

**ASSESSMENT OF PREVENTION BEHAVIOURAL PRACTICES AMONG
ADULT TUBERCULOSIS PATIENTS IN EASTLEIGH DIVISION, NAIROBI
COUNTY, KENYA**

BY

**FARHIA MOHAMUD YUSUF (BSN)
P57F/24333/2011
DEPARTMENT OF COMMUNITY HEALTH**

**A RESEARCH THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF
PUBLIC HEALTH IN THE SCHOOL OF PUBLIC HEALTH OF KENYATTA
UNIVERSITY**

SEPTEMBER, 2014

Style Definition: No Spacing: Indent: Left:
0.06", Line spacing: Double

DECLARATION

This thesis is my original work and has not been presented for a degree or other awards in any other university.

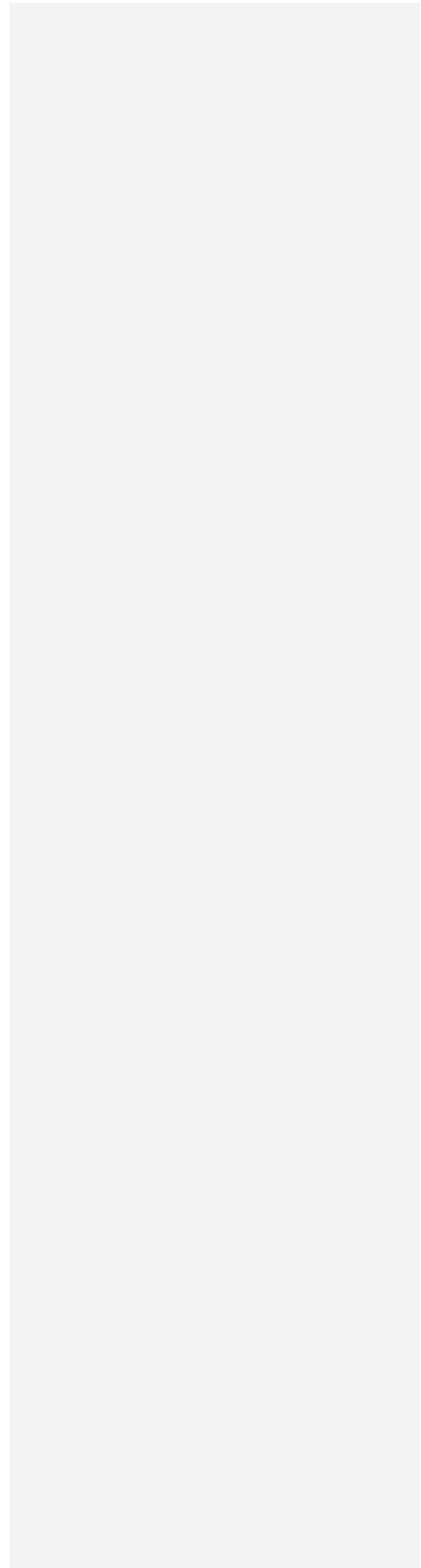
Signature Date.....
Farhia Mohamud Yusuf
REG. No. P57F/24333/2011

Supervisors

This thesis has been submitted for review with our approval as University Supervisors

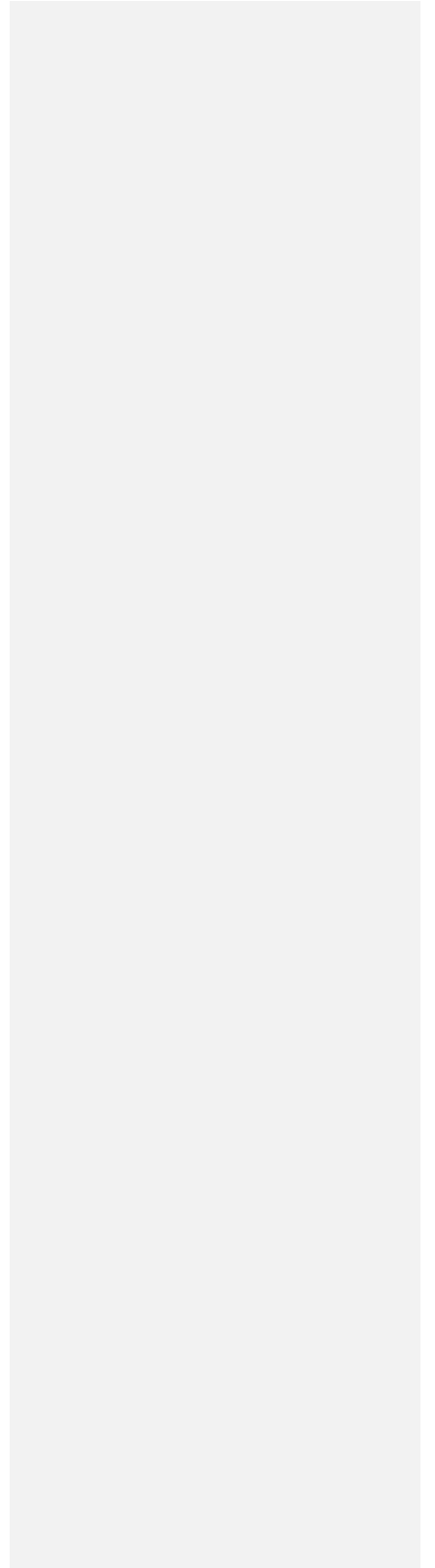
Signature:..... Date:.....
Dr. Tom Were
Department of Pathology
Kenyatta University

Signature:..... Date:.....
Dr. Justus O. S. Osero
Department of Community Health
Kenyatta University



DEDICATION

I dedicate this thesis to my father Mohamud Yusuf Ibrahim and my mother Safi Ahmed Mohamed and all my Siblings.



ACKNOWLEDGEMENT

I am grateful to Allah for the grace and opportunity to complete this thesis and give him thanks and praise. I would like to express my sincere gratitude and deep appreciation to my supervisors Dr. Tom Were and Dr. Justus. Osero for their valuable support, encouragement, supervision and suggestions that made this research work a success. I am also highly thankful to the Chairman Department of Community Health, Dr. John. P. Oyore and Dr. Isaac Mwanzo for their support and guidance throughout the study period.

I acknowledge with gratitude Mogadishu University for offering me full scholarship at Kenyatta University. My sincere appreciation extends to the President of Mogadishu University Prof. Ali Sheikh Ahmed and Vice President Administration Affairs Mr. Ibrahim Mahamed Mursal for ensuring that my scholarship was uninterrupted. Special thanks go to Mr. Abdiwali Sheikh Mohamed for his invaluable support and unending encouragement. Special thanks also go to the District Medical Officer of Health (DMOH), all doctors and nurses and other staff working at TB health facilities in Eastleigh Division for their immense participation, co-operation and support during data collection. I also wish to note and appreciate the participation and contributions made by tuberculosis patients, their observations and genuine responses forms the basis of this study. I would like to take this opportunity to thank my colleagues in the School of Public Health for their support and assistance during my study. Lastly but not least, many thanks go to my family and my friends for their understanding and support without which completing this study wouldn't have been possible. I am truly humbled by the various contributions I received during the study for which I lack words to express my appreciation, God bless you all.

TABLE OF CONTENTS

Declaration.....	ii
Dedication.....	iii
Acknowledgement.....	iv
List of tables.....	ix
List of figures.....	x
Abbreviations and acronyms	xi
Operational Definition.....	xiii
Abstract.....	xv
CHAPTER ONE: INTRODUCTION	1
1.1 Background information	1
1.2 Problem Statement of the study	3
1.3 Justification of the Study	4
1.4 Research Questions.....	5
1.5 Hypothesis of the study.....	6
1.6 Objectives of the Study.....	6
1.6.1 Broad Objectives	6
1.6.2 Specific Objectives	6
1.7 Delimitation and Limitation of the Study	7
1.8 Conceptual Framework.....	8
CHAPTER TWO: LITERATURE REVIEW.....	9
2.1 Introduction of Tuberculosis.....	9
2.2 Epidemiology and transmission of tuberculosis	9
2.3 The burden of Tuberculosis	11

2.4 Tuberculosis and HIV/AIDS.....	12
2.5 Types of Tuberculosis.....	13
2.5.1 Pulmonary tuberculosis	13
2.5.2 Extra Pulmonary Tuberculosis	14
2.6 Diagnosis of Tuberculosis.....	16
2.7 Treatment of Tuberculosis	17
2.8 Prevention of Tuberculosis	19
2.9 Knowledge and attitude of tuberculosis among patients	22
2.10 Practice of preventive behavioral towards Tuberculosis	24
CHAPTER THREE: MATERIAL AND METHODS.....	25
3.1 Introduction.....	25
3.2 Study Area	25
3.3 Study Population.....	26
3.4 Study Design.....	26
3.5 Study Variables.....	26
3.5.1 Dependent Variables.....	26
3.5.2 Independent Variables	26
3.6 Selection Criteria	26
3.6.1 Inclusion Criteria	26
3.6.2 Exclusion Criteria	27
3.7 Sampling Technique and Sample Size.....	27
3.7.1 Sample Techniques	27
3.7.2 Sample Size Determination.....	28
3.8 Data Collection Techniques.....	28

3.9 Pretest.....	28
3.10 Validity	29
3.11 Reliability.....	29
3.12 Data Management and Analysis	29
3.13 Logistical and Ethical Considerations	32
CHAPTER FOUR: RESULTS.....	33
4.1 Introduction.....	33
4.2 Socio-demographic characteristics of the respondents.....	33
4.3 Awareness of the Respondents about TB	37
4.3.1 Respondents awareness of TB.....	37
4.3.2 Respondents awareness of types of TB	37
4.3.3 Respondents sources of information about TB.....	38
4.3.4 Respondents awareness of history of TB among family members	39
4.3.5 Respondents who had lived with someone having TB.....	39
4.3.6 Respondents awareness of other TB patients living in their neighborhood	40
4.4 Knowledge level towards TB.....	41
4.5 Attitude of the respondents towards TB	46
4.6 Practice of prevention behavior towards TB	50
4.7 Association between knowledge and socio-demographic characteristic	53
4.8 Association between overall Knowledge level and overall attitude	55
4.9 Association between overall knowledge and overall practice of prevention behaviors towards TB	55
4.10 Association between attitude and socio-demographics characteristics	56

