



# Knowledge, Attitudes and health seeking behaviour of university students towards Tuberculosis: A Case Study of UKZN Howard College

by

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COLLEGE OF HUMANITIES

**DECLARATION: PLAGIARISM**

I, Chinwendu Jane Nnam declare that

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## ABSTRACT

In 2015, South Africa recorded an alarming TB incidence cases of 454 000, having 834 cases per 100 000, which accounted for 60% of the global TB burden. A shift from this trend requires the understanding of the knowledge, attitude, and practices of TB amongst young South Africans, who are at high risk, in order to properly inform the prevention strategies and to reduce infection rate.

Although several studies have been conducted on the knowledge attitude and practices of TB in South Africa, only few have been conducted amongst South African university students. This study aimed to determine the knowledge, attitude, practices and behaviour among university students in UKZN Howard college, using a quantitative method with structured questionnaire.

The study, consisting of 221 post graduate and undergraduate students, showed that students were aware of the symptoms, causes and mode of TB transmission. It showed that most (90%) of the participants had positive attitude towards TB. Although there was evidence of low (female: 29%, Male: 53%) screening practices, all the participants agreed they would go to the health facilities if they had TB. The study found that level of education was statistically ( $p < 0.01$ ) associated with knowledge of the duration of TB treatment while gender was significantly ( $p < 0.001$ ) associated with practice of testing for TB. Based on participants' responses, the study suggests that the social media should be utilized in the dissemination of TB knowledge to the public to promote prevention and treatment of TB disease.

## **DEDICATION**

This dissertation is dedicated to my daughter Tobeche Chizaram Igwe, my siblings Amandianaeze and Chibuoyim Nnam and to all who have lost a family or friend to TB

## **ACKNOWLEDGMENTS**

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## ACRONYMS

|             |                                               |
|-------------|-----------------------------------------------|
| <b>AIDS</b> | Acquired Immune Deficiency Syndrome           |
| <b>BCG</b>  | Bacillus Chalmette Guerin                     |
| <b>DHS</b>  | Demographic Health Survey                     |
| <b>DOTS</b> | Directly observed treatment strategy          |
| <b>HIV</b>  | Human Immunodeficiency Virus                  |
| <b>KABP</b> | Knowledge, Attitude and Behaviour / Practices |
| <b>KZN</b>  | KwaZulu-Natal                                 |
| <b>MDG</b>  | Millennium Development Goal                   |
| <b>MDR</b>  | Multi Drug-Resistance                         |
| <b>TB</b>   | Tuberculosis                                  |
| <b>UKZN</b> | University of KwaZulu-Natal                   |
| <b>WHA</b>  | World Health Assembly                         |
| <b>WHO</b>  | World Health Organisation                     |
| <b>XDR</b>  | Extensively Drug-Resistant                    |

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# 1 INTRODUCTION

## 1.1 Background

Tuberculosis (TB) has been identified as a public health issue in many developing countries, including South Africa. The World Health Organization (WHO) declared TB as a global health emergency in 1993, and ever since, there has been increased effort to control this disease (Agho, Hall & Ewald 2014). Globally, TB incident cases amounted to 8.8 million in 2010 (Tasnim, Rahman & Hoque 2012).

South Africa has been ranked third among the high TB burden countries, preceded only by India and China (World Health Organization 2013). Nevertheless, when corrected for population size, South Africa moves up to first place in the ranking, confirming that the TB epidemic in South Africa represents a public health concern of dramatic proportions (Kana & Churchyard 2013).

Several factors contribute to this situation. According to Kigozi et al. (2017), knowledge, attitude, and practice of TB patients and people around them contribute greatly to the state and situation of TB in South Africa. Thus, this research intends to pay special attention to students in UKZN Howard college campus considering possible influence on family and the contribution nation's workforce in the near future. Due to this role on the contribution on the nation's workforce, it is important to investigate around TB knowledge, attitude and reaction towards the disease.

## 1.2 Global Burden of TB

TB puts a strain on public health, and this disease has the highest mortality rate after Human immunodeficiency virus (HIV)/ Acquired Immune Deficiency Syndrome (AIDs) (Fogel 2015).

In 1993, TB was declared as a global health emergency by the WHO, and since then, there has been an intensification of global efforts to aid the control of the disease (Agho *et al.* 2014). According to the WHO, in 2009, TB prevalence cases were estimated to be 14 million with India (1.6–2.4 million), China (1.1–1.5 million), South Africa (0.40–0.59 million), Nigeria (0.37– 0.55 million) and Indonesia (0.35–0.52 million) as the top five countries with highest incidence (World Health Organization 2010).

In 2014, the world recorded 9.6 million new cases and 1.4 million deaths, despite the introduction of Bacillus Calmette Guerin (BCG), a vaccine for TB, after the second World War (Jacobs *et al.*, 2016).

In 2015, an estimate of 10.4 million people fell ill with TB (Owiti *et al.* 2019), and 1.8 million people died of TB globally (Luba *et al.* 2019). According to Agyeman and Ofori-Asenso (2017), across the world, one out of three people are infected with Mycobacterium Tuberculosis, which is likely to develop into active TB. This infection rate gives a call of concern for TB infection. As a result of these TB incident cases, the global effort has been made to reduce the spread of TB.

The attempt to combat TB led the WHO to introduce a strategy known as the directly observed treatment strategy (DOTS), which was developed to control and eliminate TB in all the countries (Smolovic *et al.* 2012).

DOTS creates room for proper counselling and communication, which, in turn, educates patients on TB transmission and adherence to TB treatment (Agyeman & Ofori-Asenso 2017). Although the DOTS strategy recorded a successful treatment of 41 million people between 1995 and 2009 (World Health Organization 2010), DOTS alone is insufficient to achieve global TB control and

elimination, especially in countries with the burden of HIV (World Health Organization 2008) as the DOTS strategy depends on the self-presentation of patients to the health centres (Abebe *et al.* 2010).

A limitation for the proper control of TB can be associated with negative concepts such as stigma (Kambale 2012). According to Faris, Germossa and Beyene (2018), negative concepts of a disease affects patients' social relationships and ethical identity of which has an impact on TB control. These negative concepts and ideologies, which limit the achievement of appropriate control of TB, led the WHO into launching a global strategy in 2006, known as the Stop TB strategy, which was aimed at ensuring universal access to a quality health service and a patient centred care for TB patients (Sulis *et al.* 2014). The need for this strategy by the World Health Assembly (WHA) was to build and enhance the achievements of DOTS (World Health Organization 2008). Though there has been a decline rate of 2.2% between 2010 and 2012, however, tuberculosis still remains high in Asia and Sub-Saharan Africa (World Health Organization 2012).

### **1.3 Tuberculosis Overview in Sub-Saharan Africa and South Africa**

The high TB in Sub Saharan Africa could be a result of the high prevalence of HIV/AIDS throughout this region. According to (Owiti *et al.* 2019), one million of the global TB incident cases in 2015 were HIV positive, of which 74% were from the African region. Pengpid and Peltzer (2019) suggested that the prevalence of TB in this region is also due to a high poverty rate, low levels of education regarding TB, as well as inadequate health facilities. The majority of the death cases surrounding sub-Saharan Africa is as a result of tuberculosis (TB), which claimed the lives of about 1.7 million people globally in 2006, leaving Sub-Saharan Africa with the highest number of deaths (Kasa, Minibel & Bantie 2019). In 2015, South Africa recorded incidence cases of 454

000, having 834 cases per 100 000 (Naidoo *et al.* 2017), thus, accounts for 60% of the global TB burden (Naidoo *et al.* 2017).

As TB remains the cause of death in many low-income countries, significant progress has been made over the years in the control of TB, and most of these controls were set as part of the Millennium Development Goal (MDG) (Agyeman & Ofori-Asenso 2017). A proper TB control system or programs results in a decrease in recent TB infections (Wood *et al.* 2011). According to Engelbrecht *et al.* (2016), appropriate patient flow, early identification, early initiation of effective treatment, and good organization in facilities to avoid overcrowding, are all measures for effective TB control.

The various aims of TB control and programmes include finding, treating, and preventing TB in order to avoid TB transmission and thereby reducing TB deaths (Churchyard *et al.* 2014). Hence, for effective control of TB, it is important to detect TB early for its early treatment. Furthermore, administrative measures, respiratory protection, and environmental control are part of the infection control, which in turn, aids in minimizing TB (Naidoo, Seevnarain & Nordstrom 2012).

Adding to these suggestions by Churchyard *et al.* (2014) and Naidoo *et al.* (2012), the knowledge and attitude of people towards TB still play a vital role in TB control. This is because, with knowledge and the right attitude, people will start seeking proper health service assistance when confronted with issues of TB. A way of reducing the transmission of TB and incidence rate is by addressing the awareness of TB prevention and transmission (Naidoo & Taylor 2013)

According to World Health Organization (2008), addressing the risk factors of TB, which makes individuals vulnerable to infection and developing the disease, is a way of an effective TB control. Therefore, TB control should be seen as an integral part of the country's strategy to reduce poverty.

In 2007, when South Africa launched a national TB strategic plan, which was developed in line with the infection control guideline for TB; it aimed to create a structural review of healthcare facilities (Churchyard *et al.* 2014). Also, the control guidelines provide strategies to reduce the exposure to infection by health workers (Engelbrecht *et al.* 2016). However, an effective TB control in South Africa is undermined due to the high incidence of active TB infection and also the high prevalence of HIV (Wood *et al.* 2011).

A national HIV/TB campaign was introduced in South Africa in 2011. The campaign emphasized having several programmes, especially in districts with a high burden of TB, to reduce TB burden. Such programmes include HIV counselling and testing campaigns, community mobilization, enquiries made by going door to door in areas with a high burden of smear-positive TB (Churchyard *et al.* 2014). However, this control program failed due to insufficient knowledge of health care workers, appropriate attitude and practices in order to prevent and treat TB adequately (Malangu & Mngomezulu 2015).

Despite the recent WHO reports about a declining global trend, the burden of TB in South Africa remains unacceptably high (Kigozi *et al.* 2017). The high incidence of active TB infection, the high proportion of latent infection and HIV comorbidity significantly undermine an effective TB control in the country (Wood *et al.* 2011).

According to Pengpid and Peltzer (2019), for a successful TB prevention and control, it is important to have an understanding, knowledge, and awareness of medical treatment. This is because it is necessary to understand that failure to adhere to TB treatment results in Multi Drug-Resistance (MDR) and Extensively Drug-Resistant (XDR) TB of which the MDR and XDR TB prevalence remain unacceptably high in South Africa (Naidoo *et al.* 2017). Multidrug-resistant tuberculosis (MDR-TB), can be defined as resistance to rifampin and isoniazid, which are commonly used drugs recommended for first-line therapeutic regimen (Raviglione & Sulis 2016). Hence a resistance to these drugs pose as a threat to combating TB as the medication becomes ineffective.

There are various factors associated with the knowledge and treatment of TB, which will be discussed and an understanding of these factors are crucial for implementing TB prevention health education programmes.

#### **1.4 Problem Statement**

KwaZulu-Natal (KZN) reported a significant increase in laboratory diagnosed cases of MDR TB, from 583 in 2004, to 6630 in 2012, thus making the province the most burdened province with TB and MDR TB in South Africa (Maharaj *et al.* 2016). Several factors contribute to this situation. These factors, as pointed out by Kigozi *et al.* (2017), include knowledge, attitude and practice of TB patients and people around them. The triad contributes greatly to the state and situation of TB in South Africa (Kigozi *et al.* 2017). Despite this assertion, less attention has been given to exploring whether or not knowledge, attitude and practice of KZN youths are the major causes for a high burdened of TB in the province. Thus, this study forms part of a larger initiative on



evaluating the knowledge, attitude, practices and behaviours of TB patients and people around them in order to curb TB prevalence. It however, focuses on UKZN (Howard College) students.

### **1.5 Purpose of Study**

The purpose of the study is to explore on the knowledge, attitude and practices related to TB among UKZN (Howard College) students.

### **1.6 Research Objectives**

- To measure the level of knowledge students have regarding TB.
- To describe the attitudes of students in towards TB.
- To report on behaviours and practices of students related to TB.
- To investigate whether demographic and socio-economic factors are associated with knowledge, attitudes and practices related to TB.

### **1.7 Research Questions**

- What knowledge do students have regarding TB?
- What attitudes do students have regarding TB?
- What are the behaviours and practices of students in relation to TB?
- What are demographic and socio-economic factors associated with knowledge, attitudes and practices?

### **1.8 Aim and Rationale of the Study**

TB poses to be a threat to the public and hence it is seen as a public health problem in South Africa. This study aims to assess the knowledge, attitude and practices regarding TB among university students in the UKZN Howard College campus.

