FACTORs THAT CONTRIBUTED TO CONTRACTION OF TUBERCULOSIS AMONG
THE NEWLY DIAGNOSED TUBERCULOSIS PATIENTS IN KATUTURA
TUBERCULOSIS STATE HOSPITAL

by

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SUPERVISOR: DR TG LUMADI

NOVEMBER 2016
DECLARATION

I declare that FACTORS THAT CONTRIBUTED TO CONTRACTION OF TUBERCULOSIS AMONG THE NEWLY DIAGNOSED TUBERCULOSIS PATIENTS IN KATUTURA TUBERCULOSIS STATE HOSPITAL is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references and that this work has not been submitted before for any other degree at any other institution.

............................................ ............................................
SIGNATURE                     DATE
Kopano Robert               30 November 2016
FACTORS THAT CONTRIBUTED TO CONTRACTION OF TUBERCULOSIS AMONG THE NEWLY DIAGNOSED TUBERCULOSIS PATIENTS IN KATUTURA TUBERCULOSIS STATE HOSPITAL

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ABSTRACT

The purpose of this study was to explore the factors that contributed to the contraction of Tuberculosis (TB) amongst the patients who were newly diagnosed with TB at Katutura TB state hospital Windhoek, Namibia. Quantitative, descriptive research was conducted to explore the factors that contributed to contraction of TB among the newly diagnosed patients. Data was collected using questionnaires from 8th June 2016 to the 8th September 2016. The respondents were the newly diagnosed TB patients (n=40) admitted at Katutura TB state hospital. The findings revealed that there is a change in gender infection rate, men are now on the forefront, comprising 57.5% (n=23) of the sample surveyed. Furthermore, some other factors emerged on the study like TB stigma, poor nutrition, and lack of education. However, some factors are very controversial such as accommodation and sanitation as they need to be explored more to see their influence on TB infection rate.

Key concepts

Contraction; diagnose; factors; patients; newly diagnosed; Tuberculosis.
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Dedication

I dedicate this work to God the author of all wisdom and power.

He made me who I am when no one believed in me.
# TABLE OF CONTENTS

CHAPTER 1 ........................................................................................................................................... 1
ORIENTATION TO THE STUDY ........................................................................................................... 1
1.1 INTRODUCTION .......................................................................................................................... 1
1.2 BACKGROUND TO THE PROBLEM ............................................................................................ 2
1.3 GEOGRAPHICAL AREA ............................................................................................................... 3
1.4 HEALTH CARE SYSTEM IN NAMIBIA ...................................................................................... 3
1.5 RATIONAL OF THE STUDY ...................................................................................................... 4
1.6 STATEMENT OF THE PROBLEM .............................................................................................. 4
1.7 AIM OF THE STUDY ..................................................................................................................... 5
1.7.1 Research objectives .............................................................................................................. 5
1.8 SIGNIFICANCE OF THE STUDY ............................................................................................... 5
1.9 RESEARCH DESIGN AND METHODOLOGY ........................................................................... 6
1.9.1 Research design ............................................................................................................... 6
1.9.2 Population ......................................................................................................................... 6
1.9.3 Sample and sampling ....................................................................................................... 6
1.9.4 Data collection instrument ............................................................................................... 7
1.9.5 Data analysis .................................................................................................................... 7
1.10 VALIDITY AND RELIABILITY .................................................................................................. 7
1.10.1 Validity ............................................................................................................................ 7
1.10.2 Reliability ......................................................................................................................... 8
1.11 ETHICAL CONSIDERATIONS ................................................................................................... 8
1.12 DEFINITIONS OF KEY CONCEPTS ......................................................................................... 8
1.13 SCOPE AND LIMITATIONS OF THE STUDY ....................................................................... 9
1.14 OUTLINE OF THE STUDY ....................................................................................................... 10
1.15 CONCLUSION ........................................................................................................................... 10
CHAPTER 2 ........................................................................................................................................... 11
LITERATURE REVIEW ....................................................................................................................... 11
2.1 Introduction ............................................................................................................................... 11
2.2 Health professionals and their stance on TB .............................................................................. 11
2.3 factors that contribute to the contraction of TB ........................................................................ 13
2.3.1 Infection ............................................................................................................................ 13
2.3.2 Neighbourhood characteristics ......................................................................................... 14
2.3.3 Poverty .............................................................................................................................. 14
2.3.4 Overcrowding ................................................................................................................... 16
2.3.5 Unemployment .................................................................................................................... 17
2.3.6 Education and TB .............................................................................................................. 18
2.3.7 Tuberculosis and stigma .................................................................................................... 19
RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION ................................................................................................................. 28
3.2 STUDY DESIGN ..................................................................................................................... 28
3.2.1 Quantitative research ........................................................................................................ 29
3.4 STUDY POPULATION and sampling ..................................................................................... 29
3.4.1 Inclusion criteria ................................................................................................................. 30
3.4.2 Exclusion criteria ................................................................................................................ 30
3.5 RESEARCH SETTING ............................................................................................................ 30
3.6 RESEARCH INSTRUMENT ................................................................................................... 30
3.6.1 Data collection .................................................................................................................. 31
3.7 DATA ANALYSIS ................................................................................................................ 31
3.8 VALIDITY AND RELIABILITY ............................................................................................. 32
3.8.1 Validity of research instrument ....................................................................................... 32
3.8.2 Content validity................................................................. 32
3.8.3 Construct validity of the instrument...................................... 32
3.8.4 Face validity ........................................................................ 33
3.8.5 Reliability of research instrument ........................................ 33
3.9 ETHICAL CONSIDERATIONS .............................................. 33
3.9.1 Protecting the rights of the institutions .................................. 34
3.9.2 Right to self-determination .................................................. 34
3.9.3 Right to privacy .................................................................... 34
3.9.4 Right to anonymity and confidentiality ................................. 34
3.9.5 Right to fair treatment........................................................... 35
3.9.7 Scientific integrity on the part of the researcher..................... 36
3.10 CONCLUSION..................................................................... 36

CHAPTER 4 .................................................................................. 37

ANALYSIS, PRESENTATION AND DESCRIPTION OF THE RESEARCH FINDINGS ........ 37

4.1 INTRODUCTION................................................................... 37
4.2 DATA MANAGEMENT AND ANALYSIS ...................................... 37
4.3 RESEARCH FINDINGS ............................................................ 38
4.3.1 Sample characteristics ........................................................ 38
4.3.1.1 Respondents’ gender ...................................................... 38
4.3.1.2 Respondents’ age distribution ........................................ 38
4.3.1.3 Discussion of the respondents’ demographic information .................. 39
4.3.2 Socio-economic status ......................................................... 39
4.3.2.1 Respondents’ level of education ..................................... 40
4.3.2.2 Respondents’ employment status .................................... 40
4.3.2.3 Respondents’ monthly income ....................................... 41
4.3.2.5 Discussion of the respondents’ socio economic status .............. 41
4.3.3 Respondents’ composition of household .............................. 42
4.3.3.1 Respondents’ type of settlement ..................................... 43
4.3.3.2 Respondents’ type of housing ......................................... 43
4.3.3.3 Respondents’ types of toilets .......................................... 43
4.3.3.4 Respondents’ living status with family members and number of people per room .. 44
4.3.3.5 Respondents’ types of food consumption ............................ 44
4.3.3.6 Respondents’ number of meals per day and food affordability per month .... 45
4.3.3.7 Discussion of the composition of household ......................... 45
4.3.4 Respondents’ environmental status ...................................... 46
4.3.4.1 Respondents’ dwelling proximity to an industrial site ............. 46
4.3.4.2 Respondents’ dwelling industrial site proximity to smoke excretion area ....... 46
4.3.4.3 Respondents’ dwelling proximity to places that sell alcohol and cigarettes ...... 47
CONCLUSIONS AND RECOMMENDATIONS ................................................................. 59

5.1 INTRODUCTION ......................................................................................... 59
5.2 RESEARCH DESIGN AND METHOD ......................................................... 59
5.3 SUMMARY AND INTERPRETATION OF THE RESEARCH FINDINGS ........ 60
5.3.1 Demographic information ................................................................. 60
5.3.2 Socio economic status ...................................................................... 60
5.3.3 Composition of household ............................................................... 61
5.3.4 Environmental status ....................................................................... 61
5.3.5 Knowledge of TB ............................................................................... 62
5.3.6 Social habits ..................................................................................... 62
5.3.7 Tuberculosis and stigma ................................................................. 62
5.4 CONCLUSIONS ...................................................................................... 63
5.4.1 To describe the factors that contributed to TB infection amongst patients newly diagnosed with TB at Katutura TB State Hospital .......................................................... 64
5.4.2 To assess the knowledge of respondents regarding TB, its causes and its prevention measures amongst patients newly diagnosed with TB at Katutura TB State Hospital .................................................................................. 65

5.5 RECOMMENDATIONS ........................................................................................................ 65
5.5.1 Intersectional collaboration in TB management .......................................................... 65
5.5.2 Outreach services ........................................................................................................ 65
5.5.3 Community leaders’ involvement ............................................................................. 66
5.5.4 Recommendation for future research ..................................................................... 66

5.6 CONTRIBUTIONS OF THE STUDY ............................................................................ 66
5.7 LIMITATIONS OF THE STUDY ................................................................................... 66
5.8 CONCLUDING REMARKS .......................................................................................... 67

REFERENCES ..................................................................................................................... 68

ANNEXURES ...................................................................................................................... 77

ANNEXURE 1: ETHICAL CLEARANCE CERTIFICATE ......................................................... 78
ANNEXURE 2: REQUESTING PERMISSION TO CONDUCT THE STUDY ......................... 79
ANNEXURE 3: PERMISSION GRANTED FROM MINISTRY OF HEALTH AND SOCIAL SERVICES TO CONDUCT THE RESEARCH STUDY ........................................................................................................ 81
ANNEXURE 4: PERMISSION GRANTED FROM INTERMEDIATE HOSPITAL, KATUTURA, MINISTRY OF HEALTH AND SOCIAL SERVICES, WINDHOEK CONDUCT THE RESEARCH STUDY ........................................................................................................ 83
ANNEXURE 5: RESPONDENT CONSENT FORM ............................................................. 84
ANNEXURE 6: QUESTIONNAIRE ...................................................................................... 86
ANNEXURE 7: STATISTICIAN REVIEW LETTER ............................................................... 92
ANNEXURE 8: ENGLISH LANGUAGE EDITING LETTER ..................................................... 93


## LIST OF TABLES

| Table 4.1 | Respondents' age distribution (N=40) | 39 |
| Table 4.2 | Respondents' level of education (N=40) | 40 |
| Table 4.3 | Respondents' employment status (N=40) | 40 |
| Table 4.4 | Respondents' monthly income ranges (N=40) | 41 |
| Table 4.5 | Respondents' types of toilets (N=40) | 44 |
| Table 4.6 | Respondents' types of food consumption (N=40) | 44 |
| Table 4.7 | Respondents' first source of information about TB (N=40) | 49 |
| Table 4.8 | Respondents' responses on the causes of TB (N=40) | 50 |
| Table 4.9 | Respondents' respondents on the ways of TB contraction (N=40) | 51 |
| Table 4.10 | Respondents' responses on the prevention measures against TB (N=40) | 51 |
| Table 4.11 | Respondents' responses of alcohol consumption status, frequency and type (N=8) | 53 |
| Table 4.12 | Respondents' responses on the perception of the society towards TB (N=40) | 55 |
| Table 4.13 | Respondents' reasons towards being ashamed of TB or not (N=39) | 57 |
LIST OF FIGURES

Figure 1.1  Driving force, pressure, and state, exposure, effect and action model .......... for unemployment and health .............................................................. 18
Figure 4.1  Respondents’ type of settlement (N=40) ......................................................... 43
Figure 4.2  Respondents’ dwelling proximity to alcohol and cigarettes outlets (N=40) .... 47
**LIST OF ABBREVIATIONS**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIDS</td>
<td>Acquired Immune Deficiency Syndrome</td>
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<tr>
<td>CNR</td>
<td>Case notification rate</td>
</tr>
<tr>
<td>DOTS</td>
<td>Direct observed treatment strategy</td>
</tr>
<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
</tr>
<tr>
<td>MDGs</td>
<td>Millennium development goals</td>
</tr>
<tr>
<td>MDR-TB</td>
<td>Multi drug resistant tuberculosis</td>
</tr>
<tr>
<td>MoHSS</td>
<td>Ministry of Health and Social Services</td>
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<tr>
<td>SDG</td>
<td>Sustainable development goals</td>
</tr>
<tr>
<td>SES</td>
<td>Socio economic status</td>
</tr>
<tr>
<td>SPSS</td>
<td>Statistical Package for Social Sciences</td>
</tr>
<tr>
<td>TB</td>
<td>Tuberculosis</td>
</tr>
<tr>
<td>TBL-MTP</td>
<td>Tuberculosis and Leprosy Medium Term Plan</td>
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CHAPTER 1

ORIENTATION TO THE STUDY

1.1 INTRODUCTION

Tuberculosis (TB) is an infectious disease caused by the bacillus Mycobacterium tuberculosis (National Department of Health 2014:8). It typically affects the lungs (pulmonary TB) but can affect other organs as well (extra pulmonary TB). The disease is spread in the air when people who are sick with pulmonary TB expel bacteria, for example by coughing. Overall, a relatively small proportion (5–15%) of the estimated 2–3 billion people infected with Mycobacterium tuberculosis will develop TB disease during their lifetime. However, the probability of TB is much higher among people infected with HIV (WHO 2015:4; WHO 2014:1).

TB has been identified as one of the leading causes of death, which remains a major public health burden in many developing countries of which the Republic of Namibia cannot be excluded. A quantitative and descriptive study was conducted to explore the factors that contributed to the contraction of TB among newly diagnosed TB patients hospitalised at Katutura TB State Hospital, which is an intermediate hospital in the capital city of Namibia-Windhoek.

It is estimated that one third of the world’s population is infected by the bacterium that causes TB, and that two million people die of TB each year. Namibia has a serious TB epidemic as shown by high TB case notification rates (CNR) of new smear-positive cases reaching high levels of 260/100,000 population in 2005 and as of 2012 at 206/100,000. Despite a continued downward trend in case notification rates, Namibia is still among the countries with a very high per capita TB burden (MoHSS 2012:3). The African Region had 28% of the world’s cases, but the most severe burden is relative to population (281 incident cases per 100 000 population on average, more than double the global average of 133) (WHO 2015:2).
1.2 BACKGROUND TO THE PROBLEM

Tuberculosis is a major global health problem. Globally, the absolute number of TB cases is increasing slowly, although the number of cases per capita (usually expressed as the number of cases per 100,000 population) is falling by around 1% per year. TB ranks as the eighth leading cause of death in low- and middle-income countries (seventh for men and ninth for women); among adults aged 15–59, it ranks as the third cause of death, after HIV/AIDS and ischemic heart disease. Each year, there are around 9 million new cases of TB, and close to 2 million people die from the disease. All countries are affected, but 85% of the cases occur in Africa and Asia. Africa alone accounts 30% and Asia 55%, with India and China alone accounting for 35% of all cases for Asia (Andre, Pereira & Antunes 2012:1; Sizemre, Schleif, Berstein & Heilman, 2012:20).

Namibia has been listed as one of the countries with the highest case notification rates (MoHSS 2012:1). The country reported 9 882 cases of all forms of TB of which 8 972 being relapse and new cases of TB in 2014 which translated to a CNR of 442 cases per 100 000 population. This indicates a significant decline in case notifications over the past 10 years. TB case notification rate vary across the 14 regions of Namibia. The highest disease burden is reported in Khomas region where the study was conducted. Khomas region reported 1 417 cases in 2014, which shows a significant decrease from the 2013 cases (MoHSS 2012:33).

The year 2015 was a watershed moment in the battle against TB. It marked the deadline for global TB targets set in the context of the Millennium Development Goals (MDGs), and it was a year of transitions: from the MDGs to a new era of Sustainable Development Goals (SDGs), and from the Stop TB Strategy to the End TB Strategy (WHO 2015:1).

Namibia has made gains in the implementation of the Direct Observed Treatment Strategy (DOTS) and Leprosy Medium Term Programme. Turn Around Times (TAT) for all 34 district hospitals providing TB direct microscopy services were reduced to 48 hours (MoHSS 2012:8; National Department of Health 2014:6).
1.3 GEOGRAPHICAL AREA

This study was conducted at Katutura TB State Hospital located in the capital city of Namibia, Windhoek in Khomas Region. The setting was chosen because it is the highest referral hospital facility admitting TB patients in the entire country. Windhoek has a population of 325,858 according to the 2011 population census (Namibia Population and Housing Census 2013:23). Specifically, the state hospital is situated in Katutura, a location in Windhoek with a population of 199,816 housed in an area of 261 sq.km with a population density of 765.58 per sq.km (Namibia Population and Housing Census 2013:23).

