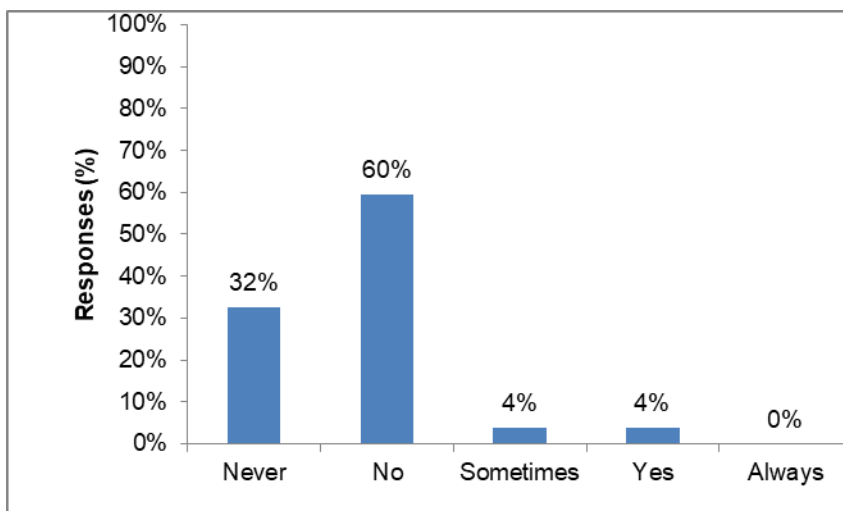
Majority of respondents (93%) indicated that they do not do quarterly chest X-ray at their workplace to check if they contracted TB although just 7% indicated that the latter is sometimes done according to Figure 4.5

**Table 4. 6 I always do quarterly chest X-ray at my workplace to check if I contracted TB?**

|                    |          |
|--------------------|----------|
| Mean               | 1.571429 |
| Standard deviation | 0.628335 |
| N (Sample size)    | 56       |
| Standard error     | 0.083965 |
| -95% Confidence    | 1.4032   |
| +95% Confidence    | 1.7397   |
| t-value            | -17.0139 |
| Degrees of freedom | 55.0000  |
| P value            | 0.0000   |

The t-test results shows mean responses of 1.57 which significantly differ to the reference point of 3 indicating that majority of respondents indicated that they do not always do quarterly chest X-ray at workplace to check if they contracted TB according to Table 4.6. This is due to t-value is greater than expected and p-value = 0.000 less than 0.05%.

**4.3.6 Chest X-ray are taken quarterly to me which indicated no findings of consistent TB disease**



**Figure 4. 6: Quarterly chest X-ray taken to me which indicated no findings of consistent TB disease**

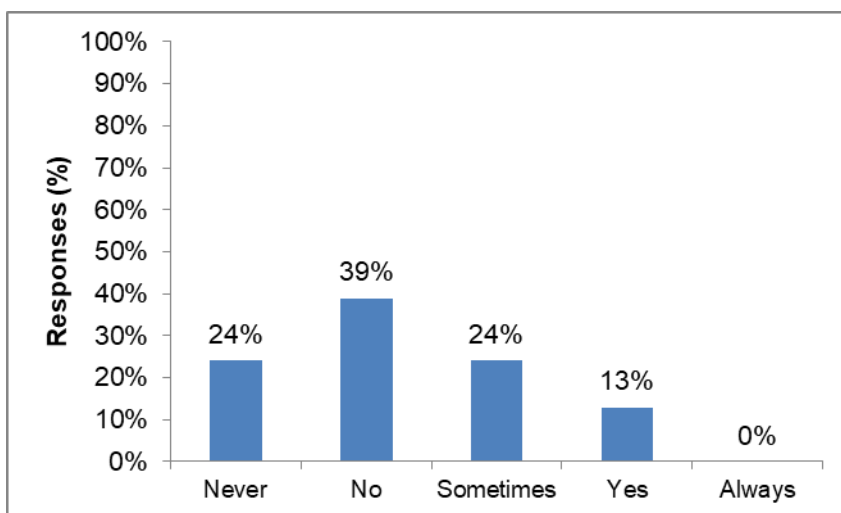
Figure 4. 6 Depict results regarding quarterly chest X-ray taken to me which indicated no findings of consistent TB disease. The results revealed that majority of respondents (93%) indicated that chest X-rays are never taken quarterly to them which indicated no findings of consistent TB disease although just 8% indicated that the latter is done.

**Table 4. 7. Chest X-ray are taken quarterly to me which indicated no findings of consistent TB disease.**

|                    |          |
|--------------------|----------|
| Mean               | 1.788462 |
| Standard deviation | 0.695547 |
| N (Sample size)    | 52       |
| Standard error     | 0.096455 |
| -95% Confidence    | 1.5948   |
| +95% Confidence    | 1.9821   |
| t-value            | -12.5607 |
| Degrees of freedom | 51.0000  |
| P value            | 0.0000   |

The t-test results in Table 4.7 shows mean responses of 1.78 which significantly differ from the reference point of 3 indicating that majority of respondents indicated that they do not always take chest X-ray quarterly to them, which indicated no findings of consistent TB disease. This is due to t-value greater than expected and p-value = 0.000 less than 0.05%. The results has 2 non-response for this question

**4.3.7 Cross is ventilation implemented in the wards/clinic at my unit/ward**



**Figure 4. 7: Implementation of cross ventilation in the wards/clinic**

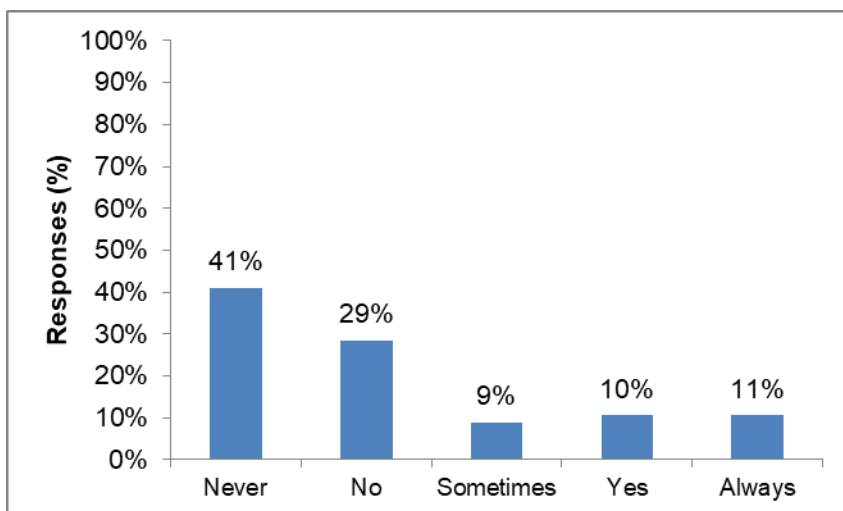
The results in Figure 4.7 show that majority of respondents (63%) indicated that cross ventilation implemented in the wards/clinics, although just 37% indicated that the latter is done.

**Table 4. 8 Cross is ventilation implemented in the wards/clinic at my unit/ward**

|                    |          |
|--------------------|----------|
| Mean               | 2.259259 |
| Standard deviation | 0.974877 |
| N (Sample size)    | 54       |
| Standard error     | 0.132664 |
| -95% Confidence    | 1.9932   |
| +95% Confidence    | 2.5253   |
| t-value            | -5.5836  |
| Degrees of freedom | 53.0000  |
| P value            | 0.0000   |

The t-test results in Table 4.8 shows mean responses of 1.78 which significantly differ from the reference point of 3 indicating that majority of respondents indicated that cross ventilation is not implemented in the wards/clinic. Thus there is a significant difference between respondent’s responses which implies enough evidence to conclude that no cross ventilation is implemented. This is due to t-value greater than expected and p-value = 0.000 less than 0.05%.

**4.3.8 Windows are always open in my unit /ward**



**Figure 4. 8: Windows are always opened in my unit /ward**

The results in Figure 4.8 show that majority of respondents (70%) indicated that windows are not always opened in the unit /ward although just 22% indicated that Windows are always opened in the unit /ward.

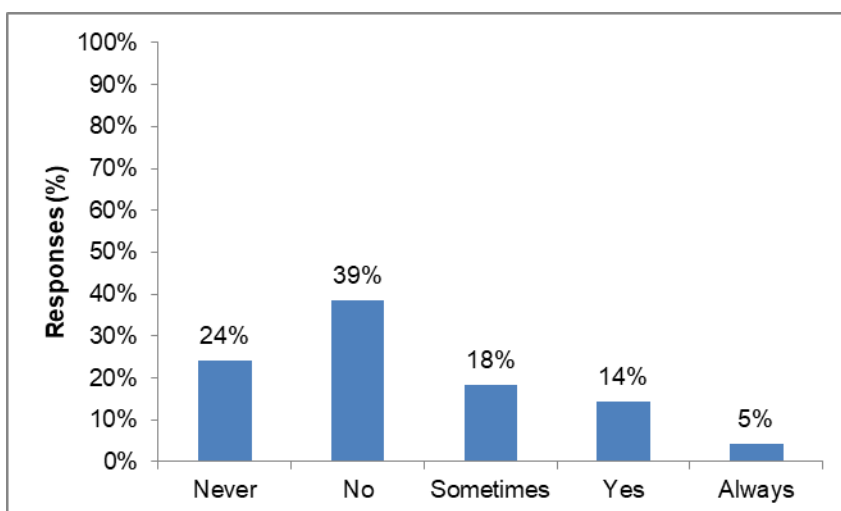


**Table 4. 9 Windows are always open in my unit /ward**

|                    |          |
|--------------------|----------|
| Mean               | 2.214286 |
| Standard deviation | 1.37132  |
| N (Sample size)    | 56       |
| Standard error     | 0.18325  |
| -95% Confidence    | 1.8470   |
| +95% Confidence    | 2.5815   |
| t-value            | -4.2877  |
| Degrees of freedom | 55.0000  |
| P value            | 0.0001   |

The t-test results in Table 4.9 shows mean responses of 2.2 which significantly differ from the reference point of 3 indicating that majority of respondents indicated that Windows are not always opened at unit/ward. This is due to t-value greater than expected and p-value = 0.0001 less than 0.05%.

#### 4.3.9 Summary Provision of marks to personnel



**Figure 4. 9: Provision of Marks to all personnel at all times**

The mean of 2.35 differs significantly with the reference point of 3 with a p-value =0.01 providing strong evidence that in general respondents do not agree that the hospital provides masks to all personnel at all times (N95 or N100). That they do not often use N95 or N100 mask.

That they do not always do quarterly screening for TB at workplace to check if they contracted TB. That they do not always do quarterly chest X-ray at workplace to check

if they contracted TB; Chest X-ray are not taken quarterly, which indicated no findings of consistent TB disease;

Cross ventilation is never implemented in the wards/clinic and windows are not always opened in the unit /ward. On the contrary respondent's experience frustration at work due to limited resources as in Figure 4.9

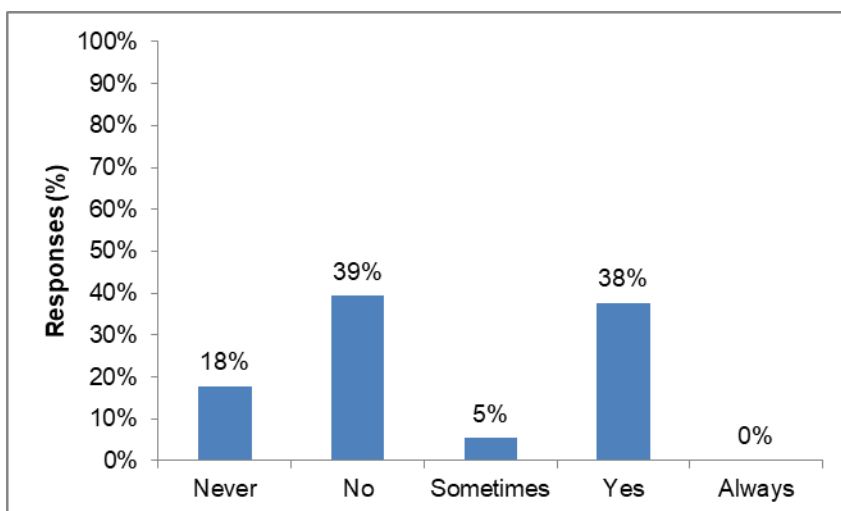
**Table 4. 10 Summary provision of marks to personnel**

|                    |          |
|--------------------|----------|
| Mean               | 2.356412 |
| Standard deviation | 0.907823 |
| N (Sample size)    | 55       |
| Standard error     | 0.12205  |
| -95% Confidence    | 2.1117   |
| +95% Confidence    | 2.6011   |
| t-value            | -5.86178 |
| Degrees of freedom | 54.2500  |
| P value            | 0.0137   |

Thus from the t-test results, it can be concluded that there is enough evidence to conclude that there is inadequate availability of resources allocated for healthcare workers caring for TB patients at the hospital at 1 Military hospital (t- test results = 5.86 and p-value = 0.01) according to Table 4.10.

**4.4 OBJECTIVE 2: TO ESTABLISH HEALTH WORKERS' TRAINING REGARDING TB MANAGEMENT AT 1 MILITARY HOSPITAL.**

**4.4.1 I have received formal training on TB**



**Figure 4. 10: Formal training received on TB**

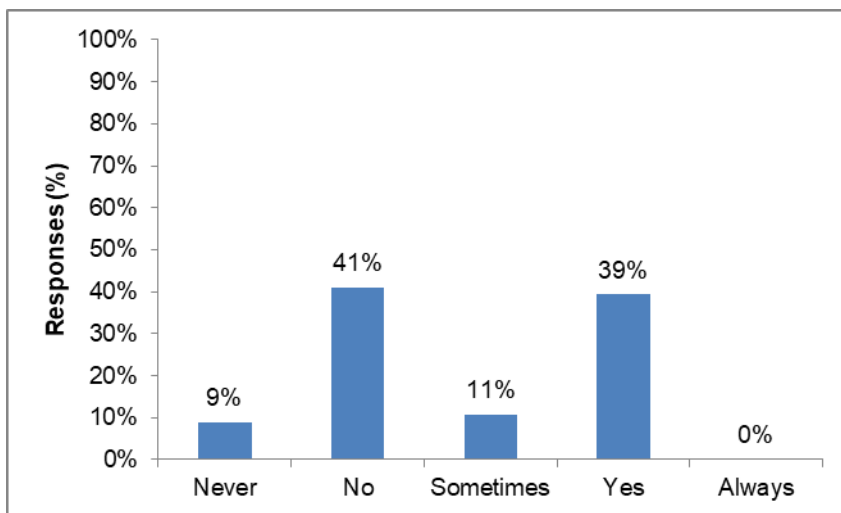
Majority of respondents (57%) in Figure 4.10 indicated that, they have never received any formal training on TB although 38%% have received formal training on TB while only 5% have sometimes received training.

**Table 4. 11 I have received formal training on TB**

|                    |          |
|--------------------|----------|
| Mean               | 2.625    |
| Standard deviation | 1.168721 |
| N (Sample size)    | 56       |
| Standard error     | 0.156177 |
| -95% Confidence    | 2.3120   |
| +95% Confidence    | 2.9380   |
| t-value            | -2.4011  |
| Degrees of freedom | 55.0000  |
| P value            | 0.0198   |

The t-test results show mean responses of 2.6 which significantly differ from the reference point of 3 indicating that majority of respondents indicated that have never received formal training on TB. This is due to t-value greater than expected and p-value = 0.02 less than 0.05% as in Table 4.11

**4.4.2 The TB safety training (precautions) I received is adequate for me to meet my responsibilities at work**



**Figure 4. 11: The TB safety training (precautions) received are adequate, to meet my responsibilities at work**

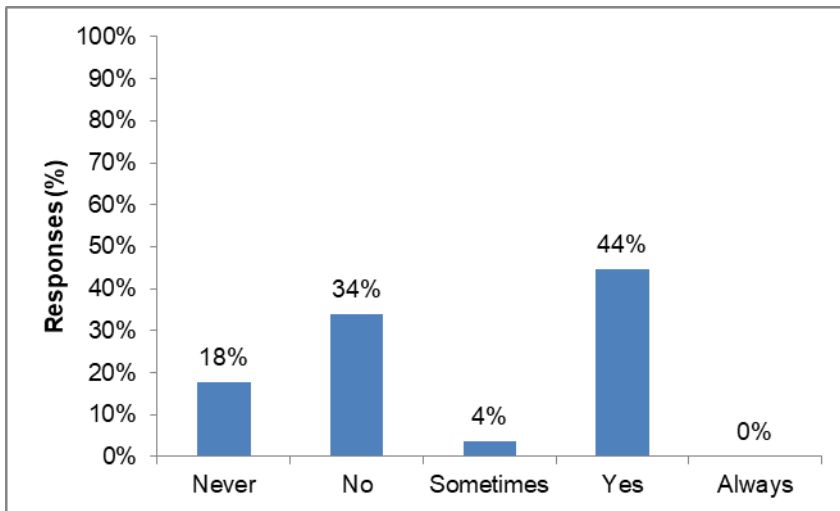
Half of the respondents (50%) in Figure 4.11 indicated that the TB safety training (precautions) received are not adequate for them to meet their responsibilities at work compared to 39% that indicated that the training is adequate while 11% said only sometimes.