The choice of UKZN Howard College was made in line with the diffusion of innovation theory (Rogers 2010; 1983; 2015; 2003) which aims to explain how, why and at what rate new ideas spread. It involves communicating new ideas among members of social system overtime (Dearing & Cox 2018). Kaminski (2011) referred to the diffusion of innovation as the process that occurs as people adopt a new idea, product, practice, and philosophy. This theory stresses the importance of peer networking and communication within an adaption process. According to the theory, those who are highly educated and living in an urban setting adopt new practices before they diffuse into the remainder of the population. Hence university students, who are in the process of obtaining a tertiary degree, while living in the urban setting of eThekweni would be expected to have better knowledge, more appropriate attitudes and adopt more protective behaviours than those living in other settings.

## **1.9 Research Preposition**

Similar studies that evaluated the knowledge, attitude and preventive practises towards tuberculosis in Ethopia (Kasa *et al.* 2019), Nigeria (Hassan *et al.* 2017), as well as sub-Saharan Africa (Luba *et al.* 2019), reported that the general population had a low level of knowledge on TB. However, it is anticipated that students will have a high-level knowledge of TB compared to the general population. South Africa has recently rolled out massive campaigns on HIV/AIDS awareness and TB control. It is anticipated that most students must have heard about TB but, due to the general emphasis on HIV compared to TB, may ignore the practices necessary to control or prevent TB because.

## **1.10 Thesis Structure**

The rest of the thesis is structured as follows:

### ***Chapter 2: Literature Review***

Chapter 2 reviews the related literature on TB knowledge, attitude, and practices of university students and the general population. It identifies the major research studies done around the knowledge, attitude, and practices of university students both in South Africa and other parts of the world. It also looks at the general TB control and its effectiveness, as well as some socio-economic and demographic factors that are associated with TB.

### ***Chapter 3: Methodology***

This chapter provides the research method applied to achieve the aims and objectives stated in chapter 1. It provides the questionnaires, the type of data analysis applied, and the rationale for the chosen methodology.

### ***Chapter 4: Results***

Chapter 4 presents the results of exploring the knowledge, attitude, and health-seeking behaviour of contracting TB among UKZN (Howard College) students.

### ***Chapter 5: Discussion and Conclusion***

This chapter discusses the result presented in Chapter 4 comparing the findings of this study to the findings of the studies discussed in Chapter 2. It then presents conclusion and recommendations of the study.

## 2 LITERATURE REVIEW

### 2.1 Introduction

This chapter reviews the literature on TB knowledge, attitude and practices of university students and community populations. This review is not limited to South Africa as it aims to identify significant research studies done around the knowledge, attitude and practices both in South Africa and other parts of the world. However, there are limited publications on the knowledge and attitude of TB among university students, specifically amongst non-medical university students, both in South Africa, and internationally so studies based on community surveys were also included in the review. Furthermore, very little has been reported on the demographic and socio-economic factors associated with the knowledge, attitude and health-seeking behaviour of university students. Overall, the lack of evidence supports the necessity of this study.

### 2.2 Knowledge of Tuberculosis

Knowledge is seen as acquiring, retaining and using of information (Wan, Rav-Marathe & Marathe 2016). However, the process of acquiring knowledge is not limited to a formal education setting. Experience and a person's environment play essential roles in acquiring knowledge. Nevertheless, lack of knowledge may have a negative impact on health and survival. For instance, a person's lack of knowledge related to TB may result in delays in seeking treatment until symptoms are severe as a result of untreated disease progression.

According to Pengpid *et al.* (2016), the lack of knowledge about TB symptoms, causes, and treatment in the general population may lead to a delay in diagnosis and TB treatment. Also, health-seeking behaviour and adherence to TB treatment aids in reducing ongoing TB transmission and are linked with a patient's knowledge of TB (Musuka *et al.* 2018). Therefore, having knowledge of TB symptoms and mode of transmission among the general public may have an impact on

health-care seeking behaviour. For the formulation of proper health education, it is essential to have a sound understanding of the knowledge of TB transmission and symptoms in the general population (Sreeramareddy, Kumar & Arokiasamy 2013).

### **2.2.1 Knowledge of Tuberculosis in Studies Focusing on General Community Populations**

There have been several studies (Nigatu & Moreda 2018; Kasa *et al.* 2019; Kwedi Nolna *et al.* 2016; Kipp *et al.* 2011; Hassan *et al.* 2017; Easwaran *et al.* 2015) conducted in various community populations to assess the knowledge of TB. These studies have shown that a patient's delay in obtaining medical services is as a result of several factors arising from lack of knowledge (Kasa *et al.* 2019). Also, some of the studies have shown a generally low level of TB knowledge in some communities. In Nigeria, for example, there was a lack of awareness of the symptoms and causes of TB (Hassan *et al.* 2017). Similarly, inadequate knowledge of the symptoms of TB was found in Cameroon (Kwedi Nolna *et al.* 2016). This might be a reflection of the age range reported by these studies, as both studies included people below age 18 and as low as age 15.

Another study carried out in Eastern Cape, South Africa on the knowledge and perception of tuberculosis, revealed that 54% of the respondents believed that TB is an African disease, while 60% thought that all TB patients eventually would develop HIV (Cramm *et al.* 2010). This is similar to the study conducted in Vietnam, where most of the participants thought TB to be hereditary (Hoa, Chuc & Thorson 2009).

Most of these communities are in the low and middle-income countries. In 2015, over 95% of TB cases occurred in low and middle-income countries; hence, the weight of TB lies within this region (Luba *et al.* 2019). South Africa, in this case, falls into this category. According to Nigatu and

Moreda (2018), HIV is a contributing factor to TB burden and development. Even though HIV poses as a leading cause of death in such countries, for example, Sub Saharan Africa, it is a condition associated with TB, as it is found to be the most common disease coexisting in people who die from AIDs (Chatterjee & Pramanik 2015). Therefore, the HIV positive status increases the risk of TB infection.

### **2.2.2 TB Knowledge among University Students**

One would expect more TB knowledge among university students compared to communities comprised of educated and non-educated people. However, low levels of knowledge have been reported among university students. A study conducted by AlSalem *et al.* (2015) in Saudi Arabia reported a low level (51.4%) of knowledge on the transmission and symptoms of TB among university students (AlSalem *et al.* 2015).

Similarly, Rana *et al.* (2015) reported that 30% of non-medical students in Bangladesh thought TB to be non-communicable, and about 14.8 % indicated that they had no idea of the term communicable and non-communicable diseases regarding TB. Another study that showed a low-level knowledge of TB among university students is a study conducted by Smolovic *et al.* (2012) in Serbia on the knowledge and attitude towards TB among the University of Belgrade students. The study revealed a low-level knowledge of the transmission and symptoms of TB. The study reported that almost one-third of the participants believed TB is not infectious, while one-fifth are unaware of the transmission (Smolovic *et al.* 2012).

Among medical students in Rio De Janeiro, Brazil, only one-third of the students correctly answered all questions related to TB transmission (Teixeira *et al.* 2008); Hence, the researcher

concluded that TB knowledge among medical students is insufficient as one would expect medical students to be knowledgeable about TB compared to non-medical students.

Contrary to the studies (AlSalem *et al.* 2015; Rana *et al.* 2015) that found low-level TB knowledge among university students, Falah *et al.* (2019) reported a high-level knowledge among university students in Indonesia. The contrast maybe as a result of medical students which were among the participants in Falah *et al.* (2019) study, compared to Rana and colleagues who focused on non-medical students. It is expected that medical students should know more about TB compared to non-medical students. Falah *et al.* (2019) confirmed this through a statistical test which confirmed that “students who were not pursuing health-related studies were more likely to have lower knowledge scores” (Falah *et al.* 2019: 99).

Based on the review of the studies carried out on the knowledge of TB among university students, the level of TB knowledge varies depending on the student's field of study. This calls for research to know whether or not this discrepancy applies to university students in South Africa, and if it does, to create more TB awareness for non-medical students.

### **2.2.3 Demographic and Socio-Economic Factors Associated with Knowledge of TB**

Various demographic factors such as age, sex and location are associated with the knowledge and attitude towards TB.

A study carried out by Musuka *et al.* (2018) using the Demographic Health Survey (DHS) data from Lesotho, Malawi, Namibia and Zambia, revealed that TB knowledge was significantly higher among individuals who are less than 26 years of age compared to those who were older. However, this finding is in disagreement with the study conducted by Pengpid and Peltzer (2019), using

Timor-Leste DHS 2016 data, where older age was associated with good TB knowledge and awareness. The disagreement shows that age alone is not capable of determining whether or not a person has TB knowledge; instead, one should take into consideration other demographic factors alongside age.

Several studies (Pengpid & Peltzer 2019; Bati, Legesse & Medhin 2013; Luba *et al.* 2019) have shown that gender is another demographic factor associated with TB knowledge. These studies have shown that males have better TB knowledge compared to females. Similarly, a study conducted in Lesotho by Luba *et al.* (2019) indicated that 67.0% of males are knowledgeable about TB compared to 41.8% of the female counterpart.

This relationship between gender and TB knowledge can as well be seen in the university and college settings. It was discovered from a study conducted in Moradabad, India that the awareness of the male students were more than the females (Khan *et al.* 2011). However, there is a study (Mokhtar *et al.* 2012) conducted in Malaysia, that reported a higher level of knowledge and awareness from female students compared to males. The study conducted in Johannesburg South Africa also discovered that females had better knowledge of TB than males (Evans *et al.* 2018). This is in disagreement with other studies (Pengpid & Peltzer 2019; Bati *et al.* 2013; Luba *et al.* 2019). The disagreement once again showed that a single demographic factor is not enough to determine a level of TB knowledge.

However, from the above, the studies that show that males are more aware of TB than females could be due to the exposure, especially in workplaces. Also, males are more likely to get several jobs, including menial jobs than women. Thus, information can be shared among colleagues and



employers. As seen in Pengpid and Peltzer (2019), information concerning TB was frequently obtained from workplace/school, as well as televisions.

An association between the level of education and TB knowledge was found in a study carried out among students in Southwest China. Third-year students had better knowledge of TB compared with students in the first and second years (Zhao *et al.* 2013). Similarly, postgraduate students exhibited more knowledge about TB than undergraduate students in Ahmednagar, India (Kadam *et al.* 2013).

In Nigeria, respondents with primary, secondary or higher levels of education were significantly more likely to believe that TB is spread through coughing or sneezing. While those with no education found the spread of TB is a result of sharing utensils (Agho *et al.* 2014). In Benin city, Nigeria, the lack of any formal education and no-access to media, was associated with the low level of TB knowledge (Tobin, Okojie & Isah 2013).

This affirms what Uchenna *et al.* (2014) postulated that educational status was related to TB knowledge. Thus, it is suggested that most people with tertiary education were more likely to have a better knowledge of TB than others. This is because education results in teaching exposures, ability to read and write, as well as access to the internet.

### **2.3 Attitude toward Tuberculosis**

Chaiklin (2011) explained that there is a sociological and psychological definition of attitude. The sociological definition of attitude sees a verbal expression as an intention to act, while the psychological meaning of attitude views a verbal expression as a behaviour. According to the author, the link between attitude and behaviour is that an attitude promotes a behavioural intention

(Chaiklin (2011)). This research, therefore, adopts the sociological definition of an attitude, which seeks to reduce discrimination by a change in behaviour

### **2.3.1 Community Attitude toward Tuberculosis**

Hassan *et al.* (2017) assert that people's attitude towards a given disease reflects on their level of understanding of the disease, especially with efforts made in seeking treatment. In Mecha Ethiopia, only 40.7% of the participants stated TB to be a serious disease. This shows that more than half of the participants do not take TB as a serious disease, which in turn could lead to a delayed health seeking.

A study carried out by Pengpid *et al.* (2016) discovered, in a survey in Thailand, that a significant proportion (22.6%) of the individual had a negative attitude towards TB patients. These proportion of people would reject TB patients for fear of being infected. This is similar to a community-based study in India that showed an overall discriminating attitude towards TB patients where most (81%) respondents replied that they would not share a meal with a person who once had TB (Sagili, Satyanarayana & Chadha 2016).