According to Polit and Beck (2012:273), research population is described as the entire aggregation of cases of which the researcher is interested in. Therefore, the population for the study was all the patients admitted in Katutura TB State Hospital who were newly diagnosed with TB. The inclusion and exclusion criteria shall be explained further in Chapter 3.

1.4 HEALTH CARE SYSTEM IN NAMIBIA

Management of TB is done at four different levels in Namibia, which are National level, regional level, district level and community level (MoHSS 2012:2). The national level is responsible for overall coordinating, implementation, monitoring and evaluation of TB control under the Directorate of Special Programmes (DSP) headed by a director. DSP consist of two sub-divisions headed by the deputy director. The regional level is responsible for the coordination of TB control at regional level, as well as supporting and overseeing TB control activities at district level led by a Regional Management Team (RMT). Through the regional level, medical doctors are responsible for diagnosis of TB; provide leadership to the clinical team in case management as well as providing support to the District TB and Leprosy Coordinator (DTLC). The third level of TB management is done at district level through the District Coordinating Committee (DCC). The DCC is responsible for the overall health planning, coordination, management and implementation of TB control activities in both the public and private sectors overseen by the principal medical officer (PMO) with the support of the Primary Health Care (PHC) supervisors and the District supervisor and the District TB and
Leprosy Coordinator. The last level of management is done under community level through identification and referring of symptomatic patients in the communities.

The private health sector is also involved in the management of TB in Namibia through TB case notifications and management of TB patients at various levels. The private sector has a reporting system of all TB cases to the Ministry of Health and Social Services. After commencement of TB treatment, the patients are managed privately or referred to the State facilities for further management of TB, in Windhoek the patients are referred to Katutura TB State Hospital. However, there is a need to strengthen public-private collaboration in diagnosis, treatment and notifications of TB (MoHSS 2012:4).

1.5 RATIONAL OF THE STUDY

The study sought to examine the risk factors that contributed to the contraction of TB among newly diagnosed TB patients in Katutura TB state hospital.

1.6 STATEMENT OF THE PROBLEM

A problem statement articulates the problem to be addressed and indicates the need for a study (Polit & Beck 2007:65). Mosley (2008:4) describes a problem statement as “a statement that identifies the key research variables, specifies the nature of the population and suggests the possibility of empirical testing”. Despite the implementation of TB prevention strategies by the government to address the TB infection, increased numbers of new TB infections in Katutura TB State Hospital Windhoek, Namibia are reported. Studies have explored several factors that predispose patients to TB infection. These factors include conditions that allow TB infections to take place, poor living conditions associated with poverty and neighbourhoods, lack of education, stigma attached to TB disease as well as HIV and AIDS. Therefore, a study was conducted to examine whether these factors apply to newly diagnosed TB patients in Katutura TB State Hospital Windhoek, Namibia.

According to the case notification rate (CNR) figure as of 2012, Namibia’s CNR is 206, which is above the global CNR average that is 133 as of 2015; hence, the country is

### 1.7 AIM OF THE STUDY

The aim of this study was to determine the factors that contributed to the contraction of TB amongst patients who were newly diagnosed with TB at Katutura TB State Hospital.

#### 1.7.1 Research objectives

The research objectives of the study are to

- describe the factors that contributed to TB infection amongst patients newly diagnosed with TB at Katutura TB State Hospital Windhoek, Namibia
- assess the knowledge regarding TB; its causes as well as its prevention measures amongst patients newly diagnosed with TB at Katutura TB State Hospital Windhoek, Namibia

### 1.8 SIGNIFICANCE OF THE STUDY

This study explored the factors that contribute to the contraction of TB amongst patients who were newly diagnosed with TB at Katutura TB State hospital in Windhoek, Namibia. The study of the reticulated links between risk factors and an infectious disease such as TB is hoped to establish the precise mechanisms by which these diseases come to have their effects in some bodies but not in others. What are the negative effects that social inequalities per se contribute to TB spreading in one community and not in another community? Such queries are important studies that examine the conjoint influence of these social forces and how such social forces have sculpted not only the distribution of TB, but also the course of disease in those affected by them. This will raise awareness on the patients on the risk factors of TB therefore, prevent TB relapse.

After completion of this study, the results will sensitise the community on TB signs and symptoms as well as the risk factors, which will promote TB case finding and reporting to curb TB infection in return. Furthermore, the findings will have potential impact in the prevention of the rise of new TB cases through the identification of risk factors and allow
officials in the Ministry of Health to use these identified risk factors as potential threat signs. New TB control policies and strategies will be developed and adopted. The results of this study will contribute to the scientific body of knowledge in the nursing profession and cultivate the need for further research on TB.

1.9 RESEARCH DESIGN AND METHODOLOGY

1.9.1 Research design

Polit and Beck (2007:49) define the study design as the overall plan for obtaining answers to the questions being studied and for handling some of the difficulties encountered during the research process. A research design is “an overall plan for collecting and analysing data, including specifications for enhancing the internal and external validity of the study” (Owen, Wang, Thompson, Heppner & Wampold 2015:115). A quantitative and descriptive study design was employed for this study. The study identified newly diagnosed TB patients and compared their risk factors on socio-demographic variables (risk factors).

1.9.2 Population

Population is “an aggregate of people or objects with common characteristics of interest to the researcher” (Bowling 2014:200). The population of the study were all TB patients confirmed to be newly diagnosed with a new case of TB in Katutura State Hospital Windhoek, Namibia from the 8th June 2016 to 8th September 2016.

1.9.3 Sample and sampling

A sample is a subset of a population selected to participate in a study. Sampling is the process of selecting a portion of the population to represent the entire population. The selected elements are then referred to as the sample (Bowling 2014:455). The criterion used was to include newly diagnosed patients in the study and to exclude other patients with any other form of TB from the study. As the number of new cases makes up less than 40% of all TB cases compared to over 60% for other forms of TB, a sample is deemed too small as past intake data from the past three quarters has indicated that less than 40 cases were registered. Hence, a population study was feasible.
A consecutive sampling technique method was use to select new cases of TB in the Katutura State Hospital, Windhoek, Namibia from the 8th June 2016 to 8th September 2016 to be included in the study. After, consecutive sampling was done; all the patients within the population of interest were included in the study, which made it possible to get deeper insight into the factors contributing to TB infection. With such wide coverage of the population of interest, there was also a reduced risk of missing potential insight from respondents, had any other form of sampling be employed in this study. Although this is a type of non-probability sampling, the use of consecutive sampling technique made it possible to make analytical generalisations about the population being studied.

1.9.4 Data collection instrument

The data was collected using a questionnaire that was formulated using information from literature review and previous studies. It consisted of seven sections, which are demographic information, socio-economic status, composition of household, environmental status, knowledge of TB, social habits and stigma and TB.

1.9.5 Data analysis

A quantitative research design was employed; therefore, both descriptive and analytic statistical methods were applied. The data was coded and entered in to Statistical Package for Social Sciences (SPSS), version 17.0. The entered data was analysed with all associated statistical elements in mind for inferential statistics. Tables, graphs, charts, and percentages were used for descriptive statistics.

1.10 VALIDITY AND RELIABILITY

1.10.1 Validity

To maintain the validity of the study, conceptual and operational definitions of terms were used according to the objective of the study. Patients that met eligibility and inclusion criteria based on laboratory confirmed diagnosis with two TB sputum smear positive were included.
1.10.2 Reliability

To maintain the reliability of the study, pre-testing of the research instrument and consulting experts in the field was done. Only the researcher was responsible for cleaning abstracted data and by so doing increased the chances of consistency in data collection.

1.11 ETHICAL CONSIDERATIONS

The goal of ethics in research is to ensure that no one is harmed or suffers adverse consequences from research activities. The ethical concerns are discussed fully in Chapter 3.

1.12 DEFINITIONS OF KEY CONCEPTS

**Contraction** refers to acquiring of illness. In this study, it will mean acquire TB (Longman Dictionary of Contemporary English 2010:297). For this study, contraction of TB shall refer to the process of inhaling the TB mycobacteria that progress to cause TB.

**Factors** refer to the things that influence or cause a situation. In this study factors refers to the causes of TB contraction (Narasimhan, Wood, MacIntyr & Mathai 2012:03).

**Patients** refer to the people receiving medical care. In this study patient refers to people newly diagnosed with TB in the Katutura State TB hospital (Sovran, 2013:10).

**Tuberculosis** refers to a mycobacterial disease that infects any part of the body, especially the lungs. It is characterised by the formation of tubercles in any tissue or organ (Van der Berg & Viljoen 2005:266). In this study, TB refers to Pulmonary TB.

**Case notification rate (CNR)** refers to the number of new and relapse disease cases notified in a given year, per 100 000 population (WHO 2013:30). In this study CNR refers to the number of new and relapse TB cases notified in a given year, per 100 000 population.
**Incidence** refers to the number of new and relapse cases of a disease in a specified time period (Joubert & Ehrlich 2012:19). In this Study, incidence refers to the number of new and relapse cases of TB in a specified time.

**Newly diagnosed** refers to new patients who have been found with an illness or problem through medical examination for the first time (Moualeu, Bowong, Tewa & Emvudu 2012: 61). In this study, newly diagnosed refers to patients who are found with TB for the first time.

**Prevalence** refers to the number of cases of a disease in a population at a given point in time (sometimes referred to as "point prevalence"). It is expressed as the number of cases per 100 000 (Joubert & Ehrlich 2012:23). In this study, prevalence refers to the number of cases of TB in a population at a given point in time expressed as the number of cases per 100 000.

**Smear-positive pulmonary case** refers to a patient with one or more initial sputum smear examinations (Direct smear microscopy) AFB positive (Oxlade & Murray 2012:05). In this study, smear-positive pulmonary case refers to a patient with one or more initial TB sputum smear examinations (Direct smear microscopy) AFB positive.

**Extra- Pulmonary TB** refers to a case of TB involving organs other than the lungs, for example pleura, lymph nodes, abdomen, genitourinary tract, skin, joints and bones among others (Aziza, Sanae, Hatim, & Bourkadi 2015:9).

**Socio economic status (SES)** Socioeconomic status means an individual has or group is position within a hierarchical social structure. Social economic status depends on a combination of variables, including occupation, education, income, wealth and place of residence (Commers 2013:172).

### 1.13 SCOPE AND LIMITATIONS OF THE STUDY

The study was limited by its design, which involved only one hospital in focus as this has a potential to conceal risk factors not associated with the Khomas Region of Namibia limiting the generalisability of the study findings on a national level.
1.14 OUTLINE OF THE STUDY

This study has five (5) chapters.

Chapter 1 introduces the study and briefly outlines the problem, purpose and significance of the study, research design and methodology, and ethical considerations.

Chapter 2 describes the literature that was reviewed for the study.

Chapter 3 discusses the research design and methodology.

Chapter 4 presents the analysis and discussion of the research findings.

Chapter 5 concludes the research project with a discussion of the limitations, conclusions and recommendations for further studies.

1.15 CONCLUSION

This chapter described the background to the problem, the purpose and significance of the study, the research design and methodology, as well as ethical considerations, and defined key terms. Chapter 2 discusses the literature review that was conducted for the study.
CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

A literature review is undertaken to assist researchers to comprehend and extend their knowledge of the phenomenon under study (Polit & Beck 2008:105). Volmink (2007:66) states that a literature review is indispensable if one wants to know (1) the current state of knowledge about any given subject, (2) what still needs to be studied so that the direction of future research can be efficiently determined, and (3) how available resources should be optimally allocated and distributed. This chapter discusses literature review conducted on risk factors for TB in Windhoek Namibia.

2.2 HEALTH PROFESSIONALS AND THEIR STANCE ON TB

Health professionals in the TB field have been more likely to refer to social factors and less likely to make immodest claims of causality about them than are behavioural scientists who study diseases (Walker & Stevens 2003:351). Furthermore, a heightened sensitivity to other common factors and terms shows that certain aspects of disease emergence are brought into relief while others are obscured.

During the second decade of the 20th century, TB declined but the stance remains from health professionals that TB’s decline in Namibia was due only in small part to measures aimed directly against it, but more to economic development that has reduced risk factors (MoHSS 2012:12). These risk factors include poverty and social inequalities, which led increasingly to differential morbidity with the development of improved housing, land drainage, sewage systems etc. all well beyond the reach of those most at risk for TB in the 1990s. Tuberculosis predominantly affects the poor, which are the groups at risk for these diseases are often bounded more by socioeconomic status than by location (MoHSS 2012:12; Kaulagekar & Radkar 2015:17).
Writings from health professionals in Africa on TB have often reminded donors that “the health of the individual is best ensured by maintaining or improving the health of the entire community”, but to go on to ask, what constitutes “the entire community”? The answer might be “part of a city” such as Katutura which is home to 199,816 people and a population density of 765.58 sq.km (MoHSS 2015:16). Despite the progress made after the implementation of the first medium-term plan for tuberculosis and leprosy control 2004-2009 (MoHSS 2004) and second medium-term plan for tuberculosis and leprosy control 2010-2015 ((MoHSS 2010), TB remains a communicable disease of major public health concern in Namibia. In addition to its direct impact to morbidity and mortality, TB also has a negative socio–economic impact on the individuals, families and society since it primarily affects the economically productive age groups.

Tuberculosis has been described as a major global public health problem and was declared a global public health emergency in 1993 (WHO 2012:3; MoHSS 2013:1; Raviglione, Marais, Floyd, Lonroth, Getahun, Migliori, Harries, Nunn, Lienhardt, Graham, Chakaya, Weyer, Cole, Kaufman & Zumla 2012:1902). The World Health Organization states that one third of the world population carries the TB bacteria. However, approximately 10% of the infected individuals progress to latent TB infection to disease status (WHO 2011:33; Young, Redon, Rosas-Taraco, Baker, Healy, Gross, Long & Hunley 2014:1). Most first world countries have reached low levels in the TB rates and the incidence rates are decreasing worldwide. However, the number of new cases has doubled over the past ten years in some metropolitan areas such as the United Kingdom (WHO 2011:33). In 2010, an estimated 8.8 million TB incidence cases were reported with 1.4 million lives claimed death by TB. A decline was reported in 2012 when an estimated 8.6 million people developed TB and 1.3 million died due to TB (WHO 2011:45; Chirwa, Christofides, Cingini, Ozumba, Sikwese, Banda, Banda, Chimbali, Ngwira, Munthali & Nyasulu 2015:1).

According to Raviglone et al (2012:1), the latest estimates shows that the global TB incidences have been decreasing by 1.3% per year since 2002 and the absolute number of incident cases has fallen since 2006 in all WHO regions. Furthermore, deaths from TB diseases have fallen by 40% globally since 1990, which was an achievement of 50% reduction target by 2015. Even though the TB incidence rates are falling, the target of halving 1990 rates by 2015 is unlikely to be achieved, except of course in America and in the Western Pacific regions (Raviglone et al 2012:1).
Most of the TB cases that were reported are from the South-East Asia (29%), followed by Africa (27%) and the Western Pacific (19%) regions (WHO 2013:1). However, TB incidence rates are high in Southern Africa with 1000 cases per 100 000 persons in the country such as South Africa and Swaziland. TB infections in the Sub-Saharan Africa mostly occur in the economically productive age groups, which ranges from 15-49 years. Malawi reported 20 000 new and relapse TB cases in 2011 (Chizimba, Christofides, Chirwa, Singini, Ozumba, Sikwese, Banda, Banda, Chimbali, Ngwira, Munthali & Nyasulu 2015:2).

The Republic of Namibia reported 13 332 cases of all forms of TB in 2009 which translated into a case notification rate of 634 cases per 100 000 population. In 2010 Namibia reported one of the highest TB cases in the world that is 12 625 which is equivalent to case notification rate of 589/ 100 000 population (MoHSS 2012:3). Furthermore, an average of 1 200 people have died of TB each year from 2004. The burden of TB in Namibia varies according to the regions, with Khomas, where Katutura TB State Hospital is located and Kavango being on the forefront (MoHSS 2012:1).