4.11 Association between overall attitude and overall practice of prevention behaviour towards TB.....	58
4.12 Association between practices of prevention behavior with socio-demographic characteristics	58
CHAPTER FIVE: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS.....	61
5.1 Discussion.....	61
5.1.1 Awareness and knowledge of the respondents about TB	61
5.1.2 Attitude of the respondents towards TB	64
5.1.3 Practice of preventive behavior of the respondents towards TB	65
5.1.4 Association between knowledge, attitude and practice of prevention behavior towards TB of the respondents.....	66
5.2 Conclusions.....	68
5.3 Recommendations.....	70
5.3.1 Recommendation from the study.....	70
5.3 Areas of further research.....	71
REFERENCES.....	72
APPENDICES.....	79
Appendix I: Informed Consent.....	79
Appendix II: Questionnaires.....	80
Appendix III: Ethical Approval Letter.....	86
Appendix IV: Research Permit.....	88
Appendix V: Map of Kenya and Nairobi County showing Eastleigh Division	90

LIST OF TABLES

Table3.1. Sampling technique used to derive desired sample size	27
Table 4.1.1 Socio-demographics characteristics of the respondents	35
Table 4.1.2 Socio-demographics characteristics of the respondents	36
Table 4.2.1 Respondents knowledge level towards TB	43
Table4.2.2 Respondents knowledge level towards TB	44
Table4.3. Attitude of the respondents towards TB	48
Table4.4. Practice of prevention behavior towards TB of the respondents	51
Table 4.5. Association between knowledge and socio-demographic characteristic	54
Table 4.6. Association between overall knowledge level and overall attitude.....	55
Table 4.7. Association between overall knowledge and overall practice of preventive behaviors towards TB.....	55
Table 4.8. Association between attitude and socio-demographic characteristics.....	57
Table 4.9 Association between overall attitude and overall practice of prevention behavior towards TB.....	56
Table 4.10.1 Association between practices of prevention behaviors with Socio- demographic characteristics	59
Table 4.10.2 Association between practices of prevention behaviors with Socio- demographic characteristics	60

LIST OF FIGURES

Figure 4.1: Respondent’s awareness of TB37

Figure 4.2: Respondents awareness of types of TB38

Figure 4.3: Respondents sources of information about TB38

Figure 4.4: Respondents awareness history of TB among family members.....39

Figure 4.5: Respondents who had lived with someone having TB.....39

Figure4.6. Respondent’s awareness of other TB patients in their areas40

Figure 4.7: Proportion of respondents with overall good and poor knowledge on TB45

Figure 4.8 The proportion of respondents with positive and negative attitude towards TB.....49

Figure 4.9. The proportion of the respondents with Good and Poor Practice of prevention
behaviour towards TB52

ABBREVIATIONS AND ACRONYMS

AFB:	Acid-Fast Bacilli
AIDS:	Acquired Immunodeficiency Syndrome
BCG:	Bacille Calmette-Guerin
DC:	District Commissioner
CNR:	Case Notified Rate
DLTLD:	Division of Leprosy and Tuberculosis Lung Disease
DMOH:	District Medical Officer Health
DOTS:	Direct Observation Treatment Short Course
E:	Ethambutol
EPTB:	Extra Pulmonary Tuberculosis
GOK:	Government of Kenya
HBC:	High Burden Countries
HIV:	Human Immunodeficiency Virus
H:	Isoniazid
IOM:	International Organization of Migrants
KANCO:	Kenya Aids NGOs Consortium
LTBI:	Latent Tuberculosis Infection
MDG:	Millennium Development Goal
MTB:	Mycobacterium Tuberculosis
MDR-TB:	Multi Drug Resistance Tuberculosis
MOH:	Ministry of Health
MPHS:	Ministry of Public Health and Sanitation

NGO:	Non Governmental Organization
NTM:	Non Tuberculosis Mycobacteria
NLTP:	National Leprosy and Tuberculosis Program
PAS:	Para-Amino Salicylic acid
PTB:	Pulmonary Tuberculosis
R:	Rifampicin
SD:	Standard Deviation
SPPTB:	Smear-Positive Pulmonary Tuberculosis
SPSS:	Statistical Package for the Social Science
TB:	Tuberculosis
US:	United State
XDR-TB:	Extensively Drug Resistant Tuberculosis
WHA:	World Health Assembly
WHO:	World Health Organization

OPERATIONAL DEFINITION

Knowledge of tuberculosis: It is information that an individual is aware of it. In this study it was measured based on the ability of patients correctly identify and respond on causes of TB, mode of transmission , susceptible people,, sign an symptoms, most useful method to diagnosis of TB , treatment of TB ,duration of completing treatment of TB, side effect of anti-TB drugs. Each correct answer had one point.

Overall knowledge: It is the summary of all the 10 questions. The mean was considered to classify good and poor knowledge.

Good Knowledge:-Knowledge score that fell above the mean.

Poor Knowledge: - Knowledge score below the mean

Attitude: is the perception or outlook regarding tuberculosis.

Preventive behavior of Tuberculosis: means that the respondent's behavior to protect them from TB infection, included, protective and health promotion activities.

Practice: is the overt behavior, habit or custom that a person does, follow up or carry out in his/her daily life. It was measured based on previous health seeking behavior, decisions and actions taken to seek treatment and advice. Twelve questions were used to assess the experience and practice of the patients. Each had one point if correctly answered. The base for classification of good and poor was the mean of each score.

Source of information of TB: refers to from whom/where patients got information about tuberculosis and treatment. Place where respondents got information included mass media and from whom patients received information included health personnel, NGO's, staff , cured –TB patients, relative and friends.

Transmission: is the passing of a disease from an infected individual or group to a previously uninfected individual or group.

Tuberculosis: TB as a “communicable disease of the lungs that can also affect any part of the body. It is caused by the Mycobacterium tuberculosis and transmission occurs by the airborne spread of infectious droplets.

Awareness-: defines awareness as “having knowledge or a attitude of a situation or fact; an act of becoming conscious of the challenging world a person lives in; developing feelings and thoughts about, and knowing the skills which will help a person in adapting and coping with challenges occurring in it”.

Occupation: refers to current job of respondents it includes business, government officer, famer, jobless and others.

Education: refers to educational level that respondent obtained/attended. It preferred to an education obtained from primary school, secondary school, college, degree, and other.

ABSTRACT

Tuberculosis is a common and often deadly airborne bacterial infectious disease which usually targets the lungs (pulmonary TB) and affects any organ outside pulmonary parenchyma (Extra-pulmonary TB), and is a major cause of illness and death worldwide. It causes ill-health among millions of people each year and ranks as the second leading cause of death from an infectious disease worldwide, after the human immunodeficiency virus (HIV). About one third of the world's population is infected with TB; two-thirds of these cases estimated to occur among people aged 15–59 years, which, unfortunately, is the most productive age group. This has a negative effect on the economy because this group contributes greatly to the workforce. Approximately 9 million new cases in 2011 and 1.4 million TB deaths (990,000 were HIV negative people and 430,000 were HIV-associated TB deaths) were reported. TB cases notified in Kenya were 99,159 TB cases in 2012 with more than 4000 deaths, thus making Kenya to be one of the 22 high TB burden countries in the world and the fifth highest burden in Africa. Kenya continues to treat an increased number of TB patients each year; however, widespread co-infection with HIV (close to 38 percent of new TB patients) makes TB treatment difficult. The aim of this study was to determine the level of knowledge, attitude and practice of preventive behavior towards tuberculosis among adult tuberculosis patients in Eastleigh Division, Nairobi County. The study population was TB patients attending TB health facilities in Eastleigh Division. The study design was descriptive cross-sectional study. Quantitative approaches through semi-structured questionnaires were used to collect data on demographic, awareness, knowledge, attitude and practice of preventive behavior among adults, where a systematic random sampling ($n=384$) of respondents was used for the study. Descriptive statistical method was used to summarize and analyze the data using the Statistical Package for Social Science (SPSS) version 20. Associations between knowledge, attitude and practice levels were analyzed using Chi-Square. A total of 78.8% were aware of pulmonary tuberculosis, few were aware of extra-pulmonary TB. A total of 51.6% of the respondents had high knowledge level on TB, while 48.4% had low knowledge level on tuberculosis. On attitude level 54.4% of the respondents had negative attitude while 45.6% had positive attitude. A total of 67.2% of the respondents had high practice of prevention behaviour towards TB. Educational status was significantly associated with TB knowledge ($P=0.001$), occupation ($P=0.006$), and religion ($P=0.001$) while nationality of the respondents was associated with TB knowledge ($P=0.001$). Gender was associated with practice of prevention behavior towards TB ($P=0.062$) and education level was associated with practice of preventive behavior towards TB ($P=0.001$). The study also established that Muslim religion was associated with attitude towards TB ($P=0.041$) while knowledge was associated with attitude towards TB ($P=0.045$). The result also indicate that attitude was associated with practice of prevention behavior towards TB ($P=0.029$). Generally over all knowledge and attitude of TB patients about TB were low. So implementation of health education and awareness creation by using different mechanisms and further research are recommended. The findings of this study is valuable in informing prevention policy of tuberculosis programs at tuberculosis health facilities in Eastleigh Division, Nairobi County as well as enhance health education related to TB knowledge on causative agents and mode of transmission with the aim of reducing new tuberculosis cases.

CHAPTER ONE: INTRODUCTION

1.1 Background information

Tuberculosis (TB) is a highly infectious disease which is caused by acid-fast bacilli (AFB), belonging to the *Mycobacterium tuberculosis* complex (*M. tuberculosis*, *M. bovis*, *M. africanum*, *M. microti*, *M. caprae*, *M. canettii* and *M. goodii*). TB continues to be identified as a major health concern worldwide (WHO, 2012). In particular, the emergence of drug resistant strains of TB is considered a global threat to the control of this disease. In spite of the fact that TB is preventable, treatable and curable it is estimated that one-third of the world's population is infected with latent TB (LTB), about eight million new cases arise each year and about two million people die from TB each year (WHO, 2012). The highest rates of TB cases are found in countries where poverty, crowding and insufficient health care programs are common problems (Farmer, 2005).