Furthermore, negative feeling such as fear, sadness, shame and embarrassment if a person has TB is attested in several community studies (Wieland *et al.* 2012; Salleh *et al.* 2018; Tolossa, Medhin & Legesse 2014; Ayub & Tariq 2017). In Somali, Ethiopia, most of the participants indicated that they would experience fear, sadness and hopelessness if they thought they had TB (Tolossa *et al.* 2014). In line with the findings of a community study in Kedah, Malaysia, that revealed most respondents would feel embarrassed if they thought they had TB, only 31% of the respondents would not feel ashamed (Salleh *et al.* 2018). Both studies were found to be in rural settings which

had an overall poor attitude towards TB. These findings could be as a result of poor attitude could be as a result of the poor health communication, teachings and limited access to health facilities among the rural communities (Uchenna *et al.* 2014). These findings are all attributed to stigma and discrimination, which are factors associated with attitude, and it leads to delays in health-seeking behavior.

### **2.3.2 TB Attitude among University Students**

Both negative and positive attitudes towards TB are found among university students. Mokhtar *et al.* (2012) discovered that on the attitude towards TB in University of Malaysia, 40.5% of the respondents stated that they would feel uncomfortable if they sat near TB patients, for they do not want to be infected. Also, 34% of the respondents stated that they are afraid of TB patients while 29% responded that they always avoid physical contacts with TB patients for fear of being infected, as TB patients are looked down on. This study suggests that the reasons for these negative attitude are as a result of the societal influence. Nonetheless, in Islamic University, Malaysia, it was discovered that majority of the respondents would not disclose their status to others if being infected with TB. (Jamaludin, Ismail & Saidi 2019). An unwillingness to disclose a particular disease condition may be due to the possibility of stigma and discrimination (Amo-Adjei 2016).

In Turkey, the attitudes of nursing and midwifery students toward tuberculosis were generally negative. Only 5.9% of the sample indicated that they prefer to care for patients with tuberculosis (Akin *et al.* 2011).

On the contrary, results from the study conducted at the University of Belgrade, Serbia, Malaysia revealed that the students had a positive attitude towards TB. The study showed that most (78.3%)

of the participants would visit TB patients. They believe that one cannot get infected with TB by going to visit TB patient (Smolovic *et al.* 2012). The study was carried out among non-medical students. However, a study among medical students in Udaipur, India, 74% of the medical students indicated that they would be willing to work in TB wards/clinics, while 88.7% of the students would be screened for TB if they had suggestive symptoms (More *et al.* 2019).

### **2.3.3 TB Associated Demographic and Socio-Economic Factors**

Various demographic factors, as well as socio-economic status, can be related to an attitude towards TB. In determining demographics factors related to attitude towards TB, a study in Kenya found an association between attitude and religion, such that 61.3% of the Muslim respondents had a negative attitude towards TB (Yusuf 2014).

In Tajikistan, TB patients revealed that all-female respondents expressed compassion and willingness to support, resulting in a statistically significant association between gender and attitude (Gilpin *et al.* 2011). Association between gender and attitude was also discovered in South Western Ethiopia, where 74.9% of female respondents had a positive attitude towards TB, as compared to 48.2% of males with positive attitudes (Bati *et al.* 2013).

Furthermore, the discriminating attitude was the most commonly observed among the respondents of better education in Tajikistan, as with no education or primary education, showed a more positive attitude towards TB patients than those with secondary and tertiary education (Gilpin *et al.* 2011).

However, a study conducted in the South-Western part of Ethiopia, found a positive association between level of education and positive attitude, with 69.8% of the respondents who had secondary

education, showing a positive attitude towards TB, as compared to 28.9% of the respondents with no form of education (Bati *et al.* 2013).

## **2.4 Behaviours and Practices Related to Tuberculosis**

The practice towards TB can be attributed to adherence of TB medication, mouth covering when coughing, as well as seeking medical help (Wan *et al.* 2016). This section presents studies that evaluated such practices.

### **2.4.1 Community TB Behaviours and Practices**

In a study conducted in Holeta, opening of windows was found to be one of positive practices for TB prevention (Nigatu & Moreda 2018). According to Nigatu and Moreda (2018), 86.2% of the people will open their window for proper ventilation. A research evidence by Kasa *et al.* (2019) on TB practices showed that 60% of the participants in North Meeha practice proper ventilation by keeping windows open. Besides, two-third of the participants stated they would cover their mouth if they thought they had TB. The overall positive practice found in the study was 48%.

Research evidence shows that window opening is also a practice in Myanmar (San Lin *et al.* 2017) where 94% of population opened the windows during the daytime. In addition, 63% of the population covered the mouth with a handkerchief when they cough, but 37% did not. (San Lin *et al.* 2017). Most of the respondents in Kedah Malaysia would cover their mouths while sneezing or coughing to avoid spreading TB (Salleh *et al.* 2018). Good practices recorded in these studies could be as a result of proper exposure and awareness of TB.

The right practice towards TB prevention could be due to a better understanding on TB transmission or following good etiquette (Salleh *et al.* 2018).

## **2.4.2 TB Behaviours and Practices among University Students**

Prevention practices such as covering nose and mouth while sneezing will significantly reduce transmission of TB (Mahmood, 2019). While these practices are essential for everyone to reduce TB transmission, studies that evaluated TB behavioural practices have focused more on medical students. The reason might be that students will soon become health workers, and health workers are at a high risk of contracting TB compared to non-health workers (van der Westhuizen & Dramowski 2017; O'Donnell *et al.* 2010; Joshi *et al.* 2006; Menzies, Joshi & Pai 2007). This is supported by the study conducted among university students in Stellenbosch university South Africa, where majority of respondents agreed they were at high risk of contracting occupational TB (van der Westhuizen *et al.* 2015).

More *et al.* (2019) is one of the recent studies that evaluated TB behavioural practices among medical students. The study reported a positive TB preventive practice among medical students in India. In the study, 95% of the students agreed to perform hand hygiene and wear a piece of personal protective equipment before they make contact with pulmonary TB patient or TB samples (More *et al.* 2019). Similarly, Behnaz, Mohammadzade and Mohammadzadeh (2014) reported positive practice of wearing a face mask (70.2%) among medical final year students in Iran.

## **2.4.3 Demographic and Socio-Economic Factors Associated with TB Related Behaviours and Practices**

In a study conducted in Indonesia, the findings revealed that female students tend to have better TB-prevention behaviour (Puspitasari, NurlaelaHadi & Setio 2018). This result is consistent with TB occurrence around the world, where TB incidence cases are higher amongst men than women.

The prevalence of tuberculosis among men is nearly double that among women (Puspitasari *et al.* 2018).

Contrast to the study in Indonesia; gender was associated with the practice of prevention behaviour towards TB in Kenya. The result, which used a quantitative approach indicated that more males had a suitable method of prevention behaviour towards TB female (Yusuf 2014).

Also, a significant association was found between education level and practice of prevention behaviour towards TB, suggesting that prevention behaviour improves with increase in education standards. According to Yusuf (2014), only 45.3% of those with no formal education exhibits a good TB preventive behaviour while 73.9% of those with Diploma exhibits a good TB preventive behaviour (Yusuf 2014).

Furthermore, the cost of transportation fee to clinics has been identified as a socio-economic factor associated with health-seeking behaviour. According to the research done by Viney *et al.* (2014), the cost of transportation and distanced clinics/hospitals are the reasons for consulting a traditional healer first before going to the clinic. This is similar to the study in Itang District, Ethiopia, where almost half of the participants would seek a traditional healer for TB treatment due to cost of transportation (Bati *et al.* 2013). In Eastern Amhara Regional State, Ethiopia, the cost and difficulty in transportation is the reason for the delay in seeking TB treatment (Esmael *et al.* 2013).

## **2.5 Conclusion**

This chapter reviewed the relevant literature on the degree of knowledge, attitudes, and behaviour students and communities have towards TB. It reported on several studies done on the factors associated with the low and high level of knowledge, attitudes, and behaviour towards TB. It is

evidence that less work has been done evaluating this trio – knowledge, attitudes, and behaviour – towards TB in KZN, irrespective of the high prevalence of TB in the province. Hence a reason for this present research.

The next chapter presents the research design and methodological approach employed to address the questions in this study.



### **3 RESEARCH DESIGN AND METHODOLOGY**

#### **3.1 Introduction**

The research design and methodology of the study is presented in this chapter. Thus, this chapter will present in detail how the research was conducted and the process, tools and procedure utilized during the research. Data collection exercises as well as the procedures involved in data collection exercise will be detailed

#### **3.2 Research design**

##### **3.2.1 Descriptive Study**

Descriptive study describes the distribution or amount of a situation and events (Babbie and Mouton (2001) . Thus, it is expected in a descriptive study that the amount (frequency) and distribution (by person, place and time) of an event or situation within a population is observed and described. Descriptive studies enhances programme implementation by providing information for planning and, as well as make comparison between groups (Araoye 2003). This study is based on the data collected using a self-administered instrument adapted for the study.

Among the various sorts of descriptive studies, the analyst embraced a cross-sectional examination since information assortment should be possible as a solitary perception (Araoye 2003) and on a more modest populace. These points of interest of cross-sectional examination strengthened the way that descriptive studies can create data rapidly and are valuable when results are required direly and when assets for the investigation are restricted.

##### **3.2.2 Surveys**

Surveys are quantitative investigations pointed toward giving an expansive outline of a representative sample of a bigger population (Mouton 2011). As indicated by Babbie and Mouton

(2001), surveys are generally suitable for studies that have distinct individuals as the unit of investigation. According to Ponto (2015), the use of surveys are commonly found in social and psychological research, as it is often used to describe human behaviour. This study described the behaviour and practices towards TB, hence, a survey was a suitable method.

Knowledge, Attitude and Behaviour / Practices (KABP/KAP) of individuals can be carried out using surveys. According to Araoye (2003), KABP/KAP studies identify certain gaps in knowledge, attitude and practices among participants on specific issues, hence, recommendations are made through interventions.

In a survey research, participants are sampled randomly, which means that there is a probability of a person in a population to be sampled (Sukamolson 2007). A standardized questionnaire and probability sampling method were used so the findings of the study were as unbiased as possible.

### **3.3 Data Collection Instrument**

This section described methods used in the development of data collection instrument for this study. The survey questionnaire, pre-testing of questionnaire and measures to ensure validity of the questionnaires were also discussed

#### **3.3.1 The Survey Questionnaire design**

“Questionnaires are documents containing questions and other types of items designed to solicit information appropriate to analysis. Questionnaires are primarily used in survey research” (Babbie & Mouton 2001: 646). Mouton (2011) states that in the use of questionnaires, researchers may either develop a new questionnaire or use existing instruments. In the case of this study, the researcher adapted existing instruments into a new questionnaire. The existing instruments are

from a research report by selected research (PVT) LTD, Zimbabwe. The research report is titled “*Knowledge, Attitudes and Practises (KAP) on TB, HIV and Silicosis Among Key Populations Aged 15 and 59 years in Southern Africa*” (Select Research (PTY) LTD 2017)

The researcher used closed ended questions in the questionnaires to measure knowledge, attitudes, behaviours and practices related to TB among students. Also, in order to ease the understanding of questions, special instructions were provided where necessary. (Babbie & Mouton 2001; Araoye 2003).

### **3.3.2 Content of the Questionnaire**

The questionnaire consists of five major sections, namely: general and demographic questions; TB knowledge and awareness; TB attitude and practice; TB knowledge of the source of information and health-seeking behaviour. The informed consent resource template for UKZN (see appendix) was presented alongside the questionnaire.

### **3.3.3 Validity of the Instrument**

As earlier stated in this chapter, this study adapted question items in existing approved tools into a new questionnaire. The validity of the questionnaire was guaranteed by observing the rule for questionnaire development (Babbie & Mouton 2001; Araoye 2003). The measures to ensure the face validity and content validity of the questionnaire are presented below.

#### ***3.3.3.1 Face and content validity***

As indicated by Araoye (2003), face validity is alluded to as the perception of significance of a measurement by the investigator. Taking into account the views of the research, the face validity of the instrument was derived from the use of previously tested questions.

Content validity measures all the component elements of a complex variable like knowledge, attitude and behaviour/practice (Babbie & Mouton 2001; Araoye 2003). This study ensured the content validity of the instrument by basing the questionnaire on TB knowledge, attitude and behaviour/practice. This is clear in the content of the questionnaire (see appendix). In addition, the questionnaire was reviewed by a subject expert as part of obtaining ethical approval for the study. The feedback from the subject expert was applied into the questionnaire for the data collection exercise.

### **3.3.4 Reliability**

According to (Bolarinwa 2015), the extent to which a questionnaire is being tested or observed and still produces the same result when repeated is called reliability. The use of established measures is a way to assure the reliability of the instrument (Babbie & Mouton 2001). This study therefore adopted questions from existing tools to form a questionnaire.