2.3 FACTORS THAT CONTRIBUTE TO THE CONTRACTION OF TB

Literature has indicated that there are numerous factors that contribute to the contraction of TB. These factors are discussed as follows:

2.3.1 Infection

It is critical to understand the journey of TB to draw a link with contributing variables. Leung and Chang (2008:66) and Raviglione et al (2012:1906) explain that mycobacterium tuberculosis is transmitted by small droplet nuclei through the air. It is imperative to understand that the possibility of exposure is determined and vary by the incidence of infectious cases and the duration of the infectiousness. Subsequently the changes of infection depend on the density of the infection agent in the air and how long an individual is exposed to it.
2.3.2 Neighbourhood characteristics

The review of literature highlights the relationship between high incidence of economic deprivation and incidence of tuberculosis infection. Large unemployment figures lead to little accommodation options and the individuals as well as families settle for the next available place to stay (Pang, Leung & Lee 2010:585; Walker & Steven 2003:361). Major housing problems have been identified in First Nations communities in Canada, and the results have shown that TB incidence is higher in communities that are located in isolated areas, and in communities with a higher average housing density (Young et al 2012:1; Leung & Chang 2008:66; De Fede, Steward, Harris, Mayfield-Smith 2008:1426).

It is further claimed that such neighbourhoods are normally densely populated with increased chances of TB infection (Young et al 2012:1; Leung & Chang 2008:66). People are living in large numbers in small spaces and according to Leung and Chang (2008:66), these are favourable conditions for the TB disease to spread in an alarming rate. Correspondingly, there is huge influx of people from across Namibia to the city of Windhoek, as it is perceived to be the Mecca of economic independence. The journey to the so called economic freedom can be endless and large numbers of the migrants usually end up living in the informal settlements and slums. Jackson, Sleigh, Chen, Shu, Hou, Xia, Xu, Bai, Nie, Cheng and Weigou Xu (2013:1) are of the opinion that the inhabitants of such locations are often living in extreme poverty.

2.3.3 Poverty

The relationship between poverty and health is well documented. Health professionals have established the powerful relationship of poverty and ill health that is attributed to poorly ventilated housing, overcrowding, insanitation and poor working conditions (Commers 2013:77) and (Khan 2006:39). With public health initiatives, the incidence of infectious diseases such as TB declined dramatically in the West even before cure for any of these diseases became available, which is the opposite case in developing countries such as Namibia (MoHSS and ICF International 2013:5). As TB CNR continues to rise despite public health initiatives such as the STOP TB campaign, hence, public health initiatives in isolation will not reduce the infection rates.
Tuberculosis mortality declined from 113 per 100,000 persons per year in 1920 to <10 per 100,000 persons per year in 1950’s before the introduction of Isoniazid and effective chemotherapy in the United States; this was attributed to improvements in housing, sanitation and general socio-economic status (SES) (Adler 2014:15). By the turn of the 20th century, the concept of SES-health gradient became established, that is the relative risk of mortality and morbidity from a particular disease increases at a relatively constant rate with decreasing SES across the entire SES-spectrum. In present studies, persons suffering from TB had increased odds for decreasing SES for all the studied SES-variables (education, income, crowding, and housing, type of water supply, toilet, and number of consumer articles per household) studied, on univariate analysis. In more recent times, TB continues to involve the groups, which are socioeconomically disadvantaged (Oxlade & Murray 2012:11).

Tuberculosis has been labelled as poverty disease (Keshavjee, Gelmanova, Pasecnikov, Mishustin, Andreev, Yedilbaye, Furi, Mukherjee, Rich, Nardell, Farmer, Kim & Shin 2008:3; Chen et al 2013:1). The authors indicate that Russia, although is an industrialised country, the uneducated, unemployed and marginalised groups such as those infected with HIV or others with disabilities are largely infected with TB. In addition to these, groups are less likely to find a job that would enable them to sustain themselves. The association between poverty and TB is well documented. Neighbourhood poverty is associated with an increased risk of TB in New York City, adjusting for several other risk factors in a multivariate Poisson Regression Model.23. The results of another study Barr, Diez-Roux, Knirsch, Pablos-Méndez (2001:1487) showed that increasing levels of income are associated with a reduced risk of TB in a community, and the combination of overcrowding and lower income levels may together increase risk of TB. Therefore, many people have to locate to the neighbourhoods of mercy where the risk of infection is almost inevitable (Barr et al 2001:1487).

In Burkina Faso, lack of financial income makes it difficult to visit health services, as these are sparsely located and often with long distances to reach while having to make serious calculated decisions on how to spend the meagre funds available. Hence travelling costs is a huge challenge (Sanou, Dembele, Theobald & Macq 2004:1481).
2.3.4 Overcrowding

Clark, Ribena and Nowgesic (2002:940) state that the effect of overcrowding on TB epidemiology and control can be expressed in terms of its impact on the basic reproductive rate. R0 is the average number of secondary infectious disease cases per infectious case. Hence, to reduce incidence of that disease and eventually achieve elimination, it is essential to bring R0 to R1 from year-to-year. Reducing the contact rate between infectious cases and other individuals generally has the effect on reducing R0, and contact rates decrease as socioeconomic conditions improve and overcrowding is prevented. The increased potential for contact due to overcrowding emphasises its relationship to crowded housing, lack of running water, and inadequate sewage disposal (Clark et al 2002:943).

However, overcrowding is largely influenced by the socioeconomic and the life style factors. Amongst these are agents such as a poverty, unemployment and lack or poor housing that could result in overcrowded populations. The lack of education is also perceived to be amongst the shaping factors to TB infection rates (Young et al 2014:1). Clark et al (2002:943) established that overcrowded-housing conditions can increase exposure of susceptible people to those with infectious respiratory disease, and in doing so may increase the probability of transmission. The association between overcrowded housing and TB incidence, paediatric TB, and TB mortality has long been recognised. Over-crowding increases the risk of disease transmission. Aerosol droplets containing tubercle bacilli are discharged into the atmosphere when an open case of tuberculosis coughs or sneezes. Fine droplet nuclei remain suspended in the air stream that reaches the alveolar space, thereby starting the infection (Clark et al 2002:943).

Overcrowding decrease the degree of air space that is shared, resulting in increased exposure to M. tuberculosis. Poor housing with its attendant poor ventilation (that prolongs contact with infectious droplet nuclei) and increased dampness (that promotes viability of tubercle bacillus) increase the risk of transmission and development of disease (Clark et al 2002:943).
2.3.5 Unemployment

Chan-Yeung, Yeh, Tam, Kam, Leung, Yew and Lam (2005:1323) and Winetsky, Almukhamedov, Pulatov, Vetznina, Dooronbekova and Zhussupov (2014:2) reported that there is a strong correlation between unemployment and tuberculosis case load, followed by the crowding index and number of shebeens per kilometre. As discussed previously, the large influx of the population to the capital city of Namibia, Windhoek, leads to a high rate of unemployment. Therefore, the vast majority of the population in Windhoek operates shebeens whereby almost every second house or shack sells alcohol. The consequences of unemployment are poor nutrition, and extreme poor living conditions that might directly lead to increased risk of TB infection.

The existence of a positive relationship between unemployment and negative health outcomes has been proven over time although each individual will experience unemployment differently (unemployment as seasonal or structural) caused by factors such as education level, age and societal support. Although health professionals are still debating on whether unemployment causes ill health or ill health causes unemployment, social models have established that both are the case as indicated in Figure 1.1.
2.3.6 Education and TB

The level of education attained by individuals influences their health behaviours, preventative service use and risk context. Although such links have been seen as non-detrimental, just by looking at demographic findings amongst TB patients, a link can be established that the lower the education level of an individual, the higher the chances of them contracting TB. Those with a higher level of education tend to have access to better healthcare and seek medical help early due to better understanding of symptoms.

Young et al (2014:1) state that there is a strong link between education and contraction of TB. In most cases, symptoms of TB are wrongly interpreted as signs of common cold, which makes patients delay to seek for medical attention. Another debilitating factor associated with the lack of education is the wrongly perceived link between HIV and TB.
as well as the generalised stigma (Sengupta, Pungrassami, Balthip, Strauss, Kasetjaroen, Chongsuvivatwong & Van Rie 2006:1010).

2.3.7 Tuberculosis and stigma

Due to the stigma attached to HIV and TB, African patients would rather seek for quick solutions from traditional healers to avoid being stigmatised (Sanou et al 2004:1481). A study conducted in Ghana by Dodor (2004:1337) found that patients are ashamed of having TB due to the way that the health professionals informed them about the disease. Furthermore, the study reveals that some respondents are rejected by family members due to the TB disease condition they have. This study also correlates with another study done by Afenyadu (2005:24) in Ghana.

2.4 STRATEGIES TO COMBAT TB

2.4.1 National Strategies to combat TB

The Ministry of Health and Social services in Namibia has developed strategies to combat the rising cases of TB. The following strategies are a result of various long-term strategies nationally and globally:

2.4.1.1 The National Tuberculosis and Leprosy Programme (NTLP)

The Ministry of Health and Social Services established a national programme for the control of TB in 1991. The activities of this programme are fully integrated as nurses and doctors who are responsible for the diagnosis and treatment of TB work together. Implementation of these activities is done in a much decentralised system at national, regional, district and community levels. The NTLP strategies are described below (MoHSS 2012:9).

2.4.1.1.1 Training

It is of vital importance to train health care workers as well as to induct newly recruited staff members on NTLP technical guidelines. Refresher workshops are also important to keep abreast with the standards of care (MoHSS 2012:9). Before starting the patient on
treatment, it is very important for the health workers to give the patient information about the diagnosis, treatment and its effectiveness, as this will enhance treatment adherence (MoHSS 2012:9). Furthermore, understanding of the disease is very important, as TB is a social disease that is transmitted through interaction as described by Gibson (2010:54). Therefore, one can conclude that training will help reduce TB infections.

2.4.1.1.2 Supervision

The main objective of supervision is to improve work performance through joint problem solving and positive reinforcement. It promotes maintenance of quality services and motivates workforce. This is only a successful strategy if the workers under supervision stay long enough in their workplace to implement the recommendations (MoHSS 2012:9). This strategy might not be so effective due to increased staff turnover caused by migration for greener pastures.

2.4.1.1.3 Advocacy, communication and social mobilisation (ACSM)

Advocacy refers to the process of ensuring that there are enough supply of financial and material resources for management and control of TB. Complementing advocacy is communication that attempts to promote behaviour change through change in knowledge, attitudes and practices amongst people towards TB. Furthermore, it is through communication that information is transmitted and conveyed to the public about TB and sensitise the public about available services. Finally, social mobilisation aims to bring together the stakeholders i.e. policy makers, private sector, government etcetera. Consequently, this promotes cohesion and participation leading to the success of TB programmes (MoHSS 2012:9). This is effective in Namibia because NGO’s and the government are in partnership in health and health related issues.

2.4.1.1.4 Planning

For the success of NTLP, it is of paramount importance for the staff members at all levels from district to national level to be abreast with programme activities. They must be in a position to make sound decision and allocate funds in an appropriate manner (MoHSS 2012:9). Success has been seen in most of the regions like Omaheke region that is at the forefront with disease surveillance.
2.4.1.1.5  **Collaboration and networking**

Team effort is needed for the success of treatment of TB and health promotion. Therefore, all governmental and non-governmental organisations should be encouraged to take part in TB programmes (MoHSS 2012:9).

2.4.1.1.6  **Operational research**

A scientific inquiry must be done to assess the need for specific programmes and then be used for evaluation of such programmes (MoHSS 2012:9). Many studies that were funded by private sector have been done and valid recommendations have been done in Namibia.

2.4.1.1.7  **Patient education and information**

Patients who understand their disease and its treatment are more likely to complete their treatment. Therefore, it is very important for the health care worker to take some time to discuss with the patient before starting them on TB treatment. This discussion should include the causes, signs and symptoms of TB as well as the prognosis of the disease and its treatment (MoHSS 2012:9).

2.4.1.2  **The Direct Observed Therapy (DOT) strategy**

This strategy was adopted from the World Health Organization. It is labelled as the most cost-effective public health approach to fight TB. Psychological support has been described to be crucial on taking medication. Therefore, under DOTS, the patient swallows tablets while a DOT supporter is observing them. A DOT supporter is the person who ensures that the patient takes medication as prescribed and goes for follow up treatment well on time, meaning this person takes co-responsibility for the treatment of the patient for the entire period to completion. It can be a health care worker, a friend, family member or any other person willing to take the responsibility (MoHSS 2012:7). This has been an effective strategy since patients cannot throw away tablets as it used to be the case.
2.4.1.3 The Stop TB strategy

According to MoHSS (2012:8) and Sizemore, Schleif, Bernstein and Heilman (2012:1), the Global Plan to Stop TB was launched at the World Economic Forum which was held in Switzerland. This plan is aiming at treating 50 million people for TB and enrolling 3 million patients on antiretroviral therapy who have both TB and HIV infection. The foundation of this strategy is laid on six elements, which will be discussed below as supported in (MoHSS 2012:8). The WHO devised an approach to care for TB patients and control TB which was launched in 2006 as “The Stop TB Strategy”. This strategy is aimed at achieving a universal access to high quality care for all people with TB; reduce human suffering and socio economic burden associated with TB; protect vulnerable populations from TB; TB/HIV and drug resistance TB; support development of new tools and enable their timely and effective use and lastly protect and promote human rights in TB prevention, care and control (MoHSS 2012:8). The WHO reported a treatment success of 85% (MoHSS 2012:3). The major elements of the Stop TB strategy are discussed.

2.4.1.3.1 Pursuing a high quality DOT expansion and enhancement

Pursuing high quality DOT expansion and enhancement entails securing a political commitment with adequate and sustained financing from governmental and non-governmental organisations in order to support TB control programmes. Furthermore, ensuring early detection of TB and diagnosis through quality assured bacteriology, which includes public health education on signs and symptoms of TB as well as procedural sputum collection and test at health care facilities. Enhancement of DOT will provide a standardised treatment with supervision and patient support maintained through the national TB treatment guidelines and DOT supporters. Treatment success will be ensured through an effective supply of medication and management to health facilities throughout the country to prevent treatment default due to lack of drugs at the health facilities. A continuous monitoring and evaluation of the performance and impact of the strategies will be done and recommendations will be made for improvements.
2.4.1.3.2 Address TB-HIV, MDR-TB and the needs of the poor and vulnerable populations

Scaling up the collaborative prevention and treatment activities of TB/HIV is important because these two conditions are considered as sister diseases according to (Sizemore 2012:1). These collaborative activities will curb treatment default on the treatment of TB/HIV thereby reducing multi drug resistant TB (African Health Sciences 2012:320). The needs of the poor and vulnerable populations should be addressed because TB is prevalent among these populations (Gibson 2010:54).

2.4.1.3.3 Contribute to the health system strengthening based on primary health care

This element entails helping to improve the national health policies on TB treatment and control, human resource development through training and workshops on new developments and technologies on TB diagnostic procedures. It covers financing TB directorate under the Ministry of Health and Social Services to ensure adequate supplies e.g. TB treatment decentralisation to the regions all over the country, service delivery accessibility to the communities within at least five kilometres radius from their residence and information dissemination on the causes of TB, signs & symptoms as well as TB prevention strategies.

Health care strengthening involves strengthening infection control in health care services through adherence to infection control policies, other congregate settings and household through health promotion on TB prevention training and workshops. Upgrading laboratory networks and implementing the practical approach to lung health (PAL) to facilitate fast TB diagnosis based on laboratory results. The health system should adapt successful approaches from other fields and sectors through inter-sectoral collaboration and foster action on the social determinants of health such as poverty.

2.4.1.3.4 Engage all care givers

All stakeholders in health care who are the public, volunteers from various organisations and communities, corporate and private health care providers should be engaged through Public-Private Mix (PPM) to promote inter-sectoral collaboration in TB care and
control. The use of International Standards of care must be promoted in all health care centres to promote successful treatment outcomes.

2.4.1.3.5 Empowering TB patients and communities

Patients and communities will be empowered through partnership, advocacy, communication and social mobilisation, which will promote their involvement in TB. Fostering the community participation in TB treatment may reduce stigma attached to TB (Senou et al 2004:1481). Empowerment will also be ensured by promoting the use of patient care charter in health care facilities for treatment of TB for the patients and communities to understand their rights and responsibilities on their TB treatment and control.

2.4.1.3.6 Enabling and promoting research

There should be a programme based research to evaluate the success and areas that need revision as well as introduction of new tools in practice. Advocacy and participation in research is vital to develop new diagnosis, medicines and vaccines.