**Table 4. 12 The TB safety training (precautions) I received is adequate for me to meet my responsibilities at work.**

|                    |          |
|--------------------|----------|
| Mean               | 2.803571 |
| Standard deviation | 1.068893 |
| N (Sample size)    | 56       |
| Standard error     | 0.142837 |
| -95% Confidence    | 2.5173   |
| +95% Confidence    | 3.0898   |
| t-value            | -1.3752  |
| Degrees of freedom | 55.0000  |
| P value            | 0.1746   |

The t t-test results in Table 4.12 show a mean response of 2.8 which is just below the reference point of 3 indicating that respondents are undecided since the results is 50/50. There is no significant difference between respondent responses since t value is less than expected and p value = 0.17 greater than 0.05%.

#### 4.4.3 I received training on TB



**Figure 4. 12: I received training on TB**

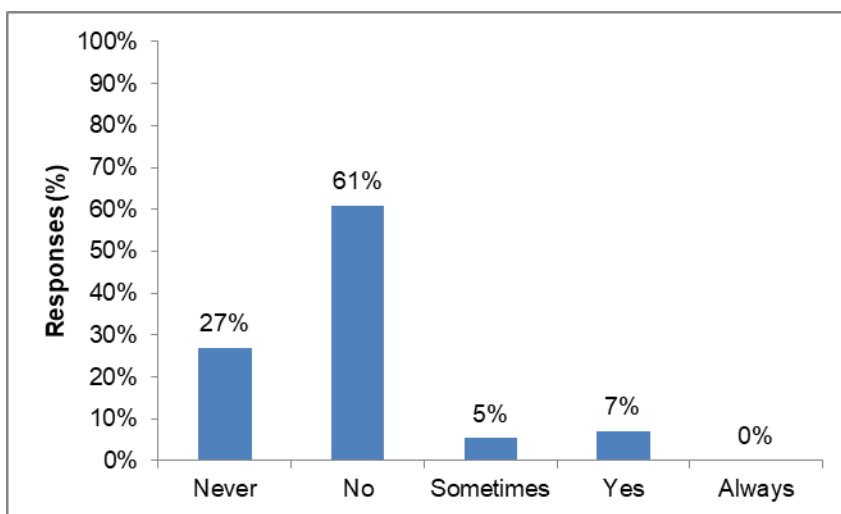
Majority of the respondents (52%) in Figure 4.12 indicated that they never received formal training on TB compared to 45% who received and 4% who sometimes received training on TB.

**Table 4. 13 I received training on TB**

|                    |          |
|--------------------|----------|
| Mean               | 2.75     |
| Standard deviation | 1.209808 |
| N (Sample size)    | 56       |
| Standard error     | 0.161667 |
| -95% Confidence    | 2.4260   |
| +95% Confidence    | 3.0740   |
| t-value            | -1.5464  |
| Degrees of freedom | 55.0000  |
| P value            | 0.1277   |

The t-test results in Table 4.13 shows a mean responses of 2.75 which is just below the reference point of 3 indicating that respondents are undecided since the results is almost 50/50. There is no significant difference between respondent responses since t-value is less than expected and p value = 0.11277 greater than 0.05%.

**4.4.4 I attend TB Continuing education courses**



**Figure 4. 13: Attendance TB continual education courses**

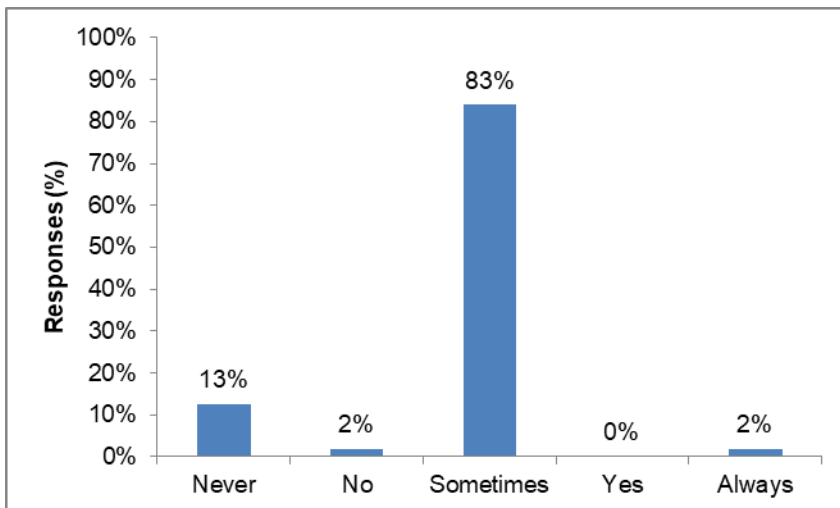
Majority of respondents (88%) in Figure 4.13 indicated that they never attended TB continuing education courses compared to 7% who have attended the course and 5% who attended sometimes.

**Table 4. 14 I attend TB Continuing education courses**

|                    |          |
|--------------------|----------|
| Mean               | 1.928571 |
| Standard deviation | 0.782935 |
| N (Sample size)    | 56       |
| Standard error     | 0.104624 |
| -95% Confidence    | 1.7189   |
| +95% Confidence    | 2.1382   |
| t-value            | -10.2407 |
| Degrees of freedom | 55.0000  |
| P value            | 0.0000   |

The t-test results in Table 4.14 shows that the mean responses of 1.92 which significantly differ from the reference point of 3 indicating that majority of respondents never attended TB Continuing education courses. This is due to t-value greater than expected and p-value = 0.00 less than 0.05%.

**4.4.5 How often do you go for TB training courses in a year?**



**Figure 4. 14: The frequency of attending TB training courses in a year**

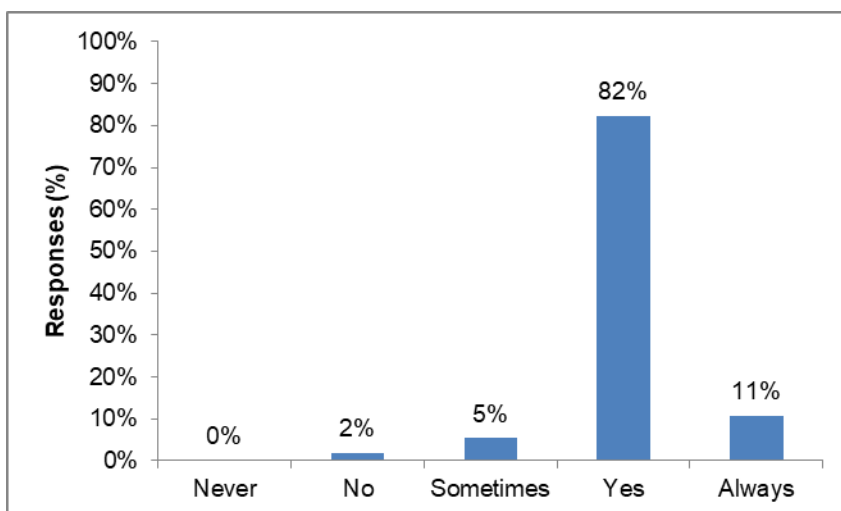
According to Figure 4.14, majority of respondents (84%) indicated that they sometimes do go for TB training courses in a year compared to 13% that never and only 2% that always do go for training courses.

**Table 4. 15 How often do you go for TB training courses in a year?**

|                    |          |
|--------------------|----------|
| Mean               | 2.767857 |
| Standard deviation | 0.738329 |
| N (Sample size)    | 56       |
| Standard error     | 0.098663 |
| -95% Confidence    | 2.5701   |
| +95% Confidence    | 2.9656   |
| t-value            | -2.3529  |
| Degrees of freedom | 55.0000  |
| P value            | 0.0222   |

The t-test results in Table 4.15 show a mean response of 2.76 which significantly differ from the reference point of 3 indicating that majority of respondents sometimes go for TB training courses in a year. This is due to t-value greater than expected and p-value = 0.02 less than 0.05%.

**4.4.6 I would like to receive more training on TB**



**Figure 4. 15: I would like to receive more training on TB**

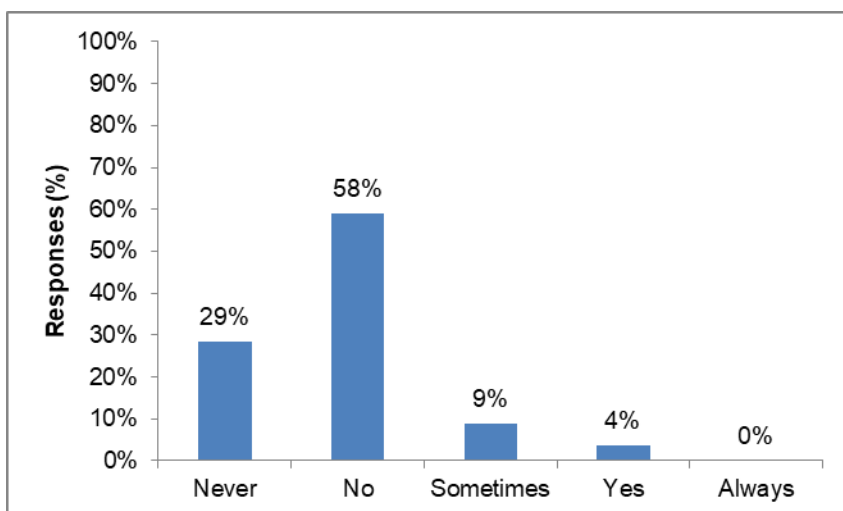
Majority of respondents (82%) in Figure 4.15 indicated that they would like to receive more training on TB. Results show that 93% of the respondents would like to receive more training on TB compared to 5% that need this training sometimes and 2% that do not need this kind of training.

**Table 4. 16 I would like to receive more training on TB**

|                    |          |
|--------------------|----------|
| Mean               | 4.017857 |
| Standard deviation | 0.485838 |
| N (Sample size)    | 56       |
| Standard error     | 0.064923 |
| -95% Confidence    | 3.8877   |
| +95% Confidence    | 4.1480   |
| t-value            | 15.6779  |
| Degrees of freedom | 55.0000  |
| P value            | 0.0000   |

According to Table 4.16 the t-test results shows a mean responses of 4 which is above a reference point of 3 indicating that majority of respondents indicated that would like to receive more training on TB. This is due to t value is greater than expected and p-value = 0.0000 less than 0.05%.

**4.4.7 I have weekly meetings to discuss TB patients and challenges experienced in the management of TB patients.**



**Figure 4. 16: Weekly meetings to discuss TB patient's challenges and their management.**

Majority of respondents (88%) in Figure 4.16 indicated that they never have weekly meetings to discuss TB patients and challenges experienced in the management of TB patients compared to 4% that had weekly meetings and 9% that sometimes do.

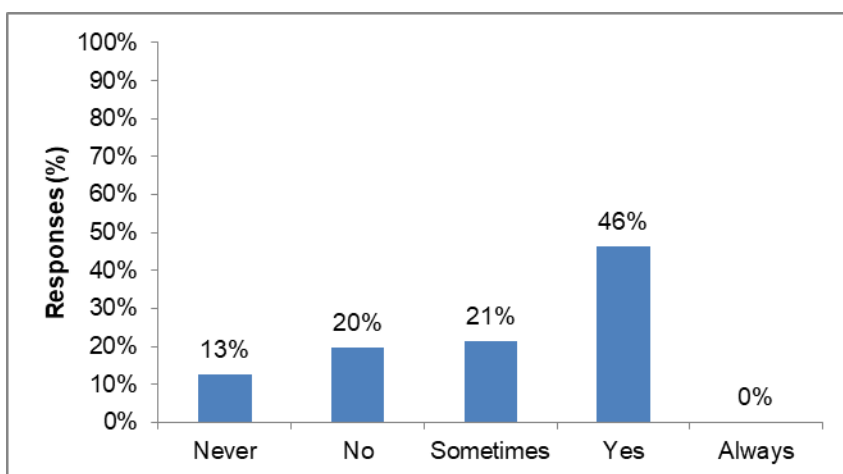


**Table 4.17 I have weekly meetings to discuss TB patients and challenges experienced in the management of TB patients.**

|                    |          |
|--------------------|----------|
| Mean               | 1.875    |
| Standard deviation | 0.715097 |
| N (Sample size)    | 56       |
| Standard error     | 0.095559 |
| -95% Confidence    | 1.6835   |
| +95% Confidence    | 2.0665   |
| t-value            | -11.7729 |
| Degrees of freedom | 55.0000  |
| P value            | 0.0000   |

The t-test results in Table 4.17 shows mean responses of 1.9 which significantly differ from the reference point of 3 indicating that majority of respondents never have weekly meetings to discuss TB patients and challenges experienced in the management of TB patients. This is due to t-value greater than expected and p- value < 0.001 less than 0.05%.

**4.4.8 There is NO any training offered on current information, updates and guidelines on TB**



**Figure 4. 17: Training offered on current information, updates and guidelines on TB**

Respondents (46%) in Figure 4.17 indicated that there is no any training offered on current information, updates and guidelines on TB compared to 33% who indicated that

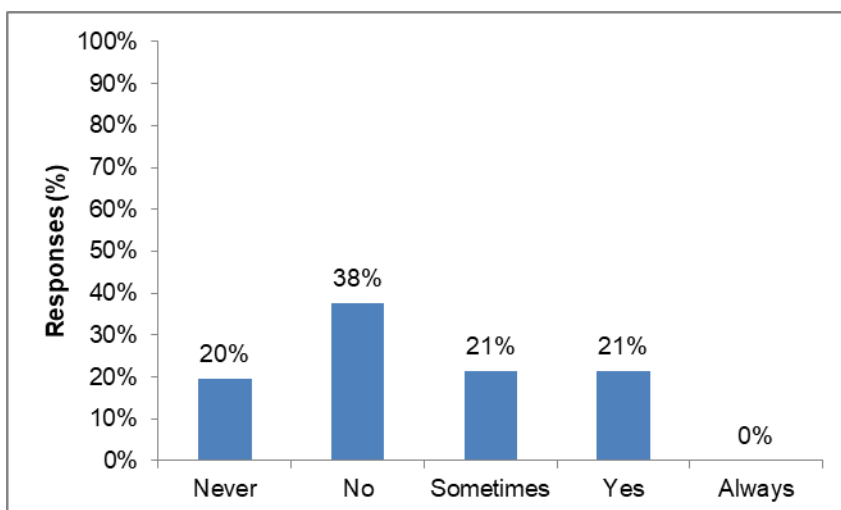
there is training offered on current information, updates and guidelines on TB and while 21% indicated that there is sometimes.

**Table 4. 18 There is NO any training offered on current information, updates and guidelines on TB**

|                    |          |
|--------------------|----------|
| Mean               | 3.017857 |
| Standard deviation | 1.086965 |
| N (Sample size)    | 56       |
| Standard error     | 0.145252 |
| -95% Confidence    | 2.7268   |
| +95% Confidence    | 3.3089   |
| t-value            | 0.1229   |
| Degrees of freedom | 55       |
| P value            | 0.9026   |

The t-test results shows a mean responses of 3.0 which is just below the reference point of 3 indicating that respondents are undecided since the results between agree and disagree are similar. There is no significant difference between respondent responses since t-value is less than expected and p- value = 0.90 greater than 0.05% according to Table 4.18

**4.4.9 In my area of responsibility the hospital has undertaken responsibility for implementing the TB screening programmes.**



**Figure 4. 18: The responsibility undertaken by the hospital for implementing the TB screening programmes**

Figure 4. 18 depict results response results regarding the responsibility undertaken by the hospital for implementing the TB screening programmes. Majority of respondents (58%) indicated that in their area of responsibility the hospital has not undertaken responsibility for implementing the TB screening programs compared to 21% who indicated that the hospital do and 21% indicated that its sometimes.