### **3.3.5 Pre-Testing of the Questionnaire**

According to Babbie and Mouton (2001), the surest way of protecting the data collection instrument against errors is by pre-testing the questionnaire. The reason for pre-testing the instrument is to decide if the questions were understood by the respondents. Likewise, the activity aided the assurance of whether there is a need to update the organization or introduction

of the survey concerning grouping and phrasing of the questions, and the requirement for extra guidance (Araoye 2003).

Guided by the suggestion of Babbie and Mouton (2001), ten post-graduate students who have had research experience from a different background from UKZN campuses not included in the study undertook the pre-testing of the questionnaire. The findings of the exercise were incorporated into the final instrument for the study.

### **3.4 Study Population and Location**

This study was carried out in the University of KwaZulu-Natal (UKZN), Howard College campus. The University is recognised as one of South Africa's top research-focused universities, with five campuses namely Edgewood, Howard College, Nelson R Mandela School of Medicine, Pietermaritzburg, Westville.

UKZN Howard College campus is comprised of four colleges, College of Agriculture, Engineering and Science, College of Health Sciences, College of Humanities, College of Law and Management Studies, giving a total of 46520 students. The campus runs various programs ranging from an undergraduate program, honours, masters and PhD programs, thus providing a platform where data was collected (on TB knowledge, attitude and behaviour/practice) from students from different backgrounds. This study was conducted among male and female students in UKZN Howard college campus.

### **3.5 Sampling**

The sample size was calculated using the Raosoft sample size calculator with a margin of error of 5%, using 90% confidence levels and a 50% response distribution (Raosoft 2004). The steps in the Raosoft sample size computation is given by Equation 1.

*Equation 1: RAOSOFT Sample Size Calculation*

$$X = Z \left( \frac{c}{100} \right)^2 r(100 - r)$$

$$n = \frac{Nx}{(N - 1)E^2 + x}$$

$$E = \sqrt{\frac{(N - n)x}{n(N - 1)}}$$

Where:

- N specifies the population size,
- r is the fraction of responses that the study is interested in,
- Z(c/100) is the critical value for the confidence level given as c.

With these equations, the sample size for the population is 269. Where the total population used is 40000, with a confidence level of 90% and an error margin of 5%.

### **3.6 Data Collection and Field Administration**

This section discussed the procedures and consideration carried out during the questionnaire administration on participants.

#### **3.6.1 Data Collection Approach**

The data collection exercise was undertaken in October/ November 2019. The researcher worked with lecturers, tutors and class representatives to administer the questionnaire. Appointments were booked, and the questionnaires were distributed during and before lectures and tutorials.

### **3.6.2 Ethical Considerations in Data Collection**

According to Mouton (2011), the ethics of science is concerned with what is wrong and what is right in the conduct of research. Ethical consideration was made before the study was conducted. Such that an ethical approval from UKZN ethics committee was obtained before the administration of the research (see Appendix). For the study to be carried out among UKZN Howard college, a Gatekeepers letter was obtained from the University of KwaZulu-Natal Howard College campus registrar permitting the researcher to conduct a research on the campus. The study obtained the rights of participants which are discussed below.

#### ***3.6.2.1 Participants right to privacy and refusal to participate***

Participation during data collection was voluntary and participants were given the option to opt out from the study at any time. Participants were also allowed to complete the questionnaire in their respective time but most conveniently in class during or before lectures with the permission of the lecturer or the tutor.

#### ***3.6.2.2 Participants right to anonymity and confidentiality***

The study maintained the anonymity of participants, as they were not required to write their names on questionnaires. Hence, answers were confidential and would not be linked to them.

#### ***3.6.2.3 Right of participants not to be harmed in any manner***

This study, allowed the participants time and space to complete the questionnaire. This was done to ensure the respondents do not feel intimidated during the process of completing the questionnaire because some of the question items may have been considered sensitive information.

### **3.7 Data Processing and Analysis**

It is anticipated that some respondent would not return questionnaires issued, thus, 280 questionnaires were distributed in total. In some instances, the respondents did not return the questionnaire. Others did not respond to the majority of the question items, and due to limited resources and time constraint, the researcher could not go back to the field. Ultimately, 221 questionnaires were analysed. The variables were created from the responses in the completed questionnaires. Data entry and analysis was done using IBM SPSS v26 (2019).

### **3.8 Data Analysis**

Most of the data were ordinal and to a lesser extent nominal. Descriptive statistics was employed in the analysis. Frequency distribution of key items on TB knowledge, attitude and behaviour/practice among student in UKZN Howard college campus were presented. Multiple response analysis was used to present the multiple response questions on TB knowledge, attitude and behaviour.

The study used cross tabulation to describe participants and to compare TB knowledge, attitude and practice among different sub-groups. The chi-square test was used to determine the significance of the differences between selected variables. The level of significance used was 10% or better, as recommended by Alston and Bowles (2003; 2019)

### **3.9 Conclusion**

This chapter discussed the research design and methodology applied for the study of TB knowledge, attitude and practice among students in UKZN Howard college campus. The study utilized a descriptive cross-section survey design. In addition, a questionnaire was adapted from a report by selected research (PVT) LTD, Zimbabwe and the research report is titled "*Knowledge,*



*Attitudes and Practises (KAP) on TB, HIV and Silicosis Among Key Populations Aged 15 and 59 years in Southern Africa*". The chapter also discussed the steps taken to ensure that the research is in line with the scientific ethics. The data analysis process was also presented.

The next chapter presents the results based on the findings from the data analysis.

## 4 RESULTS

### 4.0 Introduction

This chapter presents the findings of the study, which follows the aim of the study. The study aims to measure the levels of knowledge and attitudes towards TB in a sample of UKZN students; to examine the practices and behaviour students have towards TB prevention, as well as to investigate whether demographic and socio-economic factors are associated with knowledge, attitudes and practices related to TB. The study consists of 221 participants (males and females).

This chapter presents the findings of the study in the following manner: section 4.1 presents the demographics of the participants, and section 4.2 presents descriptive information on the participants' knowledge of TB. The findings on participants attitude towards TB is presented in section 4.3, while Section 4.4 presents their practices and behaviour towards TB. Factors associated with i.) TB knowledge, ii.) attitude towards TB and iii.) TB practices and health-seeking behaviour are presented in section 4.5, section 4.6 and section 4.7, respectively. Lastly, section 4.8 presents the chapter summary. Unless otherwise stated, the chi-square statistic presented in this chapter is conducted at 95% confidence interval. In addition, tables are presented for clarity and comparison of results.

### 4.1 Demographics of Participants

The findings of this study were obtain through a self-administered survey that recruited a total number of 221 participants, of which 86.0% were less than 25 years. The mean age of the participants was 22.02 years.

In this study, female participants were 64.7%, which outnumbered males (35.3%). Also, more than two thirds (68.8%) of the participants were undergraduate students. Despite the university's urban location, more than one third of participants noted their home was in a rural area (36.7 %). Other demographics of participants are presented in Table 4.1

*Table 4.1. Demographic data of participants*

| <b>Demographics</b>       | <b>N</b>   | <b>Percentage</b> |  | <b>Demographics</b>        | <b>N</b>   | <b>Percentage</b> |
|---------------------------|------------|-------------------|--|----------------------------|------------|-------------------|
| <b>Age Group</b>          |            |                   |  | <b>Religion</b>            |            |                   |
| Less than 25              | 190        | 86.0              |  | Christian                  | 167        | 75.6              |
| 25 and older              | 31         | 14.0              |  | Others                     | 54         | 24.4              |
| <b>Total</b>              | <b>221</b> | <b>100.0</b>      |  | <b>Total</b>               | <b>221</b> | <b>100.0</b>      |
|                           |            |                   |  |                            |            |                   |
| <b>Gender</b>             |            |                   |  | <b>Marital Status</b>      |            |                   |
| Male                      | 78         | 35.3              |  | Married                    | 12         | 5.4               |
| Female                    | 143        | 64.7              |  | Never Married              | 206        | 93.2              |
| <b>Total</b>              | <b>221</b> | <b>100.0</b>      |  | Co Habiting                | 3          | 1.4               |
|                           |            |                   |  | <b>Total</b>               | <b>221</b> | <b>100.0</b>      |
|                           |            |                   |  |                            |            |                   |
| <b>Level of Education</b> |            |                   |  |                            |            |                   |
| Undergraduate             | 152        | 68.8              |  | <b>Biological Children</b> |            |                   |
| Post graduate             | 69         | 31.2              |  | Yes                        | 46         | 20.8              |
| <b>Total</b>              | <b>221</b> | <b>100.0</b>      |  | No                         | 175        | 79.2              |
|                           |            |                   |  | <b>Total</b>               | <b>221</b> | <b>100.0</b>      |
|                           |            |                   |  |                            |            |                   |
| <b>Race</b>               |            |                   |  |                            |            |                   |
| Black African             | 174        | 78.7              |  | <b>Location</b>            |            |                   |
| Other Race                | 47         | 21.3              |  | Rural                      | 81         | 36.7              |
| <b>Total</b>              | <b>221</b> | <b>100.0</b>      |  | Urban                      | 101        | 45.7              |
|                           |            |                   |  | Peri-Urban                 | 39         | 17.6              |
|                           |            |                   |  | <b>Total</b>               | <b>221</b> | <b>100.0</b>      |

As part of the demographic component of the questionnaire, students were asked whether or not the following services – chest X-ray, HIV testing (VCT), sputum testing and general treatment,

were provided close to their location. Table 4.2 below shows that most of the participants have HIV testing services (94.6%), general treatment services (82.6%) near to their residence but that the numbers started reducing when they were asked specifically about TB diagnosis services. Referencing Table 4.2, out of 221 participants, just over half (56.6%) have chest X-ray service close to that location and only a third (33.0%) reported that the nearest health service offered a sputum testing service.

*Table 4.2. Participants' Nearest Health Services*

|                   |         | N   | percentage |
|-------------------|---------|-----|------------|
| Chest x ray       | Yes     | 125 | 56.6       |
|                   | No      | 96  | 43.4       |
|                   | Total   | 221 | 100.0      |
| HIV testing (VCT) | Yes     | 209 | 94.6       |
|                   | No      | 12  | 5.4        |
|                   | Total   | 221 | 100.0      |
| Sputum testing    | Yes     | 73  | 33.0       |
|                   | No      | 148 | 67.0       |
|                   | Total   | 221 | 100.0      |
| General Treatment | Yes     | 180 | 82.6       |
|                   | No      | 38  | 17.4       |
|                   | Missing | 3   |            |
|                   | Total   | 221 | 100.0      |

These findings will have impact on attitude, practices, and knowledge of TB amongst this population. The results of the study on students TB knowledge and awareness are presented next.

## 4.2 Descriptive Information on the Knowledge of TB

Table 4.3 shows majority of the participants (90.9%) knew that one can get TB through the air when a person with TB coughs or sneezes, only 4.1% do not know how a person can be infected with TB.

Furthermore, the study found that there is high level of knowledge among participants around symptoms of TB. Most of the participants (82.0%) were aware that coughing for 3 (three) weeks or more and coughing up blood are major symptoms of TB.

Table 4.3. Knowledge on how one can get TB

| How one can get TB                                                                   | N   | percentage |
|--------------------------------------------------------------------------------------|-----|------------|
| Through handshakes                                                                   | 27  | 12.3%      |
| Through the air when a person with TB coughs or sneezes                              | 200 | 90.9%      |
| Through sharing dishes                                                               | 10  | 4.5%       |
| Through sexual intercourse                                                           | 9   | 4.1%       |
| Through eating from the same plate                                                   | 13  | 5.9%       |
| Living in the same house or working together with someone with TB                    | 122 | 55.5%      |
| Through touching items in public places (doorknobs, handles in transportation, etc.) | 28  | 12.7%      |
| Inhaling dust                                                                        | 51  | 23.2%      |
| Living in a crowded household                                                        | 51  | 23.2%      |
| Do not know                                                                          | 9   | 4.1%       |

In addition, in the case of severe symptom or when one is sick with TB, more than three quarters (77.4%) said they would go to the government hospital/clinic. This may be because almost all participants knew TB can be cured (94.1%) and 71.6% knew that TB could be treated with specific drugs given at health centres. However, just under half (48.6%) of the participants knew that the

length of TB treatment was between 5 to 6 months, although, 51.4% were unaware of the length of treatment, as shown in Table 4.4.

*Table 4.4. Knowledge on the duration of TB treatment*

| Duration      | N          | Percentage   |
|---------------|------------|--------------|
| 5 to 6 months | 106        | 48.6         |
| Incorrect     | 115        | 51.4         |
| <b>Total</b>  | <b>221</b> | <b>100.0</b> |

Since participants had knowledge on the symptoms of TB, which could be due to how well informed they are of TB, almost three fifths (57.9%) felt they were well informed about TB even though a majority of the participants (89.0%) still wished to get more information about TB.