In 1993, World Health Organization (WHO) declared TB as a global emergency and different targets for TB control have also been set. In 1991, the World Health Assembly (WHA) set a target to detect 70% of new smear positive cases in direct observation treatment short course (DOTS) programme and to successfully treat 85% of the detected cases (Dye *et al.*, 2007). In 2006, WHO launched the Stop TB Strategy as the internationally-recommended approach to reducing the burden of TB in line with global targets set for 2015. The Millennium Development Goals (MDG) also set a target for TB control: the MDG 6 Target 6C is to halt and reverse incidence of TB by 2015 (WHO, 2008a). Two additional target impacts have been set by the Stop TB Partnership, which are to half prevalence and death rates by 2015 as compared to 1990 (WHO, 2008a).

Formatted: Font: Italic

Formatted: Font: Italic

Without the implementation of proper control measures, WHO estimates that between 2000 and 2020, nearly one billion people will be newly affected, 200 million will get sick and 35 million will die from TB (WHO, 2008b). In 2011, there were an estimated 9 million new cases of TB worldwide and 1.4 million TB deaths (990, 000 among HIV negative people and 430, 000 HIV associated TB deaths) (WHO, 2012).

The disease affects the lungs in approximately two thirds of cases, but almost all other organs can be the site of TB infection (Comstock, 2000). Its clinical presentation, therefore, depends on the site of infection, the organ affected and its severity (Teklu, 1993). The main source of infection is untreated smear-positive pulmonary TB (SPPTB) patient discharging the bacilli. TB mainly spreads by airborne route when the infectious patient expels droplets containing the bacilli. It is also transmitted by consumption of raw milk containing *M. bovis* (Harries and Dye, 2006). The risk of infection depends on the susceptibility of the host, the extent of the exposure and the degree of infectiousness of the index case (Grzybowski *et al.*, 1975). A complex interaction exists between TB and HIV infection. HIV increases the risk of infection, as it reactivates LTB and increases the progression to active disease. TB-HIV co-infection has fatal consequences as TB becomes the leading cause of death in HIV infected individuals and patients with AIDS (McShane, 2005). HIV weakens the immune systems; it increases vulnerability to TB (Datiko *et al.*, 2008).

Formatted: Font: Italic

1.2 Problem Statement of the study

Tuberculosis continues to be one of the major public health problems in the world. Kenya is one of 22 countries with highest burden of tuberculosis worldwide. The Government is making efforts to provide equitable access to high quality of care for diseases of public health importance like tuberculosis; treatment success rate is well below the target of 85% based on World Health Organization. Despite these efforts, the burden of tuberculosis in Kenya is still high. The total TB cases notified were 99,159 with more than 4000 deaths in 2012 (MOH, DLTLTD, 2012). Also TB cases notified in Nairobi were 16,891 with 2067 occur in Kamukunji District (DLTLTD, 2012). Kenya is now ranked position 15th to 13th among the 22nd high burden countries and has the fifth highest burden in Africa that collectively contribute to 80% of the global burden according to (MOH, DLTLTD, 2012).

The increasing TB burden in Kenya has been fueled by the HIV pandemic where approximately 38% of TB cases notified in Kenya are also infected with HIV and MDR-TB significantly challenge TB control efforts as it is more difficult to cure and may lead into high TB deaths (MOH, DLTLTD, 2012). Despite the international attention of TB and DOTS, knowledge of TB is not well established in Africa. There are still many superstitions and cultural beliefs surrounding TB which hampers its prevention, early diagnosis and treatment (Narain, 2004). Tuberculosis control can significantly be enhanced if more concern is given to improve knowledge and attitudes towards the diseases. Lack of knowledge about the disease, mode of transmission and negative attitude, prevention practice of TB treatment not only affect the health seeking behavior

of patients , but also could affect control strategy thereby sustaining the transmission of the disease within the community and has impact on high transmission an treatment adherence.(Jaramillo, E. *et al.* , 2000). Raising knowledge and positive attitude of the patients will reduce onward transmission and improve health and save lives.

1.3 Justification of the Study

Tuberculosis is a common and often deadly airborne bacterial infectious disease which usually targets the lungs (pulmonary TB) and affects any organ outside pulmonary parenchyma (Extra-pulmonary TB), and it causes ill-health among millions of people each year and ranks as the second leading cause of death from an infectious disease worldwide, after the human immunodeficiency virus (HIV). Approximately 9 million new TB cases occurred in 2011 and 1.4 million TB deaths (990, 000 among HIV negative people and 430, 000 HIV-associated TB deaths) (WHO, 2012). About one third of the world's population is infected with TB; two-thirds of these cases estimated to occur among people aged 15–59 years, which, unfortunately, is the most productive age group (WHO, 2011). TB kills more than two million people each year, which constitutes about 26% of the avoidable adult deaths in the developing world (Narain, 2004).

The Public health education programs in Kenya have raised awareness of knowledge about nature and mode of HIV and TB to over 90% of the population. However, this level of awareness has not been successful in bringing about changing negative attitude of the patients (KANCO, 2006). Eastleigh is a large trading Division under Kamukunji District, Nairobi County. The fact Eastleigh Division is a congested mixed residential and commercial

population with big households where a small single room could be shared by more than five people. A large proportion of the population lives in overcrowded, dark, and poorly ventilated apartment blocks, which are conducive to the spread of tuberculosis (IOM, 2011). Knowledge about any disease is obligatory and important in order to optimize the patient's treatment, prevention of transmission and to improve the quality of life (Lienhardt, C., 2001). Lack of awareness or incorrect knowledge about tuberculosis might lead to wrong beliefs and misconceptions about various aspects of the disease, which in turn may affect the timely reporting of patients to the health institutions or poor compliance with treatment (Ghuhen, 2009).

The study was significant to individuals and groups in local, national, regional and international levels in developing interventions on health consequences and prevention strategies of tuberculosis. No one has ever done this kind of research there, so this may be the first study regarding knowledge, attitude and practice of prevention behavior towards tuberculosis among adult TB patients in Eastleigh Division, Nairobi County.

1.4 Research Questions

The study was set out to address the following research questions:

- 1) What are the awareness and knowledge levels towards TB among adult TB patients attending TB health facilities in Eastleigh Division?
- 2) What are the patient's attitudes towards TB within TB health facilities in Eastleigh Division?
- 3) What are the patient's levels of prevention practice behavior towards TB within TB health facilities in Eastleigh Division?

- 4) What are the socio-demographic factors influencing adult TB patient's knowledge, attitude and prevention practice behaviors towards TB within TB health facilities in Eastleigh Division?

1.5 Hypothesis of the study

There is no association between knowledge, attitude, prevention of behavioral practice towards tuberculosis and socio-demographic variables among adult TB patients in Eastleigh Division.

1.6 Objectives of the Study

1.6.1 Broad Objectives

To determine knowledge levels, attitude and practice of prevention behavior towards tuberculosis among adult TB patients attending TB Health Facilities in Eastleigh Division.

1.6.2 Specific Objectives

- 1) To establish the awareness and knowledge level towards tuberculosis among adult TB patients attending TB health facilities in Eastleigh Division.
- 2) To examine the attitude level towards tuberculosis among adult TB patients attending TB health facilities in Eastleigh Division.
- 3) To determine the practice level of prevention behaviors towards TB among adult TB patients attending TB health facilities in Eastleigh Division
- 4) To determine the association between knowledge, attitude, practice of prevention behavior towards tuberculosis and socio-demographic variables among adult TB patients in Eastleigh Division.

1.7 Delimitation and Limitation of the Study

The study was carried out in Eastleigh Division Nairobi County for adult TB patient's attending TB health facilities in Eastleigh Division. The study was limited to adult TB patients only who are diagnosed and taking TB treatment. The sample included only a limited number of respondents in a specific location therefore the results of this study should be interpreted carefully because they are derived from this single preliminary investigation.

1.8 Conceptual Framework

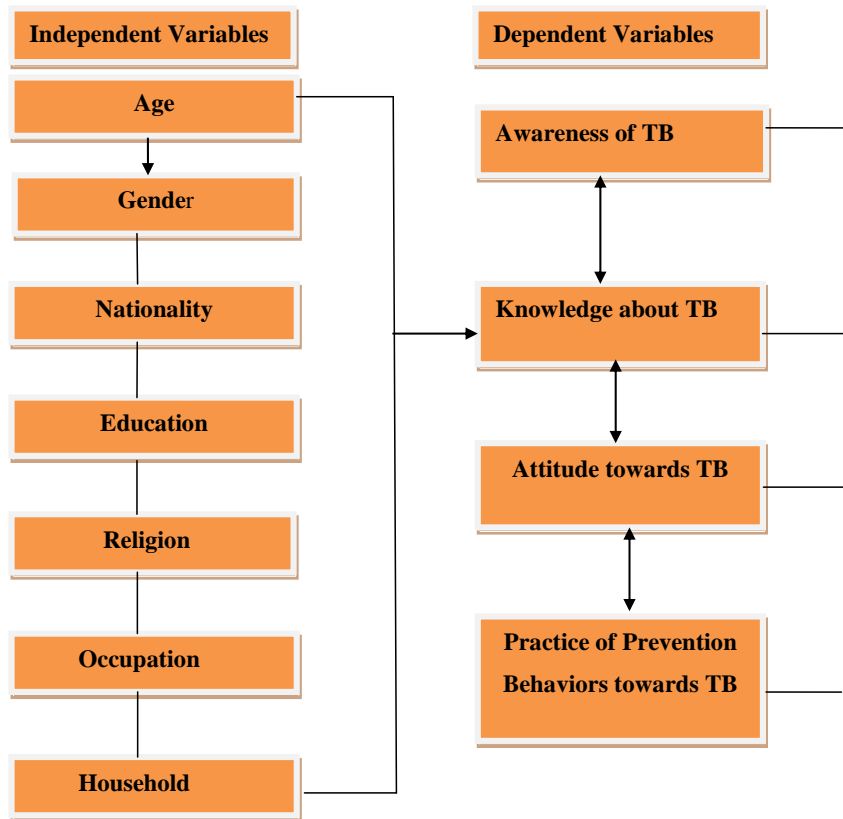


Figure 1.1: Conceptual framework of the study

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction of Tuberculosis

Tuberculosis (TB) is a highly contagious disease caused by a bacterium known as *Mycobacterium tuberculosis*. The disease generally affects the lungs, but it also can invade other organs of the body, like the brain, kidneys and lymphatic system. Extra pulmonary tuberculosis is less common than pulmonary tuberculosis but is usually more difficult to diagnose. Diagnosis usually requires invasive procedures or biopsies. More than 50 species of the genus *Mycobacterium* are now recognized as potential human pathogens and are now called simply “non-tuberculous mycobacteria” (NTM). Examples of this mycobacterium are *M. avium*, *M. bovis*, *M. fortuitum*, *M. chelonae*, *M. ulcerans*, *M. abscessus* and *M. marinum* (WHO, 2008).