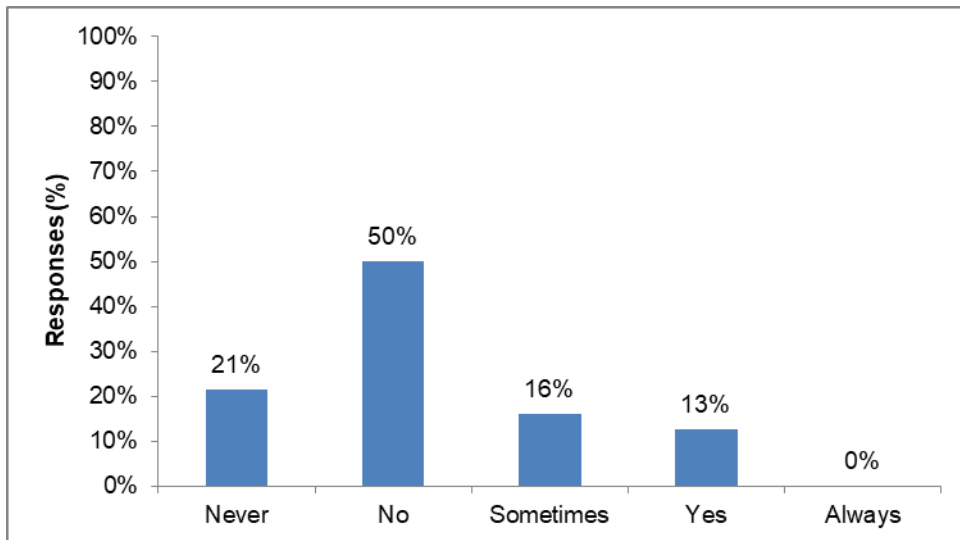
**Table 4. 19 In my area of responsibility the hospital has undertaken responsibility for implementing the TB screening programs.**

|                    |          |
|--------------------|----------|
| Mean               | 2.446429 |
| Standard deviation | 1.043066 |
| N (Sample size)    | 56       |
| Standard error     | 0.139386 |
| -95% Confidence    | 2.1671   |
| +95% Confidence    | 2.7258   |
| t-value            | -3.9715  |
| Degrees of freedom | 55       |
| P value            | 0.0002   |

The t-test results in Table 4.19 shows mean responses of 2.44 which significantly differ from the reference point of 3 indicating that majority of respondents in respondents' area of responsibility the hospital has never undertaken responsibility for implementing the TB screening programs.

Thus there is a significant difference between respondent's responses which implies enough evidence to conclude that majority of respondents believe that in respondents' area of responsibility the hospital has never undertaken responsibility for implementing the TB screening programs. This is due to t value greater than expected and p value = 0.0002 less than 0.05%. Thus there is enough evidence to conclude that in respondents' area of responsibility the hospital has never undertaken responsibility for implementing the TB screening programmes.

**4.4.10. The hospital has undertaken responsibility to identify and evaluate health-care workers who are newly infected as a result of exposure to a person with TB disease.**



**Figure 4. 19: The responsibility undertaken by the hospital to identify and evaluate health-care workers who are newly infected as a result of exposure to a person with TB disease.**

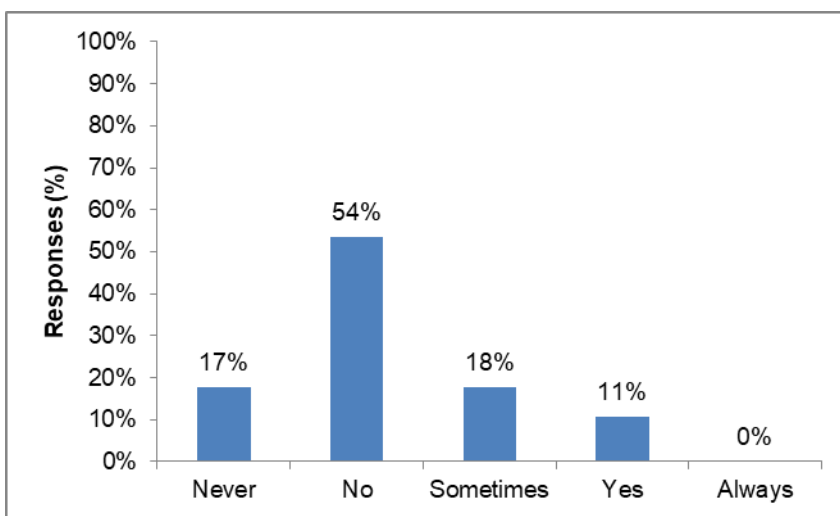
Majority of Respondents (71%) according to Figure 4.19 indicated that the hospital has not undertaken any responsibility to identify and evaluate health-care workers who are newly infected as a result of exposure to a person with TB disease, compared to 13% who indicated that the hospital has and 16% indicating that sometimes the hospital has undertaken responsibility.

**Table 4. 20 The hospital has undertaken responsibility to identify and evaluate health-care workers who are newly infected as a result of exposure to a person with TB disease.**

|                    |          |
|--------------------|----------|
| Mean               | 2.196429 |
| Standard deviation | 0.922834 |
| N (Sample size)    | 56       |
| Standard error     | 0.123319 |
| -95% Confidence    | 1.9493   |
| +95% Confidence    | 2.4436   |
| t-value            | -6.5162  |
| Degrees of freedom | 55.0000  |
| P value            | 0.0000   |

The t-test results shows mean responses of 2.19 which significantly differ from the reference point of 3 indicating that majority of respondents do not agree that the hospital has undertaken responsibility to identify and evaluate health-care workers who are newly infected as a result of exposure to a person with TB disease. Thus there is a significant difference between respondent's responses which implies enough evidence to conclude that majority of respondents do not agree that the hospital has undertaken responsibility to identify and evaluate health-care workers who are newly infected as a result of exposure to a person with TB disease. This is due to t-value greater than expected and p value < 0.0001 less than 0.05% as depicted In Table 4.20. Thus there is enough evidence to conclude the hospital has never undertaken responsibility to identify and evaluate health-care workers who are newly infected as a result of exposure to a person with TB disease.

**4.4.11 The hospital has undertaken responsibility for facility-wide TB education and documentation of education.**



**Figure 4. 20: The responsibility undertaken by the hospital for facility-wide TB education and documentation of education.**

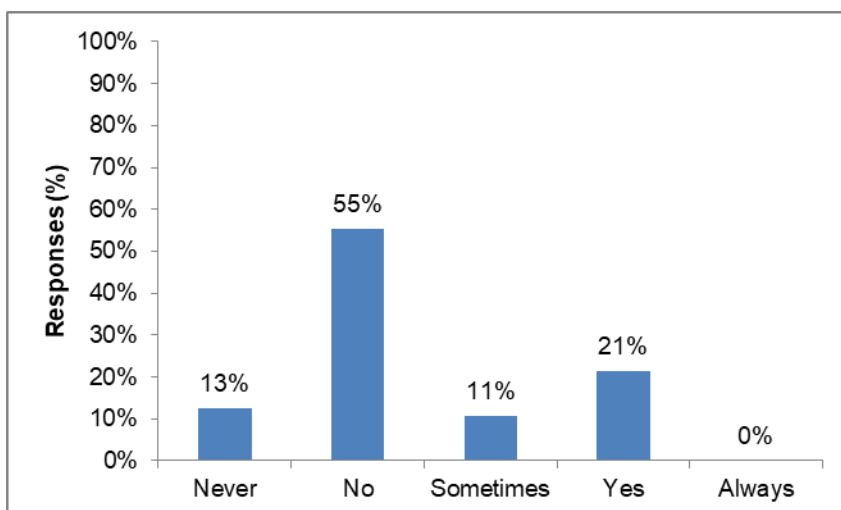
Majority of respondents (72%) in Figure 4.20 indicated that the hospital has never undertaken responsibility for facility-wide TB education and documentation of education compared to 11% who indicated that the hospital has and 18% indicating that sometimes the hospital has undertaken responsibility.

**Table 4. 21 The hospital has undertaken responsibility for facility-wide TB education and documentation of education.**

|                    |          |
|--------------------|----------|
| Mean               | 2.214286 |
| Standard deviation | 0.867898 |
| N (Sample size)    | 56       |
| Standard error     | 0.115978 |
| -95% Confidence    | 1.9819   |
| +95% Confidence    | 2.4467   |
| t-value            | -6.7747  |
| Degrees of freedom | 55.0000  |
| P value            | 0.0000   |

According to Table 4.21, the t t-test results shows mean responses of 2.2 which significantly differ from the reference point of 3 indicating that majority of respondents do not agree that the hospital has undertaken responsibility for facility-wide TB education and documentation of education. This is due to t- value greater than expected and p- value < 0.0001 less than 0.05%.

**4.4.12 I am aware of activities planned or implemented in the facility to prevent spread of TB.**



**Figure 4. 21: Personnel awareness of activities planned or implemented in the facility to prevent spread of TB**

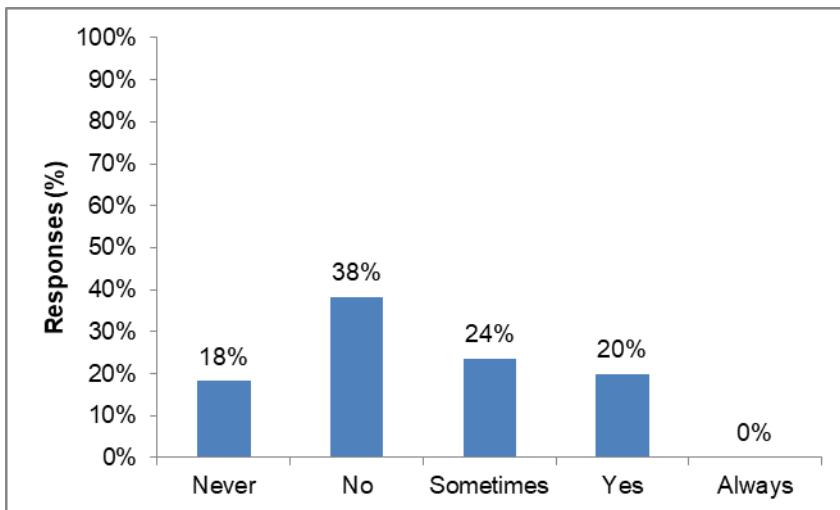
Results in Figure 4.21 shows that majority of respondents (68%) indicated that they are not aware of activities planned or implemented in the facility to prevent spread of TB, compared to 21% who indicated that they are aware and 11% indicating that they are sometimes made aware.

**Table 4. 22 I am aware of activities planned or implemented in the facility to prevent spread of TB.**

|                    |          |
|--------------------|----------|
| Mean               | 2.410714 |
| Standard deviation | 0.968162 |
| N (Sample size)    | 56       |
| Standard error     | 0.129376 |
| -95% Confidence    | 2.1514   |
| +95% Confidence    | 2.6700   |
| t-value            | -4.5548  |
| Degrees of freedom | 55.0000  |
| P value            | 0.0000   |

On the other hand, the t-test results according to Table 4.22 shows mean responses of 2.4 which significantly differ from the reference point of 3 indicating that majority of respondents do not agree that they are aware of activities planned or implemented in the facility to prevent spread of TB. This is due to t value greater than expected and p value < 0.0001 less than 0.05%.

**4.4.13 Personnel safety is given equal consideration at my institution**



**Figure 4. 22: Personnel safety is given equal consideration at my institution.**

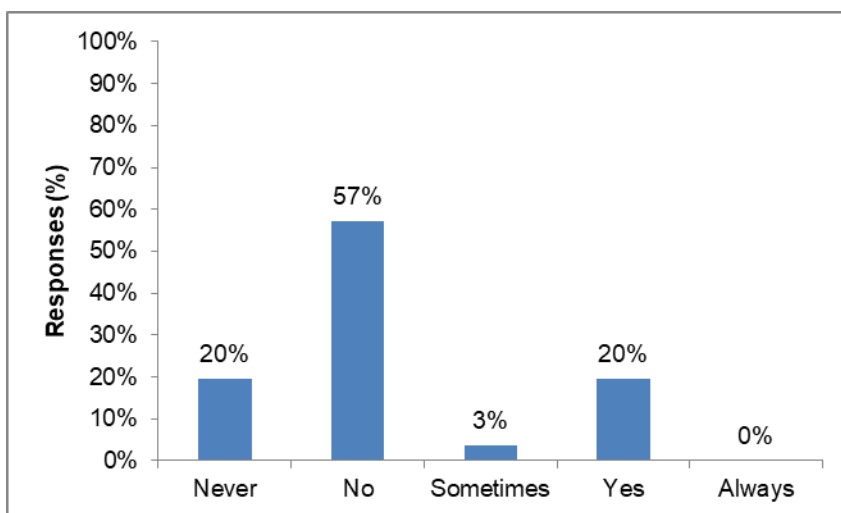
Majority of respondents (56%) indicated that personnel safety is never given equal consideration at their institution compared to 20% who indicated yes they do and 24% indicated that sometimes personal safety is give equal consideration.

**Table 4. 23 Personnel safety is given equal consideration at my institution**

|                    |          |
|--------------------|----------|
| Mean               | 2.454545 |
| Standard deviation | 1.015038 |
| N (Sample size)    | 55       |
| Standard error     | 0.136868 |
| -95% Confidence    | 2.1801   |
| +95% Confidence    | 2.7289   |
| t-value            | -3.9853  |
| Degrees of freedom | 54.0000  |
| P value            | 0.0002   |

The t-test results in Table 4.23 shows mean responses of 2.5 which significantly differ from the reference point of 3 indicating that majority of respondent’s personnel safety is never given equal consideration at their institution. This is due to t-value greater than expected and p-value = 0.0002 less than 0.05%.

**4.4.14. The overall quality of in-service training on TB, I received is above average.**



**Figure 4. 23: The in-service training on TB, received is above average.**

Majority of respondents (77%) are worried about the overall quality of in-service training on (TB) received. Results indicate that majority of respondents (77%) indicated that the overall quality of in-service training on (TB) received is below average compared to 20% who indicated it is above average and 4% who indicated that it is sometimes above average as shown in Figure 4.23

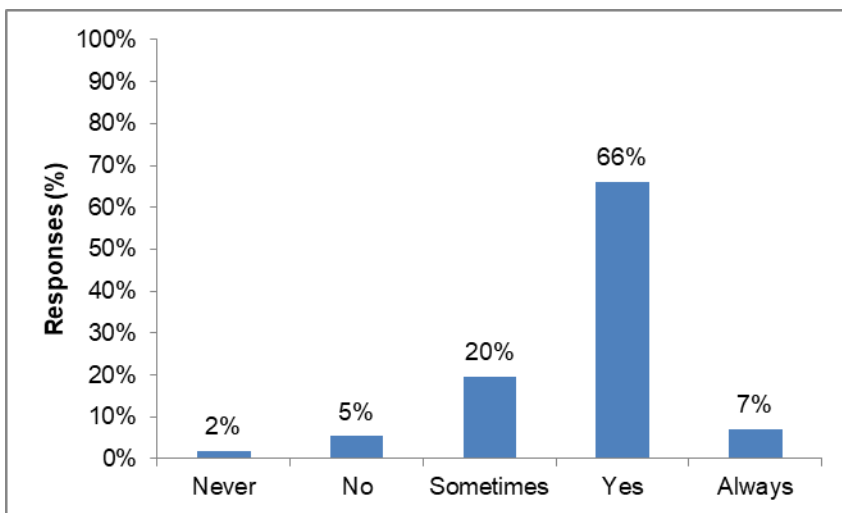


**Table 4. 24: The overall quality of in-service training on (TB) I received is above average.**

|                    |          |
|--------------------|----------|
| Mean               | 2.232143 |
| Standard deviation | 0.990704 |
| N (Sample size)    | 56       |
| Standard error     | 0.132388 |
| -95% Confidence    | 1.9668   |
| +95% Confidence    | 2.4975   |
| t-value            | -5.8     |
| Degrees of freedom | 55.0000  |
| P value            | 0.0000   |

In Table 4.24 t-test results shows mean responses of 2.23 which significantly differ from the reference point of 3 indicating that majority of respondents do not agree the overall quality of in-service training on (TB) received is above average. This is due to t value greater than expected and p value < 0.0001 less than 0.05%.

**4.4.15. If I have questions regarding TB patients’ care I go to my friends for answers**



**Figure 4. 24: If I have questions regarding TB patients’ care I go to my friends for answers**

Majority of respondents go to friends for answers if they have questions regarding TB patients’ care according to Figure 4.24. Results indicate that majority of respondents (73%) indicated that have questions regarding TB patients’ care they go to my friends for answers compared to 7% that never do and 20% who considers going to friends sometimes.