Furthermore, in Table 4.5 just over half (51.0%) of the participants reported obtaining their first knowledge of TB from teachers, family and others. Three quarters (75.0%) reported that the media would be a better means to disseminate TB information (as seen in Table 4.6). However, teaching or talking about TB in schools has created some level of seriousness around the disease. This is clear from the fact that 86.6% indicated that TB is a very serious disease. This will influence their attitude and behaviour towards the disease.

*Table 4.5. First knowledge of TB*

| First knowledge of TB      | N          | Percentage    |
|----------------------------|------------|---------------|
| Media                      | 171        | 39.0%         |
| Health Workers             | 46         | 10.0%         |
| Teachers, family and other | 222        | 51.0%         |
| <b>Total</b>               | <b>439</b> | <b>100.0%</b> |

*Table 4.6. Effective source of TB information*

| Effective sources of information | N          | Percentage    |
|----------------------------------|------------|---------------|
| Media                            | 483        | 75.0%         |
| Health Workers                   | 72         | 11.0%         |
| Teachers, family and other       | 90         | 14.0%         |
| <b>Total</b>                     | <b>645</b> | <b>100.0%</b> |

### 4.3 Attitude towards TB

The result shows that most of the participants (90.0%) are aware that they can get TB because they believe that anyone can get TB. However, as seen in

Table 4.7 over half (53.1%) reported that they cannot get TB because they do not live with someone who has TB.

*Table 4.7. Knowledge on why one cannot get TB*

| Why one cannot get TB                     | N  | Percentage |
|-------------------------------------------|----|------------|
| Am HIV negative                           | 23 | 16.1%      |
| Do not stay with anyone with TB           | 76 | 53.1%      |
| Do not abuse alcohol or use illegal drugs | 24 | 16.8%      |
| Had TB and got treated                    | 8  | 5.6%       |
| Was vaccinated                            | 53 | 37.1%      |
| I can get TB Because anyone can           | 17 | 11.9%      |

In addition, more than half (54.3%) of the participants felt compassion and the desire to help people with TB, even though 70.7% expressed that they would be fearful if they had TB. This desire to help may come as a result that 69.2% knew someone who has/had TB. The results also shows that 90.0% of participants thought people with HIV should be concerned about TB. This concern is

shown because as seen in, Table 4.8, shows that majority of the respondent (88.5%) believed that people living with HIV should be concerned with TB because there are more likely to develop TB.

*Table 4.8. Why people with HIV should be concerned with TB*

| Why people with HIV should be concerned with TB | N          | Percentage |
|-------------------------------------------------|------------|------------|
| A person with HIV is more likely to develop TB  | 193        | 88.5%      |
| Do not know                                     | 25         | 11.5%      |
| Total                                           | 218        | 100.0%     |
| Missing                                         | 3          |            |
| <b>Total</b>                                    | <b>221</b> |            |

When asked who they would talk to if they had TB, 81.0% reported that they would talk to a doctor or other medical workers, just over two thirds (67.9%) would speak with their parent (as seen in Table 4.9), this might be because of the support they would get from their family. However, less than two fifths (37.6%) of the participants would speak to a close friend. A possibility why a small fraction of the participants would speak to close friends could be a feeling of not wanting lots of people to know of their TB status, which is closely linked to the stigma associated with TB.

*Table 4.9. Participants' reports of who they would speak to if they had TB*

| Who people would speak to if they had TB | N   | Percentage |
|------------------------------------------|-----|------------|
| Doctor or other medical worker           | 179 | 81.0%      |
| Spouse                                   | 13  | 5.9%       |
| Parent                                   | 150 | 67.9%      |
| Child(ren)                               | 5   | 2.3%       |
| Other family member                      | 69  | 31.2%      |
| Close friend                             | 83  | 37.6%      |
| Religious leader                         | 8   | 3.6%       |
| No one                                   | 3   | 1.4%       |



In Table 4.10, 45.7% of the participants would disclose their TB status while 44.8% said they would; this may be out of fear that it could affect both their social relationships and school. The study shows that 67.0% thought their social relations and 64.3% thought that school would be affected if they had TB.

*Table 4.10. Participants' response if they would disclose their TB status*

|             | N   | Percentage |
|-------------|-----|------------|
| Yes         | 99  | 44.8%      |
| No          | 101 | 45.7%      |
| Do not know | 21  | 9.5%       |
| Total       | 221 | 100.0%     |

#### **4.4 Practices and Behaviour of Students**

Table 4.11 shows that all the participants said that they would go to the health facilities if they had TB. However, only 69.2% of participants would seek treatment as soon as they realize TB symptoms. Almost two fifths (37.6%) of participants have tested for TB, which might be related to factors surrounding knowledge, attitude and practice of TB

*Table 4.11. Where participants' would go if they had TB*

| What one would do if they had TB                  | N   | Percentage |
|---------------------------------------------------|-----|------------|
| Go to health facility                             | 221 | 100.0%     |
| Go to pharmacy                                    | 23  | 10.4%      |
| Go to traditional healer                          | 2   | 0.9%       |
| Go the church leader                              | 3   | 1.4%       |
| Pursue other self-treatment options (herbs, etc.) | 3   | 1.4%       |

#### **4.5 Factors Associated with Knowledge**

Demographic factors such as gender, level of education and age are often associated with TB knowledge. In other to have a fair comparison of this study to other literature, this section presents the result of how these factors are associated with TB knowledge.

Most (97.0% male and 92.0% female) of the participants knew TB can be cured (see Table 4.12), and there is no significant association ( $\chi^2 = 2.3974$ ,  $p = 0.121534$ ) between gender and the knowledge of whether or not TB can be cured. However, male participants (60.0% in Table 4.13) were more likely to know that TB can be completely treated within 5 to 6 months compared to female participants (42.0%). This is evident from the chi-square statistic which, at 95% confidence interval, shows that gender was significantly associated with knowledge of the duration of TB treatment ( $\chi^2 = 6.579$ ,  $p = 0.015367$ ).

*Table 4.12. Cross tabulation for Gender and participants' response to whether or not TB can be cured*

| Participants response to whether or not TB can be cured |     |            |    |            |       |        |
|---------------------------------------------------------|-----|------------|----|------------|-------|--------|
|                                                         | Yes | Percentage | No | Percentage | Total | Total% |
| Male                                                    | 76  | 97.0%      | 2  | 3.0%       | 78    | 100.0% |
| Female                                                  | 132 | 92.0%      | 11 | 8.0%       | 143   | 100.0% |

*Table 4.13. Cross tabulation for Gender and participants' response on the duration of TB treatment*

|                                                                 | Duration      | Male      | Percentage    | Female     | Percentage    |
|-----------------------------------------------------------------|---------------|-----------|---------------|------------|---------------|
| Participants knowledge on how long TB can be completely treated | 5 to 6 months | 47        | 60.0%         | 59         | 42.0%         |
|                                                                 | Incorrect     | 31        | 40.0%         | 81         | 58.0%         |
|                                                                 | <b>Total</b>  | <b>78</b> | <b>100.0%</b> | <b>140</b> | <b>100.0%</b> |

The result as shown in Table 4.14 also shows that 68.0% of postgraduate students knew how long TB can be completely treated, only 38.0% of undergraduates answered that TB can be completely treated between 5 to 6 months. In addition, 65.1% of students who were less than 25 years knew the symptoms of TB, while 20.8% were unaware of the symptoms (as seen in Table 4.15), further chi square statistics shows ( $\chi^2 = 0.0368$ ,  $p = .847946$ ) that age was not significantly

associated with participants knowledge on the symptoms of TB. However, the chi square statistics ( $X^2=14.4942$ ,  $p = .000141$ ) shows that level of education was statistically associated with knowledge of the duration of TB treatment.

*Table 4.14. Cross tabulation for level of education and participants' correct response on the duration of TB treatment*

| Respondent Level of Education | Duration |               |            | Total |
|-------------------------------|----------|---------------|------------|-------|
|                               |          | 5 to 6 months | Incorrect  |       |
| Undergraduate                 |          | 38.0% (61)    | 56.0% (91) | 152   |
| Postgraduates                 |          | 68.0% (45)    | 32.0% (21) | 66    |

*Table 4.15. Cross tabulation for age and participant response on the symptoms of TB*

|                          |                                                                                                         | Less than 25 | 25 and older | Total |
|--------------------------|---------------------------------------------------------------------------------------------------------|--------------|--------------|-------|
| Signs and symptoms of TB | Cough that last more than 3weeks, chest pain, coughing blood, fatigue, night sweat, weight loss, fever, | 65.1% (144)  | 10.4% (23)   | 167   |
|                          | Rash, cough, severe headache, nausea, breathe shortness                                                 | 20.8% (46)   | 3.7% (8)     | 54    |
|                          | Total                                                                                                   | 190          | 31           | 221   |

#### 4.6 Factors Associated with Attitude

Regarding the attitude towards TB, Table 4.16 shows the relationship between religion and participants feeling about people with TB. Almost three fifths (57.0%) of Christians and 46.0% of other religious groups will feel compassion and desire to help. Almost half (48.0%) of those who were not Christian reported feeling compassion but that they tend to stay away from those with TB. However, the chi square result showed that religion was not significantly associated with people's feeling towards TB patients ( $X^2=38.8446$ ,  $p = 1.82642$ ).

Table 4.16. Cross tabulation for religious group and participants feeling about people with TB

|           | Participants feeling about people with TB |                                                             |                                        |                              | Total        |
|-----------|-------------------------------------------|-------------------------------------------------------------|----------------------------------------|------------------------------|--------------|
|           | I feel compassion and desire to help      | I feel compassion but I tend to stay away from these people | I fear them because they may infect me | I have no particular feeling |              |
| Christian | 57.0% (94)                                | 12.0% (19)                                                  | 12.0% (20)                             | 19.0% (32)                   | 100.0% (165) |
| Others    | 46.0% (25)                                | 48.0% (26)                                                  | 0.0% (0)                               | 6.0% (3)                     | 100.0% (54)  |

As seen in Table 4.17, 91.0% of undergraduates and 87.0% of postgraduates students agreed that they are also at risk of contracting TB. However, the chi square shows that level of education was not significantly associated with participants' perception that they could contract TB ( $X^2 = 1.0677$ ,  $p = .301456$ ).

Amongst gender in Table 4.18, 88.0% of female participants knew TB to be a serious disease, while 3.0% of male participant said TB is not a very serious disease. Following the chi square statistics, ( $X^2 = 3.9632$ ,  $p = .137847$ ), gender is not statistically significant with how serious participant take TB.

Table 4.17. Cross tabulation for level of education and if participants think they can get TB

|                                |                | When Participants were asked if they think they can get TB |           | Total        |
|--------------------------------|----------------|------------------------------------------------------------|-----------|--------------|
|                                |                | Yes                                                        | No        |              |
| Respondents level of education | Undergraduates | 91.0% (139)                                                | 9.0% (13) | 100.0% (152) |
|                                | Postgraduates  | 87.0% (60)                                                 | 13.0% (9) | 100.0% (69)  |

Table 4.18. Cross tabulation for gender and participants feeling about seriousness of TB

|                   |        | Perspective on the seriousness of TB |                  |                  | Total               |
|-------------------|--------|--------------------------------------|------------------|------------------|---------------------|
|                   |        | Very serious                         | Somewhat serious | Not very serious |                     |
| Respondent Gender | Male   | 83.0% (65)                           | 14.0% (11)       | 3.0% (2)         | <b>100.0% (78)</b>  |
|                   | Female | 88.0% (126)                          | 12.0% (17)       | 0.0% (0)         | <b>100.0% (143)</b> |
|                   | Total  | 191                                  | 28               | 2                | <b>221</b>          |

#### 4.7 Factors Associated with Practices and Health-Seeking Behaviour

It was discovered that there is poor health-seeking behaviour towards TB among the participants. As mentioned above, out of 221 participants that took part in the research 83 (37.0%) of the participants have tested for TB previously and 63.0% of the participants have never tested for TB. However, all the participants identified that they would go to a health facility as soon as they realize that they had symptoms of TB. Some of the participants (34.0%) went further to point out that if it happens that they do not go to a health facility, it would be due to cost. This is because of the socio-economic background of most of the participants as they are students from middle- and low-income families. Although, the result shows that more than half of the participants who grew up in rural areas have ever tested for TB compared to just over one quarter (26.0%) of those from urban areas as seen in Table 4.19. With a chi square test conducted, it shows that there is a significant association between location and if participants have ever been tested for TB ( $X^2 = 16.0146$ ,  $p = 0.000333$ ). A further cross tabulation between participants who have been tested for TB and gender, it was discovered that more of male participants (53.0%) than female (29.0%) have ever tested for TB (seen in Table 4.20). Also, further chi square analysis shows that there is

a significant association between gender and if participants have tested for TB ( $\chi^2 = 11.577, p = 0.000668$ ).