Formatted: Font: Italic

Formatted: Font: Italic

2.2 Epidemiology and transmission of tuberculosis

Tuberculosis has existed for several thousand years. There was an increase of the disease in the 19th century lasting until the living conditions improved in the 20th century. The cause of the disease was discovered by Robert Koch in 1882 when he distinguished the *M. tuberculosis* from *M. bovis*. The tuberculin tests were available from 1890, and the Bacillus Calmette-Guérin (BCG) vaccine was used in humans for the first time in 1921 but became widely used in 1945. At the same time the first medications were used in treatment (Faktaark, 2010). Despite the early known diagnostic tools and the existence of the vaccine, TB is still a global challenge.

Roughly one-third of the world's population has been infected with *M. tuberculosis*, and new infections occur at a rate of one per second. However, not all infections with *M. tuberculosis* cause tuberculosis disease and many infections are asymptomatic. In 2007 there were an estimated 13.7 million chronic active cases and in 2010 there were 8.8 million new cases, and 1.45 million deaths, mostly in developing countries. 0.35 Million of these deaths occur in those co-infected with HIV. Tuberculosis is the second most common cause of death from infectious disease (after HIV), the absolute number of tuberculosis cases has been decreasing since 2005 and new cases since 2002 .China has achieved particularly dramatic progress, with an 80 percent decline in its TB mortality rate The distribution of tuberculosis is not uniform across the globe; about 80% of the population in many Asian and African countries test positive in tuberculin tests, while only 5–10% of the U.S. population test positive. In 2007, the country with the highest estimated incidence rate of TB was Swaziland, with 1200 cases per 100,000 people. India had the largest total incidence, with an estimated 2.0 million new cases. In developed countries, tuberculosis is less common and is mainly an urban disease. The incidence of TB varies with age. In Africa, TB primarily affects adolescents and young adults. However, in countries where TB has gone from high to low incidence, such as the United States, TB is mainly a disease of older people, or of the immuno-compromised (-WHO, 2009).

Tuberculosis is spread by airborne contamination, through coughing, sneezing, and spitting. Only a small amount of inhaled germs are needed to become infective, however prolonged exposure to someone else that has TB is the easiest way to get the disease.

Those who have a weakened immune system are even more at risk. The infected droplets are carried through the air and then inhaled by other people. Not everyone who is exposed to TB gets an active infection. Only those who have the actual bacteria in their lungs get sick and are considered infectious (Deborah, 2011).

2.3 The burden of Tuberculosis

Tuberculosis has re-emerged as a major public health problem in the world. It is estimated that a third of the world population is infected with tubercle bacillus, with eight (8) million people progressing to active tuberculosis disease each year, 2 million of whom die of the disease. The WHO reported that incidence of TB grew by 1% globally in the year 2003 even though the incidence fell or was stable in five out of six WHO regions. In 2003 the African region witnessed a sharp rise in the incidence of TB which was attributed to the high HIV prevalence in this region. Of the more than nine million new cases of active TB that occur worldwide each year, a disease that is both curable and preventable, approximately 30% of the patients are in Africa (WHO, 2004). This translates into 363 per 100,000 persons in Africa each year being newly infected with TB.

Twenty-two countries designated as having a high-burden of TB by the World Health Organization account for 80% of the world's TB cases; nine are in Africa (Democratic Republic of Congo, Ethiopia, Kenya, Mozambique, Nigeria, South Africa, Tanzania, Uganda, and Zimbabwe). The most TB-affected part of Africa is Southern Africa, with the disease also cutting a deadly swath through East and Central Africa. A few West African countries also bear a large TB burden while most North African countries are relatively less affected. In most cases, a heavy TB burden goes hand-in-hand with a high

HIV prevalence. In Africa, TB is often the first manifestation of HIV infection, and it is the leading cause of death among HIV-infected individuals. The Millennium Development Goal (MDG) regarding TB is to halt and reverse the incidence of TB by 2015. In addition, the Stop TB Partnership has set targets including halving the TB prevalence and death rates by 2015 compared to the levels in 1990.

Kenya is one of the 22 high TB burdened countries in the world which collectively contribute 80% of the global TB disease burden. Kenya is experiencing a generalized TB epidemic affecting the young economically productive age groups (15-44 year old). Males are 1.4 times more likely to have TB than females. The number of TB cases had increased tenfold from 11,625 in 1990 to 116,723 cases in 2007 to 106,083 in 2010. The average annual increase over the past 10 years was 4% for all forms of TB. In 2012, the total TB cases notified in Kenya were 99,159 cases (MOH and DLTLD, 2012).

The major reason for the increasing burden of TB in Kenya is the concurrent HIV epidemic. People Living with HIV/AIDS (PLWHA) are the major subgroup with increased incidence of tuberculosis. The national average co-infection with HIV was 39% in 2011 (MOH and DLTLD, 2012). So TB infection control remains a major programmatic intervention in TB control especially in this era of HIV epidemic and the increasing prevalence of drug resistant TB.

2.4 Tuberculosis and HIV/AIDS

It is a fact that HIV/AIDS influences tuberculosis in several ways as the virus is the most potent known risk factor for reactivation of dormant infection. Individuals infected with

HIV/AIDS, the tubercle bacilli have an annual risk of disease of 5-10% as opposed to non-HIV infected individuals who have a similar risk but over a life time. About one in two to three persons infected with both TB and HIV will have TB in their lifetime. The HIV/AIDS increases the rate of progression of new TB infections to disease and also increases the risk of recurrence of previously successfully treated disease. In 2005 it was estimated that more than 60% of TB patients in Kenya were HIV infected. Similarly HIV infected TB patients are more likely to develop other acute infections and be hospitalized while receiving TB treatment. Some of these infections include bacteremic *Streptococcal pneumonia* and *Non-typhi Salmonella septicemia*. Additionally, HIV infected TB patients are more likely to die while receiving TB treatment than TB patients who are not HIV infected. Early deaths in HIV infected TB patients may be due to TB itself and related to late diagnosis of the TB while late deaths are usually due to non-TB HIV related infections(MOH, NLTP, 2006).

Formatted: Font: Italic, Font color: Auto

2.5 Types of Tuberculosis

2.5.1 Pulmonary tuberculosis

Pulmonary TB occurs in a previously infected individual when there are major amounts of bacteria, and/or in the presence of immune deficiency, but seldom due to progression during primary infection. It is more commonly seen by endogenous reactivation of bacteria that have remained latent after primary infection or as a new infection in a previously infected individual (exogenous re-infection). In absence of treatment and immune deficiency, the risk of endogenous reactivation is estimated at 10% in 10 years following infection, and later 5%. Untreated, 30% of patients will achieve cure by the

body's defense mechanisms, 50% die within 5 years, and 20% continue to remain sources of infection by continuing to excrete bacteria. The transmission occurs by breathing in air droplet, droplet infection from cough or sneeze of an infected person. (Aitkhaled, 1999).

Symptoms usually develop over several weeks. Chest symptoms can mimic virtually any respiratory condition. Cough is almost always present, as inflammation and tissue necrosis ensue sputum is produced. Possibly the patient will experience chest pain and/or dyspnea as accompanying symptoms, usually due to spontaneous pneumothorax. Hemoptysis may occur, but does not necessarily indicate active TB; it may result from post TB bronchiectasis, rupture of dilated blood vessels in the wall of old cavity bronchi/ fungal infection; etc. (Hopewell *et al.*, 2005). Systemic symptoms (night sweat, fever in the evening, loss of appetite, fatigue) are nonspecific.

2.5.2 Extra Pulmonary Tuberculosis

Extra-pulmonary TB is defined as TB that affects any organ outside pulmonary parenchyma. It presents more of a diagnostic and therapeutic challenge than pulmonary TB. This relates to it being more uncommon, also it involves relatively inaccessible sites- (Aitkhaled, 1999). Certain forms of TB occurring in sites that are fully or partially within the chest are also considered extra-pulmonary:

↳

↳ 1) Pleural TB and TB of the hilar or mediastinal lymph nodes are classified as extra-pulmonary.

3)2) •Disseminated TB is a form of the disease that affects many sites in the body simultaneously and is not limited to the lungs.

Disseminated (miliary) TB and tuberculosis meningitis are acute forms of TB infection caused by the haematogenous spread of the bacteria, often occurring soon after primary infection. They occur most often in children and young adults, with a peak incidence of meningitis in children > 4 years of age. These acute forms are highly fatal- (Hopewell *et al.*, 2005).

The diagnosis of disseminated TB is based on clinical signs (general deterioration, high fever and dyspnea). Signs of involvement of other organs include: pleural effusion, digestive problems, hepato-splenomegaly and sometimes meningeal symptoms. It results in a characteristic chest radiography: a "miliary" pattern may be seen; extensive, tiny (1-2 mm) nodules resembling millet seeds, all the same size and spread symmetrically over both lungs. Meningitis is the most frequent form of CNS TB. The process takes place primarily at the base of the brain; hence symptoms include affection of cranial nerves (such as paralysis of the oculomotor nerve, leading to strabismus and/or ptosis and sometimes convulsions) in addition to headache, stiff neck and loss of consciousness. The diagnosis of tuberculosis meningitis is based on clinical signs, and cerebrospinal fluid obtained by lumbar puncture should be examined even if there are no clear meningeal signs. The other forms of extra-pulmonary TB are not as life threatening as disseminated TB. They can however lead to complications and severe sequela: deficit of a vital function (respiratory, cardiac, hepatic or renal), important neurological deficits (due to compression of the spinal chord) or sterility (genital tuberculosis)- (Hopewell *et al.*, 2005).