2.4.1.4 Bacillus Calmette-Guerin (BCG) vaccine

Bacillus Calmette-Guerin vaccine is a live attenuated mycobacterium bovis. In Namibia, all new born babies are given BCG vaccine to protect them from getting TB as emphasised in Kumar and Sharma (2012:60). According to the WHO (2012:8), the MDG which targeted halting and reducing the incidence of TB, has been achieved as evidence of its effectiveness. This has been substantiated by global statistics, which indicate a drastic fall in TB incidents rates by 2.2% between the year 2010 and 2011 as well as fall in TB mortality rate by 41% since 1990. The MoHSS in Namibia is participating in this MDG by implementing the national strategies discussed above, although there is a challenge to achieve the MDG due to several factors that include TB co-infection with HIV/AIDS.
2.4.1.5 The WHO Global task force on TB impact measurement

This task force was adopted in 2006 with the mandate to assess and measure whether the reduction of the burden of TB is being reduced at country level, globally. There are three strategies of this task force discussed as follows:

- Strengthening surveillance data by applying the benchmark standards, inventory studies to measure TB under reporting as well as ensuring electronic recording and reporting of data (WHO 2012:21).
- Conducting TB prevalence rate globally.
- Periodic assessment of the method that are used to translate surveillance data to estimates of TB incidence, prevalence and mortality.

Namibia is participating in this strategy through TB surveillance and reporting. There is an annual publication on National TB and Leprosy Programme (MoHSS 2010: 5).

2.4.1.6 Financing TB care and control

It is the responsibility of the Global plan to stop TB by 2010-2015 to set the funding needed for the implementation of TB care and control in low to middle-income countries. About US$8 billion is required from 2013-2015 per year. Furthermore, in 2015 alone US$2 billion will be needed for the diagnosis and treatment of drug susceptible TB, another US$ 2 billion for the treatment of MDR TB and at least US$ 1 billion for the interventions for TB/HIV (WHO 2012:52). The department of TB special programmes under the Ministry of Health and Social Services benefits from the donors to support their programmes (WHO 2012:3).

2.4.2 New global TB control strategies

The World Health Organisation according to (WHO 2015:7) has developed a new strategy on the year 2015 adopted in 2016 not yet fully adopted in Namibia discussed as follows.
2.4.2.1 *The End TB Strategy (ETS)*

This strategy was formulated with a vision to create a world free of TB. That is a world where there are zero deaths, disease and suffering due to TB. The ETS is grounded in four principles discussed as follows:

- **Government stewardship and accountability, with monitoring and evaluation:** Countries are expected to take up ownership of this strategy through their different health care systems.
- **Strong coalition with civil society organisations and communities:** this strategy motivates for strong intersectional collaboration and community involvement on TB control and care.
- **Protection and promotion of human rights, ethics and equity:** that is equal opportunity should be given to all individuals for TB treatment and control including the marginalized communities.
- **Adaptation of the strategy and targets at country level, with global collaboration:** there should be integration of this strategy in the control strategies at country and global level in order to end TB.

With the above-discussed principles, there are three pillars and components for the ETS discussed as follows:

- **Integrated, patient-centered care and prevention:** aimed at early diagnosis of TB including universal drug-susceptibility testing and systematic screening of contacts and high-risk groups. It emphasise continuity of treatment all people with TB including drug resistant TB and patient support to ensure successful treatment outcome. Since TB/HIV have been described as sister diseases, there will be collaborative activities and management of this two conditions as well as other co-morbidities. This pillar emphasise preventive treatment of high risk persons and vaccination against TB.
- **Bold policies and supportive system:** this pillar motivates for political commitment with adequate resources allocation for TB care and prevention. The should be improved engagement of communities, civil society organisations and public and private care providers in TB prevention, treatment and control. A universal health
coverage policy for TB and regulatory frameworks for TB case notification is emphasised here, with vital registration, quality and rational use of medicines and infection control for TB. The society should be protected against TB, poverty should be alleviated as well as other determinants of TB.

- Intensified research and innovation: ETS motivates for discovery, development, and rapid uptake of new tools, interventions and strategies for TB prevention, care and control through scientific inquiry. There should be optimized research in implementation, impact and promotion of TB control.

2.5 CONCLUSION

Data on socio-economic risk factors for tuberculosis in Namibia is sparse. In this literature review, the impact of socioeconomic factors on TB was indicated as well as the existence of a SES-health gradient with respect to risk of tuberculosis. Successful implementation of tuberculosis control programmes in Namibia has likely led to a direct tangible economic and social benefit. Public health efforts focused on control of tuberculosis through treatment of patients. It is not surprising that cost-effective strategies such as DOT have emerged and largely have been successful, even within populations of lower SES such as Katutura TB State Hospital. However, the current predominantly treatment-based approach to tuberculosis control cannot be expected to lead to eradication of tuberculosis unless matching and forceful efforts in prevention through improvement in socio-economic status are also initiated. Chapter 3 describes the research design and methodology.
CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

This section covers the design of the study, how respondents in the study were selected, the setting where the study was conducted, the study population, inclusion and exclusion criteria, which was used during the study.

3.2 STUDY DESIGN

Research methodology is the approach or the design that is followed by a researcher to answer a particular research question. As described by Burns and Grove (2012:211), research methodology is the strategy that will be applied in a process that begins with the identification of the research problem and ends with plan of data collection. Polit and Beck (2007:49) define the study design as the overall plan for obtaining answers to the questions being studied and for handling some of the difficulties encountered during the research process.

A research design is a blueprint for conducting the study that maximises control over factors that could interfere with the validity of the findings (Burns & Grove 2012:195). A research design is a plan indicating how the study is going to be carried out. It is a plan guide for providing sound answers to a research questions. The study design guides what type of observations, and which measurement instrument will be adopted and when to conduct the data collection (Boswell & Cannon 2015:67). This research was conducted using a quantitative and descriptive research design. Data was collected using questionnaires that were designed to probe potential risk factors in patients while also in the same length eliminating non risk factors not contributing to TB.
3.2.1 Quantitative research

In quantitative research, evidence is gathered according to a specified plan, using formal instruments to collect the needed information (Creswell 2014:247). Quantitative research is defined as “a formal, objective, systematic process in which numerical data are utilised to obtain information about the world” (Cottrell & McKenzie 2012:193). Quantitative research was used in order to capture descriptive statistical data on factors that contributed to the infection of TB among the newly TB patients at the Katutura TB State Hospital Windhoek, Namibia. It also ensured capturing of a large amount of data without biasness. The study population was newly admitted TB patients at the Katutura TB State Hospital Windhoek, Namibia from 8th June 2016 to 8th of September 2016, their data was used to identify risk factors using inferential statistics.

3.4 STUDY POPULATION AND SAMPLING

A population is the collection of persons, objects or things that fulfil certain criteria set by the researcher for inclusion in the study where the researcher has a reasonable access (Burns & Grove 2012:352). Consecutive sampling technique involves recruiting all of the people from accessible population who meet the eligibility criteria over a specific time interval (Polit & Beck 2012:278). Furthermore, the entire population may possibly be chosen if the size of the population that has the particular set of characteristics that the researcher is interested in is very small (Burns & Grove 2012:352).

A consecutive sampling technique was employed for the patients who were newly diagnosed with TB patients hospitalised in the Katutura State Hospital Windhoek, Namibia over a period of three months, from the 8th June 2016 to 8th September 2016. In this study, the study population comprised of all newly diagnosed patients with a positive sputum smear or clinically diagnosed with TB based on the new 2015 TB guidelines confirmed by the Katutura TB State Hospital Windhoek, Namibia from the 8th June 2016 to 8th September 2016 meeting the following inclusion criteria:
3.4.1 Inclusion criteria

- All consenting patients with new TB sputum smear positive who were clinically diagnosed. This was to ensure ethical aspects on protection of the study respondents and to ensure selection of the respondents who meet the study criteria only.
- All TB patients admitted in the Katutura TB State Hospital Windhoek, Namibia from the 8th June 2016 to 8th September 2016 to ensure reliability of the data collection by collecting data over a period of three months.

3.4.2 Exclusion criteria

- Patients who were admitted for any form of TB that is recurring (MDR and XDR-TB) because the study was focused on newly diagnosed TB patients only.
- Patients that will be admitted after the 8th June 2016 to 8th September 2016 because data was to be collected over a period of three months.

3.5 RESEARCH SETTING

The study was conducted at Katutura TB State Hospital that services the capital city Windhoek, Namibia with a population of 325,858. During the data collection of this study the Katutura TB State Hospital was the sole hospital of focus. Katutura TB State Hospital comprises of 120 patient bed occupancy, of which 70 beds are for normal TB patients while 50 are for drug resistant TB patients. The hospital has two TB wards appropriated to formal TB and drug resistant TB respectively. It is staffed with one physician, two medical doctors, one senior registered nurse in charge, nine registered nurses and twenty enrolled nurses.

3.6 RESEARCH INSTRUMENT

A research instrument is used to measure a variable of interest (Bowling 2014:322). The questionnaire was developed after a thorough review of literature and consultation of TB focal persons and programme managers. The questionnaire comprised of closed ended questions and dichotomous questions. The questionnaire comprised of the following
sections: a demographic, socio-economic status, composition of household, environmental status, knowledge of TB, social habits and stigma and TB.

3.6.1 Data collection

Data collection is the process by which values are obtained for the characteristics of individuals being studied (Joubert et al 2007:106). Data collection is further explained as the gathering of all the pertinent information necessary to answer a particular research question or hypothesis (Anastas 2012:248). The questionnaires were pre tested on ten newly TB diagnosed patients at Katutura TB State Hospital Windhoek, Namibia for any discrepancies, before the actual data collection took place. This was done in order to make the tool to be more appropriate and user friendly, to validate if the questions asked were clear and relevant and to determine the time taken to complete the questionnaire. This also enabled the researcher to identify commonly misunderstood questions. Furthermore, the researcher got feedback on the validity of questions asked and the validity and reliability of the tool was established and confirmed.

Thereafter, corrections were made on the questionnaire to ensure that the questions are understandable in simplified English for the participants, missing questions were added, and irrelevant ones were removed. The pre-test questionnaires were not included on the study results. Data collection took place once a week, which equalled four times a month. Over the data collection period (3 months), there were 14 data collection sessions. The sessions took place in the conference room of the Katutura TB State Hospital.

3.7 DATA ANALYSIS

Trochim (2006:101) explained that in most social research, data analysis involves three major steps, namely cleaning and organising the data for analysis, describing the data, and testing hypotheses and models. Gelman, Carlin, Stern, Dunson, Ventari and Rubin (2013:147) describe data analysis as the process of categorising, putting into order, manipulating and ultimately summarising data in order to be able to answer the original research questions. Polit and Beck (2008:507) identified the purpose of data analysis as to organise, provide structure, and elicit meaning from research data. The data was entered in to SPSS, version 17.0. Odds ratio, Chi-square test, and logistic
regression were calculated for inferential statistics and tables, graphs, charts, and percentages were used for descriptive statistics.

3.8 VALIDITY AND RELIABILITY

Validity and reliability are concerned with the quality of the data and appropriateness of the methods used in carrying out the study. The researcher ensured that there is content, construct, face validity of the research instrument.

3.8.1 Validity of research instrument

Polit and Beck (2007:196) define validity as the soundness of the study evidence-that is, whether the findings are unbiased, cogent and well grounded. Validity indicates whether there is evidence to support the assertion that the methods are really measuring the abstract concept that they purport to measure. Validity refers to the instrument’s accuracy to measure the characteristics or attributes that it intends to measure (Fitzpatrick & Kazer 2011:168). The researcher ensured validity by employing content validity, construct validity of the instrument and face validity as discussed below.

3.8.2 Content validity

Content validity refers to ensuring that all major elements relevant to the construct, which is being measured, are included in the method of measurement (Fitzpatrick & Kazer 2011:170). In order to ensure content validity the researcher had to gather knowledge about the study phenomenon. This can be achieved by literature review of the area being researched and reflected in the structure of the instrument. The researcher did literature review before compiling questionnaires for the study.

3.8.3 Construct validity of the instrument

Construct validity is an evaluation of the degree to which an instrument measures the construct the researcher wishes to measure (Fitzpatrick & Kazer 2011:170). To ensure construct validity, patients that met eligibility and inclusion criteria based on clinical and laboratory results confirmed diagnosis were selected. Pilot study tested questionnaires were also used.
3.8.4 Face validity

Face validity is defined as measurements, which appear to be measuring an item under study (Fitzpatrick & Kazer 2011:170). In this study, face the supervisor with expertise in research methods ensured validity who on reviewing the instrument was satisfied with its construction and the variables included. Furthermore, statistical analysis by a statistics expert was done on the questionnaire before data collection to rule out statistical errors on data collection tool.

3.8.5 Reliability of research instrument

Reliability refers to the accuracy and consistency of information obtained in the study (Polit & Beck 2008:196). Reliability is the reproducibility and consistency of a measurement instrument’s ability to produce results that are consistent across persons and time (Fitzpatrick & Kazer 2011:199).

A structured questionnaire is designed based on previous similar studies; in relation to the objectives of the study, the questionnaire seeks data from the patients on possible risk factors for inferential results. The questionnaire has six (6) sections namely demographic information, socio economic status, composition of household, environmental status, knowledge of tuberculosis (TB) and social habits. To maintain the reliability of the study, only the researcher was responsible for administering questionnaires, cleaning of the data during conducting of the actual research and by so doing increased the chances of consistency of the collected data.

3.9 ETHICAL CONSIDERATIONS

Research ethics refers to the moral principles guiding research (Longman Dictionary of Contemporary English 2010:1533). In order to maintain anonymity and confidentiality, the actual names of the respondents whose responses are used for the study are not indicated in the final entries entered onto the statistical software for analysis. In place of the actual names and file numbers, a code was used for identification. All the documents relating to the study was stored away from public access and will remain so for at least three (3) years.
3.9.1 Protecting the rights of the institutions

Permission to conduct the study was granted by the Health Studies Higher degrees Committee, College of Human Sciences, University of South Africa (Annexure 1). Thereafter, permission to proceed with the research was requested (Annexure 2) and granted by the Ministry of Health and Social Service of Namibia, specifically by the Committee of Research (Annexures 3 and 4). Data collection was done during weekends when the patient traffic was lower than what is experienced during the week. This ensured minimal disruption of hospital activities and enabled better concentration. The researcher undertook to share the findings and recommendations of the study with the facility, regional and national departments of the Health Ministry.

3.9.2 Right to self-determination

Self-determination means that the research respondents should be treated as autonomous agents and be allowed to voluntarily decide whether to participate in the study (Polit & Beck 2012:154). It also implies that the respondents have the right to withdraw from the study at any time of their choice without any penalty (Grove et al., 2013:164). The study involved direct interaction with patients, therefore patients were personally involved in the study and they were allowed the right to self-determination.

3.9.3 Right to privacy

The right to privacy refers to the right of the research respondent to determine the manner in which personal information will be shared or withheld from another party (Grove et al 2013:69) and (Belmont Report 1979:1). The researcher was granted access by the Namibian Ministry of Health Research Committee. Respondents’ right to privacy was upheld. During data collection, only the researcher had access to the patients’ information prior to coding.

3.9.4 Right to anonymity and confidentiality

Anonymity refers to a situation where any individual will not link the identity of the research respondents and the responses provided during data collection back to them.
Confidentiality refers to the proper management of information provided by the research respondents for the purpose of the study such that the information will not be shared or disclosed to others without prior authorisation from them (Grove et al., 2013:172). The respondents thus have the right to anonymity in addition to the understanding that the data collected will be kept confidential.

The researcher took the following steps to ensure that breach of anonymity and confidentiality do not occur:

- Solely the researcher did collection of the required information from questionnaire responses.
- The researcher assigned a unique identification code to represent each patient record. This was carried out after data cleaning and prior to commencing analysis.
- The researcher stored the data in a locked cabinet and the soft copies in a password-protected and secured database maintained by the researcher.
- The study findings were reported in a way that the information could not be traced to any individual.

3.9.5 Right to fair treatment

Right to fair treatment is based on the ethical principle of justice and dictates that everyone should be treated fairly (Grove et al 2013:173). In upholding this principle during the study, selection of research respondents was based on the requirements for the study and not on their vulnerability (Polit & Beck 2012:155). No one in this study was discriminated against based on his or her disease status or social standing. The researcher demonstrated respect for respondents ‘different backgrounds.

3.9.6 Right to protection from discomfort or harm

The right to protection from discomfort or harm is based on the ethical principle of beneficence, which indicates that the researcher should do well and not harm the respondents (Grove et al 2013:174). According to the risk/benefit ratio, there is a possibility of exposing the respondents to discomfort or harm, as there is direct interaction with the patients. Nevertheless, potential benefit of the study is that the
research will contribute to the existing body of knowledge about TB in determining the
risk factors. In order to ensure that the rights of study respondents are not violated,
researchers have to adhere to strict ethical standards (Burns & Grove 2012:176). The
primary ethical principles on which standards of ethical conduct in research are based
are beneficence, respect for human dignity and justice (Polit & Beck 2008:170-174).