Table 4.19. Cross tabulation for where the respondents grew up and their response to whether or not they have ever been tested of TB

| Where the Respondent Grew up |           | when participants were asked if they have ever been tested for TB |            |    |            |       |        |
|------------------------------|-----------|-------------------------------------------------------------------|------------|----|------------|-------|--------|
|                              |           | Yes                                                               | Percentage | No | Percentage | total |        |
|                              | Rural     | 44                                                                | 54.0%      | 37 | 46.0%      | 81    | 100.0% |
|                              | Urban     | 26                                                                | 26.0%      | 75 | 74.0%      | 101   | 100.0% |
|                              | Pre-Urban | 13                                                                | 33.0%      | 26 | 67.0%      | 39    | 100.0% |

Table 4.20. Cross tabulation for gender and if participants have ever tested for TB

| When participants were asked if they have ever been tested for TB |        |     |            |     |            |       |        |
|-------------------------------------------------------------------|--------|-----|------------|-----|------------|-------|--------|
|                                                                   |        | Yes | Percentage | No  | Percentage | Total | Total  |
| Respondent Gender                                                 | Male   | 41  | 53.0%      | 37  | 47.0%      | 78    | 100.0% |
|                                                                   | Female | 42  | 29.0%      | 101 | 71.0%      | 143   | 100.0% |

The result from Table 4.21 shows that 26.0% of undergraduates would go to a health facility when symptoms that look like TB lasts 3 to 4 weeks. Although 68.0% of undergraduates would go to a health facility as soon as TB symptoms. Also, a chi square statistics does show a significant association between level of education and when participants would go to a health facility if they develop TB symptoms ( $\chi^2 = 13.4805, p = 0.009152$ ).

*Table 4.21. Cross tabulation for level of education and when participants would go to a health facility if they had symptoms of TB*

|                                                                                              |                                                            | Respondent Level of Education |               |
|----------------------------------------------------------------------------------------------|------------------------------------------------------------|-------------------------------|---------------|
|                                                                                              |                                                            | Undergraduate                 | Postgraduates |
| Participants view on what point they will go to a health facility if they had symptoms of TB | When treatment on my own does not work                     | 2.0% (3)                      | 12.0% (8)     |
|                                                                                              | When symptoms that look like TB last for 3 - 4 weeks       | 26.0% (39)                    | 17.0% (12)    |
|                                                                                              | As soon as I realize that my symptoms may be related to TB | 68.0% (103)                   | 71.0% (49)    |
|                                                                                              | I would not go to the health facility                      | 2.0% (3)                      | 0.0% (0)      |
|                                                                                              | Do not know                                                | 3.0% (4)                      | 0.0% (0)      |
| <b>Total</b>                                                                                 |                                                            | <b>152</b>                    | <b>69</b>     |

#### **4.8 Summary**

This chapter presented the findings of the study on the knowledge, attitude, practices and behaviour of TB among UKZN students. The findings were presented based on the aims of the research. The study revealed that students had the knowledge of how a person can contact and prevent TB. The study also showed that students knew TB was a very serious disease, hence would take swift action by going to a health facility,

The next chapter discusses these findings, comparing them to relevant literature.

## **5 DISCUSSION AND CONCLUSION**

### **5.1 Introduction**

This chapter presents discussion on the findings related to the knowledge, attitude, practices and behaviours associated with TB among UKZN students. TB is a communicable disease which prevalence is high in South Africa. Therefore, knowledge of the signs, symptoms and causes of a communicable disease such as TB, are important factors which will enable minimal spread. According to Pengpid et al. (2016), the lack of TB knowledge, especially on the causes, signs and symptoms may lead to a delay in treatment and increased transmission risk. Against this backdrop, the objectives of the research were developed as follows:

- To measure the level of knowledge students have regarding TB.
- To describe the attitudes of students in towards TB.
- To report on behaviours and practices of students related to TB.
- To investigate whether demographic and socio-economic factors are associated with knowledge, attitudes and practices related to TB.

These objectives were achieved by asking questions on the curability of TB, who can get TB and what one would do if they had TB. These questions were answered through the use of questionnaires

### **5.2 Descriptive Information on the Knowledge of TB**

In a setting such as the university, where learning and teaching takes place, one would expect a high level of knowledge related to the symptoms, cause and mode of transmission of TB. The current study shows that students were aware of the symptoms, causes and mode of TB transmission, which is similar to some other studies (Salleh *et al.* 2018; Sanusi, Talip & Mohamed 2017). In Kedah Malaysia, 93.1% of the participants knew that persistent cough that lasts over 2



weeks is a symptom of TB (Salleh *et al.* 2018). This can be attributed to the effective TB control programmes set aside to educate healthcare workers. Several occupational health programmes were set up to enable community health workers find and treat TB (Churchyard *et al.* 2014).

This study also showed that the majority of respondents (51%) indicated that they got their first hand knowledge of TB from teachers, family and others followed by the media (39%). This is consistent with the study by Jamaludin *et al.* (2019) among students in International Islamic university Malaysia where majority of the participants got their first knowledge of TB from teachers (62.3%), followed by family, friends, neighbors and colleagues (48.1%). These findings suggests that teaching or talking about TB in schools or homes has created some level of awareness and increased knowledge around the disease.

Although, findings from this study showed that teachers, family and friends contributed to the participants' source of knowledge about TB, participants specified media as an effective means to disseminate TB information. This study highlighted the importance of media in disseminating TB information to the public, such that 75.0% of participants mentioned the media to be an effective means to disseminate TB information. This is similar to findings from Salleh *et al.* (2018) in Kedah Malaysia, of which the media was mentioned as the most effective source to receive TB information. This portrays positive impact of governments' initiatives on community awareness through the media. According to Wakefield, Loken and Hornik (2010), mass media messages plays an important role by influencing people's understanding about a disease and provide necessary steps to prevent TB, or spreading the disease. Hence, the media should be utilized in dissemination information about TB to the public, to promote the prevention and treatment of TB.

In this study, almost all participants thought TB can be cured, especially with medications from health centres. This goes further to show high level of awareness and knowledge among the study

participants. Previous studies (Bati *et al.* 2013; Sanusi *et al.* 2017; Uchenna *et al.* 2014) have presented similar findings, for instance a study conducted in Nigeria revealed that 96.3% knew that TB can be cured especially with modern drugs (90.5%) (Uchenna *et al.* 2014). The result is also supported by the study in Shinile town of Eastern Ethiopia, where 82.2% of the participants knew that TB is curable (Bati *et al.* 2013). A reason for the knowledge on TB curability could be the setting of these research, as these countries (Ethiopia, Nigeria and South Africa) are known to have a high burden of TB and hence would have more idea on if TB can be cured (World Health Organization 2013). Although the result of this study showed knowledge about the curability of TB, the result showed low knowledge of the duration of treatment, as only 48.6% of the respondents knew the actual length of TB treatment. This findings are similar to those of a study by Sanusi *et al.* (2017), in which 88.9% university students in Malaysia were unaware of the actual duration of TB treatment.

### **5.3 Attitude towards TB**

The results showed that most of the participants had positive attitude towards TB. In this study 90.0% of the respondents are aware that they can get TB because they believe that anyone can get TB. The results of this study are similar to those of a study conducted in International Islamic university Malaysia, in which, 96.9% of the participants believed that anyone can get TB (Jamaludin *et al.* 2019).

Most of the participants indicated that they would show compassion and desire to help TB patients. The desire to help may come as a result of the fact that majority of the participants knew someone who has/had TB. Similar results were found in a study that was conducted in University of Belgrade, Serbia, Malaysia, where positive attitude were discovered towards TB patients. That study found that 78.3% of the respondents indicated that they would visit TB patients (Smolovic

*et al.* 2012). This positive attitude exhibited by both studies might be due to the spatial similarities since both studies were conducted among university students, who were more likely to be knowledgeable and have positive attitude towards TB.

A crucial feature of this study is that most of the participants thought that their schooling and social relations will be affected if they had TB, this might be due to a feeling of being stigmatized and discriminated. Furthermore, this feeling of discrimination and stigma is seen in several other studies (Ayub & Tariq 2017; Salleh *et al.* 2018; Uchenna *et al.* 2014). The high understanding of the basic knowledge of TB presented above did not have much impact on the stigma and discrimination. This is because the fear of being infected is one of the reasons for discrimination, as seen in this study, majority of participants pointed out that they are afraid of TB. This includes the fear of having or being exposed to TB. Similar results were found from a study that was done in South western Ethiopia, where 69.3% would experience fear if they had TB (Tolossa *et al.* 2014). The feeling of fear may come because of being discriminated by members of society. For example, in Kashmir Valley, India, the participants sees TB as a shameful and disgraceful disease (Ayub & Tariq 2017). This feeling of fear may be a reason why most participants in this study would keep their TB status a secret. In this study, 44.8% of the participants would keep their status a secret, which may be due to fear of their schooling being affected, since 64.3% of the participants said TB would affect their school. This finding is similar to the study by Jamaludin *et al.* (2019), where majority of the students in International Islamic university students would not expose their status to others if they have been infected with TB.

In addition, this study found that majority of participants would speak to a medical worker if they suspect to have TB, which is consistent with the study in South Western Ethiopia. In South Western Ethiopia, 66.3% of the participants would speak to a doctor if they had TB (Tolossa *et al.* 2014). This similarity may be due to confidence and trust placed on doctors or medical workers for getting TB treatment and consultation, that is why all the participants in this study would visit the health facility if they had TB. It can also be because of the medical ethics of health workers, in which health state of a patient should be kept between the health worker and patient. According to Dhai and Mkhize (2006), part of the guidelines of the Health Professional Council of South Africa (HPCSA) includes confidentiality and informed consent. Although this study also discovered that a significant number of participants will speak to their parent and a possibility for this is because a parent may likely not disclose TB status of their child.

On the other hand, majority of the students thought that people with HIV should be more concerned about contracting TB. This response from participants may be because of the high rate of HIV in South Africa, which makes HIV patients more vulnerable to most diseases including TB. According to (Churchyard *et al.* 2014), South Africa has one of the world's worst TB epidemics that is driven by HIV. The findings of this study corroborates the study in Shinile town of Eastern Ethiopia, where, participants thought that people with HIV/AIDS should be concerned with TB (Bati *et al.* 2013).

#### **5.4 Practices and Behaviour of Students**

In this study, all the participants would go to the health facilities if they had TB and 69.2% of the participants would seek treatment as soon as they recognize TB symptoms. This result is consistent with the study in Pakistan, where 97.0% urban and 94.1% rural participants would visit a health

facility immediately they had TB symptoms (urban 83.6%, rural 74.7%) (Mushtaq *et al.* 2011). This shows that the participants in this study take TB seriously, which can be due to various TB programmes set to combat TB.

In 2011, South Africa introduced a screening program, which focused on screening high risk population and high burden areas, which also included counselling and testing campaign (Churchyard *et al.* 2014). However, screening practice for TB in the current study was low as only 37.6% of participants ever screened for TB, which is similar to a study carried out in North Mecha, Ethiopia, in which only 19.4% had undergone a TB test (Kasa *et al.* 2019). A reason for this low figure may be because students feel they do not fall into the risk group category. According to the World Health Organization (2013) a risk group is a group in which TB prevalence of incidence is significantly higher in the general population, in other words, people living in a specific location that is associated with a high burden of TB. For example, living in a house with someone with active TB, of which 53.1% of participants in this study felt they cannot get TB because they do not live with any TB patient.

## **5.5 Factors Associated with Knowledge**

One would expect age, gender or level of education to be associated with a high knowledge of TB. Several other studies (Pengpid & Peltzer 2019; Bati *et al.* 2013; Luba *et al.* 2019) have shown that gender is another demographic factor associated with TB knowledge. These studies have shown that males have better TB knowledge compared to females. Similarly, this study found that gender had an association with knowledge of the duration of TB treatment. According to the result, male had greater knowledge on the duration of TB treatment than female participants. The differences in knowledge on the duration of TB treatment between gender can be attributed to level of exposure, participation, and information available to different groups.

In addition, this study showed an association between level of education and knowledge on the duration of TB treatment. This study showed that post graduates students had a higher knowledge on the duration of TB treatment than undergraduate students. This study is similar to a study conducted in Ahmednagar, India, where 58.1% of postgraduate students had more knowledge on the treatment and drug therapy of TB, than undergraduates (53.0%) (Kadam *et al.* 2013). In addition, some studies conducted among community population (Agho *et al.* 2014; Tobin *et al.* 2013) have shown that those with a better or higher level of education are more likely to have a better knowledge about TB.