2.6 Diagnosis of Tuberculosis

There are four steps in diagnosing of tuberculosis disease; medical history tuberculin skin test, chest x-ray, and bacteriologic examination (National Tuberculosis Center, 1996). A medical history includes asking the patients whether they have been exposed to a person with tuberculosis, symptoms of TB disease, if they have had TB infection or TB disease before, or risk factors for developing the disease. The symptoms of pulmonary tuberculosis include: coughing, pain in the chest when breathing or coughing, coughing up sputum or blood. The general symptoms of TB disease (pulmonary or extra pulmonary) include weight loss, fatigue, malaise, fever; night sweats (National Tuberculosis Center, 1996). The tuberculin skin test is used to determine whether a person has TB infection. the mantoux tuberculin skin test is preferred type of skin test because it is the most accurate whether a reaction to the mantoux tuberculin skin test is classified as positive depends on the size of the indurations, the person's risk factors for TB, and for people who may be exposed to TB on the job, the risk of exposure to TB in the person's job. Several factors can affect how skin test reaction is interpreted. close contacts of someone with infectious tuberculosis disease that have a negative reaction to the tuberculin test should be retested 10 weeks after the last time they were in contact with person who has TB. Patients with symptoms of tuberculosis disease may be given a tuberculin skin test. They should be evaluated for TB disease, regardless of their skin tests results (National Tuberculosis Center, 1996).

The chest x-ray is used to help rule out the possibility of pulmonary TB disease in a person who has a positive reaction to the tuberculin skin test. And check for long abnormalities in people who have symptoms of TB a disease. The results cannot confirm that a person has tuberculosis disease (National Tuberculosis Center, 1996).

The fourth step is a bacteriologic examination: A sputum specimen is obtained from patients suspected of having pulmonary TB disease; other specimen is obtained from patients suspected of having extra-pulmonary TB disease. The specimen is examined under a microscope for presence of acid-fast bacilli. When AFB is seen, they are counted. Patients with positive smears are considered infectious. The specimen is then cultured, or grown to determine whether it contains *m. tuberculosis*. A positive culture for *m. tuberculosis* confirms the diagnosis of TB disease. After the specimen has been cultured it is tested for drug susceptibility. The results of drug susceptibility test can help clinicians choose the appropriate drugs for use in treatment (National Tuberculosis Center, 1996).

2.7 Treatment of Tuberculosis

The overall goals for treatment of tuberculosis are: to cure the individual patient and to minimize the transmission of *m. tuberculosis* to other person. Thus, successful treatment of tuberculosis has benefits both for the individual patient and the community in which patient resides. Tuberculosis is the leading cause of death from a single infectious disease over a quarter of avoidable death among adults (Nakajima, H., 1993). Despite the discovery of the tuberculosis bacilli in 1882 and of anti TB drugs. Since 1944, efforts to

control TB globally have so far failed. The main reasons for failure include inadequate political commitment and funding; inadequate organization of services; inadequate case management (failure to cure cases that were diagnosed), over reliance on BCG (Maher, 1997).

In order to improve the situation, the WHO tuberculosis control was represented a strategy for the effective in identifying and curing patients. The strategy called directly observed treatment short course (DOTs). A short course treatment for the patient under the specific procedure. overall objectives of this strategy is aimed to reduce mortality, morbidity disease transmission and prevent the development of drug resistance by setting objectives at 85% cure rate of detected new cases of sputum, smear positive TB and detect 70% of existing cases of sputum smear positive TB (WHO, 2006).

Short-course chemotherapy, standardized treatment regimes consisting of two phases: - includes 4 drugs during the initial phase and 2 drugs during the continuation phase. These regimes are particularly as effective in patients with initially resistance organisms as in those with sensitive organisms. There are three main properties of anti-TB drugs: bactericidal ability, sterilizing ability and the ability to prevent resistance. The anti TB drugs possess three properties to different extent. Isoniazid and [Rifampicin](#) are the most powerful bactericidal drug, active against all populations of TB bacilli (Maher, 1997). Rifampicin (R) is [RNA](#)- polymerase inhibitor, rapid complete absorption on an empty stomach. Isoniazid (H) interferes with cell wall synthesis absorbs in to the cerebro-spinal fluid, therefore often used in TB meningitis.

Prazinamide and streptomycin are also bactericidal and sterilizing against certain populations of TB bacilli. Prazinamide is well absorbed orally, penetrates into the cerebro-spinal fluid and active in an acid environment against TB bacilli inside macrophages and reduces tuberculosis relapse rate (Govender, 1998). Streptomycin is an active against rapidly multiplying extracellular TB bacilli. Ethambutol (E) and thioacetazone are bacteriostatic drugs used in combination with more powerful bactericidal drugs to prevent the emergence of resistant bacilli (Maher, 1997). Since properly applied anti TB chemotherapy is effective in curing the infectious cases and interrupting the chain of transmission the best prevention of tuberculosis is the cure of infectious cases.

2.8 Prevention of Tuberculosis

According the guideline of WHO, 2009 strategies for global tuberculosis control and prevention included: Directly observed therapy (DOTs) implementation, diagnosis and treatment of MDR-TB, collaborate TB/HIV activities, address the needs of poor and vulnerable population, strengthen health care system based on primary health care, engage all care providers, empower people with tuberculosis and communities, and promote research. Besides, investigate TB contacts, follow up and give preventive therapy for those who are being infected were also recommended in many countries.

Primary prevention denotes action taken to prevent the development of a disease in a person who is well and does not have the disease in question. These activities include health promotion as well as disease prevention activities (Levey M., 1999). Health

promotion activities can be as simple as using appropriate hand washing techniques or can be more sophisticated such as vaccination to prevent disease occurrence. The only vaccination for TB on the market is the bacille Calmette-Guérin (BCG) vaccine.

Secondary prevention denotes the identification of people who have already developed a disease, at an early stage in the disease's natural history, through screening and early intervention. The rationale for secondary prevention is that if we can identify disease earlier in its natural history, intervention measures will be more effective. Perhaps we can prevent mortality or complications of the disease and use less invasive or less costly treatment to do so. Another type of secondary prevention measure is called a contact investigation (Petrovici *et al.*, 2006). During a contact investigation a public health worker interviews patients with active TB disease in order to identify "contacts" or people who may have been exposed to that person. Once identified the contacts will be evaluated for LTBI and TB disease and provided with appropriate treatment, when necessary.

Ilongo (2004) in his study indicated that the treatment of people who have already developed a disease is often described as tertiary prevention. The final strategy used for preventing and controlling TB is identifying and treating patients with active TB. Each person with infectious TB has the potential to infect many others; however, the site of the infection is important in determining its capability to spread. For example, the lungs and larynx are two common organs where TB may be highly infectious. If instead, the TB infection is localized to areas such as lymph nodes or outside the lung,

treatment is necessary, yet it is not transmissible and, therefore, is not a major public health concern.

The prevention involves either preventive of infection or if the infection has already occurred, elimination of viable population of organism within the host. The BCG vaccine can prevent the TB (tuberculosis) bacteria from spreading within the body, thus preventing TB from developing. the BCG vaccine is administered to infants in parts of the world where TB is much more common BCG vaccination results in 60% to 80% decrease to incidence of tuberculosis in a given population group. The vaccine is harmless when properly prepared and administered, but it gives a relative, rather than absolute immunity. It does reduce the immediate complications of infections stemming from lymphatic or lymphogenous spread, especially military tuberculosis and tuberculosis (Joklik, 1995). The value of BCG vaccination depends on the infection rate in the population to be vaccinated and the proportion of the population that is uninfected. The BCG vaccination should be recommended for special groups in the morbidity rates are high and the factors favoring rapid transmission of the organisms are temporarily uncontrollable. It is also recommended for infants and children with negative tuberculosis test that have intimate and prolonged exposure to persons with active disease. Positive tuberculin reaction is obtained in 92% to 100% of person who receive the vaccine and the hypersensitivity persists for 3 to 4 years or longer.

Isoniazid Prophylaxis (INH), preventive therapy with isoniazid has become frequently used well established procedure, especially in the treatment of recent tuberculosis. This method is used in those infected with mycobacterium tuberculosis but do not have TB

disease, which are called latent tuberculosis infection. Chemotherapy with INH for one year has been shown to reduce the risk of evaluation of dormant infection in tuberculosis disease by approximately 75%. INH prophylaxis is recommended for all household contacts of persons with newly diagnosed active tuberculosis. In addition, isoniazid is recommended for patients whose health and defenses may be compromised by diabetes, alcoholism, gastrectomy, silicosis, malignancy or prolonged corticosteroid therapy levels of prevention in public health.

2.9 Knowledge and attitude of tuberculosis among patients

Most studies reviewed which directly explore the knowledge and attitude of patients towards TB are drawn from developing countries where there is a high incidence of TB and significant socio-economic problems making the context similar to Africa. Despite the international attention of TB and DOTS, knowledge of TB is not well established in Africa. There are still many superstitions and cultural beliefs surrounding TB which hamper its prevention, early diagnosis and treatment (Nthaita, 2009). It has been reported that TB infected patients seek assistance for treatment when the disease is well advanced and that this delay is the result of factors, such as a lack of knowledge, lack of awareness of the significance of the symptoms or a negative attitude (Bayouni *et al.*, 2007). The fact that the disease is transmitted by bacteria is important information not understood by many patients, and health care providers often fail to give patients any in-depth explanation of disease causation (Bayouni *et al.*, 2007). Patients believed that TB is a result of breaking cultural rules that demand abstinence from sex after the death of a family member or after a woman has a spontaneous abortion. Furthermore, they believed that only traditional healers could cure TB (Edginton *et al.*, 2002). This role of the

traditional healer in TB cure is also reported in another study on knowledge, attitude and practice of TB among Maasai in Tanzania (Haasnoot *et al.*, 2010).