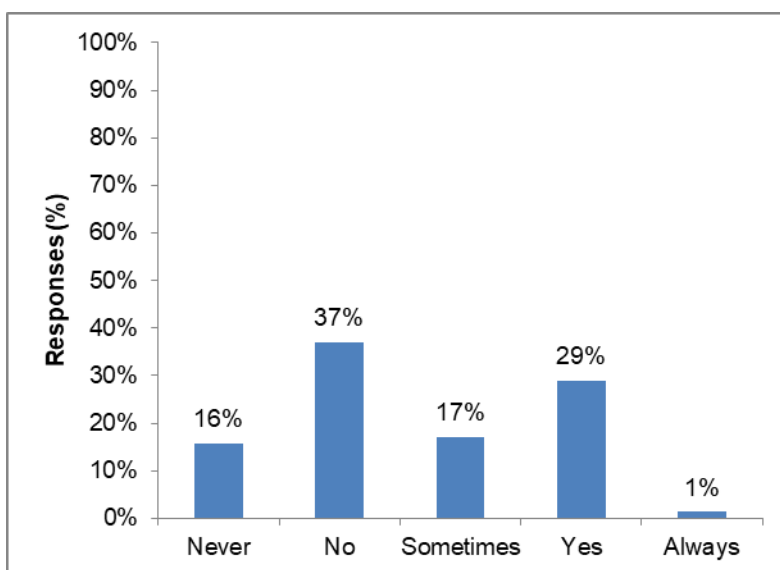
Thus 87% of respondents agree that they go to their friends / colleagues when they have questions regarding TB management.

**Table 4. 25 If I have questions regarding TB patients’ care I go to my friends for answers**

|                    |          |
|--------------------|----------|
| Mean               | 3.714286 |
| Standard deviation | 0.755929 |
| N (Sample size)    | 56       |
| Standard error     | 0.101015 |
| -95% Confidence    | 3.5118   |
| +95% Confidence    | 3.9167   |
| t-value            | 7.0711   |
| Degrees of freedom | 55.0000  |
| P value            | 0.0000   |

The t-test results in Table 4.25 shows the mean responses of 3.7 which significantly differ from the reference point of 3 indicating that majority of respondents agree that if they have questions regarding TB patients’ care they go to friends for answers. This is due to t value greater than expected and p-value < 0.0001 less than 0.05%. Thus there is enough evidence to conclude that respondents go to friends if they have questions regarding TB patients’ care.

**4.4.16 Summary of formal training received**



**Figure 4. 25: Summary of formal training received**

The mean of 2.60 differs significantly with the reference point of 3 with a p-value =0.02 providing strong evidence that in general (53%) respondents do not agree that they have received formal training on TB; the TB safety training (precautions) received is

inadequate for them to meet my responsibilities at work; they have not received training on TB, they have attended TB Continuing education courses; often do go for TB training courses in a year;

They do not have weekly meetings to discuss TB patients and challenges experienced in the management of TB patients; In their area of responsibility the hospital has not undertaken any responsibility for implementing the TB screening programmes; the hospital has not undertaken responsibility to identify and evaluate health-care workers who are infected as a result of exposure to a person with TB disease.

The hospital has not undertaken responsibility for facility-wide TB education and documentation of education; they are not aware of activities planned or implemented in the facility to prevent spread of TB; personnel safety is given equal consideration at my institution; the overall quality of in-service training on (TB), they received is above average. Contrary respondents would like to receive more training on TB and that if they have questions regarding TB patients' care they go to friends for answers. The results indicate that majority health care workers need formal training on TB management, since there is inadequate health workers' training regarding TB management. The results are as shown in Figure 4.25

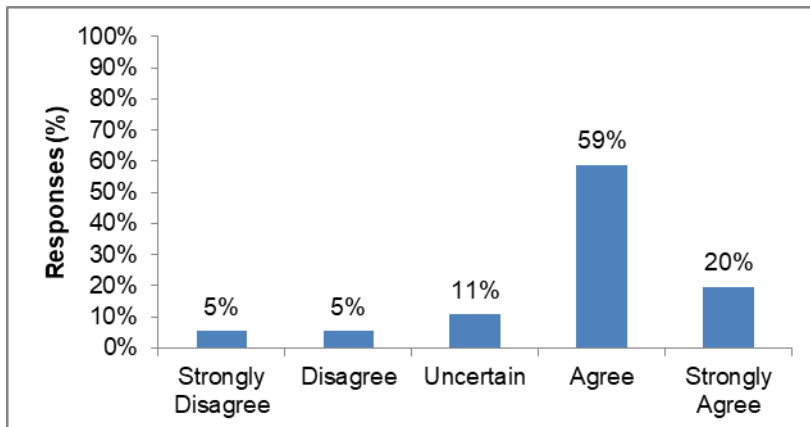
**Table 4. 26 Summary of formal training received**

|                    |         |
|--------------------|---------|
| Mean               | 2.60    |
| Standard deviation | 0.9095  |
| N (Sample size)    | 56      |
| Standard error     | 0.1216  |
| -95% Confidence    | 2.3589  |
| +95% Confidence    | 2.8464  |
| t-value            | -2.7531 |
| Degrees of freedom | 55      |
| P value            | 0.0246  |

In Table 4. 26 the results confirms that the study can conclude that there is enough evidence to conclude that there is not enough health workers' training regarding TB management at 1 Military hospital, (t- test = 2.6; p- value= 0.02).

**4.5 OBJECTIVE 3: TO ESTABLISH THE RELATIONSHIP BETWEEN GENERAL SATISFACTION, RESPONSIBILITY, PATIENT CARE, TIME PRESSURE AND STAFF RELATIONS, AMONG HEALTHCARE PROFESSIONALS.**

**4.5.1 I really enjoy my work**



**Figure 4. 26: I really enjoy my work**

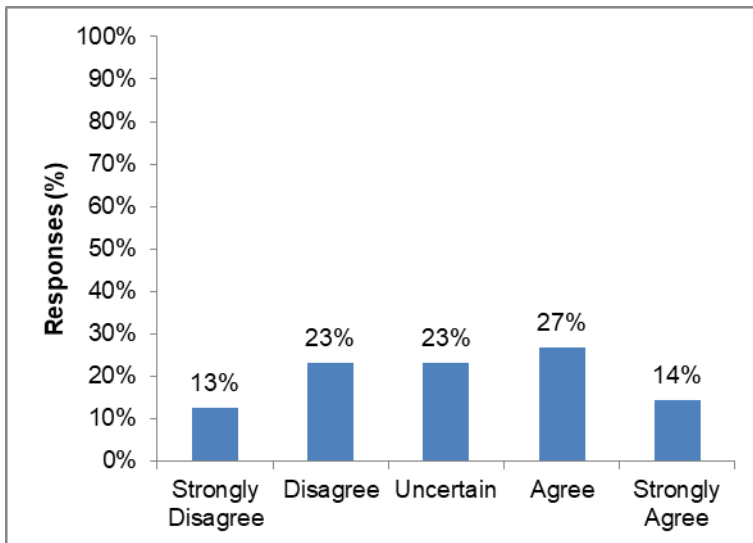
In Figure 4.26 Majority of respondents (79%) agree that they really enjoy their work compared to 10% that disagreed and 11% uncertain.

**Table 4. 27 I really enjoy my work**

|                    |          |
|--------------------|----------|
| Mean               | 3.821429 |
| Standard deviation | 0.992831 |
| N (Sample size)    | 56       |
| Standard error     | 0.132673 |
| -95% Confidence    | 3.555547 |
| +95% Confidence    | 4.087311 |
| Reference          | 3        |
| t-value            | 6.1914   |
| Degrees of freedom | 55       |
| P value            | 0.000    |

The t-test results in Table 4.27 shows the mean responses of 3.8 which significantly differ from the reference point of 3 indicating that majority of respondents agree that they really enjoy their work. This is due to t-value greater than expected and p value < 0.0001 less than 0.05%.

#### 4.5.2 My job has more advantages than disadvantages.



**Figure 4. 27: My job has more advantages than disadvantages.**

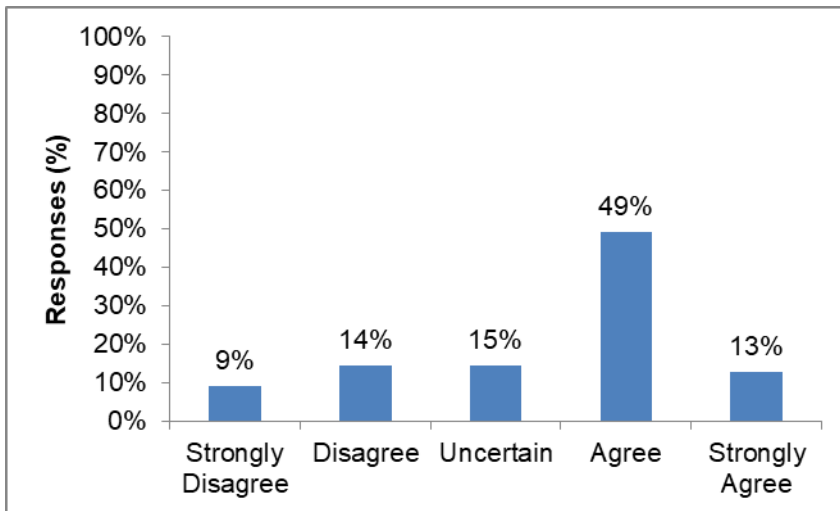
In Figure 4.27, results shows that majority of respondents (41%) agree that their job has more advantages than disadvantages compared to 36% that disagreed and 23% uncertain.

**Table 4. 28 My job has more advantages than disadvantages.**

|                    |          |
|--------------------|----------|
| Mean               | 3.071429 |
| Standard deviation | 1.262856 |
| N (Sample size)    | 56       |
| Standard error     | 0.168756 |
| -95% Confidence    | 2.733234 |
| +95% Confidence    | 3.409624 |
| Reference          | 3        |
| t-value            | 0.4233   |
| Degrees of freedom | 55       |
| P value            | 0.674    |

The t-test results in Table 4.28 shows mean responses of 3.1 which do not differ from the reference point of 3 indicating that respondents are uncertain if whether their job has more advantages than disadvantages. This is due to t-value greater than expected and p-value < 0.67 less than 0.05%.

### 4.5.3 In general I am satisfied with my work.



**Figure 4. 28: In general I am satisfied with my work.**

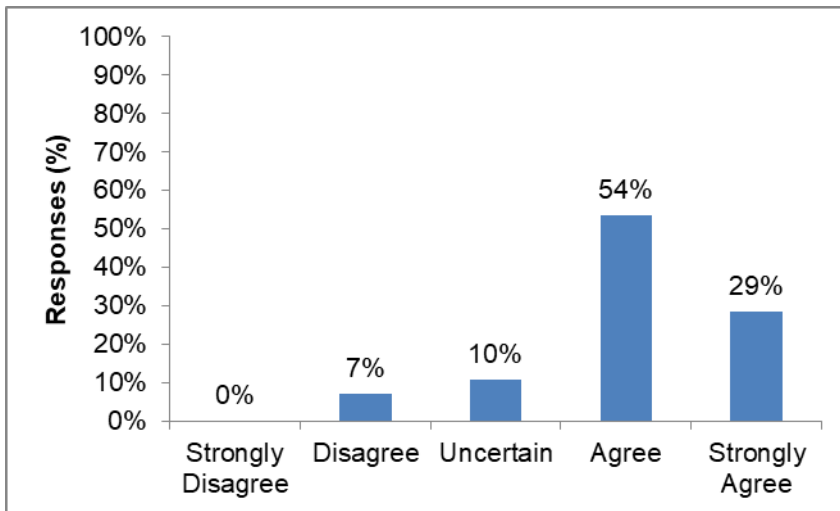
In general majority of respondents (62%) are satisfied with their work compared to 24% that disagreed and 15% uncertain according to Figure 4.28

**Table 4. 29 In general I am satisfied with my work.**

|                    |          |
|--------------------|----------|
| Mean               | 3.418182 |
| Standard deviation | 1.165728 |
| N (Sample size)    | 56       |
| Standard error     | 0.157187 |
| -95% Confidence    | 3.103041 |
| +95% Confidence    | 3.733322 |
| Reference          | 3        |
| t-value            | 2.6604   |
| Degrees of freedom | 54       |
| P value            | 0.010    |

Furthermore the t-test results in Table 4.29 shows mean responses of 3.4 which significantly differ from the reference point of 3 indicating that majority of respondents agree that they are satisfied with their work. This is due to t- value greater than expected and p- value = 0.01 less than 0.05%.

#### 4.5.4 The patients appreciate what I do for them



**Figure 4. 29: The patients appreciate what I do for them**

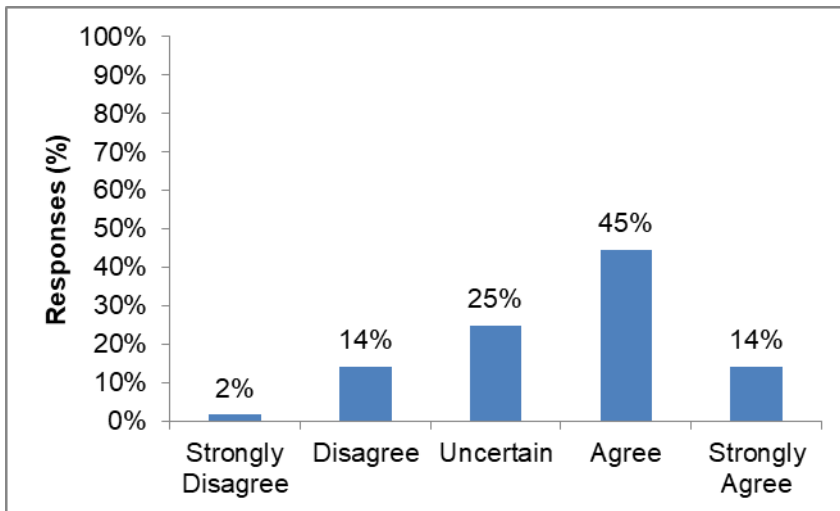
Majority of respondents (62%) agree that patients appreciate what they do for them compared to 7% that disagreed and 11% uncertain according to figure 4.29

**Table 4. 30: The patients appreciate what I do for them**

|                    |          |
|--------------------|----------|
| Mean               | 4.035714 |
| Standard deviation | 0.830428 |
| N (Sample size)    | 56       |
| Standard error     | 0.110971 |
| -95% Confidence    | 3.813324 |
| +95% Confidence    | 4.258104 |
| Reference          | 3        |
| t-value            | 9.3332   |
| Degrees of freedom | 55       |
| P-value            | 0.000    |

The t-test in Table 4.30 results shows mean responses of 4 which significantly differ from the reference point of 3 indicating that majority of respondents agree that the patients appreciate what respondents do for them.. This is due to t-value greater than expected and p- value < 0.0001 less than 0.05%.

#### 4.5.5 My patients co-operate because they understand my working conditions



**Figure 4. 30: My patients co-operate because they understand my working conditions.**

Majority of respondents (59%) agree their patients co-operate because they understand my working conditions compared to 16% that disagreed and 25% uncertain as shown in Figure 4.30.

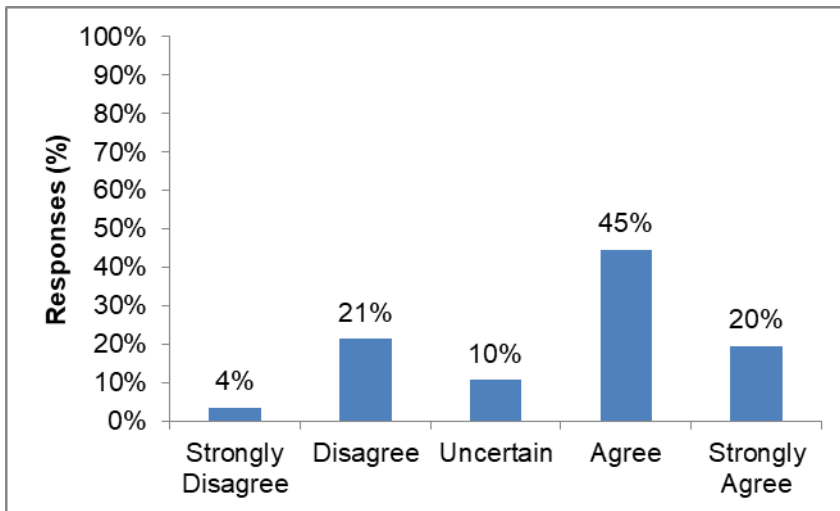
**Table 4. 31: I have sufficient time for each patient**

|                    |          |
|--------------------|----------|
| Mean               | 3.553571 |
| Standard deviation | 0.970841 |
| N (Sample size)    | 56       |
| Standard error     | 0.129734 |
| -95% Confidence    | 3.293578 |
| +95% Confidence    | 3.813564 |
| Reference          | 3        |
| t-value            | 4.267    |
| Degrees of freedom | 55       |
| P-value            | 0.000    |

The t-test results in Table 4.31 shows mean responses of 3.55 which significantly differ from the reference point of 3 indicating that majority of respondents agree that their patients co-operate because they understand their working conditions. This is due to t-value greater than expected and p-value < 0.0001 less than 0.05%.