This study found no association between gender and knowledge of TB curability which is in contrast to the study conducted in Bangladesh, assessing the knowledge regarding tuberculosis among non-medical university students, which showed that there is a significant association between gender and knowledge of TB curability (Rana *et al.* 2015).

Furthermore, this study found no association between age and knowledge on the symptoms of TB, which is in contrast to some previous studies (Musuka *et al.* 2018; Pengpid & Peltzer 2019), where age was associated with good knowledge of TB. For example, in the study conducted by Pengpid and Peltzer (2019) in Timor-Leste, older age was associated with good TB knowledge and awareness, which is different from the study conducted by Musuka *et al.* (2018) using Demographic Health Survey (DHS) data from Lesotho, Malawi, Namibia and Zambia. Musuka *et al.* (2018) found that TB knowledge was higher among individuals who are less than 26 years, compared to those who were older. This therefore means that age alone is not a good factor for determining person's knowledge of TB.

However, it should be noted that this study did not include all age groups, since university students are typically, although not exclusively, young people. This may be the reason for the non-significant association between age and knowledge in this study.

## **5.6 Factors Associated with Attitude**

The result measured the level of attitude by comparing religion and feelings towards TB patient; and discovered that religion was not significantly associated with participants feeling towards TB patients. However, a study in Kenya, showed that religion was associated with attitude such that 50.9% of Christians had a good attitude than the other religion (38.8%) (Yusuf 2014). The non-significant effect found in this study may be as a result of good relationship between different religious societies in South Africa as all religious have equal rights and freedoms (Benson 2011).

In addition, the results of this study showed that both undergraduate and postgraduate students believed they can get TB, even though, the percentage of undergraduate student is slightly higher than postgraduate students. Again, this result is not comparable to other studies as it compares only a specific variable (level of education) to whether or not participant can get TB.

However, other studies (Bati *et al.* 2013; Salleh *et al.* 2018) compared demographics to the study's general overall attitude and not to specific questions. For example, the study in South Western Ethiopia discovered that favourable attitude towards TB patients was significantly associated with high educational level. These attitudes were defined by asking questions like “should TB patients feel ashamed?”, “would you share meals with TB patients?”. (Bati *et al.* 2013).

From the result of this present study, both male and female agreed that TB is a very serious disease. The result showed that gender was not associated with how seriously participants take TB. The result from this study is similar to the study finding from Somali, Eastern Ethiopia, where 56.8%

of male and 53.9% of females agreed that TB is a very serious disease (Tolossa *et al.* 2014). In contrast to these findings, the study conducted in south western Ethiopia, discovered that gender was associated with attitude towards TB, in the study, 74.9% of female respondent had a positive attitude towards TB, as compared to 48.2% of males with positive attitudes (Bati *et al.* 2013).

### **5.7 Factors Associated with Practices/Health Seeking Behaviour**

Gender as a demographic factor is associated to practices and health-seeking behaviour in this study. From the results of this study, gender was significantly associated with practice of testing for TB as more males than females had been tested for TB than females. The study is similar to one conducted in Kenya, where 71.3% of males had a suitable method of prevention behaviour towards TB compared to 61.9% of females (Yusuf 2014). This results is consistent with TB occurrence around the world, where TB incidence cases are higher amongst men than women, hence prevention practices and positive health seeking behaviour is encouraged to prevent TB. According to Puspitasari *et al.* (2018), the prevalence of tuberculosis among men is nearly double that among women.

This study went further to compare level of education with health seeking behaviour; and found a significant association between level of education and when participants would go to a health facility if they had TB. The result found that 26% of undergraduate students would wait till TB symptoms lasts for 3 to 4 weeks. This finding is similar to the study by Yusuf (2014) in Kenya, where a significant association was found between education level and practice of prevention behaviour towards TB, suggesting that prevention behaviour improves with increase in education standards. Although the study in Kenya consists of both those with no formal education and formal education whilst this study only includes those with formal education.



## **5.8 Recommendations**

From the results of this study, some recommendations may be suggested in order to improve knowledge, attitude, practices and behavior of both students and South Africa at large. Since TB continues to pose as a threat in South Africa, it is important that health information be disseminated in a proper manner, which would generally bring a considerable change in people's attitude and improve their knowledge and health seeking behaviour.

The importance of public health information through the media is being highlighted in this study. Thus, it is strongly suggested that the social media which is part of mass media and popular among students, should be utilized in the dissemination of TB knowledge to the public to promote prevention and treatment of TB disease. The use of social media also gives avenues for various views and opinions hence, creates a strong community relationship. In addition, teachers and parents should be well equipped with all the necessary information on TB as most of the participants got their first knowledge from them.

Furthermore, continuous support is needed to ensure the quality and the sustainability of the health education, such as campaigns, which can help in the reduction of stigma

Lastly, subsidized health care and availability of health services especially to people from rural area can increase the number of people visiting the health care center when they have symptoms of TB.

## **5.9 Limitations**

TB is considered as a sensitive topic, as such, some participants refused to answer questions regarding the topic and some other participants could possibly give biased responses. In addition, some questions were left unanswered. Another limitation found is that the study is purely quantitative, which limits a more in-depth exploration and expression of emotions.

## **5.10 Conclusion**

The study found that students had good knowledge and attitude towards TB, although, it showed that several demographics such as level of education and gender are associated with health seeking behaviours. The study also identified that most students got their information of TB through their parents but would prefer more TB information through the media. It is therefore advisable that several measures be taken to remove hindrances to educational messages that are transmitted through the mass media, so as to promote TB knowledge.

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## APPENDIX A: INFORMED CONSENT FORM

# UKZN HUMANITIES AND SOCIAL SCIENCES RESEARCH ETHICS COMMITTEE (HSSREC)

### APPLICATION FOR ETHICS APPROVAL For research with human participants

#### INFORMED CONSENT

Note to researchers: Notwithstanding the need for scientific and legal accuracy, every effort should be made to produce a consent document that is as linguistically clear and simple as possible, without omitting important details as outlined below. Certified translated versions will be required once the original version is approved.

There are specific circumstances where witnessed verbal consent might be acceptable, and circumstances where individual informed consent may be waived by HSSREC.

#### **Information Sheet and Consent to Participate in Research**

Date:

Hello participants,

My name is Chinwendu Jane Nnam a Master student of Population Studies at the University of KwaZulu Natal, Howard campus, from the School of Built Environment and Development Studies. phone number is 0730985539 and my email addresses are: [nnamjane@gmail.com](mailto:nnamjane@gmail.com)

You are being invited to consider participating in a study that involves research on the knowledge, attitude and practice of tuberculosis among youths, a case study of UKZN Howard campus students. The aim and purpose of this research is to measure the level of knowledge students have regarding TB, to describe the attitudes of students in UKZN towards Tuberculosis to report on practices of students related to TB prevention and to investigate whether demographic and socioeconomic factors are associated with attitudes towards TB.

The study is expected to enroll 269 participants. It will involve the following procedures of filling the questionnaires presented. The duration of your participation if you choose to enroll and remain in the study is expected to be 30 minutes. The study is not funded.

The study involves no risks and/or discomforts (describe). We hope that the study. Will improve the knowledge and attitude of participants towards tuberculosis.

This study has been ethically reviewed and approved by the UKZN Humanities and Social Sciences Research Ethics Committee (approval number HSSREC/00000047/2019).

In the event of any problems or concerns/questions you may contact the researcher at [nnamjane@gmail.com](mailto:nnamjane@gmail.com) or [218081897@stu.ukzn.ac.za](mailto:218081897@stu.ukzn.ac.za) or the UKZN Humanities & Social Sciences Research Ethics Committee, contact details as follows:

### **HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION**

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Email: [HSSREC@ukzn.ac.za](mailto:HSSREC@ukzn.ac.za)

You will be required to do one of the following tasks if you agree to participate in this venture:

- Fill in the questionnaires given
- Then sign the consent's declaration for participation

Typically, 30 minutes of your time will be required for your participation in this project. Your participation will involve written responses.

If you should agree to participate, you will be requested to maintain the confidentiality of what is asked.

Your participation is voluntary, and you are free to withdraw at any stage for any reason. The decision not to participate will not result in any form of disadvantage to you.

---

### **CONSENT (Edit as required)**

I (Name) have been informed about the study entitled (provide details) by (provide name of researcher/fieldworker).

I understand the purpose and procedures of the study (add these again if appropriate).

I have been given an opportunity to answer questions about the study and have had answers to my satisfaction.

I declare that my participation in this study is entirely voluntary and that I may withdraw at any time without affecting any of the benefits that I usually am entitled to.

If I have any further questions/concerns or queries related to the study I understand that I may contact the researcher at (provide details).

If I have any questions or concerns about my rights as a study participant, or if I am concerned about an aspect of the study or the researchers then I may contact her on 0730985539 or [nnamjane@gmail.com](mailto:nnamjane@gmail.com)

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Additional consent, where applicable

I hereby provide consent to:

Audio-record my interview / focus group discussion                      YES / NO

\_\_\_\_\_  
Signature of Participant

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of Witness  
(Where applicable)

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of Translator  
(Where applicable)

\_\_\_\_\_  
Date

## APPENDIX B: GATEKEEPER'S PERMISSION



17 May 2019

Ms Chinwendu Jane Nnam  
School of Built Environment and Development Studies  
College of Humanities  
Howard College Campus  
UKZN  
Email: [nnamjane@gmail.com](mailto:nnamjane@gmail.com)

Dear Ms Nnam

### RE: PERMISSION TO CONDUCT RESEARCH

Gatekeeper's permission is hereby granted for you to conduct research at the University of KwaZulu-Natal (UKZN), provided Ethical clearance has been obtained. We note the title of your research project is:

*"Knowledge, Attitudes and health seeking behavior of university students towards Tuberculosis: A Case Study of UKZN Howard College."*

It is noted that you will be constituting your sample by handing out questionnaires to Undergraduate honours and course work masters students on the Howard College campus.

Please ensure that the following appears on your notice/questionnaire:

- Ethical clearance number;
- Research title and details of the research, the researcher and the supervisor;
- Consent form is attached to the notice/questionnaire and to be signed by user before he/she fills in questionnaire;
- gatekeepers approval by the Registrar.

You are not authorized to contact staff and students using 'Microsoft Outlook' address book. Identity numbers and email addresses of individuals are not a matter of public record and are protected according to Section 14 of the South African Constitution, as well as the Protection of Public Information Act. For the release of such information over to yourself for research purposes, the University of KwaZulu-Natal will need express consent from the relevant data subjects. Data collected must be treated with due confidentiality and anonymity.

Yours sincerely

  
MR SS MOKOENA  
REGISTRAR

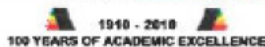
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#### Office of the Registrar

Postal Address: Private Bag X54001, Durban, South Africa

Telephone: +27 (0) 31 260 8006/2206 Facsimile: +27 (0) 31 260 7824/2204 Email: [registrar@ukzn.ac.za](mailto:registrar@ukzn.ac.za)

Website: [www.ukzn.ac.za](http://www.ukzn.ac.za)



Founding Campuses:  Edgewood  Howard College  Medical School  Pietermaritzburg  Westville

## APPENDIX C: ETHICS APPROVAL LETTER



UNIVERSITY OF  
KWAZULU-NATAL  
INYUVESI  
YAKWAZULU-NATALI

13 August 2019

Miss Chinwendu Jane Nnam (218081897)  
School Of Built Env & Dev Stud  
Howard College

Dear Miss Nnam,

**Protocol reference number: HSSREC/00000047/2019**

**Project title:** Knowledge, Attitudes and health seeking behaviour of university students towards Tuberculosis: A Case Study of University of KwaZulu-Natal UKZN Howard College

### Full Approval – Expedited Application

This letter serves to notify you that your application received on 01 July 2019 in connection with the above, was reviewed by the Humanities and Social Sciences Research Ethics Committee (HSSREC) and the protocol has been granted **FULL APPROVAL**.

**Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.**

This approval is valid for one year from 13 August 2019.

To ensure uninterrupted approval of this study beyond the approval expiry date, a progress report must be submitted to the Research Office on the appropriate form 2 - 3 months before the expiry date. A close-out report to be submitted when study is finished.