In Egypt, a study of the predictors of treatment failure among patients infected with TB revealed that the most significant risk factor for treatment failure was non-compliance due to poor patient knowledge about the disease and deficient health education programmes (Bayouni *et al.*, 2007). This is further sustained by Ilongo (2004) who explains that non-compliance to treatment has been reported to be a barrier to TB control, and that lack of knowledge could impact on people's attitude and increase the stigma around the disease. Relevant knowledge and positive attitude are predisposing factors for behavioural change, making people more likely to seek healthcare and medical treatment (Dennill *et al.*, 1999). Lack of knowledge about TB can limit people's ability to prevent its spread and seek early treatment. People's knowledge, attitudes, and perceptions with respect to health in general and specific illness, such as TB, influences their behavior (Petrovici *et al.*, 2006). People's knowledge and attitudes with respect to health in general and specific illnesses, such as TB, influence their behaviour (Petrovici *et al.*, 2006). These factors can influence health seeking, understanding the diagnosis and treatment, treatment initiation and adherence, and general interactions with health care providers. Unless people are knowledgeable they will not get the treatment and the control of TB will be almost impossible, as the main strategy for TB control globally relies on self-presentation of adults from the community and sputum smear for diagnosis (Promtussananon *et al.*, 2005). Knowledge and attitude regarding TB represent a vital preliminary step in TB health education programme planning in order to dispel misconceptions and improve both the knowledge and levels of awareness of TB within

society (Promtussananon *et al.*, 2005). Individual attitude of those suffering from TB could influence the utilization or non-utilization of services that provide DOTS. They often go to case treatment once the symptoms were less visible.

2.10 Practice of preventive behavioral towards Tuberculosis

Prevention depends greatly on personal health maintenance, balance diet, management of exposure to risk factors, environmental factors and health life style. In order to get effective prevention knowledge of TB plays an important role. Educational background is an important determinant of patient's level of knowledge about tuberculosis (Levey M., 1999). Therefore, public health should have TB education program in order to give information make them know the symptoms of TB include cough, fatigue, weight loss and fever, and need to also give information about health life style, health food, health living to enhance high immunity and good ventilation provision to their house. If they experience them, get a test even if they are not in high risk group, and the disease is progressive, it continues to damage their lungs and it can be fatal if untreated. Tuberculosis, like influenza and common cold is spread by airborne droplets coughs, sneezes, speech, and simple proximity. Most people casually exposed cannot be infected, but in close contacts and people who have contact with an infected person over a long period of time are high risks. Tuberculosis patients become noninfectious soon after beginning therapy but therapy must be continued for the prescribed length of time. Misinformation about what causes TB, how it transmitted to the stigmatization of tuberculosis and of people with TB. These factors are very important for prevention of TB infection and decreasing the rate of active TB cases.

CHAPTER THREE: MATERIAL AND METHODS

3.1 Introduction

This chapter discusses the procedures and strategies used in the study. It is organized under the following sections: study area, , study design , study population, variables , selection criteria, sampling techniques and sample size determination, data collection technique, pretest tool, validity and reliability, data management & analysis and ethical consideration.

3.2 Study Area

The study was conducted at the TB health facilities in Eastleigh Division, Kamukunji District Nairobi County. Eastleigh Division, a commercial hub and hosts middle and upper class, has residential homes with modern shopping malls, hotels, as well as financial institutions. As a commercial and financial hub, Eastleigh hosts many nationalities that include Somalis, Kenyans, Ethiopians and Oromos who have settled in Eastleigh according to (District Commissioner, 2011). The population of Eastleigh Division is estimated to be 174,387 (Kenya Population Census, 2009). The Division administratively is divided into four locations: Eastleigh North; Eastleigh South; Kiambiu and Airbase. Also there are Six Sub locations: Eastleigh North; Eastleigh Garage; Airbase; Maina Wanjigi; California and Eastleigh section three (District Commissioner, 2011). Eastleigh is further partitioned into three areas: Section I - from Juja Road, Section II - the commercial center and Section III - situated towards Jogoo Road. The Eastleigh Airport (Moi Air Base) is located in Northern part of Eastleigh. The majority of the asylum seeker and refugee population resides in Eastleigh North and Airbase (District Commissioner, 2011).

3.3 Study Population

The study population comprised both new and follow-up adult TB cases (at least 18 years old and above) attending TB health facilities in Eastleigh Division.

3.4 Study Design

The study design was a descriptive cross-sectional study based on TB health facilities among adult TB patients living in Eastleigh Division, Kamukunji District Nairobi County. Quantitative methods through semi-structured questionnaires were used to collect data.

3.5 Study Variables

3.5.1 Dependent Variables

The dependent variable was patient's awareness and knowledge, attitude, practice of prevention behavior towards TB.

3.5.2 Independent Variables

The patient's socio-demographic factors: age, gender, marital status, nationality, education, religion, occupation, and relationship to the household, household members, and duration staying in Eastleigh Division.

3.6 Selection Criteria

3.6.1 Inclusion Criteria

All adult tuberculosis patients aged 18 and above attending TB health facilities in Eastleigh Division and volunteered to participate in the study

3.6.2 Exclusion Criteria

Tuberculosis cases whose address either out of Eastleigh Division or who are referred to other institutions out of the Division. Those who are serious sick.

3.7 Sampling Technique and Sample Size

3.7.1 Sample Techniques

Eastleigh Division was purposively selected and 10 TB Health facilities with large patients' volume were purposively selected. The study sample was distributed among the 10 TB health facilities based on the proportionate distribution. Systematic random sampling was used to select the patient who participated in the study. The method of systematic random sampling selects units at a fixed interval throughout the sampling frame or stratum after a random start. Table 3.1 shows the sampling technique. Systematic random sampling controls the distribution of the sample by spreading it throughout the sampling frame or stratum at equal intervals, thus providing implicit stratification.

Table 3.1. Sampling technique used to derive desired sample size

No	Facilities	Type of facilities	No. of cases	Proportion	No. selected patients
1	Blue house	NGO	424	0.424	163
2	Eastleigh H/C	GOK	283	0.283	109
3	Biafra	GOK	47	0.047	18
4	Moi Air Base	GOK	29	0.029	11
5	Makkah	Private	53	0.053	20
6	IOM	NGO	60	0.060	23
7	Madina	Private	26	0.026	10
8	Dorkcare N/H	Private	10	0.01	4
9	Ushirika N/H	Private	48	0.048	18
10	Alliance Medical Clinic	Private	21	0.021	8
10	Total	1001	1001		384

Source: Author

3.7.2 Sample Size Determination

The sample size was calculated using the formula by Fisher *et al.* 1998) for determining sample size when the population is greater than 10,000.

$$n = \frac{Z^2 pqD}{d^2}$$

Where n= Minimum required sample size (when target population was more than 10,000).

Z= Standard normal deviation (1.96) which is corresponding to 95% confidence level.

P= proportion of target population estimated to have required characteristics being measured (no reasonable estimate a default of 50% or 0.5 is used).

d= degree of occurrence =0.05

q = 1-p = 0.5

D = design effect = 1

They $n = \frac{(1.96)^2(0.5)(0.5)(1)}{(0.05)^2} = 384$ Respondents

3.8 Data Collection Techniques

Data collection was done through semi-structured questionnaire (Appendix II) from the respondents. The questionnaire was used to assess adult TB patient's awareness and knowledge, attitude, practices of prevention behaviors towards TB.

3.9 Pretest

The study tool was pre-tested at one of the dispensaries which were not included in a study to observe if it is understood by the patients. Debriefing was done to ask the respondents understanding of questions that appeared to cause difficulty during the

interview. Questions were adjusted according to the pre-test results in order to achieve better clarity.

3.10 Validity

In this study, the researcher was focused on content validity, which refers to the accuracy with which an instrument measures the factors under study. To establish the validity of the research instrument the researcher sought opinions of scholars and experts including the supervisors. This allowed modification of the instrument thereby enhancing validity. Furthermore, the study assessed the responses and non-responses per question to determine if there was any technical dexterity with the questions asked.

3.11 Reliability

Reliability and validity are means of evaluation of research instruments. Accurate and careful phrasing of each question to avoid ambiguity and leading respondents to particular answers ensured the questionnaire's reliability. The respondents were informed of the purpose of the study and the need to respond truthfully. Questions relevant to the subject of investigation were used in order to enhance the reliability of the instrument.

3.12 Data Management and Analysis

An interview schedule was used to capture data from tuberculosis patients attending TB health facilities. Data collected was entered, coded and cleaned in the excel software, Microsoft office Excel 2007 and then exported into IBM® SPSS version 20.0 (SPSS Inc, USA). All statistical analyses were performed using the Statistical Package for Social Sciences (SPSS) software. Descriptive statistics was computed to generate frequencies,

mean, and standard deviation. Awareness level was determined using a series of 6 questions on TB, type of TB, source of information about TB family history of TB.

Knowledge levels were determined using a series of 10 questions on definition on TB causes TB, mode of transmission, susceptible people, signs and symptoms, most useful method to diagnosis of TB, treatment of TB, duration of completing treatment of TB, side effect of anti-TB drugs. Each correct answer was assigned a score of ONE and the incorrect answer was **ZERO** the maximum expected score was 10 and the overall mean (\pm Standard Deviation) knowledge score = 5.72 (SD \pm 2.318). This mean was used as a cut-off for good (values \geq mean) and poor (values $<$ mean) knowledge. Thus, 198 (51.6%) of the respondents had good knowledge while 186 (48.4%) of the respondents had poor knowledge.

Attitude towards TB was assessed using 13 statements the scale rating was used for the respondents were: "Agree", "Undecided", "Disagree". Total score was 39, range was 0-39. There were 5 positive statements and 8 negative statements. Positive statements were scored as: +3 (Agree); +2 (Undecided); +1 (Disagree). Negative statements were scored as: +1 (Agree); +2 (Undecided); +3 (Disagree). The mean (\pm standard deviation) of the cumulative linker scores on the attitude scores on TB was 31.047 (\pm 3.082). The mean was therefore used as the cut-off for positive (values \geq mean) and negative (values $<$ mean) attitude towards TB. Thus, 209 (54.40%) of the respondents had negative attitude while 175 (45.60%) of the respondents had positive attitude.