#### 4.5.6 I have sufficient time for each patient



**Figure 4. 31: I have sufficient time for each patient**

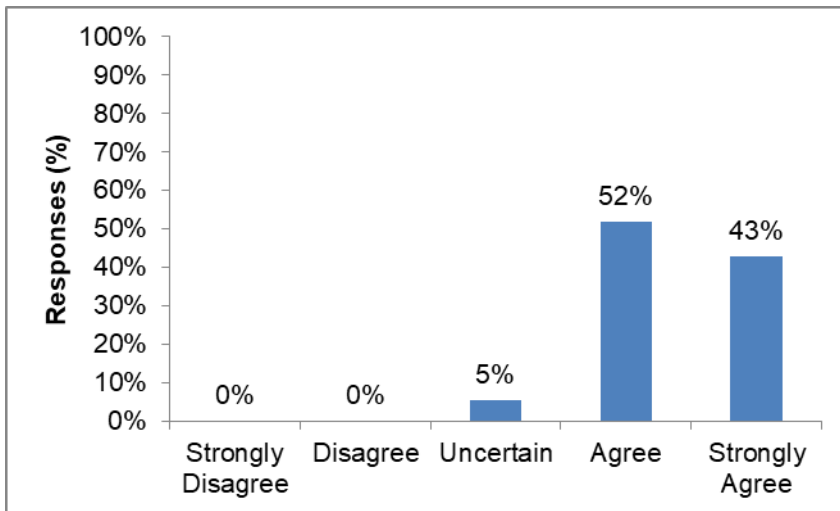
According to Figure 4.31 majority of respondents (65%) agree that I have sufficient time for each patient compared to 25% that disagreed and 11% uncertain.

**Table 4. 32: I have sufficient time for each patient**

|                    |          |
|--------------------|----------|
| Mean               | 3.553571 |
| Standard deviation | 1.142877 |
| N (Sample size)    | 56       |
| Standard error     | 0.152723 |
| -95% Confidence    | 3.247507 |
| +95% Confidence    | 3.859636 |
| Reference          | 3        |
| t-value            | 3.6247   |
| Degrees of freedom | 55       |
| P-value            | 0.001    |

The t-test results in Table 4.32 shows mean responses of 3.55 which significantly differ from the reference point of 3 indicating that majority of respondents agree that they have sufficient time for each patient. This is due to t-value greater than expected and p-value = 0.01 less than 0.05%.

#### 4.5.7 I have a good working relationship with my colleagues



**Figure 4. 32: I have a good working relationship with my colleagues**

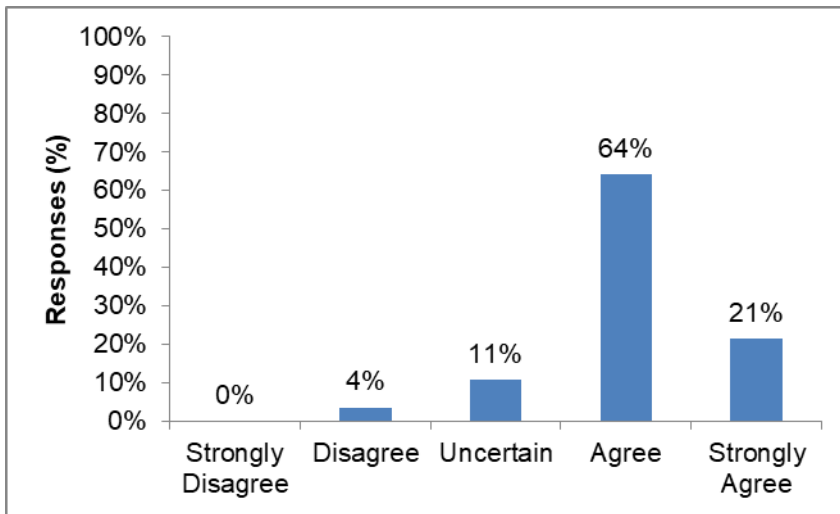
In Figure 4.32, majority of respondents (95%) agree that they have a good working relationship with my colleagues while 5% are uncertain.

**Table 4. 33: I have a good working relationship with my colleagues**

|                    |          |
|--------------------|----------|
| Mean               | 4.375    |
| Standard deviation | 0.589684 |
| N (Sample size)    | 56       |
| Standard error     | 0.0788   |
| -95% Confidence    | 4.217082 |
| +95% Confidence    | 4.532918 |
| Reference          | 3        |
| t-value            | 17.4493  |
| Degrees of freedom | 55       |
| P-value            | 0.000    |

The t-test results in Table 4.33 shows mean responses of 4.37 which significantly differ from the reference point of 3 indicating that majority of respondents agree that respondents have a good working relationship with colleagues. This is due to t-value greater than expected and p-value <0.001 less than 0.05%.

#### 4.5.8 There is an atmosphere of co-operation between me & patients



**Figure 4. 33: There is an atmosphere of co-operation between me & patients**

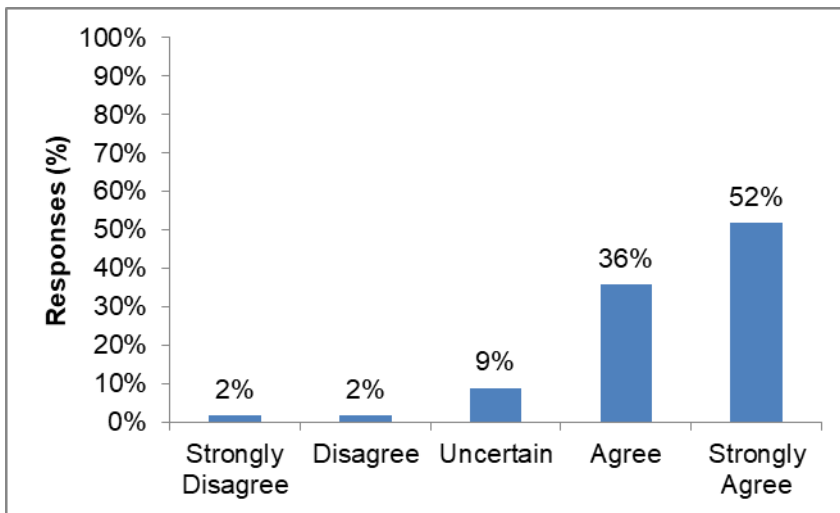
Majority of respondents (85%) agree that there is an atmosphere of co-operation between them, and patients, compared to 4% that disagreed and 11% uncertain according to Figure 4.33.

**Table 4. 34: There is an atmosphere of co-operation between me & patients.**

|                    |          |
|--------------------|----------|
| Mean               | 4.035714 |
| Standard deviation | 0.686607 |
| N (Sample size)    | 56       |
| Standard error     | 0.091752 |
| -95% Confidence    | 3.85184  |
| +95% Confidence    | 4.219589 |
| Reference          | 3        |
| t-value            | 11.2882  |
| Degrees of freedom | 55       |
| P-value            | 0.000    |

In Table 4.34, the t-test results shows mean responses of 4.04 which significantly differ from the reference point of 3 indicating that majority of respondents agree that there is an atmosphere of co-operation between me & patients. This is due to t-value greater than expected and p-value <0.001 less than 0.05%.

**4.5.9 Most health care workers are afraid that they may contract TB from the patients.**



**Figure 4. 34: Most health care workers are afraid that they may contract TB from the patients**

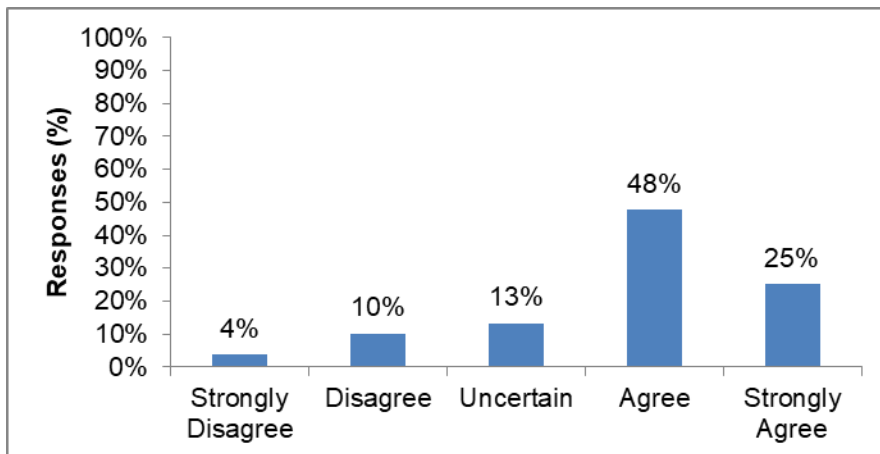
Figure 4. 34 depicts results regarding most health care workers are afraid that they may contract TB from the patients, majority of respondents (88%) agree that most health care workers are afraid that they may contract TB from the patients compared to 4% that disagreed and 9% uncertain.

**Table 4. 35: Most health care workers are afraid that they may contract TB from the patients.**

|                    |          |
|--------------------|----------|
| Mean               | 4.339286 |
| Standard deviation | 0.858684 |
| N (Sample size)    | 56       |
| Standard error     | 0.114746 |
| -95% Confidence    | 4.109329 |
| +95% Confidence    | 4.569243 |
| Reference          | 3        |
| t-value            | 11.6717  |
| Degrees of freedom | 55       |
| P-value            | 0.000    |

The t-test results in Table 4.35 shows mean responses of 4.33 which significantly differ from the reference point of 3 indicating that majority of respondents agree that most health care workers are afraid that they may contract TB from the patients. This is due to t-value greater than expected and p- value <0.001 less than 0.05%.

#### 4.5.10 Summary general satisfaction, responsibility, patient care, time pressure and staff relations



**Figure 4. 35: Summary general satisfaction, responsibility, patient care, time pressure and staff relations**

The mean of 3.80 differs significantly with the reference point of 3, but contrary a p-value of 0.07 greater which is than 0.05 indicates that there is no significant difference between respondent responses which implies that in general respondents were not certain of general satisfaction, responsibility, patient care, time pressure and staff relations, among healthcare professionals.

Although responses such as I really enjoy my work; in general I am satisfied with my work. The patients appreciate what they do for them. Respondents indicated that patients co-operate because they understand my working conditions. They have sufficient time for each patient; Have a good working relationship with colleagues.

There is an atmosphere of co-operation between respondents and patients and that most health care workers are afraid that they may contract TB from the patients were generally positive. These were offset by respondents being uncertain about job has more advantages than disadvantages which resulted to respondents not being certain about the relationship between general satisfaction, responsibility, patient care, time pressure and staff relations, among healthcare professionals. The results are as shown in Figure 4.35

**Table 4. 36: Summary general satisfaction, responsibility, patient care, time pressure and staff relations**

|                    |          |
|--------------------|----------|
| Mean               | 3.800433 |
| Standard deviation | 0.944504 |
| N (Sample size)    | 55.88889 |
| Standard error     | 0.126371 |
| -95% Confidence    | 3.547165 |
| +95% Confidence    | 4.053701 |
| Reference          | 3        |
| t-value            | 7.434356 |
| Degrees of freedom | 54.88889 |
| P value            | 0.076    |

Thus, there is no enough evidence to conclude that Respondents had a good relationship with the patients, and were satisfied with their job, (t- test = 7.4: p- value= 0.076) as in Table 4.36

#### 4.5.11 Correlation analysis regarding job satisfaction

**Table 4. 37: Correlation analysis results on job satisfaction**

|                                                                                  | I really enjoy my work | My job has more advantages than disadvantages. | In general I am satisfied with my work. | The patients appreciate what I do for them | My patients co-operate because they understand my working conditions | I have sufficient time for each patient | I have a good working relationship with my colleagues | There is an atmosphere of co-operation between me & patients. | Most health care workers are afraid that they may contract TB from the patients. |
|----------------------------------------------------------------------------------|------------------------|------------------------------------------------|-----------------------------------------|--------------------------------------------|----------------------------------------------------------------------|-----------------------------------------|-------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------------------------------------|
| I really enjoy my work                                                           | 1<br>p= ---            |                                                |                                         |                                            |                                                                      |                                         |                                                       |                                                               |                                                                                  |
| My job has more advantages than disadvantages.                                   | 0.7077<br>p=.000       | 1<br>p= ---                                    |                                         |                                            |                                                                      |                                         |                                                       |                                                               |                                                                                  |
| In general I am satisfied with my work.                                          | 0.8117<br>p=.000       | 0.7735<br>p=.000                               | 1<br>p= ---                             |                                            |                                                                      |                                         |                                                       |                                                               |                                                                                  |
| The patients appreciate what I do for them                                       | 0.1158<br>p=.400       | -0.0539<br>p=.696                              | 0.0496<br>p=.719                        | 1<br>p= ---                                |                                                                      |                                         |                                                       |                                                               |                                                                                  |
| My patients co-operate because they understand my working conditions             | -0.1048<br>p=.446      | -0.0244<br>p=.859                              | -0.1388<br>p=.312                       | 0.491<br>p=.000                            | 1<br>p= ---                                                          |                                         |                                                       |                                                               |                                                                                  |
| I have sufficient time for each patient                                          | 0.1672<br>p=.223       | 0.2881<br>p=.033                               | 0.2359<br>p=.083                        | 0.3047<br>p=.024                           | 0.4864<br>p=.000                                                     | 1<br>p= ---                             |                                                       |                                                               |                                                                                  |
| I have a good working relationship with my colleagues                            | -0.0742<br>p=.590      | -0.1262<br>p=.358                              | -0.1447<br>p=.292                       | 0.2902<br>p=.032                           | -0.0292<br>p=.832                                                    | 0.1233<br>p=.370                        | 1<br>p= ---                                           |                                                               |                                                                                  |
| There is an atmosphere of co-operation between me & patients.                    | -0.0222<br>p=.872      | -0.0871<br>p=.527                              | -0.0798<br>p=.562                       | 0.5916<br>p=.000                           | 0.486<br>p=.000                                                      | 0.3468<br>p=.009                        | 0.4455<br>p=.001                                      | 1<br>p= ---                                                   |                                                                                  |
| Most health care workers are afraid that they may contract TB from the patients. | -0.2339<br>p=.086      | -0.3111<br>p=.021                              | -0.3115<br>p=.021                       | -0.0106<br>p=.939                          | -0.1754<br>p=.200                                                    | -0.1635<br>p=.233                       | 0.1314<br>p=.339                                      | -0.1482<br>p=.280                                             | 1<br>p= ---                                                                      |

Correlation analysis was conducted to identify association between variables representing general satisfaction, responsibility, patient care, and time pressure and staff relations, amongst healthcare professionals. Results shows that enjoying work has

70% significant p-value <0.01 positive correlation with job having more advantages than disadvantages and job satisfaction (81%, =p <0.01).

A significant 28% with a p-value of 0.03 correlation was also noticed between job having more advantages than disadvantages and satisfaction with job, and having sufficient time with patients while a negative correlation was noted with most health care workers are afraid of contracting TB from the patients ( 31%, P= 0.021). Job satisfaction also had a negative correlation where most of health care workers are afraid of contracting TB from the patients (31%, P= 0.021).

Patients appreciating what respondents do is positively correlated to patients co-operate because they understand working conditions (49%, p<0.01): I have sufficient time for each patient (30%; p=0.02), I have a good working relationship with my colleagues (29%, p=0.03), There is an atmosphere of co-operation between me and patient (59%, p<0.01).