Yours sincerely,



Dr Rosemary Sibanda (Chair)

/dd

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Humanities & Social Sciences Research Ethics Committee  
Dr Rosemary Sibanda (Chair)  
UKZN Research Ethics Office Westville Campus, Govan Mbeki Building  
Postal Address: Private Bag X54001, Durban 4000  
Website: <http://research.ukzn.ac.za/Research-Ethics/>

Founding Campuses: ■ Edgewood ■ Howard College ■ Medical School ■ Pietermaritzburg ■ Westville

INSPIRING GREATNESS

**APPENDIX D: QUESTIONNAIRE**

**Questionnaire NO. \_\_\_\_.**

**Questionnaire for Participants**

**General and demographic questions**

**Age**

|             |
|-------------|
| 15-19 years |
| 20-24 years |
| 25-29 years |
| 30-34 years |
| 35-39 years |
| 40-44 years |

**Sex**

|        |
|--------|
| Male   |
| Female |

**What is the level of education you have completed?**

|                |
|----------------|
| Undergraduate  |
| Honours Degree |
| Masters Degree |
| Ph.D           |

**Race**

|                    |
|--------------------|
| White              |
| Black African      |
| Asian              |
| Coloured/mixed     |
| Other specify..... |



**Religion**

|                   |
|-------------------|
| Muslim            |
| Christian         |
| Buddhism          |
| Hinduism          |
| Atheist           |
| Traditional (ATR) |
| Other specify ... |

**Marital Status**

|                      |
|----------------------|
| Married              |
| Never Married        |
| Divorced             |
| Widowed              |
| Separated            |
| Co Habiting          |
| Other (Specify) .... |

**Do you have own biological children?**

|     |
|-----|
| Yes |
| No  |

**Cluster location of where you grew up.**

|            |
|------------|
| Rural      |
| Urban      |
| Peri-Urban |

**Are you aware if the following services are offered at the nearest Health centre?**

Chest X-ray

|            |
|------------|
| Yes        |
| No         |
| Don't Know |

HIV Testing (VCT)

|            |
|------------|
| Yes        |
| No         |
| Don't Know |

Sputum Testing

|            |
|------------|
| Yes        |
| No         |
| Don't Know |

General Treatment

|            |
|------------|
| Yes        |
| No         |
| Don't Know |

**TB knowledge and awareness**

|                                                            |
|------------------------------------------------------------|
| <b>Where did you first learn about tuberculosis or TB?</b> |
| <b>Multiple Responses</b>                                  |
| Newspapers and magazines                                   |
| Radio                                                      |
| TV                                                         |
| Billboards                                                 |
| Brochures, posters and other printed materials             |
| Health workers                                             |
| Family, friends, neighbours and colleagues                 |

|                            |
|----------------------------|
| Religious leaders          |
| Teachers                   |
| Other (please explain).... |

**In your opinion, how serious a disease is TB? (Tick one)**

|                  |
|------------------|
| Very serious     |
| Somewhat serious |
| Not very serious |

**Where should one go to find out if he or she has TB? (Tick one)**

|                                                        |
|--------------------------------------------------------|
| Private clinic                                         |
| Government clinic or hospital                          |
| Traditional or homeopathic healer                      |
| Clinic/Hospital/health centre run by the school        |
| Clinic run by a nongovernmental organization or church |
| Other specify....                                      |

**What are the signs and symptoms of TB? (Multiple Response)**

|                                                       |
|-------------------------------------------------------|
| Rash                                                  |
| Cough                                                 |
| Cough that lasts longer than 3 weeks                  |
| Coughing up blood                                     |
| Severe headache                                       |
| Nausea                                                |
| Weight loss                                           |
| Fever without clear cause that lasts more than 7 days |
| Chest pain                                            |
| Shortness of breath                                   |
| Ongoing fatigue                                       |

|                  |
|------------------|
| Do not know      |
| Night sweats     |
| Other specify... |

**How can a person get TB? (Multiple Response)**

|                                                                                      |
|--------------------------------------------------------------------------------------|
| Through handshakes                                                                   |
| Through the air when a person<br>with TB coughs or sneezes                           |
| Through sharing dishes                                                               |
| Through sexual intercourse                                                           |
| Through eating from the same plate                                                   |
| Living in the same house or working together with someone with TB                    |
| Through touching items in public places (doorknobs, handles in transportation, etc.) |
| Inhaling dust                                                                        |
| Living in a crowded household                                                        |
| Don't know                                                                           |
| Other specify....                                                                    |

**How can a person prevent getting TB? (Multiple Response)**

|                                                     |
|-----------------------------------------------------|
| Avoid shaking hands                                 |
| Covering mouth and nose when coughing or sneezing   |
| Avoid sharing dishes                                |
| Washing hands after touching items in public places |
| Closing windows at home                             |
| Through good nutrition                              |
| Coughing under armpit                               |
| By praying                                          |
| Do not know                                         |

|                    |
|--------------------|
| Other specify .... |
|--------------------|

**In your opinion, who can be infected with TB? (Multiple Response)**

|                                 |
|---------------------------------|
| Anyone can contract TB          |
| Poor people                     |
| Homeless people                 |
| Alcoholics                      |
| Drug users                      |
| People living with HIV and AIDS |
| People who have been in prison  |
| Other specify...                |

**Can TB be cured?**

|            |
|------------|
| Yes        |
| No         |
| Don't Know |

**How can someone with TB be cured? (Multiple Response)**

|                                       |
|---------------------------------------|
| Herbal remedies                       |
| Home rest without medicine            |
| Praying                               |
| Specific drugs given by health centre |
| DOTS                                  |
| Do not know                           |
| Other specify....                     |

**How long does it take to be completely treated from TB?**

|            |
|------------|
| 2 months   |
| 3-4 Months |
| 5-6 Months |

|                    |
|--------------------|
| 7-8 Months         |
| 8-10 Months        |
| 11-12 Months       |
| Don't Know         |
| Other (Specify)... |

## TB Attitudes and Practise

**Do you think you can get TB?**

|     |
|-----|
| Yes |
| No  |

**Why do you think you can get TB? Multiple response**

|                                                                             |
|-----------------------------------------------------------------------------|
| Have HIV infection                                                          |
| Have been infected with TB bacteria in the last 2 years                     |
| Have other health problems that make it hard for your body to fight disease |
| Abuse alcohol or use illegal drugs                                          |
| Was not treated correctly for TB infection or TB disease in the past        |
| Anyone can get TB                                                           |
| Took care of someone with TB                                                |
| Other specify...                                                            |

**Why do you think you cannot get TB? Multiple response**

|                                           |
|-------------------------------------------|
| Am HIV negative                           |
| Do not stay with anyone with TB           |
| Do not abuse alcohol or use illegal drugs |
| Had TB and got treated                    |
| Was vaccinated                            |

|                   |
|-------------------|
| Other specify.... |
|-------------------|

**What would be your reaction if you were found to have TB? Multiple response**

|                         |
|-------------------------|
| Fear                    |
| Surprise                |
| Shame                   |
| Embarrassment           |
| Sadness or hopelessness |
| Other specify ....      |

**Who would you talk to about your illness if you had TB? Multiple response**

|                                |
|--------------------------------|
| Doctor or other medical worker |
| Spouse                         |
| Parent                         |
| Child(ren)                     |
| Other family member            |
| Close friend                   |
| Religious leader               |
| No one                         |
| Other specify.....             |

**What would you do if you thought you had symptoms of TB? Multiple response**

|                                                   |
|---------------------------------------------------|
| Go to health facility                             |
| Go to pharmacy                                    |
| Go to traditional healer                          |
| Go the church leader                              |
| Pursue other self-treatment options (herbs, etc.) |
| Other specify....                                 |

**If you had symptoms of TB, at what point would you go to the health facility? (Please check one)**

|                                                              |
|--------------------------------------------------------------|
| When treatment on my own does not work                       |
| When symptoms that look like TB signs last for 3–4 weeks     |
| As soon as I realize that my symptoms might be related to TB |
| I would not go to the health facility                        |
| Do not know                                                  |
| Other specify....                                            |

**If you would not go to the health facility, what is the reason?**

|                                                                                |
|--------------------------------------------------------------------------------|
| Not sure where to go                                                           |
| Cost                                                                           |
| Difficulties with transportation                                               |
| Distance to clinic                                                             |
| Do not trust medical workers                                                   |
| Do not like attitude of medical workers                                        |
| Cannot leave work (overlapping work hours with medical facility working hours) |
| Do not want to find out that something is really wrong                         |
| Other specify...                                                               |

**On the following statements, respond Yes or No to each one of them:**

**I can get TB treatment from my health facility within my community and school?**

|             |
|-------------|
| Yes         |
| No          |
| Do not know |

**My family would support me if I was to be on or TB treatment**

|     |
|-----|
| Yes |
| No  |



|             |
|-------------|
| Do not know |
|-------------|

## **TB Attitudes and Stigma**

**Question ID Question Answer**

**Do you know people who have/had TB?**

|     |
|-----|
| Yes |
|-----|

|    |
|----|
| No |
|----|

|             |
|-------------|
| Do not know |
|-------------|

**Which statement is closest to your feeling about people with TB disease? (Read the following choices and check one answer)**

|                                      |
|--------------------------------------|
| I feel compassion and desire to help |
|--------------------------------------|

|                                                             |
|-------------------------------------------------------------|
| I feel compassion but I tend to stay away from these people |
|-------------------------------------------------------------|

|                                         |
|-----------------------------------------|
| It is their problem and I cannot get TB |
|-----------------------------------------|

|                                        |
|----------------------------------------|
| I fear them because they may infect me |
|----------------------------------------|

|                              |
|------------------------------|
| I have no particular feeling |
|------------------------------|

**Do you think that HIV positive people should be concerned about TB?**

|     |
|-----|
| Yes |
|-----|

|    |
|----|
| No |
|----|

|            |
|------------|
| Don't Know |
|------------|

**Why should HIV positive people be concerned with TB?**

|                                                |
|------------------------------------------------|
| A person with HIV is more likely to develop TB |
|------------------------------------------------|

|             |
|-------------|
| Do not know |
|-------------|

|                  |
|------------------|
| Other specify... |
|------------------|

**Do you think TB would affect your social relations?**

|     |
|-----|
| Yes |
|-----|

|    |
|----|
| No |
|----|

|              |
|--------------|
| I don't know |
|--------------|

**Do you think TB would affect your school?**

|     |
|-----|
| Yes |
| No  |

**On the following statements, I would like to respond whether you say Yes, No or Dont Know to each one of them: If on TB treatment I would not like people to know**

|              |
|--------------|
| Yes          |
| No           |
| I don't know |

**I can access TB services without fear of being discriminated**

|              |
|--------------|
| Yes          |
| No           |
| I don't know |

## **TB Knowledge of sources of information**

**Question ID Question Answer**

**Do you feel well informed about TB?**

|            |
|------------|
| Yes        |
| No         |
| Don't Know |

**Do you wish you could get more information about TB?**

|     |
|-----|
| Yes |
| No  |

**What are the sources of information that you think can most effectively reach people like you with information on TB? (Please choose the three most effective sources)**

|                          |
|--------------------------|
| Newspapers and magazines |
| Radio                    |

|                                                   |
|---------------------------------------------------|
| TV                                                |
| Billboards                                        |
| Social media                                      |
| Brochures, posters and other<br>printed materials |
| Health workers                                    |
| Family, friends, neighbours and<br>colleagues     |
| Religious leaders                                 |
| Teachers                                          |
| Politicians (MPs, councillors)                    |
| Other specify....                                 |

## Health-Seeking Behaviour

Now we want to briefly talk about TB Testing?

**Have you ever been tested for TB?**

|            |
|------------|
| Yes        |
| No         |
| Don't Know |

**Where were you tested for TB? Private clinic**

|                                                         |
|---------------------------------------------------------|
| Government clinic or hospital                           |
| Mine Clinic                                             |
| Clinic run by an nongovernmental organization or church |
| At work                                                 |
| Other specify ....                                      |

**What tests were performed?**

|                          |
|--------------------------|
| Multiple Response; PROBE |
| Chest-X-ray              |
| Sputum Smear Microscopy  |
| Blood Test               |
| Skin Test                |
| Other Specify .....      |

**Did your partner also get tested at the same time?**

|     |
|-----|
| Yes |
| No  |

**Would you encourage your partner to go for the same test?**

|     |
|-----|
| Yes |
| No  |

**Where do you usually go if you are sick, or to treat a general health problem?**

|                                                        |
|--------------------------------------------------------|
| Private clinic                                         |
| Government clinic or hospital                          |
| Traditional or homeopathic healer                      |
| Clinic run by a nongovernmental organization or church |
| School Clinic                                          |
| Other specify ....                                     |

**What worries you the most when you think about TB?**

|                                          |
|------------------------------------------|
| Likelihood of being HIV positive         |
| Likelihood of contracting the disease    |
| Not being able to get treatment          |
| TB may decrease you chance of employment |
| Other specify....                        |