3.9.7 Scientific integrity on the part of the researcher

To maintain scientific integrity and eliminate the possibility of scientific misconduct and
plagiarism, the researcher strictly adhered to ethical and appropriate use of scientific
knowledge by refraining from falsifying or fabricating primary and secondary data.

The information obtained from respondents’ questionnaires was recorded as such.
Clear reference is given to the respective source when citing ideas, words, processes,
findings and results obtained by other authors, and important results, which are contrary
to the researcher’s results and conclusions.

3.10 CONCLUSION

This chapter described the research design and methodology, including the population,
data collection and analysis, validity and reliability, and ethical considerations. Chapter
4 presents the data analysis and interpretation, with reference to the literature review.
CHAPTER 4

ANALYSIS, PRESENTATION AND DESCRIPTION OF THE RESEARCH FINDINGS

4.1 INTRODUCTION

In the previous chapter, the research design and methodology was described. This chapter presents the results with the aid of percentages, tables and graphs. The purpose of the study was to investigate the risk factors that contributed to the contraction of TB among newly diagnosed TB patients in Katutura TB State Hospital Windhoek, Namibia and to add to the body of knowledge regarding risk factors in the contraction of TB worldwide and public health.

The objectives of the study were to

- describe the factors that contributed to TB infection amongst patients newly diagnosed with TB at Katutura TB State Hospital Windhoek, Namibia
- assess the knowledge regarding TB, its causes as well as its prevention measures amongst patients newly diagnosed with TB at Katutura TB State Hospital Windhoek, Namibia

The findings of this study are discussed according to the seven sections of the questionnaire that was used to collect data from the respondents which: are demographic information, socio economic status, composition of household, environmental status, knowledge of TB, social habits and TB and stigma.

4.2 DATA MANAGEMENT AND ANALYSIS

Questionnaires were administered to 40 patients at the Katutura TB State Hospital Windhoek-Namibia, all those with new cases of TB were considered for the study. The data collection lasted over three (3) months from the 8th June 2016 to 8th September 2016. The data was at all times kept safely and stored in a place to which no one other
than the researcher had access. The data was saved and protected by a secret password.

Initial descriptive analyses of all variables of interest were performed. Statistical inference was made at 95% confidence limit. A statistician assisted in data entry using Epi Info version 3.5 and analysis by exporting data to the SPSS, version 16.0, and microcomputer program. The data analysis was discussed in accordance with the sections of the checklist.

4.3 RESEARCH FINDINGS

Questionnaires were distributed to the respondents at Katutura TB State Hospital after giving consent to participate in the study (Annexure 5). During the data collection period (8th June to 8th September 2016), 40 questionnaires were successfully completed and collected from the respondents (Annexure 6).

4.3.1 Sample characteristics

This section covers description of the study respondents' background by characteristics such as age and gender. It sought to determine the infection rate according to the age group and gender.

4.3.1.1 Respondents’ gender

Out of the 40 respondents, 57.5% (n=23) were males, 40% (n=16) were females and 2% (n=1) chose not to answer the gender question.

4.3.1.2 Respondents’ age distribution

Age range distributions were provided for the respondents to indicate their ages. Table 4.1 displays respondents’ age distribution.
Table 4.1  Respondents’ age distribution (N=40)

<table>
<thead>
<tr>
<th>Age distribution</th>
<th>Frequency</th>
<th>Distribution (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 30 years</td>
<td>14</td>
<td>35.0</td>
</tr>
<tr>
<td>31 - 40 years</td>
<td>15</td>
<td>37.5</td>
</tr>
<tr>
<td>41 - 50 years</td>
<td>7</td>
<td>17.5</td>
</tr>
<tr>
<td>Over 50 years</td>
<td>4</td>
<td>10.0</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Out of the 40 respondents, 35% (n=14) fell in the under 30 years range, 37.5% (n=15) fell in the 31 - 40 years range, 17.5% (n=7) fell in the 41 - 50 years range and 10% (n=4) fell in the over 50 years range (Table 4.1).

4.3.1.3  Discussion of the respondents’ demographic information

This study found that a majority, 72.5% (n=29) of the respondents were 40 years and below. These findings were consistent with a study by Jethan, Kakkar, Semwal and Rawat (2014:34) in which sputum positivity was highest (39%) in age group of 0 - 40 years in new TB infection cases. Furthermore, a study conducted by Gupta, Shenoy, Mukhopadhyay, Bairy and Muralidharan (2011:75) on the underlying risk factors in TB patients at a tertiary hospital setting at Manipal found that maximum cases (41.5%) were in age group 21 - 40 years.

This study found a significant change in the infection rate between men and women. Men were on the forefront constituting 57.5% (n=23) of the respondents while women were only 40% (n=16) of the respondents. Previous studies conducted by Wondimu et al. (2007:150) and Van Wyk, Reid, Mandalakas, Enarson, Beyers, Morris and Hesseling (2011:1071) indicate that TB infection was more prevalent among women because they do not have time to seek medical attention as they are captivated by household chores. Young et al. (2014:1) added that women sought traditional herbs to treat symptoms of the disease.

4.3.2  Socio-economic status

TB has been labelled as a poverty disease. This section of the questionnaire covered socio economic indicators such as level of education, employment status and income
level. The level of education was assessed to determine the respondent's knowledge and understanding of TB. Employment status and income levels were assessed to determine their influence on the respondent’s affordability of daily needs like food.

4.3.2.1 Respondents’ level of education

Respondents were given a question to indicate their highest level of education. Table 4.2 presents the respondents’ level of education.

Table 4.2 Respondents’ level of education (N=40)

<table>
<thead>
<tr>
<th>Level of education</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No formal education</td>
<td>10</td>
<td>25.0</td>
</tr>
<tr>
<td>Primary</td>
<td>12</td>
<td>30.0</td>
</tr>
<tr>
<td>Secondary</td>
<td>15</td>
<td>37.5</td>
</tr>
<tr>
<td>Tertiary</td>
<td>2</td>
<td>5.0</td>
</tr>
<tr>
<td>No data</td>
<td>1</td>
<td>2.5</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Only two respondents have received university level education, while the rest of the respondents’ level of education was 37.50% (n=15) secondary education and 30% (n=12) primary education. Unfortunately 2.50% (n=1) of respondents did not answer the question (see Table 4.2).

4.3.2.2 Respondents’ employment status

A question was asked for the respondents to indicate their employment status and the results were as indicated in Table 4.3.

Table 4.3 Respondents’ employment status (N=40)

<table>
<thead>
<tr>
<th>Employment status</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployed</td>
<td>22</td>
<td>55.0</td>
</tr>
<tr>
<td>Casually employed</td>
<td>3</td>
<td>7.5</td>
</tr>
<tr>
<td>Permanently employed</td>
<td>12</td>
<td>30.0</td>
</tr>
<tr>
<td>Self-employed</td>
<td>3</td>
<td>7.5</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>100.0</td>
</tr>
</tbody>
</table>
The results for employment status show that 55\% (n=22) of the respondents are unemployed, 7.5\% (n=3) are employed on a casual basis, 30\% (n=12) are employed on a permanent basis and 7.5\% (n=3) are self-employed.

### 4.3.2.3 Respondents’ monthly income

A question with income range distribution was asked. Table 4.4 presents the respondents monthly income.

**Table 4.4 Respondents’ monthly income ranges (N=40)**

<table>
<thead>
<tr>
<th>Monthly income (N$)</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>N$ 0</td>
<td>25</td>
<td>62.5</td>
</tr>
<tr>
<td>N$ 1 – N$ 1000</td>
<td>4</td>
<td>10.0</td>
</tr>
<tr>
<td>N$ 10001 – N$ 5000</td>
<td>8</td>
<td>20.0</td>
</tr>
<tr>
<td>Above N$ 5000</td>
<td>3</td>
<td>7.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

The findings of the research study on income level shows that 62.5\% (n=25) of respondents have an income level of N$ 0.00, 10\% (n=4) of respondents have an income level of N$ 1.00 – N$ 1000.00, 20\% (n=8) of respondents have an income level of N$ 1001.00 – N$ 5000.00 AND 7.5\% (n=3) have an income level of N$ 5001.00 and above (see Table 4.4).

### 4.3.2.5 Discussion of the respondents’ socio economic status

The results of this study show that increasing levels of income are associated with a reduced risk of TB among the respondents, and the combination of overcrowding and lower income levels may together increase the risk of TB contraction. In contrast to low-income levels, this study found that increased unemployment lead to TB contraction. Therefore, low income and unemployment leads to poverty. The association between poverty and TB is well documented. Barr et al (2001:1488) showed that poverty was associated with an increased risk of TB in New York City, adjusting for several other risk factors in a multivariate Poisson regression model 23.
It is important to highlight that this study found that poverty still prevails in the communities where the respondents came from, with 62.5% (n=25) of the population having no permanent employment and only 30% (n=12) of the sample being permanently employed. Furthermore, the study found that 72.5% (n=29) of the respondents earn less than NAD 1000.00 and less per month. A microscopic look into the data shows that income uncertainty prevails as 62.5% (n=25) of the population stated their income level as N$ 0.00. This can be an indication of absolute to relative poverty.

Young et al. (2014:1) state that there is a strong link between lack of education and contraction of TB. In most cases, symptoms of TB are wrongly interpreted as signs of common cold, which makes patients delay seeking medical attention. Another debilitating factor associated with the lack of education is the wrongly perceived link between HIV and TB (Sengupta et al 2006:1010). The data collected show that there still exists a positive relationship between the lack of education and income and TB infections amongst the respondents. In this study 67.5% (n=27) had an educational level only until secondary level. A further look into this data shows that 45% (n=18) of the respondents have an educational level lower than primary education whereas 55% (n=22) of the respondents have received primary level education only.

4.3.3 Respondents’ composition of household

This section of the questionnaire focused on the settlement type of the respondents: the location where the respondents stay to determine if it is formal or informal settlement; the type of housing; the number of people per room in order to assess overcrowding; whether the respondents’ stay with family members to ascertain social support systems as well; the type of toilet facilities to determine sanitation measures used for human waste disposal. Nutrition is a vital aspect in disease contraction therefore, types of food eaten at home was assessed to determine the nutritional value of the diet taken by the respondents. Questions were also asked on the number of meals the respondents take per day and whether they can afford food budget for the entire month.
4.3.3.1 Respondents’ type of settlement

The findings indicate that 65% (n=26) of respondents live in the informal settlement and 30% (n=12) live in the formal settlement. There was no data for 5% (n=2) of respondents.

4.3.3.2 Respondents’ type of housing

The research findings show that 52.5% (n=21) of the research respondents currently stay in modern housing facilities while 40% (n=16) stay in shacks. There was no data for 7.5% (n=3) of the research respondents.

4.3.3.3 Respondents’ types of toilets

Different types of toilet facilities were provided for the respondents to choose the ones they use at home. Table 4.5 indicates the respondents’ types of toilets.
The study found that 60% (n=24) of the respondents use water closet for human waste disposal. However, 17.5% (n=7) is still using the old bush system followed by bucket system with 15% (n=6) and pit latrine being the least with only 7.5% (n=3).

### 4.3.3.4 Respondents’ living status with family members and number of people per room

The results show that 75% (n=30) of research respondents live with other family members and 25% (n=10) of the research respondents do not live with family members. Three quarter 75%, (n=30) of the respondents live in a room with a total of 1-4 people followed by 20% (n=8) living in a room with 5-8 people. Five per cent (n=2) of the respondents did not answer this question.

### 4.3.3.5 Respondents’ types of food consumption

The respondents were given a question on the type of food they eat. A list of food according to food groups was provided to choose from. Table 4.6 indicates the results.
The findings show that respondents eat more grains 65% (n=26) followed by protein with 20% (n=8). Vegetables were the least eaten foods 2.5% (n=1) (Table 4.6).

### 4.3.3.6 Respondents’ number of meals per day and food affordability per month

The study found that at least 47.5% (n=19) respondents eat two meals per day followed by 37.5% (n=15) who eat three meals per day. Ten per cent (n=4) indicated that they eat more than three meals per day. However 5% (n=2) indicated that they only eat one meal per day.

In response to a question on food affordability for the whole month, 52.5% (n=21) of the respondents indicated that they can afford to have food for the whole month and 47.5% (n=19) cannot afford to have food for the whole month.

### 4.3.3.7 Discussion of the composition of household

According to Jackson et al 2006:1104; Chen, Shu, Hou, Xia, Xu, Bai, Nie, Cheng & Weigou Xu 2013:1 people who live in informal settlements are more at risk of contracting TB. Informal settlement is a kind of dwelling densely populated and people stay in shacks (Jackson et al 2006:1104; Chen, Shu, Hou, Xia, Xu, Bai, Nie, Cheng & Weigou Xu 2013:1). Such places do not have appropriate sanitation facilities, which increases TB incidences. Surprisingly, this study found that at least 52.5% (n=21) of the respondents live in modern houses. In addition to that, 60% (n=24) of the respondents use water closet toilet facilities at home while 7.5% (n=3) use pit latrines. Even though the target is to see the whole community having appropriate sanitation facilities, one can conclude that these study respondents had appropriate sanitation facilities despite contracting TB. However, it might be that even though the respondents have improved sanitation facilities, they still use old practices for waste disposal.

Clark 2002:941 has investigated wrong eating as a factor that causes TB infection. Lack of balanced diet makes the body susceptible to infections (Clark 2002:941). This study correlates with (Clark 2002:941) on that matter because 65% (n=25) of the study respondents indicated that they take grains for their meals. This might be because there is a local mahangu (millet) meal as a staple food for at least 58% of the country’s
population, which is readily available and cheap and one can even get it free from the neighbour’s house.

Lack of nutritional knowledge among respondents was found as a factor in this study. Eating should not just be a daily habit but must have purpose and meaning. Although the respondents could afford food, the study found that the meals are not appropriately planned. Poorly planned meals will not contribute to a healthy lifestyle but will only fill the stomach. Most respondents indicated that they eat the same type of food daily. The study found that respondents barely ate fruits and vegetables. Even though 52.5% (n=21) of the respondents can afford food for the whole month 47.5% (n=19) cannot afford food for the whole month which may lead to some nutritional ailments.

4.3.4 Respondents’ environmental status

This section describes the place where the respondents live. Exposure to extreme smoke leads to TB susceptibility. Proximity to industrial sites was assessed. Furthermore, residence next to alcohol and cigarettes outlets can influence their intake rates. The WHO recommends less than 5 km proximity to a health facility in order to facilitate health-seeking behaviour. In this research study, respondents’ proximity to places that sell alcohol as well as proximity to the health facilities was assessed. Questions were also asked to determine whether respondents could afford fares to go to the clinic, as this can be an influence to health seeking behaviour.

4.3.4.1 Respondents’ dwelling proximity to an industrial site

The findings revealed that 90% (n=36) of research respondents do not live near an industrial site, and 5% (n=2) of research respondents live next to an industrial site. The rest of the respondents 5% (n=2) chose not to answer this question.

4.3.4.2 Respondents’ dwelling industrial site proximity to smoke excretion area

Among the respondents who indicated that they live next to an industrial site 50% (n=1) indicated that the industry excrete high levels of smoke while 50% (n=1) indicated that the industry does not excrete high levels of smoke.
4.3.4.3 Respondents’ dwelling proximity to places that sell alcohol and cigarettes

Figure 4.2 indicates the respondents dwelling proximity to places that sell alcohol and cigarettes.

![Figure 4.2 Respondents’ dwelling proximity to alcohol and cigarettes outlets (N=40)](chart)

The results indicated that only 32.5% (n=13) live next to places that sell alcohol and cigarettes while 67.5% (n=27) do not live in places that sell alcohol (Figure 4.2).

4.3.4.4 Respondents’ proximity to a health care facility

In response to a question on the proximity to the nearest health facility, it was found that 77.5% (n=31) of the research respondents live less than five kilometres from a health facility, while 22.5% (n=9) live more than six kilometres away from the nearest health facility.
4.3.4.5 Respondents’ affordability of transport to health facility

Half, 50% (n=20) of the research respondents could not afford transport to their nearest health facility whilst 40% (n=16) could afford transport to their nearest health facility. Only 10% (n=4) of the respondents did not answer this question.