The levels of practice of preventive behaviour towards TB were assessed using 12 questions. The type of the questions were “Yes”, “No” the correct answer was **ONE** while the incorrect answer was **Zero**. The total score was 12; the range was 0-12. The mean (\pm standard deviation) of the cumulative scores on practice of preventive behaviour towards TB was 8.9 (\pm 1.868). The mean was therefore used as the cut-off for good (values \geq mean) and poor (values $<$ mean) on practice of preventive behaviour on TB. Thus, 258 (67.2%) of the respondents had good practice on prevention behaviour on TB while 126 (32.8%) of the respondents had poor practice on preventive behaviour on TB.

Dichotomous data were summarized as number and proportion using frequency tables and pie-charts while continuous data was summarized as medians (range) and mean (\pm standard deviation). Chi-square tests were used to examine the differences in proportions between the socio-demographic variables (age; gender; marital status; educational level; occupation; religion; nationality) and each of the dependent variables (knowledge, attitude, and practice of preventive behaviors towards TB). In addition, the relationship between knowledge, attitude, and practice of preventive behaviors towards TB were examined using the chi-square tests. All tests were two-tailed with a *P*-value of less than 0.05 being considered significant for all statistical analyses.

3.13 Logistical and Ethical Considerations

This research work was approved by Kenyatta university graduate school and the ethical approval was by the Kenyatta University Ethics Review Committee (KU-ERC), Ref No. KU/R/COMM/51/194. Thereafter, research clearance was obtained from the National Council for Science and Technology (Ref No.: NCST/RCD/12A/013/135) prior to the study. These approvals were then used to seek administrative authorization to carry out the study which was granted by the District medical officers of health (DMOH). Informed consent was obtained from study participants prior to their enrollment into the study. Participation in the study was voluntary and participants were free to withdraw from the study at any stage during the study. Confidentiality of the information from the study participants was maintained throughout the study. In addition, codes were used to maintain anonymity of all participants and keep their information confidentiality.

CHAPTER FOUR: RESULTS

4.1 Introduction

In the previous chapter the research design and methodology of this study was described. This chapter describes the data analysis, findings and interpretation of the results. The data was analyzed and the results were presented with the aid of percentages, tables and graphs, figures whenever applicable and relevant research findings and literature to support the findings are included. The purpose of the study was to assess prevention behavioural practices among adult tuberculosis patients in Eastleigh Division, in order to enhance the paucity of knowledge in this area of public health.

4.2 Socio-demographic characteristics of the respondents

The socio-demographic characteristics of the study participants are shown in (Table 4.1.1 and 4.1.2). A total of 384 patients [median age ranged from 35.532 to (30.5-39.5) years] were interviewed. The age distribution of the respondents was as follows: 20-29 years, 201 (52.3%); 30-39 years, 113 (29.4%); 40-49 years, 44 (11.5%); 50-59 years, 26 (6.9%). Gender distribution of the respondents was 216 (56.3%) males and 168 (43.8%) females. Marital status included 169 (44.0%) in stable marriages, 164 (42.7%) unmarried, 29 (7.6%), divorced and 22 (5.7%) widows. The education level of participants varied amongst the patients with 64 (16.7%) having no formal education, 138 (35.9%) with primary education, 121 (31.5%) had secondary education, 46 (12.0%) with diploma, and 15 (3.9%) having degree level education.

The distribution of employment status showed that 180 (46.9%) were employed 156 (40.6%) were unemployed, while 48 (12.5%) were housewives. Religious affiliations also differed among the study participants with 222 (57.8%) belonging to the Christian

faith, as 162 (42.2%) of them were Muslims. The citizenry of the patients also varied within the respondents such that 297 (77.3%) were Kenyans, and 83 (21.6%) were non-Kenyans. Summary of the household members within the study participants indicated that 193 (50.3%) were household heads, 98 (25.5%) were sons or daughters to the households, and 93 (24.2%) were spouses. Analysis of the household size showed that 191 (49.7%) of the respondents inhabited households having 4-6 family members, 132 (34.4%) lived in households with 1-3 family members, and 61 (15.9%) inhabited households with more than 6 family members. The duration of the respondents living in Eastleigh also differed with 125 (32.6%) indicating they had lived in Eastleigh for 5-10 years, 114 (29.7%) had stayed in Eastleigh for 2-5 years, 86 (22.4%) had resided in Eastleigh for less than 2 years and 56 (14.6%) had resided in Eastleigh for more than 10 years. Finally, at least 233 (60.7%) of the respondents lived with their families, 70 (18.2%) lived alone, 46 (12.0%) lived with relatives, 18 (4.7%) lived with their spouses and 17 (4.4%) lived with their friends.

Table 4.1.1 Socio-demographics characteristics of the respondents

Characteristic	Frequency	%
Age (yrs.)		
Median (range)	35.532 (30.5-39.5)	
Mean SD 35.532 (\pm 0.914)		
Age distribution		
20-29	201	52.3
30- 39	113	29.4
40-49	44	11.5
50- 59	26	6.8
Gender		
Male	216	56.3
Female	168	43.8
Marital status		
Married	169	44.0
Not Married	164	42.7
Divorced	29	7.6
Widowed	22	5.7
Education level		
Primary	138	35.9
Secondary	121	31.5
No formal	64	16.7
Diploma	46	12.0
Degree	15	3.9
Occupation		
Employed	180	46.9
Unemployed	156	40.6
Housewife	48	12.5
Religion		
Christians	222	57.8
Muslims	162	42.2
Nationality		
Kenyan	297	77.3
None Kenyan	83	21.6
No Responses	4	1.0
Relationship to head of household		
Head of HH	193	50.3
Son/Daughter	98	25.5
Spouse	93	24.2

Table 4.1.2 Socio-demographics characteristics of the respondents

Characteristic	Frequency	Percent (%)
Household member		
4– 6 members	191	49.7
1 – 3 members	132	34.9
Above 6 members	61	15.9
Duration of stay Eastleigh (yrs.)		
5 –10	125	32.6
2 –5	114	29.7
Less than 2	86	22.4
Above 10	56	14.6
No response	3	0.8
With whom do you stay		
Family	233	60.7
Alone	70	18.2
Relative	46	12.0
Spouse	18	4.7
Friends	17	4.4

Formatted Table

Data are represented as the number and proportions (%) of respondents. Response rates for the socio-demographic characteristics of the study participants were at least 99.0%. HH, head of the household.

4.3 Awareness of the Respondents about TB

4.3.1 Respondents awareness of TB

The study sought to establish awareness of patients on tuberculosis. Analysis of the findings showed that 351 (91.4%) of patients reported that they aware about the disease called tuberculosis while 33 (8.6%) didn't aware the TB disease. Figure 4.1 displays the findings of the study.

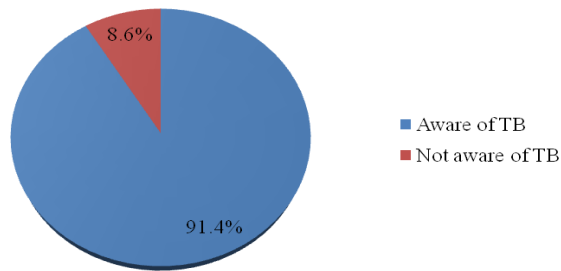


Figure 4.1: Respondent's awareness of TB

4.3.2 Respondents awareness of types of TB

Assessment of the types of TB indicated that 300 (78.1%) of the respondents were aware of pulmonary TB, 72 (18.8%) were aware of extra-pulmonary TB, and 12 (3.1%) were unaware of these main TB types. Figure 4.2 shows the findings of the study.

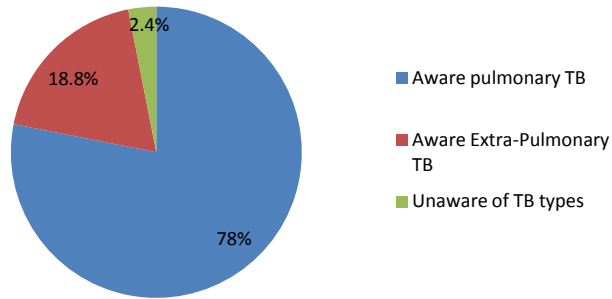


Figure 4.2: Respondents awareness of types of TB

4.3.3 Respondents sources of information about TB

Different sources of information on TB were reported among the respondents. These included, health professionals [143 (37%)]; public media (television, radio, newspapers, magazines, and internet) [126 (32.8%)]; friends [52 (13.5 %)]; family members [50 (13%)] and neighbours [13 (3.6%)] as shown in figure 4.3.

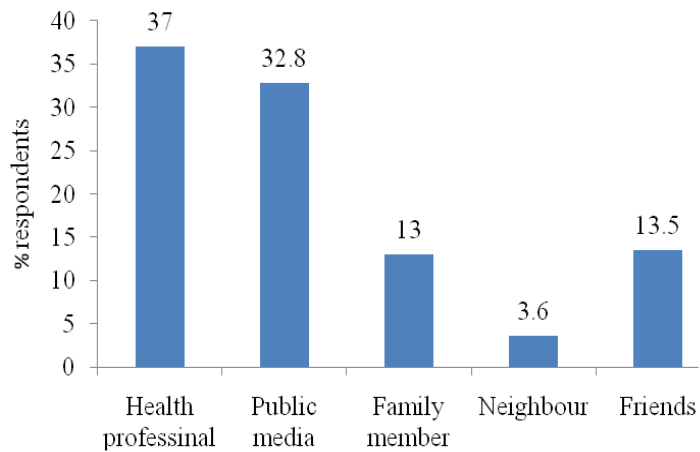


Figure 4.3: Respondents sources of information about TB

4.3.4 Respondents awareness of history of TB among family members

Awareness of a family member having a history of TB among the respondents was 209 (54.4%), while 175 (45.6%) of the respondents were unaware of a history of TB among the family members (Figure 4.4).