My patients co-operate because they understand my working conditions is positively correlated to, I have sufficient time for each patient, having a good working relationship with my colleagues (48%, p<0.01), an atmosphere of co-operation between me and patients (48%, p<0.01). Having sufficient time with patient has a positive correlation with having an atmosphere between patients and respondents (39%, p = 0.009). Having a good working relationship with colleagues also has a direct correlating with having an atmosphere between patients and respondents (44%, p=0.001). The results are shown in Table 4.37

#### 4.5.12 Regression analysis

**Table 4. 38: Regression results on Job satisfaction**

|                                                                                                                                                                                                                                            | Beta    | Std.Err. of Beta | B       | Std.Err. of B | t(46)   | p-level |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------------------|---------|---------------|---------|---------|
| <b>Regression analysis</b>                                                                                                                                                                                                                 |         |                  |         |               |         |         |
| Intercept                                                                                                                                                                                                                                  |         |                  | 1.6597  | 0.9967        | 1.6652  | 0.1027  |
| I really enjoy my work                                                                                                                                                                                                                     | 0.4668  | 0.1073           | 0.5432  | 0.1248        | 4.3512  | 0.0001  |
| My job has more advantages than disadvantages.                                                                                                                                                                                             | 0.3665  | 0.1099           | 0.3369  | 0.1011        | 3.3341  | 0.0017  |
| The patients appreciate what I do for them                                                                                                                                                                                                 | 0.1197  | 0.0980           | 0.1686  | 0.1381        | 1.2207  | 0.2284  |
| My patients co-operate because they understand my working conditions                                                                                                                                                                       | -0.2086 | 0.1020           | -0.2487 | 0.1216        | -2.0453 | 0.0466  |
| I have sufficient time for each patient                                                                                                                                                                                                    | 0.1206  | 0.0885           | 0.1238  | 0.0908        | 1.3632  | 0.1794  |
| I have a good working relationship with my colleagues                                                                                                                                                                                      | -0.0989 | 0.0866           | -0.1957 | 0.1714        | -1.1421 | 0.2593  |
| There is an atmosphere of co-operation between me & patients.                                                                                                                                                                              | -0.0186 | 0.1042           | -0.0319 | 0.1787        | -0.1787 | 0.8589  |
| Most health care workers are afraid that they may contract TB from the patients.                                                                                                                                                           | -0.0937 | 0.0781           | -0.1357 | 0.1131        | -1.1998 | 0.2364  |
| Regression Summary for Dependent Variable: 34. In general I am satisfied with my work. (Data analysis 1) R= .87788553 R <sup>2</sup> = .77068301 Adjusted R <sup>2</sup> = .73080179 F(8,46)=19.324 p<.00000 Std.Error of estimate: .60483 |         |                  |         |               |         |         |

To establish the relationship between general satisfaction, responsibility, patient care, time pressure and staff relations, among healthcare professionals, regression analysis was applied. The results in Table 4.38 shows that respondents enjoying work, job

having more advantages than disadvantages, patients appreciating what respondents do, patients co-operation, time, good working relationship, atmosphere and fear of contracting TB from patients has a significant relationship with job satisfaction. Results shows that job satisfaction explained 77% of data points from the latter variables.

Thus, the results revealed that there is a direct relationship between job satisfaction and respondents enjoying work, job having more advantages than disadvantages and co-operation by patient as the p-values were less than 0.05% indication a strong relationship. However the results also revealed that job satisfaction has no significant relationship to patients appreciating what respondents do, respondents having sufficient time for each patient, good working relationship with colleagues, atmosphere of co-operation between respondents and patients as well as fear of contracting TB from patients as p-values were greater than 0.05%.

#### **4.6 CONCLUSION**

This Chapter presented results analysis and interpretation according to the set objectives in order to answer the research objectives. In this chapter the data was collected from sample size of all 56 health care workers comprising of nurses (20), doctors (8), clinical associates (10), physiotherapists (8), and occupational therapists (10) and analyzed using using, STATISTICA 7, IBM SPSS version 23 method of data, as well as Microsoft Excel for presentation of tables and graphs. Lastly the previous chapter presented results analysis and interpretation according to the set objectives in order to answer the research objectives.



## CHAPTER 5

### DISCUSSION, CONCLUSION AND RECOMMENDATION

#### 5.1 INTRODUCTION

This chapter discusses the results, analysis, provides conclusion and recommendation of the study. Discussion to the findings are based on literature review and in line with the results analyzed including objectives of the study.

The objectives of the study were:

- To establish the availability of resources allocated to health care workers caring for TB patients at 1 Military Hospital
- To establish health worker's training regarding TB management at 1 Military Hospital.
- To establish the relationship between general satisfaction, responsibility, patient care, time pressure and staff relations, among healthcare professionals.

The findings of this study are limited to 1 Military Hospital and may need to be confirmed by further research in other hospitals, especially military hospitals in South Africa. However numerous studies in different parts of the world such Uganda, Kuwait and Rome do allow a direct comparison with the current study. The purpose of the study was to investigate the challenges faced by health care workers caring for patients with tuberculosis at 1 Military Hospital, Gauteng Province, South Africa, and the results highlighted overall dissatisfaction.

#### 5.2 DISCUSSION OF THE FINDINGS

Discussion of the findings in this study is according to the objectives in answering to the research questions, which the researcher outlined, which are based on results presented in Chapter 4 of this study:

##### **5.2.1 To establish the availability of resources allocated to healthcare workers caring for TB patients at the hospital at 1 Military hospital**

Although policies and protocols are available, they were not consistently followed and implemented by healthcare workers, especially doctors. This is in line with the findings (South Africa, 2007) which revealed that most of the TB management facilities in South Africa experiences inadequate supply of N95 respirators, which the health care workers reports to be always out of stock in their institutions. Even though the N95 respirator is an essential PPE in the TB facility which protects health care workers from inhaling TB only if standard work practice and environmental controls are in place.

In this study, majority of respondents 79% indicated that they do not often use N95 or N100 mask although 21% do use it often. The t-test results shows a mean responses of 2.5 which is below a reference point of 3, indicating that majority of respondents indicated that they do not often use N95 or N100 masks. The findings regarding personal protective equipment are of concern. Biscotto et al, had similar findings, in which they found that health care workers used masks frequently when performing attending patients with high risk of health care associated infection of those attending TB isolation rooms, only 39.5% were observed to be using N95 respirators.

Thus, there is a significant difference between respondent's responses which implies enough evidence to conclude that respondents do not use N95 or N100 mask often. This is due to t- value which is greater than expected and p-value = 0.0004 less than 0.05%. Thus there is enough evidence to conclude that N95 or N100 mask is not often used, at 1 Military highlighted overall dissatisfaction. (Refer to Chapter 4, Figures 4.1-4.9 and Tables 4.2 – 4.10)

There is strong evidence that most of health care institutions especially at TB facilities in South Africa, lacks essential personal protective equipment, in this study 79% of respondents indicated that they do not often use N95 or N100 mask as they are always out of stock. In the study by, Arjun, 2011, the results revealed that respondents expressed their concern over having to use one mask for a number of days, because of lack of resources or at times due to lack of resources respondents were encouraged to use one mask twice or more than twice. Furthermore, the findings revealed that health care workers had insufficient theoretical knowledge to provide quality care to their patients; findings also indicated that training and knowledge are needed in the assessment and management of TB patients. Findings reveals that respondents needs more information to improve on treating their patients effectively, and they also need effective communication, as they do not receive the latest information or update continuously.

In most institutions the lack of provision of PPE e.g. N95, apron, gloves and goggles led to health care workers often distancing themselves from their patients and frequently refrained from touching their patients, with regard provision, findings revealed that sometimes there are no masks and aprons available in the most public sector hospital, at some stage the health care workers have to go on strike because there were no N95 masks available in the hospitals, hence most of health care workers would chose to absent themselves from work for the sake of their health (Arjun, 2011). Health care workers have to use one mask for a number of days, because the durability of the mask is not known to go to that level of functioning. There is also no hand wash basins and visors to be used when inserting drips (Arjun, 2011). The results/ findings by Arjun (2011) agrees with the findings of the study conducted at 1 Military Hospital.

It is essential that a TB facility must have the basic requirements of infection control; most health care facilities have inadequate supply of N95 masks in the wards for health care worker's use. The N95 masks are essential for reducing the spread of infection especially TB in hospitals and this is a simple infection control measure. Health care workers may themselves be immune suppressed due to HIV infection and may be at higher risk of developing TB (South Africa, 2007).

This is supported by the findings of the study conducted at 1 military hospital that shows that 50%, of the respondents sometimes experience frustration at work due to limited resources with 34%, indicating that they certainly do and 11%, indicating always do. The t-test results with  $p < 0.001$  in Table 4.4 implies enough evidence to conclude that respondent do experience frustration at work due to limited resources, hence most of health care workers would chose to absent themselves from work for the sake of their health.

The findings furthermore revealed that most respondents 82%, do not do quarterly screening for TB regularly at workplace to check if they contracted TB although 11% indicated that the latter is sometimes done and only 7%, said it is done (Chapter 4, Figure 4.4) It is only done when the health care worker is sick or showing suggestive symptoms of respiratory tract infections, while 93%, of respondents don't do quarterly chest X-ray. The significant difference in respondents responses confirms that there is enough evidence to conclude that respondent do not always do quarterly screening for TB as well as chest X-ray ( $p < 0.001$ ) as in Table 4.6 and 4.7

The results revealed that 63% of respondents indicated that cross ventilation is not implemented in the wards/clinic although just 37%, indicated that the latter is done. The t-test results shows mean responses of 1.78 which significantly differ from the reference point of 3 indicating that most respondents indicated that cross ventilation is not implemented in the wards/clinic at my unit/ward.

The findings revealed that the respondents did not get support at times from management. The findings demonstrates that management seemed not to understand fully what the health care workers are experiencing on daily basis even though they work in the same institution. Results demonstrates that health care workers are working in a challenging environment with a lack of human, physical and material resources. However, they do receive and give support to their colleagues, as results revealed that most of respondents do go to their friends for answers if they have questions regarding TB diagnosis and management especially on latest information and discussion of the management thereof, which is according to the latest guidelines. This is supported by the results that revealed that most of the respondents 73%, when they have questions regarding TB diagnosis and management especially on latest information and discussion of the management thereof, according to the latest guidelines, they go to their friends for answers as compared to 7%, that never do and 20%, who considers going to friends sometimes.

Thus, there is a significant difference between respondent's responses which implies enough evidence to conclude that respondent do not always do quarterly chest X-ray. This is due to t-value greater than expected and p value = 0.000 less than 0.05%. Thus there is enough evidence to conclude that cross is ventilation implemented in the wards/clinic at my unit/ward

The findings furthermore revealed that majority of respondents 82%, do not do quarterly screening for TB always at workplace to check if they contracted TB although 11%, indicated that the latter is sometimes done and only 7%, said it is done. It is significant to note that health care workers who are exposed to TB patients have an increased risk of acquiring the infection. Therefore, TB screening of health care workers especially those who are working directly with patients diagnosed with TB is a beneficial prevention strategy. The researcher noted in the study, that at the study site it will be important factor in realizing a decrease in transmission of TB, in that everyone who reports to the healthcare center for whatever medical complain should be screened for TB. Therefore, a screening tool must be developed to ease the process of screening, and healthcare workers should use the tool to ensure TB suspects are not missed.

The t-test results shows the mean responses of 1.8% which significantly differ to the reference point of 3 indicating that majority of respondents indicated do not always do quarterly screening for TB.

Thus, there is a significant difference between respondent's response which implies enough evidence to conclude that respondent do not always do quarterly screening for TB. This is due to t-value greater than expected and p-value = 0.000 less than 0.05%. Thus there is enough evidence to conclude that respondents do not always do quarterly screening for TB at workplace to check if contracted TB. Furthermore, results revealed that 93%, of respondent don't do quarterly chest X-ray always at my workplace to check if I contracted TB although just 7%, indicated that the latter is sometimes done.

The t-test results shows mean responses of 1.57 which significantly differ to the reference point of 3% indicating that majority of respondents indicated that they do not always do quarterly chest X-ray at workplace to check if contracted TB. Thus there is a significant difference between respondent's responses which implies enough evidence to conclude that respondent do not always do quarterly chest X-ray. This is due to t-value greater than expected and p-value = 0.000 less than 0.05%. Thus there is enough evidence to conclude that respondents do not always do quarterly chest X-ray at workplace to check if contracted TB.

The results revealed that most health care workers 63%, of respondents indicated that cross ventilation is not implemented in the wards/clinic although just 37%, indicated that the latter is done. The t-test results shows mean responses of 1.78 which significantly

differ from the reference point of 3 indicating that majority of respondents indicated that cross is ventilation implemented in the wards/clinic at my unit/ward.

The results show that majority of respondents 70%, indicated that windows are not always opened in my unit /ward although just 22%, indicated that windows are always opened in my unit/ward. The open door/window policy emerged as an effective infection control intervention that most most institutions adhered to, with open door/window practice, air flows freely and, when accelerated, there is a reduction of TB transmission in the unit/ward. It became evident during the study that an open door/window policy is not practiced which puts health care workers at high risks to contract TB at the study site. The t-test results shows mean responses of 2.2 which significantly differ from the reference point of 3 indicating that majority of respondents indicated that windows are not always open in my unit/ward. Thus there is a significant difference between respondent's response which implies enough evidence to conclude that respondent windows are not always open in their unit /ward. This is due to t-value greater than expected and p value = 0.0001 less than 0.05%. Thus there is enough evidence to conclude that windows are always opened in their unit /ward.

The WHO (2008) recommended that at the TB units/wards the most important factors in the environmental controls includes ventilation, filtration and ultraviolet germicidal irradiation, whereby ventilation relies on open doors and windows to bring in air from the outside, which mean during ventilation fresh air enters a room, and dilutes the concentration of particles in the room air especially droplets nuclei that contains mycobacterium tuberculosis (WHO, 2008c). The recommendation, by the WHO (2008) also have relevance at 1 Military Hospital buildings, whereby 63%, of respondents indicated that cross ventilation is not implemented in the wards/clinic, which is also further supported by the results that show that majority of respondents, which 70% them indicated that windows are not always opened in my unit /ward. It is therefore significant that waiting areas, wards, and examination room's windows, especially where TB patients are seen or examined are opened at all times to maximise natural ventilation and reduce the spread of TB. In warm climates, open air shelters with a roof to protect patients from fans may also assist in distributing the air. However, the use of ceiling fans is only justified if there is free air flow out from the room through open windows (WHO, 2008c).

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

Negative pressure ventilation is another method used to prevent contaminated air from flowing out of the room into areas in laboratories or healthcare facilities, by maintaining an air pressure difference between the two areas. Air is drawn into the room from areas

and exhausted directly to the outside, removing and diluting any infectious particles. This may be the method of choice in some settings, depending on various factors that include climatic conditions and available resources (WHO, 2008c). If patients are requested to provide sputum specimens for TB; they must do so outside in the open air area, away from other people (WHO, 2008c).

In a study conducted by Chung, Wong & Suen (2005), on the experiences of health care workers while caring for TB and Severe Acute Respiratory Syndrome (SARS) patients, the findings revealed a variety of emotions that were experienced by health care professionals, where the nurses felt vulnerable and at risk of contracting the disease themselves due lack adequate resources. The study conducted by Adams, Ehrlich, Baatjies, van Zyl-Smit, Said-Hartley, Dawson, (2015), also discovered that healthcare workers were likely to become infected with TB. These findings further affirms the high risk of TB transmission among healthcare workers due to occupational exposure. Therefore, implementation of infection control measures is the responsibility of all healthcare workers. Wearing protective masks and open door/window policies are some of the measures participants agreed on.

Furthermore there is a feeling of frustration when health care workers did not follow the infection control guidelines properly and fell victim to TB leading to them being unable to help their patients in a competent manner. The findings indicate that their feelings and attitude changed as empathy is developed towards the patients (Chung et al, 2005). It could also be the case with 1 Military Hospital, as the researcher has, observed the same trend, that there is deterioration in the health care worker's morale and caring for patient diagnosed with TB. Thus, at the study site the health care workers have reduced therapeutic relationships and compromised quality of caring for patients, which resulted in health care workers being unable to help their patients in a competent manner, as they have lost interest in caring for patient diagnosed of TB.

There has been a significant increased staff turnover and absenteeism amongst health care workers at the study site, other health care workers would request to be rotated to different wards or units or even refuse to work directly with patients diagnosed with TB with fear that they will contract TB, due lack adequate resources, as they will be directly interacting with patients when they provides care. This affected the efficiency of health care services and caring for patient who are diagnosed with TB. The health care workers turnover, absenteeism, grievances and highly stressful environment have greatly affected the efficiency of health care services and caring for patient who are diagnosed with TB at the study site, as this study sought to find out what were the challenges that were health care workers might have been facing at 1 Military Hospital.

It is the responsibility of the employer to ensure that health care workers work in a safe and low-risk environment by providing PPEs, so that health care workers can do their work effectively without concerns that they might contract infections (Parsons, 2004). Close contact with someone who has active TB in a high risk setting results in

inhalation of airborne nuclei from the infected person that is proportional to the amount of time spent in the same air space, the proximity of the person and the degree of ventilation (Smeltzer, Bare, Hinkle & Cheever, 2008).