4.3.4.6 Discussion of the environmental status

The findings of this research study revealed that only 5% (n=2) of the research respondents live next to an industrial site with only one stating that that industrial site excreted a lot of smoke. The question related to smoke pollution was included because people in urban areas such as Katutura are exposed to more smoke pollution from various sources, which include cars. The findings are in line with Schluger and Feiden (2012:66) and University of Medicine and Dentistry of New Jersey (2012:1) who concluded that the exposure to automobile fumes, for example diesel, probably causes exposed individuals to be less able to fight off new Mycobacterium tuberculosis infections or to suppress a reactivation of a latent infection by these bacteria. It is also asserted that exposure to air pollutants on long-term and short-term is a major contributor to morbidity and mortality (Corvalán, Briggs & 1996:2). High alcohol consumption (on average >40 g alcohol per day) with or without an alcohol use disorder is associated with three folds risk of developing TB (National Department of Health 2014:11). However, this study found that 27 (67.5%) of the respondents do not live next to alcohol outlets which sometimes proximity to alcohol make it readily available to drink.

4.3.5 Respondents’ knowledge of tuberculosis (TB)

This section presents the findings on knowledge of respondents about TB. The level of information dissemination was explored by asking the respondents about where they learnt about TB for the first time, their knowledge on the causes of TB, signs and symptoms, mode of TB transmission and TB prevention.
4.3.5.1 The first source where research respondents first learnt about TB

Table 4.7 indicates different sources where the respondents learnt about TB for the first time.

Table 4.7 Respondents' first source of information about TB (N=40)

<table>
<thead>
<tr>
<th>Source of information</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newspapers</td>
<td>5</td>
<td>12.5</td>
</tr>
<tr>
<td>Magazines</td>
<td>1</td>
<td>2.5</td>
</tr>
<tr>
<td>Radio</td>
<td>13</td>
<td>32.5</td>
</tr>
<tr>
<td>Television</td>
<td>5</td>
<td>12.5</td>
</tr>
<tr>
<td>Billboards</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Brochures</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Posters</td>
<td>1</td>
<td>2.5</td>
</tr>
<tr>
<td>Other printed materials</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Health workers</td>
<td>4</td>
<td>10.0</td>
</tr>
<tr>
<td>Family members</td>
<td>4</td>
<td>10.0</td>
</tr>
<tr>
<td>Friends</td>
<td>2</td>
<td>2.5</td>
</tr>
<tr>
<td>Neighbours</td>
<td>1</td>
<td>2.5</td>
</tr>
<tr>
<td>Colleagues</td>
<td>4</td>
<td>10.0</td>
</tr>
<tr>
<td>Religious leaders</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Radio was on the forefront constituting 32.5% (n=13) as the source of information on TB for the first time. The least of the first information source came from magazines, posters and the neighbours with 2.5% (n=1) each respectively. The rest of the first information came from other sources such as health workers, newspapers and so on (Table 4.7).

4.3.5.2 Respondents' understanding on the causes of TB

The study found that 40% (n=16) of the respondents chose Mycobacteria as the cause of TB. However 60% (n=24) of the respondents chose other options such as God, Satan, alcohol, smoking and dust as the cause of TB.
4.3.5.3 Respondents’ knowledge of the signs and symptoms of TB

Table 4.8 indicates the respondents’ responses on the causes of TB.

**Table 4.8 Respondents’ responses on the causes of TB (N=40)**

<table>
<thead>
<tr>
<th>Causes of TB</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rash</td>
<td>3</td>
<td>7.5</td>
</tr>
<tr>
<td>Cough</td>
<td>13</td>
<td>32.5</td>
</tr>
<tr>
<td>Cough that lasts longer than 3 weeks</td>
<td>6</td>
<td>15.0</td>
</tr>
<tr>
<td>Coughing up blood</td>
<td>1</td>
<td>2.5</td>
</tr>
<tr>
<td>Severe headaches</td>
<td>2</td>
<td>5.0</td>
</tr>
<tr>
<td>Nausea</td>
<td>2</td>
<td>5.0</td>
</tr>
<tr>
<td>Weight loss</td>
<td>4</td>
<td>7.5</td>
</tr>
<tr>
<td>Fever without clear cause that’s lasts more than 7 days</td>
<td>3</td>
<td>7.5</td>
</tr>
<tr>
<td>Chest pain</td>
<td>3</td>
<td>7.5</td>
</tr>
<tr>
<td>Shortness of breath</td>
<td>1</td>
<td>2.5</td>
</tr>
<tr>
<td>On-going fatigue</td>
<td>4</td>
<td>10.0</td>
</tr>
<tr>
<td>Do not know</td>
<td>8</td>
<td>20.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

The findings of the research study on current understanding of the symptoms, cause of TB and ways of preventing TB infections amongst research respondents showed that 20% (n=8) of the respondents chose the “do not know” option, whilst a majority of the respondents 15% (n=6) chose cough that last longer than 3 weeks, ongoing fatigue 10% (n=4), and shortness of breath 2.5% (n=1). Some respondents did not have a clue on the signs and symptoms of TB, with 32.5% (n=13) choosing coughing without duration and 7.5% (n=3) choosing rashes on the body as the symptoms (Table 4.8).

4.3.5.4 Respondents’ knowledge on TB contraction

Table 4.9 indicates the results on the question that asked the respondents what they think as the mode of TB contraction.
Table 4.9  Respondents’ responses on the ways of TB contraction (N=40)

<table>
<thead>
<tr>
<th>Mode of TB contraction</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Through handshake</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Through the air when a person with TB coughs or sneezes</td>
<td>23</td>
<td>57.5</td>
</tr>
<tr>
<td>Through sharing dishes</td>
<td>1</td>
<td>2.5</td>
</tr>
<tr>
<td>Through eating from the same plate</td>
<td>4</td>
<td>10.0</td>
</tr>
<tr>
<td>Through touching items in the public places (doorknobs, handles in transportation, etc)</td>
<td>1</td>
<td>2.5</td>
</tr>
<tr>
<td>Do not know</td>
<td>8</td>
<td>20.0</td>
</tr>
<tr>
<td>Other ways of infection (alcohol, smoking, dust and witchcraft)</td>
<td>3</td>
<td>7.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Just above half 57.5% (n=23) of the respondents chose correct options related to contraction of TB. Less than a quarter 20% (n=8) of the respondents indicated that they do not know the causes of TB, whereas the rest of the respondents chose other various wrong options (Table 4.9).

4.3.5.5  **Respondents’ knowledge on TB prevention**

Respondents were given options to indicate prevention measures against TB. Table 4.10 indicates the results.

Table 4.10  Respondents’ responses on the prevention measures against TB (N=40)

<table>
<thead>
<tr>
<th>Prevention of TB measures</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoid shaking hands</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Covering the mouth when coughing or sneezing</td>
<td>28</td>
<td>28.0</td>
</tr>
<tr>
<td>Avoid sharing dishes</td>
<td>3</td>
<td>7.5</td>
</tr>
<tr>
<td>Washing hands after touching items in the public places</td>
<td>1</td>
<td>2.5</td>
</tr>
<tr>
<td>Closing windows at home</td>
<td>2</td>
<td>5.0</td>
</tr>
<tr>
<td>Through good nutrition</td>
<td>2</td>
<td>5.0</td>
</tr>
<tr>
<td>By praying</td>
<td>1</td>
<td>2.5</td>
</tr>
<tr>
<td>Do not know</td>
<td>8</td>
<td>20.0</td>
</tr>
<tr>
<td>Other reasons such as not smoking</td>
<td>1</td>
<td>2.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>
This study found that 70% (n=28) of the respondents chose an option of covering the mouth when coughing, which is correct. However, there were 20% (n=8) respondents who indicated that they do not know the preventive measures of TB option (Table 4.10).

4.3.5.6 Discussion on the knowledge of TB

This study found that a majority of the respondents lack knowledge on the causes of TB. Lack of knowledge on the causes of TB may lead to the delay in seeking medical treatment while seeking help from churches and traditional healers. However, Dewi, Lesley Barclay, Passey and Wilson (2016:740) claim that the delay in health seeking behavior is related to ignorance of TB symptoms.

The present study has shown that 60% (n=24) of respondents indicated the wrong choice on the causes of TB. It is evident that in an urban setting, community-based health education is neglected due to the fallacy that those in an urban setting are overexposed to health education. Hossain, Abdul, Ashaque, Martien and Van Leth (2015:1) found that there is an association of “poor knowledge” with urban residency, which may be related to the larger presence of NGOs in rural areas compared to urban areas in Bangladesh.

4.3.6 Social habits of research respondents

There is a close relationship between cigarette smoking and TB contraction in the literature. Respondents were given questions to determine whether they smoke or not and if they do, how many cigarettes per day. Habitual non-medical drugs and excessive alcohol intake have been a point of interest in TB contraction. Therefore, respondents were asked to indicate if they are on any non-medical drugs as well as whether they drink alcohol or not. The questions solicited responses of the type of alcohol that the respondents take and the frequency at which they drink.

4.3.6.1 Respondents’ smoking status and number of cigarettes smoked per day

The findings on the prevalence of smoking cigarettes amongst research respondents shows that 92.5% (n=37) do not smoke and 7.5% (n=3) indicated that they do smoke
cigarettes. All the respondents 100% (n=3) who smoke indicated that they smoke 0-10 cigarettes per day.

4.3.6.2 Respondents’ non-medical drugs consumption and type of the drugs

Only 5% (n=2) of the respondents indicated that they take non-medical drugs whereas 95% (n=38) indicated that they do not take any form of non-medical drugs. This shows that the respondents who take non-medical drugs, 50% (n=1) take marijuana while 50% (n=1) did not specify the type of drugs they take.

4.3.6.3 Respondents’ alcohol consumption status, frequency and type

Questions were asked for the respondents to indicate whether they take alcohol or not. The ones who take alcohol had follow up questions to indicate the type of alcohol they take as well as the frequency of alcohol consumption. Table 4.11 indicates the results.

Table 4.11 Respondents’ responses of alcohol consumption status, frequency and type (N=8)

<table>
<thead>
<tr>
<th>Type of alcohol</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional brewed alcohol</td>
<td>1</td>
<td>12.5</td>
</tr>
<tr>
<td>Spirits</td>
<td>1</td>
<td>12.5</td>
</tr>
<tr>
<td>Wines</td>
<td>5</td>
<td>62.5</td>
</tr>
<tr>
<td>Beer</td>
<td>1</td>
<td>12.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

The findings show that 72.5% (n=29) of the research respondents do not drink alcohol, 20% (n=8) consume alcohol and for 7.50% (n=3) there was no data available from the research respondents. All the respondents who consume alcohol indicated that they do so weekly. The respondents take more wines 62.5% (n=5), and the rest take beer, spirits and traditional brewed alcohol 12.5% (n=1) each respectively (Table 4.11).

4.3.6.4 Discussion of the social habits

This study attempted to link if social habits of the patients are risk factors to TB contraction. The social factors were smoking of tobacco products and consumption of
alcohol. Therefore, this study found that 92.5% (n=40) of the respondents do not smoke tobacco products and the 7.5% (n=40) that smoke consumed less than three (3) cigarettes per day. This result are not in line with those of Thorax (2005:60) who indicated that current or ex-smoker have an increased chance of becoming infected with *M tuberculosis*.

Boon den, Van Lill, Borgdorff, Verver, Bateman, Lombard, Enarson and Beyers (2005:556) study shows that current or ex-smokers had a higher prevalence of *M tuberculosis* infection than those who never smoked and that there is a slightly higher risk of infection for those who smoked more than 15 packs per month than for those who smoked less than 15 packs per month. However, this was not significant in this study. Boon den et al (2005:556) state that the reason for the increased risk of infection in smokers is unclear, but may be explained by the effects of smoking on pulmonary host defences. Smoking has been shown to reduce natural killer cytotoxic activity, to suppress T cell function in both lung and blood, to impair mucociliary clearance of particles, and to increase numbers of alveolar macrophages in the lower respiratory tract. Cells of the macrophage-phagocytic group influence immediate or innate immunity through their handling and elimination of mycobacteria, and products of cigarette smoke may therefore favour persistence and/or replication of ingested mycobacteria by impairing the macrophage or dendritic cell function.

World Lung Foundation (2011:35) put forward that definitive evidence on the link between tobacco and TB has been slow in upcoming research. Research has largely focused on other risk factors, including poverty, poor nutrition, alcohol use, overcrowding, and HIV, and it can be difficult to tease out tobacco’s role from these interrelated factors. As a result, tobacco control has been neglected as a means of reducing TB-related infection, illness and death.

The findings of this study on the prevalence of alcohol consumption amongst the respondents did not yield any significant correlation between alcohol consumption and TB contraction. Seventy-two per cent (n=29) of the research respondents indicated that they do not drink alcohol, 20% (n=8) indicated that they consume alcohol and 20% (n=8) consume beer in quantities of less than three (3) times per month.
However, a study by Lönnroth, Williams, Stadlin, Jaramillo and Dye (2008:67) found that the risk of active TB is substantially elevated in people who drink more than 40g alcohol per day, and/or have an alcohol use dependency. This may be due to both increased risk of infection related to specific social mixing patterns associated with alcohol use, as well as influence on the immune system of alcohol itself and of alcohol related conditions.

4.3.7 TB and stigma

This section looked at the stigma that is associated with TB. The respondents were asked questions that determined the attitude and perception of the society towards TB. The attitudes and perceptions of the society towards TB patients can influence their health seeking behaviour, disease disclosure and treatment adherence. The respondents’ perception towards TB was explored by asking questions on the respondents’ TB disclosure to the family members and the employer for those who are employed. It is important to note that the respondents’ attitude towards TB can be a problem in health seeking behaviour.

4.3.7.1 Respondents’ responses on perception of TB in the society

Table 4.12 indicates the respondent’s responses on their society’s perception of TB.

Table 4.12  Respondents’ responses on the perception of the society towards TB (N=40)

<table>
<thead>
<tr>
<th>Perception of the society</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease for poor people</td>
<td>3</td>
<td>7.5</td>
</tr>
<tr>
<td>Disease for HIV positive people</td>
<td>14</td>
<td>35.0</td>
</tr>
<tr>
<td>Punishment from God</td>
<td>6</td>
<td>15.0</td>
</tr>
<tr>
<td>Other perceptions like a disease for weak people</td>
<td>6</td>
<td>15.0</td>
</tr>
<tr>
<td>Disease for promiscuous people</td>
<td>5</td>
<td>12.5</td>
</tr>
<tr>
<td>No data</td>
<td>6</td>
<td>15.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

The results indicated that 35% (n=14) of the respondents believed that their communities viewed TB as a disease for HIV positive people, while 15 % (n=6) stated
that their communities viewed TB as a punishment from God, 50% (n=20) of the respondents stated that their communities viewed TB as a disease for promiscuous people and other perceptions such as a disease for weak people (Table 4.12).

4.3.7.2 Respondents’ responses on the attitude towards people with TB in the society

A majority of the respondents 70% (n=28) indicated that TB infected people are treated friendly by their society, whereas 30% (n=12) highlighted unfriendly treatment in the society.

4.3.7.3 Respondents’ TB disease disclosure to family members and reasons for non-disclosure

The study found that 97.5% (n=39) have disclosed their illness to family members with only 2.5% (n=1) non-disclosure to family member due to fear of isolation.

4.3.7.4 Respondents’ TB disease disclosure to the employer and reasons

In this study, only fifteen respondents were employed on casual and permanent basis. Therefore 100% (n=15) indicated that they did not disclose to their employers that they had TB with a sole reason of fear of isolation.

4.3.7.5 Findings on whether respondents consider TB to be a source of shame to them and the reasons

Table 4.13 indicates the respondent’s results on the reasons why they are ashamed of having TB or not.
Table 4.13  Respondents’ reasons towards being ashamed of TB or not (N=39)

<table>
<thead>
<tr>
<th>Reasons</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shameful disease</td>
<td>2</td>
<td>5.1</td>
</tr>
<tr>
<td>No hope for treatment</td>
<td>1</td>
<td>2.6</td>
</tr>
<tr>
<td>Its’ just a disease that can be treated</td>
<td>4</td>
<td>10.3</td>
</tr>
<tr>
<td>I have accepted it</td>
<td>32</td>
<td>82.0</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The study found that 82.5% (n=33) of the respondents are not ashamed of having TB, 15% (n=6) are ashamed of having TB and 2.5% (n=1) decided not to answer this question. Various reasons were given on either being ashamed of having TB or not (Table 4.13).