The mean of 2.35 differs significantly with the reference point of 3 with a p-value =0.01 providing strong evidence that in general respondents do not agree that the hospital always provides masks to all personnel at all times (N95 or N100). Cross ventilation is never implemented in the wards/clinic and windows are not always opened at the unit /ward. The results shows that most of respondents 63%, indicated that cross ventilation is not implemented in the wards/clinic at my unit/ward although just 37% indicated that the latter is done.

The results indicates that physical environment in the wards is not conducive to preventing the spread of infection. The ventilation was not good and there are no extractor fans available to remove the TB bacilli out of the wards at all the times. Furthermore, respondents do experience frustration at work due to limited resources as results in Chapter 4 of this study revealed such evidence. Thus we can conclude that there is enough evidence to conclude that there is inadequate availability of resources allocated for healthcare workers caring for TB patients at the hospital at 1 Military hospital (t-test results = -5.86; p -value = 0.01).

### **5.2.2 To establish health worker's training regarding TB management at 1 Military hospital.**

The findings revealed that the respondents did not get support at times from management. The analysis to support this objective are in Figures 4.10-4.24 and Tables 4.11 – 4.25 in Chapter 4 of this study suggests that management seemed not to understand fully what the health care workers at grass-roots level are experiencing on daily basis. The health care workers are working in a challenging environment with a lack of human, physical and material resources. The analysis shows that most of respondents 57%, indicated that they have never received formal training and they needed some sort of support from management, which they did not receive, that indicate lack of support from management and in-service training. Training of health care workers is an important strategy for improving productivity. Poor performance may be as a result of health care worker not being sufficient in numbers, or not providing care according to the set standards, or not being responsive to the needs of the community and patients at 1 military hospital.

The study by Dielman (2006) revealed that apart from training, other influences on productivity of health workers in TB control include personal and lifestyle-related factors, ventilation, Proper PPE"s e.g. N95 mask, living circumstances, adequacy of preparation for work during pre-service education; health-system related factors such as human resources policy and planning; job satisfaction related factors such as financial remuneration, working conditions, management capacity and styles, professional advancement and safety at work. These factors may play a role if not

addressed appropriately by the management and the human resources, of which TB training is an important component, the WHO (2006) finding by Dielman also have relevance at 1 Military Hospital, as the analysis from the most of respondents 57%, indicated that they have never received any formal training and as they needed some sort of support from management, which they did not receive, that indicate lack of support from management and in-service training at 1 Military hospital. As training of health workers is an important strategy for improving health care workers' productivity.

However, the results also indicates that health care workers who did receive formal training do give support to their colleagues, as results indicated that majority of respondents 73%, when having questions regarding TB patients management they do go to their friends/colleagues for answers as compared to 7%, that never do and 20%,who considers going to friends/colleagues sometimes, these results strongly indicates lack of training.

In this study findings revealed that health care workers at 1 Military hospital provide health care to their patients under very difficult circumstances with limited human and material resources. Most health care workers rely on their friends/colleagues when having questions regarding TB patients, or they just refer them to other department due to lack extensive knowledge about TB management. The results suggest that respondents have been receiving support from colleagues. They provided in-service training for each other and they assist each other when they needed latest information since there was no formal training at the hospital.

Majority of respondents 88%, indicated that, they never attended any TB continuing education courses compared to 7%, who have attended the course and 5%, who attended sometimes, respondents 84%, indicated that they sometimes do not go for TB training courses in a year compared to 13%, that never and only 2%, that always do go for training courses. Majority of respondents indicated that they would like to receive more training on TB management; this is clear evidence that most of health care workers are willing to receive a formal education and training about TB management so that they can provide quality care to their patients.

Tuberculosis training must be incorporated into the basic training curriculum of all health care workers, in most developing countries, the quality of such training must address the scope of diseases irrespective of the area country the health care worker foresee to work at widely within and between countries. The quality and sustainability of integrated TB programmes depend critically on the extent to which such basic training and education is of uniformly high quality. Post-basic training for TB control and management must be adequately funded in most developing country governments. The extent to which such courses can be well-funded will positively impact on health worker performance in developing.

Results revealed that 93%, of the respondents would like to receive more training on TB compared to 5%, that need this training sometimes and 2% that do not need this



kind of training, the 2% could be those that educate themselves whom when their colleagues have questions ask them. The respondents indication of the lack formal training is in line with the findings from a study by Wynne et al, (2014), the study that was conducted at Western Uganda, where the findings revealed that more health care workers called for more training on TB management, and identified poor referral practices between health units and lack of program funding resulting in the abandonment of DOTS programmes.

The study furthermore suggested that training for health care workers is needed to better improve the management of TB patients. Therefore, the overall agreement is that the health care workers need more formal educational training to strengthen the health system, which but including the referral systems tracking patients between health centres (Wynne, 2014).

It furthermore profusely calls for in-depth training for health care workers, especially at primary health centres. The training is needed to better identify TB and manage TB infected patients, and it will be welcomed by health care workers. This would be a realistic and cost-effective approach. Overall health system strengthening is needed, including communication, which agrees with the finding from the study (Wynne, 2014).

This study also revealed that majority of respondents 68%, indicated that they are not aware of activities planned or implemented in the facility to prevent spread of TB compared to 21%, who indicated that they are aware and 11%, indicating that they are sometimes aware, furthermore, 56% of respondents indicated that personnel safety is never given equal consideration at their institution compared to 20% who indicated yes they do and 24% indicated that sometimes personal safety is give equal consideration.

There is as yet no international consensus regarding the relative emphasis that should be placed on the training of health care workers in order to produce an optimal human resources mix for TB control and management, and nations in Central Asia and Eastern Europe, with a strong medical hierarchy in TB control and management, are somewhat sceptical about initiatives to 'dilute' the concentration of TB doctors with nurses and community health workers. Furthermore, few national programmes monitor links between TB retraining and health worker performance (WHO, 2002).

The mean of 2.60 differs significantly with the reference point of 3 with a p-value =0.02 providing strong evidence that in general 53%, respondents do not agree that they have received adequate formal training on TB, Thus we can conclude that there is enough evidence to conclude that there is inadequate health care worker's training regarding TB management at 1 Military hospital.

This is supported by Arjun (2011) his findings reveled that training and knowledge were needed in the assessment and management of TB patients. Respondents indicated that they needed more information to improve on treating their patients effectively, and

they needed effective communication, as they didn't receive the latest information continuously.

Finally the lack of health care worker training is resulting in delays in diagnosis and early initiating patients on medication which can lead to patient unnecessary mortality, or patients repeated visits at health care facility without receiving effective medication, thus, increases the burden of the public sector, which is perceived as inefficient, ineffective and unable to deliver quality healthcare. It is possible that these conditions impact on job satisfaction among healthcare workers working at 1 Military Hospital.

### **5.2.3 To establish the relationship between general satisfaction, responsibility, patient care, time pressure and staff relations, among healthcare professionals.**

The results shows that measuring satisfaction with respondent's work by their enjoying work, job having more advantages than disadvantages, patients appreciating what respondents do, patients cooperation, time, good working relationship, atmosphere and fear of contracting TB from patients, will determine their level of relationship and their overall satisfaction. This study revealed that most health care workers experienced lower job satisfaction, especially with regard to caring for TB patients, which is supported by the results in Chapter 4 Figures 4.26 – 4.35 and Tables 4.27 – 4.36.

In 2007, Aleksandra et al, undertook a study on job satisfaction among Serbian health care workers who work with disabled patients. The study found very low levels of job satisfaction among healthcare worker, respondents agreed that their working environment was not stimulating and that they did not find their job motivating, furthermore most respondents indicated that they rarely participated in a decision-making process. Sixty-four per cent felt that they did not have adequate professional development or educational stimulation at their workplace. The study found that job satisfaction was associated with good hospital politics, good interpersonal relationships and a feeling of being able to provide good quality care. Other studies suggest that there is a strong association between low levels of job satisfaction and organizational factors (Piko et al, 2006). Furthermore various studies conducted among healthcare workers show the importance of interpersonal relationships in job satisfaction (Eker et al, 2004).

In this study the results revealed that job satisfaction could explain 77% of data points from the latter variables. Thus, the results revealed that there is a direct relationship between job satisfaction and respondents enjoying work, job having more disadvantages than advantages and cooperation by patients as the p-values were less than 0.05%, which is an indication of a strong relationship. The evidence from published research points to specific determinants and correlates of job satisfaction and productivity. Various studies have established that dissatisfaction with one's job may result in higher employee turnover, absenteeism, tardiness and grievances. Improved job satisfaction, on the other hand, results in increased productivity (White, 2000).

However, the results also revealed that job satisfaction has no significant relationship to patients appreciating what respondents do, respondents having sufficient time for each patient, good working relationship with colleagues, atmosphere of co-operation between respondents and patients as well as fear of contracting TB from patients as p-values were greater than 0.05%.

These findings are consistent with that of Smith, 2002, where it was found that people respond unfavourably to restrictive work environments therefore it is imperative for the organizations to create working environment that is enabling to the employees which will enhance the ability and freedom to think, that will ignite the employee engaging and motivating the workforce to reach a higher level of job satisfaction.

These findings are consistent with those of Gigantesco et al, 2003, in Rome, where it was reported that few respondents expressed full satisfaction with their job. The results showed no relationship and no proportional difference between socio-demographic characteristics and level of satisfaction. This contradicts the findings of Shah et al, ,2001, in Kuwait, where it was found that nationality, education and age were significant determinants of job satisfaction.

Ayers, 2005, suggested that the work environment should motivate employees to perform at their best and show commitment to the organization, enhancing work conditions to support the organization's mission and thus impacting on job satisfaction. The conditions under which jobs are performed can have as much impact on people's effectiveness, comfort and safety as the intrinsic details of the task itself.

### **5.3 CONCLUSION TO THE RESEARCH STUDY**

This chapter presented findings of the study and literature control and discussion. The aim of this chapter is to provide concluding remarks. The purpose of this study was to investigate the challenges faced by health care workers caring for patients with Tuberculosis at Tertiary 1 Military Hospital, Gauteng Province, South Africa. By employing a cross-sectional descriptive approach: The objectives of the study were also to:

- To establish the availability of resources allocated to healthcare workers caring for TB patients at 1 Military Hospital.
- To establish health care worker's training regarding TB management at 1 Military Hospital.
- To establish the relationship between general satisfaction, responsibility, patient care, time pressure and staff relations, among healthcare professionals

Both descriptive and inferential statistical methods were used in analysing the data. The findings of this study revealed that health care workers are working under challenging working environment, whereby they have not received formal training on TB, with a mean of 2.60 which differs significantly with the reference point of 3, with a

p-value =0.02 providing strong evidence that in general (53%) respondents do not agree that they have received formal training on TB.

On contrary respondents would like to receive more training on TB and that if they have questions regarding TB management they go to their friends/colleagues for answers. Thus we can conclude that there is enough evidence to conclude that there is no enough health workers' training regarding TB management at 1 Military Hospital, (t-test = -2.6; p value= 0.02). Therefore the unresolved challenges faced by the health care workers at 1 Military Hospital, might have increased the burden for health care workers, which they might be perceived as inefficient, ineffective and unable to deliver quality health care services to their patients. It is therefore possible that these conditions impacted on job satisfaction among health care workers working at 1 Military Hospital. It was revealed that healthcare workers are confronted with challenges that threaten their well-being. The next chapter presents the recommendations, limitations and conclusion of the study.

## **5.4 RECOMMENDATIONS**

In the previous chapter the findings and literature control of the study were discussed. This chapter presents an overview of the study findings and its implications. Recommendations are proposed and the limitations of the study are addressed, followed by a conclusion to the study. The discussion is guided by the findings mentioned in chapter 5.

Based on the findings of this study, the following recommendations are made in order to enable the health care workers at 1 Military Hospital to remain committed in providing high-quality health care. These recommendations are referred to the National Department of Defence (SAHMS), Gauteng, Province.

### **5.4.1 To establish the availability of resources allocated to healthcare workers caring for TB patients at the hospital at 1 Military hospital**

With regard to availability or resources, the following are the recommendations; the researcher recommends that the employer should:

- Ensure environmental controls are in place, such as installing fans or extractors.
- Implement infection prevention and control measures wards/clinics.
- Design screening policies and rules of the institution, and enforce implementation of such policies consistently by all staff members.
- A screening tool must be developed to ease the process of screening, and health care workers should use the tool to ensure TB suspects are not missed.
- The safety of the health care workers must be the priority.

- Purchase good-quality personal protective equipment, viz N-95 masks and aprons. Ensure a constant supply of quality personal protective equipment such as N95 masks and aprons of good quality.
- Provide a safe and secure environment for health care workers, patients, visitors and relatives.
- Health care worker must be provided with adequate resources to render quality health care to patient diagnosed with TB.
- Windows must always be opened at all times to allow ventilation, It is therefore significant that waiting areas, wards, and examination room's windows, especially where TB patients are seen or examined are opened at all times to maximise natural ventilation and reduce the spread of TB.
- The risk for TB transmission should be evaluated in all departments and areas where infectious TB patients might access care.

#### **5.4.2 To establish health workers' training regarding TB management at 1 Military hospital.**

With regard to health workers training and education, the following are the recommendations:

- Regular in-service training and updates should be provided for all health care workers.
- Regular health care worker's training on TB control and management
- Regular meetings should be held with health care workers on patient care and management in discussing patients thoroughly and management thereof.
- Regular updates should be given and workshops should be facilitated on the latest information about the management of TB.

#### **5.4.3 To establish the relationship between general satisfaction, responsibility, patient care, time pressure and staff relations, among healthcare professionals.**

With regard to relationship between general satisfaction, responsibility, patient care, time pressure and staff relations, among healthcare professionals, the following are the recommendations; the researcher recommends that:

- The healthcare worker's daily challenges should be given an utmost attention and priority in improving relationships between management and staff in increasing decision-making latitude amongst staff members.
- Continuous service evaluations and monitoring of job satisfaction can be useful to determine aspects of the services that need improvement.
- TB hospitals and clinics should employ supportive structures to all workers.

## **5.5 CONCLUDING REMARKS.**

This chapter concludes the study, described limitations and made recommendations for improved practice and future research. The study was to investigate the challenges faced by health care workers caring for patients with Tuberculosis at 1 Military Hospital, Gauteng Province, South Africa. Questionnaires were distributed in order to enable all 56 health care workers caring for TB patients to articulate challenges faced when caring for TB patients.

The study focused on the lived experiences and challenges of health care workers caring for TB patients. The study design was quantitative study. The findings revealed with strong evidence that health care worker needs formal education whilst caring for TB patients and to provide quality health care.

The findings can therefore be shared in supporting the health care workers to improve the environment in which health care workers facing on daily basis. The researcher is of the opinion that the results of this study can be applied in hospitals and clinics that manages TB patients and recommends that future TB hospitals and clinics should employ supportive structures when opening other TB centres in the country.

The findings should influence the policies and training to health care workers, so that health care workers can provide quality health care to patients. The study findings revealed possibilities of health care workers being infected with TB at work. Addressing these possibilities may decrease transmission of TB from patients to health care workers caring for TB patients. The health care workers will be able to continue providing quality care to patients if they are not infected with TB.

## **5.6 LIMITATIONS OF THE STUDY.**

- The findings of the study may not be generalized to healthcare professionals in other hospitals, as the different environment and circumstances prevailing in other hospitals may impact on the results.
- The study focused on TB wards and clinics, at Tertiary 1 Military Hospital, Gauteng Province, South Africa, and therefore the findings cannot be generalised.
- The sample size collected was 56; however missing responses were not included. This reduced the original sample size of 56 to between 52 and 55. The results achieved with 56 sample size did not differ significantly to those between 52 – 55. The study stuck to actual responses by removing missing responses.

## **5.7 FURTHER STUDY.**

1. Since this study was only conducted at 1 hospital, it would be good to see how other respondents at other hospitals would have responded to these questions in order to improve and effectively strategize the health care system in South Africa based on a much wider sampling unit.
2. The study focused on the lived experiences and challenges of health care workers caring for TB patients at Tertiary 1 Military Hospital, Gauteng Province, South Africa, however, there are other diseases with characteristics like that of TB and it will be great to see how the hospital management have catered for such diseases.
3. A follow-up study on how health care worker's formal education to address training gaps will have a great contribution in policies and training and development, making to the future of the health care workers.