4.3.7.6  Discussion of TB and stigma

TB stigma has been one of the major public health issues in TB case finding, health-seeking behavior as well as in treatment success. This has been due to its close association with HIV/AIDS as one of the reasons amongst many (Moller & Erstad 2007:107). It is interesting to see that this study found that only 35% (n=14) of the respondents indicated that in their communities TB is associated with HIV positive people. A study done in Eastern Mediterranean region and Nigeria found that there is a fear of being diagnosed with TB and subsequent isolation (Fatiregun & Ejeckam 2010:7). However, this study paints a different picture, with 97.5% (n=39) of the study respondents indicating that they have told their family members that they have TB. Therefore, this result could mean a positive progress in the acceptance of TB as disease that can be cured and accepted like any other communicable disease in the society. This will bring change in health seeking behavior and treatment adherence to reduce the alarming rates of drug resistance TB.

The close association of TB and HVI/AIDS is rooted in the signs and symptoms of the two diseases e.g. excessive loss of weight. A patient with either of the two diseases can easily be mistaken to have the other diseases and vice-versa. As discussed above, the disease disclosure found by this study shows a great improvement in the knowledge of
the difference between the two diseases even though the difference is not that high, which can be regarded as a great achievement.

Due to the close association of TB and HIV/AIDS, TB is the main cause of mortality and morbidity in HIV-infected individuals (WHO 2011:1). Therefore, this is an obstacle in health seeking behaviours of the communities (Meintjes, Schoeman, Morroni, Wilson & Maartenes 2008:5) although the study highlighted only 35% of the respondents indicating an association of TB and HIV/AIDS in their communities. In Kenya, for example, Yuen, Weyenga, Kim, Malika, Muttaï, Katana, Nganga, Cain and De Cock (2014:7) compared incidences of TB among persons with and without HIV and found a persistent high incidence of TB among people living with HIV. The findings revealed that among persons living with HIV, the TB incidence increased during 1998–2004, remained relatively stable until 2007 at approximately 2,750 cases per 100,000 population, then declined to 1,962 cases per 100,000 population in 2012. Among persons without HIV, the trend was similar, but overall incidence was 141 substantially lower, peaking at approximately 320 cases per 100,000 population during 2005–2007, and declining to 231 cases per 100,000 population in 2012 (Yuen et al 2014:3).

4.6 CONCLUSION

This study has presented the research results as well as how the data was analysed. Risk factors were highlighted. In addition, a summary of the statistically significant risk factors associated with new TB infected patients have been presented. Chapter 5 discusses the main findings and will also highlight the limitations of the study and provide some recommendations based on the research findings.
CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

Chapter 4 comprised of the presentation and interpretation of quantitative data. Data was analysed using SPSS software, version 17.0. Data was then presented in the form of graphs, pie charts and tables. This chapter presents a summary and interpretation of findings, conclusions, recommendations, contributions and limitations of this research study.

The purpose of the study was to determine the risk factors that may have contributed to TB infection amongst new cases in Katutura TB State Hospital Windhoek, Namibia. The specific objectives of the study were to

- describe the factors that contributed to TB infection amongst patients newly diagnosed with TB at Katutura TB state hospital Windhoek, Namibia
- assess the knowledge regarding TB, its causes as well as its prevention measures amongst patients newly diagnosed with TB at Katutura TB state hospital Windhoek, Namibia

5.2 RESEARCH DESIGN AND METHOD

A quantitative, non-experimental and consecutive sampling study was used to assess and identify risk factors that contributed to TB amongst new patients. The researcher took into consideration time, and historical TB CNR figures in the study design and feasibility of the study. Data was collected using structured, self-administered questionnaires from patients at the Katutura TB State Hospital Windhoek, Namibia. The source of data was patients with newly diagnosed cases of TB admitted in the Katutura TB State Hospital Windhoek, Namibia at the time of data collection. A total of 40 patients participated in this research study.
5.3 SUMMARY AND INTERPRETATION OF THE RESEARCH FINDINGS

This study gives insight on the risk factors amongst newly diagnosed TB patients in the Katutura TB State Hospital. The results are discussed in the following section.

5.3.1 Demographic information

The study showed that that 55% (n=22) of the research respondents are unemployed. The following section describes the respondents’ demographic and social characteristics:

- A majority of the respondents 37.5% (n=15) were within the 31 to 40 age range
- A majority of the respondents 57.5% (n=23) were males

The result shows that TB affects the productive age group the most, which could be related to late health care seeking behaviour, since this, is the working age group. A shift in gender infection rate was noted with men being on the lead as compared to women. The implication of this shift could be the fact that men normally take illnesses for granted and overall men does not have health care seeking tradition as compared to women.

5.3.2 Socio economic status

This section discussed the respondents’ socio-economic status in regards to their level of education, employment status and earning per month. A large number of the respondents 68% (n=40) have an educational level only until secondary school. A further look into the data shows that 55% (n=40) of the population has an educational level lower than primary education. A large number of respondents 62.5% (n=40) have no income. Therefore, the respondents have some level of education but they still lack knowledge on TB because the education system starts teaching about diseases only at higher secondary and tertiary level. More than half of the respondents did not have a monthly income, which concluded that TB is still a poverty-stricken disease.
5.3.3 Composition of household

This study revealed that more than half 65% (n=26) of the respondents live in the informal settlement and 30% (n=12) of the research respondents live in the formal settlement. Furthermore, the findings show that 40% (n=16) of the respondents use informal toilet facilities (bushes, the bucket system and pit latrine) and 60% (n=24) have access to formal toilet facilities (water closet). Few respondents 20% (n=8) of the population have access to a balanced diet, with majority of the respondents 65% (n=26) surviving on a diet of grain only. The respondents were exposed to unhygienic waste disposal as well as poor nutrition, which placed them at a high risk of TB infection. The body needs various nutrients to fight against infections.

5.3.4 Environmental status

The study found that 90% (n=36) of research respondents do not live near an industrial site that excretes high levels of smoke. Five percent (n=2) of research respondents indicated that they live next to an industrial site that excrete a lot of smoke. At least 67.5 % (n=27) of research respondents do not stay next to a place that sells alcohol nor cigarettes and 32.5% (n=13) do stay next to a place that sells alcohol and cigarettes. This means that respondents of this study did not have alcohol and cigarettes readily available at their disposal in their neighbourhoods. However, this does not mean that they cannot be frequent drinkers and smokers. It could be said that industrial smoke was not much of a TB contraction factor in the study.

The study yielded that 77.5% (n=31) of the research respondents lived less than five kilometres from a health facility, while 22.5% (n=9) lived more than six kilometres from the nearest health facility. The findings show that patients live near health facilities with 77.5% (n=31) living less than five kilometres from a health facility. These findings are in line with Onanga (2013:34) who found that more than 91% of the patients arrived at their nearest health facility on foot within 30 minutes of walking. This suggests that accessibility to a health facility was not a problem for the patients in this study. However, this does not influence respondents’ health seeking behaviour since this is influenced by many factors that include cultural beliefs.
5.3.5 Knowledge of TB

The study found that the electronic media was the main source where respondents heard about TB for the first time. Radio 32.5% (n=14) and TV 12.5% (n=5) with the rest of the first knowledge coming from other sources such as health workers, newspapers et cetera. The study found out that 40% (n=16) of the respondents indicated Mycobacteria as the cause of TB. Sixty percent (n=24) chose other options such as God, Satan, alcohol, smoking and dust as being the cause of TB. Only 20% (n=8) of the respondents did not know the signs and symptoms of TB, whilst 20% (n=8) of the respondents indicated the right options (cough that last longer than 3 weeks, ongoing fatigue, shortness of breath and so on). A total of 57.5% (n=23) of the respondents indicated an understanding on the transmission of TB and 65% (n=26) of the respondents indicated an understanding on the prevention of TB.

The findings show that there exists good knowledge about the causation and prognosis of the disease, although the majority of the respondents attributed the causation of TB to factors such as dust, witchcraft, God and alcohol. This implies that information dissemination on TB is lacking amongst the respondents.

5.3.6 Social habits

The study found that 92.5% (n=37) do not smoke and 7.5% (n=3) indicated that they do smoke tobacco products. Furthermore, 72.5% (n=29) of the research respondents indicated that they do not drink alcohol, while 20% (n=8) indicated that they consume alcohol. Therefore, social habits were a minor contributing factor to TB contraction in among respondents of the study.

5.3.7 Tuberculosis and stigma

A total of 35% (n=14) respondents believed that their communities viewed TB as a disease for HIV positive people, 15% (n=6) stated that their communities viewed TB as a punishment from God, 50% (n=20) of the respondents stated that their communities viewed TB as a disease for promiscuous people and other perceptions such as a disease for weak people. Stigma is seen trending as a contributing factor to TB infection.
among respondents in the study. A close association of TB and HIV/AIDS emerged in this study as leading to stigma.

Almost three quarters 70% (n=28) of respondents stated that community members were friendly to them with their TB status and 30% (n=12) stated that community members were unfriendly. There still exists some level of tolerance for TB patients in the community but that does not rule out stigma.

Disease disclosure to family members is high amongst the respondents; 97.5% (n=39) of the respondents have told their family members of their TB status and 2.5% (n=1) have not told their family member stating the fear of isolation at home as their reason. This shows a level of comfortability the respondents have with family members. However, these results do not guarantee family support during the illness.

All the employed respondents 100% (n=15) (casual or permanent) did not tell their employer with the reason given as fear of isolation at work. This clearly highlights stigma against TB in the work place. It might not be from the employer alone but from the work colleagues as well.

The respondents show some acceptance of TB with 82.5% (n=33) of respondents answering no that they do not feel that TB brought shame upon them, with the reasons given that it is just a disease that could have infected someone else, and treatment will cure them. However, 15% (n=6) that answered yes gave reasons such as TB is a shameful infection, they did nothing wrong to deserve being infected and that there is no hope for treatment. This could be aggravated by stigma factors against TB even though the respondents did not bluntly state that.

5.4 CONCLUSIONS

The objectives of this study as stated in Chapter 1, section 1.6.1 were evaluated to see if they were achieved. Each objective will be listed and conclusion will be drawn respectively.
5.4.1 To describe the factors that contributed to TB infection amongst patients newly diagnosed with TB at Katutura TB State Hospital

This study found that the possible factors that contribute to TB infection are:

- Gender has been found to be a contributing factor to TB. This study found that men were more prevalent in new TB infection as compared to women. Contrary to the previous studies that found women to be the most infected with TB than men (Wondimu et al 2007:150; Van Wyk et al 2011:1071; Baburao, Bhaskar, Deepak & Sharma 2009:10).
- Poverty was identified as one of the factors that possibly contribute to TB infection rates because a majority of the respondents did not have monthly income to sustain themselves. A good percentage of the respondents live in poverty stricken informal settlement.
- Poor nutrition emerged as a contributing factor to TB infection rate based on poor eating habits of the respondents. Most respondents barely lived on grains alone, indicating that they do not eat any other food. However, they sparingly eat meat with the local mahangu grain.
- Lack of education was identified as another contributing factor to new TB cases because a majority of the respondents had education only until secondary school. This is basic education whereby the curriculum does not teach anything about diseases.
- Stigma and misconceptions about the relationship between TB and HIV/AIDS was also noted amongst the respondents in relation to close association of TB and HI/AIDS. This factor was identified based on the way in which the community where the respondents come from perceive TB. Most of the respondents indicated that the society thinks that TB is a disease for HIV positive people. A continuous community health education and better coordination of TB and HIV/AIDS is needed (Escott & Newell 2007:507).
- Even though only few respondents take alcohol and smoke, the social habits of alcohol consumption and smoking cannot be ignored. For example, passive smoking is also dangerous and should be considered a contributing factor to TB contraction.
Exposure to toxic smoke from industries was considered as a minimal contributing factor to TB contraction. Only very few of the respondents had exposure to industrial smoke. However, toxic smoke should be given attention when looking at the factors to TB contraction.

It can be concluded that this objective was achieved.

5.4.2 To assess the knowledge of respondents regarding TB, its causes and its prevention measures amongst patients newly diagnosed with TB at Katutura TB State Hospital

This study found that respondents’ knowledge of TB ranged from no knowledge to basic knowledge of TB in relation to its causes and prevention. Therefore, this objective was achieved.

5.5 RECOMMENDATIONS

Based on the findings of the study, the following recommendations are made:

5.5.1 Intersectional collaboration in TB management

The study found that 68% of the respondents had at least secondary level education. Therefore, it is recommended that TB must be incorporated in the primary and secondary school as this might help with symptom identification and early health seeking behaviour. Furthermore, the knowledge of the disease might help with taking appropriate prevention measures. In most cases, children share what they learn in school with their parents.

5.5.2 Outreach services

The Ministry of Health and Social Services should launch outreach services that disseminate information on appropriate use of sanitation facilities, healthy lifestyle, correct eating habits but utilising the readily available food in the communities, importance of rest and exercise.
5.5.3 Community leaders’ involvement

The Ministry of Health and Social Services should work together with the community leaders to combat TB. Leaders are the ones to encourage the community to visit health facilities for help when sick because they are usually called to visit the sick in their communities. The communities respect their leaders and they trust them better than the strangers so, hearing the information from them will make them more compliant to healthy habits.

5.5.4 Recommendation for future research

- This study can be replicated as a qualitative study, using interviews so that in-depth information can be obtained through probing. This will help to understand attitudes and non-verbal responses.
- Research needs to be undertaken to find the shift in gender infection rates of TB.
- A study should be conducted to investigate why TB infection is still prevalent amongst the majority of respondents who stay in modern houses with appropriate sanitation facilities.

5.6 CONTRIBUTIONS OF THE STUDY

This study highlighted a shift in TB Infection factors. Furthermore, this study outlined the knowledge of TB in regards to its causes and prevention measures. Therefore, the TB Directorate under the Ministry of Health and Social Services (MoHSS) may use this study results to formulate new TB policies and protocols to fight against TB. The recommendations made by this study will assist the MoHSS with a way forward to strategize in their resources allocation in TB control and treatment. It is important to highlight that this study paved a way for further TB research in Namibia concerning TB control and treatment.

5.7 LIMITATIONS OF THE STUDY

- The study was conducted in Windhoek in Khomas Region, of Namibia. Therefore, the results cannot necessarily be generalised to the whole country.
• The use of questionnaires prevented the researcher from probing more information from the respondents.
• The data was captured from the hospitalised patients only, thus there might be different data from the patients at the clinics or the discharged ones.
• Some respondents chose not to answer some questions, which led to missing important data.

5.8 CONCLUDING REMARKS

This study looked at the factors that contributed to infection of TB amongst the newly diagnosed TB patients at Katutura TB State Hospital. Some factors surfaced clearly from the study, such as TB stigma, poor nutrition, and lack of education. However, some factors were not very clear on their contribution to TB on this study. These factors are, accommodation, sanitation and gender infection.

The recommendations were made for the Ministry of Health and Social Services for policymaking, programme formulation and implementation. Finally, the researcher gave a layout of the suggested future.
REFERENCES


Creswell, JC. 2014. Research design: *Qualitative, quantitative and mixed methods approaches.* University of Nebraska: SAGE/Lincoln.


Ministry of Health and Social Services and ICF International. 2013. *Demographic and Health Survey 2013*. Windhoek, Namibia, and Rockville, Maryland, USA: MoHSS and ICF

MoHSS see Ministry of Health and Social Services.

MoHSS and ICF International see Ministry of Health and Social Services and ICF International.


Oxlade, O & Murray, M. 2012. *Tuberculosis and poverty: why are the poor at greater risk in India?* PLoS ONE 7:11.


University of Medicine and Dentistry of New Jersey. 2012. *Possible connection between air pollution and tuberculosis susceptibility.*


WHO see World Health Organization.


ANNEXURES
ANNEXURE 1: ETHICAL CLEARANCE CERTIFICATE

UNIVERSITY OF SOUTH AFRICA
Health Studies Higher Degrees Committee
College of Human Sciences
ETHICAL CLEARANCE CERTIFICATE

REC-012714-039
HSHDC/465/2015

Date: 25 November 2015
Student No.: 5120 009 3

Project Title: Factors that contributed to tuberculosis among newly diagnosed tuberculosis patients in a tuberculosis state hospital.