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## APPENDIX 1

### Questionnaire

#### Section A

#### Socio-demographic details

1. Your age..... (Years)

2. Gender

|      |        |
|------|--------|
| 1    | 2      |
| Male | Female |

3. Marital status:

|        |         |          |         |
|--------|---------|----------|---------|
| 1      | 2       | 3        | 4       |
| Single | Married | Divorced | Widowed |

4. Check one category that best describes your profession?

|        |       |                     |                        |                 |
|--------|-------|---------------------|------------------------|-----------------|
| 1      | 2     | 3                   | 4                      | 4               |
| Doctor | Nurse | Clinical associates | Occupational therapist | Physiotherapist |

5. Since you graduated, how many years of experience do you have?

|            |            |            |           |             |
|------------|------------|------------|-----------|-------------|
| 1          | 2          | 3          | 4         | 5           |
| 1 -2 years | 3 -4 years | 5 -6 years | 7-8 years | 9 and above |

6. How many years have you been working in the TB unit/ward?

|           |           |           |           |
|-----------|-----------|-----------|-----------|
| 1         | 2         | 3         | 4         |
| 1-3 years | 4-6 years | 7-9 years | >10 years |

## Section B

### Questions about availability of adequate resources allocated to healthcare workers, ventilation and protective masks

7. The Hospital provides us with masks to all personnel at all times (**N95** or **N100**)?

|     |    |        |       |           |
|-----|----|--------|-------|-----------|
| 1   | 2  | 3      | 4     | 5         |
| Yes | No | Always | Never | Sometimes |

8. How often do you use **N95** or **N100** mask?

|        |           |            |
|--------|-----------|------------|
| 1      | 2         | 3          |
| Always | Sometimes | Not at all |

9. I experience frustration at my work due to limited resources.

|     |    |        |       |           |
|-----|----|--------|-------|-----------|
| 1   | 2  | 3      | 4     | 5         |
| Yes | No | Always | Never | Sometimes |

10. I always do quarterly screening for TB at my workplace to check if I contracted TB.

|     |    |        |       |           |
|-----|----|--------|-------|-----------|
| 1   | 2  | 3      | 4     | 5         |
| Yes | No | Always | Never | Sometimes |

11. I always do quarterly chest X-Ray at my workplace to check if I contracted TB?

|     |    |        |       |           |
|-----|----|--------|-------|-----------|
| 1   | 2  | 3      | 4     | 5         |
| Yes | No | Always | Never | Sometimes |

12. If yes, when was your last chest x-ray? \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_

13. Chest X-ray are taken quarterly to me which indicated no findings of consistent TB disease.

|     |    |        |       |           |
|-----|----|--------|-------|-----------|
| 1   | 2  | 3      | 4     | 5         |
| Yes | No | Always | Never | Sometimes |

14. Cross is ventilation implemented in the wards/clinic at my unit/ward

|     |    |        |       |           |
|-----|----|--------|-------|-----------|
| 1   | 2  | 3      | 4     | 5         |
| Yes | No | Always | Never | Sometimes |

15. Windows are always open in my unit /ward

|     |    |        |       |           |
|-----|----|--------|-------|-----------|
| 1   | 2  | 3      | 4     | 5         |
| Yes | No | Always | Never | Sometimes |

|     |    |
|-----|----|
| 1   | 2  |
| Yes | No |

16. If NO, have you raised your concern about this with the management?

## Section C

### Questions about training, managing TB by health care workers

17. I have received formal training on TB

|     |    |        |       |           |
|-----|----|--------|-------|-----------|
| 1   | 2  | 3      | 4     | 5         |
| Yes | No | Always | Never | Sometimes |

18. The TB safety training (precautions) I received is adequate for me to meet my responsibilities at work.

|     |    |        |       |           |
|-----|----|--------|-------|-----------|
| 1   | 2  | 3      | 4     | 5         |
| Yes | No | Always | Never | Sometimes |

19. I received training on TB

|     |    |        |       |           |
|-----|----|--------|-------|-----------|
| 1   | 2  | 3      | 4     | 5         |
| Yes | No | Always | Never | Sometimes |

20 I attend TB Continuing education courses

|     |    |        |       |           |
|-----|----|--------|-------|-----------|
| 1   | 2  | 3      | 4     | 5         |
| Yes | No | Always | Never | Sometimes |

21. How often do you go for TB training courses in a year?

|        |         |           |          |            |
|--------|---------|-----------|----------|------------|
| 1      | 2       | 3         | 4        | 5          |
| Weekly | Monthly | Quarterly | Annually | Not at all |

22. I would like to receive more training on TB

|     |    |        |       |           |
|-----|----|--------|-------|-----------|
| 1   | 2  | 3      | 4     | 5         |
| Yes | No | Always | Never | Sometimes |

23. I have weekly meetings to discuss TB patients and challenges experienced in the management of TB patients.

|     |    |        |       |           |
|-----|----|--------|-------|-----------|
| 1   | 2  | 3      | 4     | 5         |
| Yes | No | Always | Never | Sometimes |

24 There is NO any training offered on current information, updates and guidelines on TB

|     |    |        |       |           |
|-----|----|--------|-------|-----------|
| 1   | 2  | 3      | 4     | 5         |
| Yes | No | Always | Never | Sometimes |

25. In my area of responsibility the hospital has undertaken responsibility for implementing the TB screening programs.

|     |    |        |       |           |
|-----|----|--------|-------|-----------|
| 1   | 2  | 3      | 4     | 5         |
| Yes | No | Always | Never | Sometimes |

26. The hospital has undertaken responsibility to identify and evaluate health-care workers who are newly infected as a result of exposure to a person with TB disease.

|     |    |        |       |           |
|-----|----|--------|-------|-----------|
| 1   | 2  | 3      | 4     | 5         |
| Yes | No | Always | Never | Sometimes |

27. The hospital has undertaken responsibility for facility-wide TB education and documentation of education.

|     |    |        |       |           |
|-----|----|--------|-------|-----------|
| 1   | 2  | 3      | 4     | 5         |
| Yes | No | Always | Never | Sometimes |

28. I am aware of activities planned or implemented in the facility to prevent spread of TB.



|     |    |        |       |           |
|-----|----|--------|-------|-----------|
| 1   | 2  | 3      | 4     | 5         |
| Yes | No | Always | Never | Sometimes |

29. Personnel safety is given equal consideration at my institution

|     |    |        |       |           |
|-----|----|--------|-------|-----------|
| 1   | 2  | 3      | 4     | 5         |
| Yes | No | Always | Never | Sometimes |

30. The overall quality of in-service training on (TB) I received is above average.

|     |    |        |       |           |
|-----|----|--------|-------|-----------|
| 1   | 2  | 3      | 4     | 5         |
| Yes | No | Always | Never | Sometimes |

31. If I have questions regarding TB patients' care I go to my friends for

Answers

|     |    |        |       |           |
|-----|----|--------|-------|-----------|
| 1   | 2  | 3      | 4     | 5         |
| Yes | No | Always | Never | Sometimes |

## Section D

### Questions about General Job satisfaction and patient's behaviour on managing TB by health care workers

32. I really enjoy my work

|                |       |           |          |                   |
|----------------|-------|-----------|----------|-------------------|
| 1              | 2     | 3         | 4        | 5                 |
| Strongly Agree | Agree | Uncertain | Disagree | Strongly disagree |

33. My job has more advantages than disadvantages.

|                |       |           |          |                   |
|----------------|-------|-----------|----------|-------------------|
| 1              | 2     | 3         | 4        | 5                 |
| Strongly Agree | Agree | Uncertain | Disagree | Strongly disagree |

34. In general I am satisfied with my work.

|                |       |           |          |                   |
|----------------|-------|-----------|----------|-------------------|
| 1              | 2     | 3         | 4        | 5                 |
| Strongly Agree | Agree | Uncertain | Disagree | Strongly disagree |

35. The patients appreciate what I do for them

|                |       |           |          |                   |
|----------------|-------|-----------|----------|-------------------|
| 1              | 2     | 3         | 4        | 5                 |
| Strongly Agree | Agree | Uncertain | Disagree | Strongly disagree |

36. My patients co-operate because they understand my working conditions

|                |       |           |          |                   |
|----------------|-------|-----------|----------|-------------------|
|                |       |           |          |                   |
| Strongly Agree | Agree | Uncertain | Disagree | Strongly disagree |

37. I have sufficient time for each patient

|                |       |           |          |                   |
|----------------|-------|-----------|----------|-------------------|
| 1              | 2     | 3         | 4        | 5                 |
| Strongly Agree | Agree | Uncertain | Disagree | Strongly disagree |

38. I have a good working relationship with my colleagues

|                |       |           |          |                   |
|----------------|-------|-----------|----------|-------------------|
| 1              | 2     | 3         | 4        | 5                 |
| Strongly Agree | Agree | Uncertain | Disagree | Strongly disagree |

39. There is an atmosphere of co-operation between me & patients.

|                |       |           |          |                   |
|----------------|-------|-----------|----------|-------------------|
| 1              | 2     | 3         | 4        | 5                 |
| Strongly Agree | Agree | Uncertain | Disagree | Strongly disagree |

40. Most health care workers are afraid that they may contract TB from the patients.

|                |       |           |          |                   |
|----------------|-------|-----------|----------|-------------------|
| 1              | 2     | 3         | 4        | 5                 |
| Strongly Agree | Agree | Uncertain | Disagree | Strongly disagree |

## APPENDIX 2

### Consent form

**PARTICIPANT CONSENT FORM**

(Please read and understand the document before signing)

STUDY TITLE:

RESEARCH TITLE: CHALLENGES FACED BY HEALTH CARE WORKERS CARING FOR PATIENTS WITH TUBERCULOSIS AT TERTIARY 1 MILITARY HOSPITAL THABA TSHWANE, GAUTENG PROVINCE, and SOUTH AFRICA.

Researcher: Lt MW Maako

Supervisor: Mr SP Kekana

Co –Supervisor: Dr SF Matlala

You are invited to participate in a research study that forms part of my formal **Master of Public Health** studies. This participant document will help you to decide if you would like to participate in the study. Before you agree to take part, you should understand what is involved in this study. You should not agree to take part unless you are completely satisfied with all aspects of the study.

**WHAT IS THE STUDY ALL ABOUT?**

Tuberculosis (TB) is an airborne infectious disease, caused by infection of a bacteria, called *Mycobacterium tuberculosis*, which is mostly found in the lungs. Tuberculosis is commonly spread from person to person by droplets nuclei from persons infected with tuberculosis during inhalation or during exhalation such as coughing, sneezing, singing and as well as inhalation by the susceptible contact. TB poses a threat to public health throughout the world especially to persons and health care workers who are every day in close contact with patients with active pulmonary tuberculosis.

Health care workers believe that they have no extensive training in control measures and felt uncomfortable about adhering to precautions that are in place, most of the health care workers believe that masks provided are uncomfortable although legislation and policies prescribes that masks as a Personal Protection Equipment (PPE) must be used at all times for infection control and prevention of TB transmitted

from patients to health care workers and from health care workers to patients. PPE use is viewed as an obstruction to the patients and healthcare worker's relationship

Some patients at the 1 Military Hospital are too ill to care for themselves, which means that health care workers have to assist, supervise their treatment and care for them holistically during their hospital stay. The study will therefore try to find out challenges that health care workers face whilst caring for these patients at the hospital.

#### **PURPOSE OF THE STUDY**

The aim/purpose of this study is to investigate the challenges faced by health care workers caring for patients with Tuberculosis at Tertiary 1 Military Hospital Gauteng Province, South Africa.

The sample of my study is 56 health care workers comprising of be Nurses (20), Doctors (8), Clinical associates (10), Physiotherapists (8), and Occupational therapists (10).

#### **WHAT WILL YOU BE REQUIRED TO DO IN THIS STUDY?**

If you decided to take part in the study you will be required to do the following:

- Read the information and informed consent document and pose questions about the study.
- Sign the Participant information and Consent document.
- Complete the questionnaire and answer all questions in the questionnaire as honest as reasonably practical.

#### **ARE THERE ANY CONDITIONS THAT MAY EXCLUDE YOU FROM THE STUDY?**

All hospital employees who are not directly caring for patient with TB and who do not work in a high risk environment for contracting tuberculosis will be excluded in the study. The population comprise of laboratory workers, student nurses and student doctors who come for sessions and practical.

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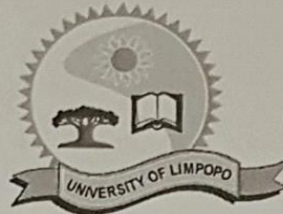
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## APPENDIX 3

### Ethics Committee clearance - University of Limpopo



**University of Limpopo**  
Department of Research Administration and Development  
Private Bag X1106, Sovenga, 0727, South Africa  
Tel: (015) 268 2212, Fax: (015) 268 2306, Email:noko.monene@ul.ac.za

**TURFLOOP RESEARCH ETHICS  
COMMITTEE CLEARANCE CERTIFICATE**

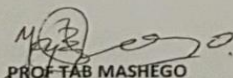
**MEETING:** 08 September 2016

**PROJECT NUMBER:** TREC/131/2016: PG

**PROJECT:**

**Title:** Challenges faced by Health Care workers caring for patients with tuberculosis at Tertiary 1 Military Hospital Thabatswane, Gauteng Province, South Africa

**Researcher:** Mr MW Maako  
**Supervisor:** Mr MP Kekana  
**Co-Supervisor:** Mr SF Matlala  
**School:** Health Care Sciences  
**Degree:** Masters in Public Health

  
**PROF. TAB MASHEGO**  
CHAIRPERSON: TURFLOOP RESEARCH ETHICS COMMITTEE

The Turfloop Research Ethics Committee (TREC) is registered with the National Health Research Ethics Council, Registration Number: REC-0310111-031


- Note:**
- i) Should any departure be contemplated from the research procedure as approved, the researcher(s) must re-submit the protocol to the committee.
  - ii) The budget for the research will be considered separately from the protocol. PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES.

## APPENDIX 4

### Ethics Committee clearance - 1 Military Hospital

RESTRICTED

1MH/302/6/02.09.2016



**sa military health service**  
Department:  
Defence  
**REPUBLIC OF SOUTH AFRICA**

Telephone: 012 314 0013  
Facsimile: 012 314 0013  
Enquiries: Prof / Lt Col M.K. Baker

1 Military Hospital  
Private Bag x 1023  
Thaba Tshwane  
0143  
04 November 2016

**CLINICAL TRIAL APPROVAL: 02.09.2016: "CHALLENGES FACED BY HEALTH CARE WORKERS CARING FOR PATIENTS WITH TUBERCULOSIS AT TERTIARY 1 MILITARY HOSPITAL THABA TSHWANE, GAUTENG, SOUTH AFRICA"**

1. The 1 Military Hospital Research Ethics Committee (1MHREC) registered in South Africa with the National Health Research Ethics Council (NHREC) (REC-111208-019-RA) adhering to GCP/ICH and SA Clinical Trial guidelines, evaluated the above-mentioned protocol and additional documents.
2. The following members approved the study:
  - a. Lt Col M.K. Baker: Neurologist, male, chairman 1 MHREC.
  - b. Lt Col C.S.J. Duvenage: Specialist physician, female, member 1 MHREC.
  - c. Lt Col S. Hassim: Medical Doctor, male, member 1 MHREC.
  - d. Lt Col A.D. Moselane: Urologist, male, member 1 MHREC.
  - e. Lt Col E.J. Venter: Periodontist, male, member 1 MHREC.
  - f. Maj M.L. Kekana: Specialist physician, female, member 1 MHREC.
  - g. DR T.J. Marè: Advocate, independent of the organization, male, member 1 MHREC.
  - h. Mrs. C. Jackson: Layperson, independent of the organization, female, member 1 MHREC.
  - i. Maj. M.M.M. Ledwaba: Specialist physician, female, member 1 MHREC
3. The following documents were evaluated:
  - a. Personalised covering letter from investigator
  - b. Research proposal
  - c. Time frame
  - d. Budget
  - e. Questionnaire
  - f. Informed Consent Document
  - g. Updated Curricula Vitae:
    - i. M.W. Windvoel
    - ii. M.P. Kekana
    - iii. S.F. Matlala
  - h. Turfloop Research Ethics Committee Clearance Certificate

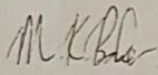
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1MH/302/6/02.09.2016

4. The recommendations are: The study was ethically approved on 4 November 2016. The principal investigator, Lt. M.W. Maako, will be supervised by Mr. M.P. Kekana and Mr. S.F. Matlala. Report backs are to be made to the 1MHREC six monthly, in the event of any serious adverse events and on completion or termination of the study. Should publications result from the study the relevant manuscripts will also need to be approved by Military Counter Intelligence. All funds generated through this research study should be paid into an approved Regimental fund account.

The 1 MHREC wishes you success with the study.



(M.K BAKER)  
CHAIRMAN 1 MILITARY HOSPITAL RESEARCH ETHICS COMMITTEE:  
LT COL / PROF

**DIST**

For Action

Lt. M.W. Maako

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