Researcher: Robert Kogano

Degree: MA in Nursing Science
Code: MPCHS94

Supervisor: Dr TG Lumadi
Qualification: D Lit et Phil
Joint Supervisor:

DECISION OF COMMITTEE
Approved [ ] Conditionally Approved [ ]

Prof L Roost
CHAIRPERSON: HEALTH STUDIES HIGHER DEGREES COMMITTEE

Prof MM Moloki
ACADEMIC CHAIRPERSON: DEPARTMENT OF HEALTH STUDIES

PLEASE QUOTE THE PROJECT NUMBER IN ALL ENQUIRIES
ANNEXURE 2: REQUESTING PERMISSION TO CONDUCT THE STUDY

PO BOX 27439
Windhoek
Tel Work: 061 270 2015
Mobile: +264 81 333 2468
Email: rkpone2000@gmail.com

17 November 2015

Permanent Secretary
Ministry of Health and Social Services
Private Bag 13198
Windhoek
Namibia

Dear Sir

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT KATUTURA TB STATE HOSPITAL

This letter serves as request to conduct a research at the Katutura TB State hospital as my Masters of Arts in Nursing from the University of South Africa (UNISA). The research topic is FACTORS THAT CONTRIBUTED TO THE CONTRACTION OF TB AMONG THE NEWLY DIAGNOSED TB PATIENTS IN KATUTURA TB STATE HOSPITAL.

This research is aimed at exploring the factors that contributed to the contraction of TB amongst patients who are newly diagnosed with TB at Kaututura TB state hospital. I got inspired to conduct this study due to the fact that TB continues to be a health hazard in Namibia and the rest of the world. Therefore, the results of this study will be used to point out the areas that still need to be addressed to promote prevention of TB. Furthermore, the results of this study will facilitate formulation of programmes and policies by the Ministry of Health and Social Services to sensitize the public about the
factors that place them at the risk of contracting TB and measures they can use to prevent TB infection.

Patients who are admitted in the wards will be requested to sign the consent form and fill in the questionnaires. Codes instead of names will be used to protect the patients’ privacy.

Thanking you in anticipation.

Yours faithfully

Mr Kopano Robert (Student no: 51909693)
ANNEXURE 3: PERMISSION GRANTED FROM MINISTRY OF HEALTH AND SOCIAL SERVICES TO CONDUCT THE RESEARCH STUDY

OFFICE OF THE PERMANENT SECRETARY

Re: Factors that contributed to the contraction of TB among newly diagnosed TB patients in Katutura TB State Hospital.

1. Reference is made to your application to conduct the above-mentioned study.

2. The proposal has been evaluated and found to have merit.

3. Kindly be informed that permission to conduct the study has been granted under the following conditions:

   3.1 The data to be collected must only be used for completion of your Masters of Art in Nursing.

   3.2 No other data should be collected other than the data stated in the proposal.

   3.3 Reputed ethical considerations in the protocol related to the protection of Human Subjects’ information should be observed and adhered to; any violation thereof will lead to termination of the study at any stage.

   3.4 A quarterly report to be submitted to the Ministry’s Research Unit.

   3.5 Preliminary findings to be submitted upon completion of the study.

Date: 19th January 2016

Mr. Koponn Robert
P.O. Box 27439
Windhoek
Namibia

Dear Mr. Robert,
3.6 Final report to be submitted upon completion of the study;
3.7 Separate permission should be sought from the Ministry for the publication of the findings.

Yours sincerely,

[Signature]

Andreas Mwoombola (Dr)
Permanent Secretary

2016-01-25

“Health for All”
ANNEXURE 4: PERMISSION GRANTED FROM INTERMEDIATE HOSPITAL, KATUTURA, MINISTRY OF HEALTH AND SOCIAL SERVICES, WINDHOEK CONDUCT THE RESEARCH STUDY

Republic of Namibia
Ministry of Health and Social Services

Private Bag 12315
WINDHOEK
Namibia

Intermediate Hospital Katutura
Independence Avenue
WINDHOEK

Telephone (061) 203 4064
Telefax (061) 222206

Enquiries Dr. N. T. Amagulu

Date: 17 June 2016

Mr. Kopano Robert
P. O. Box 27439
Windhoek

RE: PERMISSION TO DO RESEARCH IN FACTORS THAT CONTRIBUTED TO THE CONTRACTION OF TB AMONG NEWLY DIAGNOSED TB PATIENTS AT INTERMEDIATE HOSPITAL KATUTURA

This office hereby grants you permission to do research in factors that contributed to the contraction of TB among newly diagnosed patients at TB unit, Intermediate Hospital Katutura.

Thank you.

Yours in Health,

[Signature]

DR. N.T. AMAGULU
MEDICAL SUPERINTENDENT
ANNEXURE 5: RESPONDENT CONSENT FORM

Research title: Factors that contribute to the contraction of TB among the newly diagnosed TB patients in Katutura TB state hospital

Dear respondent

My name is Kopano Robert I am a student at the University of South Africa conducting a research study on Factors that contribute to the contraction of TB among the newly diagnosed TB patients in Katutura TB state hospital. The purpose of this study is to explore the factors that contributed to the contraction of TB amongst patients who are newly diagnosed with TB at Katutura TB state hospital.

I therefore request your participation in this research study by filling in/answering questions on a questionnaire related to the factors that may lead to a person getting TB.

Your participation in this study is voluntary which means you do not necessarily have to participate. Refusal to participate or withdrawal from the study will not result in any penalty. If you choose to participate, you can withdraw from the study at any time. You may also choose not to answer some questions on the questionnaire given to you. You are assured that the information collected on this study will be kept strictly confidential. Codes instead of names will be written on the questionnaire.

If you choose to participate in this study, your signed consent is required before I start collecting data from you.

Respondent’s signature

I consent voluntarily to be a respondent in this study. I understand the purpose of the research study, that I have the right to withdraw from the study at any time and to choose not to answer some questions in the study.
My name and signature indicate that I am willing to participate in this research.

(Respondent name printed)

------------------------------------------  ------------------------------------------

(Respondent signature)  (Consent date)

------------------------------------------  ------------------------------------------

(Signature of researcher)  (Date)
ANNEXURE 6: QUESTIONNAIRE

You are kindly requested to participate in this study by replying to the following questions.

Please indicate your choice by placing an (x) next to the answer of your choice.

For the questions that need more than one answer, please place an (x) on all your choices.

Do not feel obligated to answer a question if it does not apply to you.

No individual names are required since the information you are giving is strictly confidential.

Respondent no:………………………………………………
Date:………………………………………………………

1. DEMOGRAPHIC INFORMATION

<table>
<thead>
<tr>
<th>NO</th>
<th>QUESTION</th>
<th>OPTIONS (mark with an x)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Gender</td>
<td>1. Male</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Female</td>
</tr>
<tr>
<td>1.2</td>
<td>How old are you?</td>
<td>1. Under 30 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. 31-40 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. 41-50 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Over 50 years</td>
</tr>
</tbody>
</table>

2. SOCIO ECONOMIC STATUS

<table>
<thead>
<tr>
<th>NO</th>
<th>QUESTION</th>
<th>OPTIONS (mark with an x)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>What is your highest level of education?</td>
<td>1. No formal education</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Primary education</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Secondary education</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Tertiary level</td>
</tr>
<tr>
<td>2.2</td>
<td>What is your employment status?</td>
<td>1. Unemployed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Casual employee</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Permanently employed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Self employed</td>
</tr>
</tbody>
</table>
### 2.3 How much do you earn per month?  
* (Do not answer if you are unemployed)  

<table>
<thead>
<tr>
<th>Options</th>
<th>Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. N$0</td>
<td></td>
</tr>
<tr>
<td>2. N1-N$ 1000</td>
<td></td>
</tr>
<tr>
<td>3. N$ 1000-N$ 5000</td>
<td></td>
</tr>
<tr>
<td>4. Above N$ 5000</td>
<td></td>
</tr>
</tbody>
</table>

### 3. COMPOSITION OF HOUSEHOLD

#### 3.1 Where do you live?  

<table>
<thead>
<tr>
<th>Options</th>
<th>Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Informal settlement</td>
<td></td>
</tr>
<tr>
<td>2. Formal settlement</td>
<td></td>
</tr>
</tbody>
</table>

#### 3.2 What type of housing do you stay?  

<table>
<thead>
<tr>
<th>Options</th>
<th>Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Shack</td>
<td></td>
</tr>
<tr>
<td>2. Modern House</td>
<td></td>
</tr>
</tbody>
</table>

#### 3.3 Which toilet facilities do you have?  

<table>
<thead>
<tr>
<th>Options</th>
<th>Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bush</td>
<td></td>
</tr>
<tr>
<td>2. Bucket system</td>
<td></td>
</tr>
<tr>
<td>3. Pit latrine</td>
<td></td>
</tr>
<tr>
<td>4. Water closet</td>
<td></td>
</tr>
<tr>
<td>5. Other........................</td>
<td></td>
</tr>
</tbody>
</table>

#### 3.4 Do you stay with your family members?  

<table>
<thead>
<tr>
<th>Options</th>
<th>Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Yes</td>
<td></td>
</tr>
<tr>
<td>2. No</td>
<td></td>
</tr>
</tbody>
</table>

#### 3.5 How many people live in the dwelling per room?  

<table>
<thead>
<tr>
<th>Options</th>
<th>Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 1-4</td>
<td></td>
</tr>
<tr>
<td>2. 5-8</td>
<td></td>
</tr>
<tr>
<td>3. More than 8</td>
<td></td>
</tr>
</tbody>
</table>

#### 3.6 What kind of food do you eat?  
* (mark the ones you eat with an x)  

<table>
<thead>
<tr>
<th>Options</th>
<th>Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Grains e.g. mealie meal, rice, macaroni</td>
<td></td>
</tr>
<tr>
<td>2. Proteins e.g. meat (beef), chicken, mutton</td>
<td></td>
</tr>
<tr>
<td>3. Fruits e.g. oranges</td>
<td></td>
</tr>
<tr>
<td>4. Vegetables e.g. spinach</td>
<td></td>
</tr>
<tr>
<td>5. Milk and milk products e.g. yoghurt</td>
<td></td>
</tr>
</tbody>
</table>

#### 3.7 How many meals do you eat per day?  

<table>
<thead>
<tr>
<th>Options</th>
<th>Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. One</td>
<td></td>
</tr>
<tr>
<td>2. Two</td>
<td></td>
</tr>
<tr>
<td>3. Three</td>
<td></td>
</tr>
<tr>
<td>4. More than three</td>
<td></td>
</tr>
<tr>
<td>3.8</td>
<td>Can you afford food for the whole month?</td>
</tr>
<tr>
<td>4. ENVIRONMENTAL STATUS</td>
<td></td>
</tr>
<tr>
<td>4.1</td>
<td>Do you live next to an industrial site?</td>
</tr>
<tr>
<td>4.2</td>
<td>If your answer to 4.1 was YES, does that industry excrete a lot of smoke?</td>
</tr>
<tr>
<td>4.3</td>
<td>Do you stay next to a place that sells alcohol and cigarettes?</td>
</tr>
<tr>
<td>4.4</td>
<td>How far do you live from the nearest health facility?</td>
</tr>
<tr>
<td>4.5</td>
<td>Do you have enough money to go to the clinic?</td>
</tr>
<tr>
<td>5. KNOWLEDGE OF TUBERCULOSIS (TB)</td>
<td></td>
</tr>
<tr>
<td>5.3</td>
<td>What are the signs and symptoms of TB? <em>(mark all the relevant answers)</em></td>
</tr>
<tr>
<td>-----</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>1. Rash</td>
</tr>
<tr>
<td></td>
<td>2. Cough</td>
</tr>
<tr>
<td></td>
<td>3. Cough that lasts longer than 3 weeks</td>
</tr>
<tr>
<td></td>
<td>4. Coughing up blood</td>
</tr>
<tr>
<td></td>
<td>5. Severe headache</td>
</tr>
<tr>
<td></td>
<td>6. Nausea</td>
</tr>
<tr>
<td></td>
<td>7. Weight loss</td>
</tr>
<tr>
<td></td>
<td>8. Fever without clear cause that lasts more than 7 days</td>
</tr>
<tr>
<td></td>
<td>9. Chest pain</td>
</tr>
<tr>
<td></td>
<td>10. Shortness of breath</td>
</tr>
<tr>
<td></td>
<td>11. On-going fatigue</td>
</tr>
<tr>
<td></td>
<td>12. Do not know</td>
</tr>
<tr>
<td></td>
<td>13. Other………………………………………………………………………...</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.4</th>
<th>How can a person get TB? <em>(mark all the relevant answers)</em></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Through handshakes</td>
</tr>
<tr>
<td></td>
<td>2. Through the air when a person with TB coughs or sneezes</td>
</tr>
<tr>
<td></td>
<td>3. Through sharing dishes</td>
</tr>
<tr>
<td></td>
<td>4. Through eating from the same plate</td>
</tr>
<tr>
<td></td>
<td>5. Through touching items in public places (doorknobs, handles in transportation, etc.)</td>
</tr>
<tr>
<td></td>
<td>6. Do not know</td>
</tr>
<tr>
<td></td>
<td>7. Other………………………………………………………………………...</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.5</th>
<th>How can a person prevent getting TB? <em>(mark all the relevant answers)</em></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Avoid shaking hands</td>
</tr>
<tr>
<td></td>
<td>2. Covering mouth and nose when coughing or sneezing</td>
</tr>
<tr>
<td></td>
<td>3. Avoid sharing dishes</td>
</tr>
<tr>
<td></td>
<td>4. Washing hands after touching items in public places</td>
</tr>
</tbody>
</table>
5. Closing windows at home  
6. Through good nutrition  
7. By praying  
8. Do not know  
9. Other……………………………..
………………………………………..
………………………………………..

### 6. SOCIAL HABITS

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>6.1</strong> Do you smoke?</td>
<td>1. Yes</td>
<td>2. No</td>
</tr>
<tr>
<td><strong>6.2</strong> How many cigarettes do you smoke per day?</td>
<td>1. 0-10</td>
<td>2. 11-20</td>
</tr>
<tr>
<td><strong>6.3</strong> Do you take any other form of non-medical drugs?</td>
<td>1. Yes</td>
<td>2. No</td>
</tr>
</tbody>
</table>
| **6.4** If the answer to 6.3 is YES, which non-medical drugs do you take? | Answer…………………………………..
………………………………………..
……………………………………….. |
| **6.5** Do you take alcohol? | 1. Yes | 2. No |
| **6.6** If you take alcohol, what kind of alcohol do you drink? (mark all the relevant answers) | 1. Traditional brewed alcohol | 2. Spirits | 3. Wines | 4. Beer |

### 7. TUBERCULOSIS AND STIGMA

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Question</td>
<td>Options</td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
</tbody>
</table>
| 7.2 How do you perceive the attitude of the society towards people with TB? | 1. Friendly  
2. Unfriendly                                                   |
| 7.3 Have you told your family members that you have TB?                  | 1. Yes  
2. No                                                      |
| 7.4 If the answer to 7.3 is NO, give reasons why?                       | 1. Fear of isolation at home  
2. Fear of negative response  
3. Other.................................................. |
| 7.5 Have you told your employer that you have TB? (only if employed)     | 1. Yes  
2. No  
3. Not applicable                                                 |
| 7.6 If your answer to 7.4 is NO, give reasons                           | 1. Fear of losing the job  
2. Fear of isolation at work  
3. Other.................................................. |
| 7.7 Are you ashamed of having TB?                                       | 1. Yes  
2. No                                                      |
| 7.8 Give reasons for the answer you provided in 7.7                     | Answer..................................................  
........................................................................  
........................................................................ |

Thank you very much for your participation.
ANNEXURE 7: STATISTICIAN REVIEW LETTER

31 October 2016

To whom it may concern

This serves as confirmation that I have assisted Kopano Robert with the statistical analysis of his research thesis entitled “Factors that contributed to contraction of TB among newly diagnosed TB patients in Katutura TB hospital”.

Regards

Dr Florida Beukes
Senior Manager: Strategic and Curriculum Development
African leadership Institute, Windhoek
Tel: + 264 61 250 229
Cell: +264 81 392 0875
florida@ali.com.na

Florida holds a master’s degree in education and a doctorate in leadership and management. She has 13 years’ experience of teaching and researching in higher education and has published a number of articles in refereed journals. In addition, she has assisted numerous students and lecturers with statistical analysis in the past.
ANNEXURE 8: ENGLISH LANGUAGE EDITING LETTER

To whom it may concern

I hereby confirm that the thesis titled:

FACTORTS THAT CONTRIBUTED TO CONTRACTION OF TUBERCULOSIS AMONG THE NEWLY DIAGNOSED TUBERCULOSIS PATIENTS IN KATUTURA TUBERCULOSIS STATE HOSPITAL

by Kopano Robert

was proofread and language edited by Patrick Panduleni Paulus.

Patrick P. Paulus (M.A. TESOL)
Coordinating Lecturer: English for Academic Purposes
Language Centre
University of Namibia
ppaulus@unam.na
+264812830269