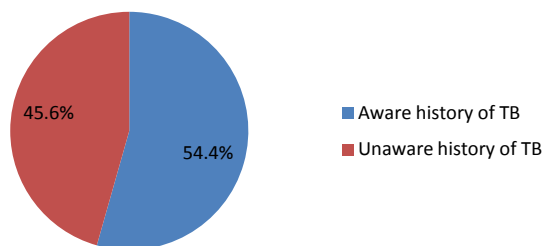


Figure 4.4: Respondents awareness history of TB among family members

4.3.5 Respondents who had lived with someone having TB

Analysis of respondents living with a TB infected person showed that 225 (58.6%) reported had not lived with a TB infected individual, as 159 (41.4%) indicated that they had lived with someone suffering from TB (Figure 4.5).

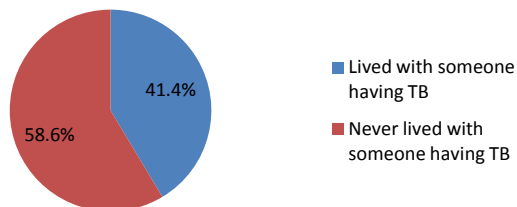


Figure 4.5: Respondents who had lived with someone having TB

4.3.6 Respondents awareness of other TB patients living in their neighborhood

The majority of the respondents 244 (63.5%) were unaware of other TB patients living in their neighborhood, while 140 (36.5%) had other TB patients in their neighborhood (Figure 4.6).

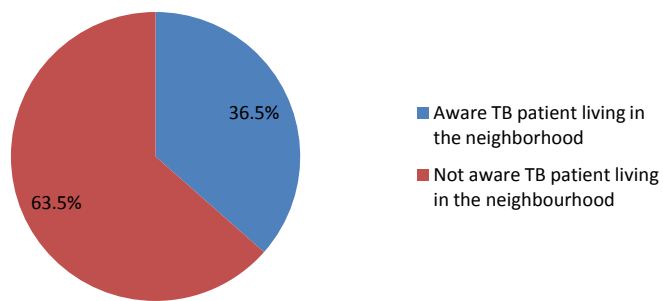


Figure4.6. Respondent's awareness of other TB patients in their areas

4.4 Knowledge level towards TB

Evaluation of the respondents knowledge on tuberculosis encompassing definition, causes, transmission, signs and symptoms, susceptibility, diagnosis and treatment revealed that 228 (59.4%) of the respondents knew the definition of TB as an infectious disease that effects the lungs; 87 (22.7%) of the respondents knew that TB is a contagious disease; however 27 (7.0%) of the respondents indicated that TB is a hereditary condition; 24 (6.3%) of the respondents defined TB as an ancient disease that had been eradicated; and 14 (3.6%) of the respondents indicated that TB is a symptom for HIV infection. Assessing knowledge on the etiology of TB illustrated that 125 (32.6%) of the respondents knew that TB is caused by bacteria; 111 (28.9%) reported that TB was caused by malnutrition; 68 (17.7%) indicated that the causes of TB were bacilli germs; 26 (6.8%) reported that TB was caused by a virus; 25 (6.5 %) indicated that TB was caused by smoking; 11 (2.9%) reported TB was caused by hard work; while 8 (2.1%) reported that TB was caused by chewing khat. Regarding the mode of TB transmission, 166 (43.6%) of the respondents knew that tubercle bacilli can spread and transmit TB to another person through the airways, coughing or sneezing without covering the mouth and nose. Moreover, 199 (51.8%) of the patients knew that people around TB patients can't get the infection.

The majority of the tuberculosis patients, 208 (54.2%) had good knowledge on the signs and symptoms of TB. About TB risk factors, 338 (88.0%) of the respondents indicated that anybody is likely to be infected with TB, while 18 (4.6%) of the patients reported that only poor people can be infected with TB. Regarding knowledge about diagnosis of TB, most [265 (69.0%)] of the patients knew about detection of TB using sputum

examination. Knowledge on TB treatment among the respondents was also good with 287 (73.7%) of the patients knowing that tuberculosis disease can be cured by anti-TB drugs. More than half of the respondents 207 (53.9%) knew the duration for completing TB treatment. A majority of the patients 230 (49.9%) reported experiencing side effects from the anti-TB drugs that included skin rash and mild fever; vomiting and nausea; and coloured urine (Table 4.2.1 and 4.2.2). Importantly, the respondents with overall good knowledge about TB was 198 (51.6%), as 186 (48.4%) of the respondents had overall poor knowledge (Figure 4.7).

Table 4.2.1 Respondents knowledge level towards TB

Statements		Freq	%
Definition of TB			
	TB is infectious disease that usually affect the lungs	228	59.4
	TB is contagious	87	22.7
	TB is a hereditary condition	27	7.0
	TB is an ancient disease that has been eradicated	24	6.3
	TB is a symptoms of HIV	14	3.6
	Don't know	4	1.0
Causes of TB			
	Bacteria	125	32.6
	Malnutrition	111	28.9
	Bacilli/germs	68	17.7
	Virus	26	6.8
	Smoking	25	6.5
	Hard work	11	2.9
	Don't know	10	2.6
	Chewing Kat	8	2.1
Transmission of TB			
	Through airway when a person with TB coughing, sneezing without cover the mouth and nose	166	43.2
	Sleeping in the same net	79	20.6
	Kissing an infected TB patient	62	16.1
	Drinking with same glass	43	11.2
	Having meal together	34	8.9
Susceptible people on TB			
	All of them are susceptible	199	51.8
	People living in same roof	124	32.3
	Spouse	43	11.2
	Neighbour	9	2.3
	None response	9	2.3
Signs and Symptoms of TB			
	Chest pain; persistence cough for more than 3 weeks; loss of appetite; fever and night sweat; coughing up blood; unexplained weight loss; shortness of breath; severe headache; nausea:	208	54.2
	fever and night sweat; loss of appetite	92	24.0
	severe headache; nausea; chest pain	84	21.9

Table 4.2.2 Respondents knowledge level towards TB

	Statement	Freq	%
People infected with TB			
	Anybody	338	88.0
	Only poor people	18	4.6
	Only Alcoholic people	7	1.8
	Only poor people	7	1.8
	Only people living with HIV/AIDS	5	1.3
	Only homeless people	5	1.3
	Non response	2	0.5
	Only drug users	2	0.5
Most useful methods to diagnosis TB			
	Sputum examination	265	69.0
	Chest X-ray	51	13.3
	Tuberculosis skin test	28	7.3
	Urine test	22	5.7
	Blood test	16	4.2
	No response	2	0.5
Treatment of TB			
	Anti TB drug combination	283	73.7
	Antibiotic	68	17.7
	Traditional medicine	16	4.2
	None response	7	1.8
	Recovery itself	6	1.6
	Avoiding sex	4	1.0
Duration for completing TB treatment			
	6 months	207	53.9
	8 months	113	29.4
	Don't know	26	6.8
	12 months	21	5.5
	More than 12 months	17	4.4
Side effects of TB drugs			
	Skin rash/mild fever/change color of urine/vomiting and nausea	230	59.9
	Have not seen any side effect	52	13.5
	Oliguria	46	12.0
	Diarrhea	45	11.7
	None respondents	6	1.6
	Blindness	5	1.3

A total of 384 respondents filled the questionnaire. Data are presented as number (No.) of subjects and proportions (%). TB, tuberculosis, HIV/AIDS, human immunodeficiency virus, acquired immunodeficiency syndrome.

Knowledge levels were determined using a series of 10 questions on definition on TB causes TB, mode of transmission , susceptible people,, sign an symptoms, most useful method to diagnosis of TB , treatment of TB ,duration of completing treatment of TB, side effect of anti-TB drugs. Each correct answer was assigned a score of ONE and the incorrect answer was **ZERO** the maximum expected score was 10 and the overall mean (\pm Standard Deviation) knowledge score = 5.72 (SD \pm 2.318). This mean was used as a cut-off for good (values \geq mean) and poor (values $<$ mean) knowledge. Thus, 198 (51.6%) of the respondents had good knowledge while 186 (48.4%) of the respondents had poor knowledge.

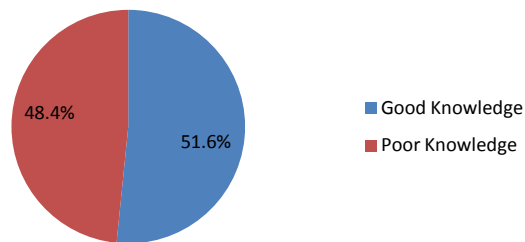


Figure 4.7: Proportion of respondents with overall good and poor knowledge on TB

4.5 Attitude of the respondents towards TB

The findings of this variable are summarized as indicated in table 4.3. Attitude of patients towards tuberculosis was how patients perceived or believed TB to be. The level of attitude of the TB patients was classified into three levels based on best rating criteria. On assessing the positive statement towards TB among patients, 365 (95.1%) of the respondents believed that everybody has a chance to get the infection from untreated TB patients, 8 (2.1%) disagreed with that view and 11 (2.8%) were undecided. Most of the respondents 327 (85.2%) agreed that those who got TB infection can develop other diseases in short time if they have low immunity like HIV/AIDS while 32 (8.3%) disagreed to that view and 25 (6.5%) were undecided. More than half of the respondents 209 (54.4%) agreed that malnutrition and poor people are risk of getting TB infection while 117 (30.5%) disagreed and 58 (15.1%) were undecided.

A majority of the respondents 309 (80.5%) were of the opinion that TB is dangerous and can lead to disability (lung fibrosis) if not diagnosed and treated early, 42 (10.9%) disagreed and 33 (8.6%) did not know. Most of the respondents 352 (91.7%) agreed that TB patients can work as usual after completing their treatment while 17 (4.4%) disagreed and 15 (3.9%) were undecided. On assessing the negative statement towards TB patient's attitude, 252 (65.6%) still perceived that they are feeling isolated from their family and society, 106 (27.6%) disagreed while 26(6.8%) were undecided. More than half of the respondents 247 (65.3%) indicated that they lost their time from work due to the TB infection, 107 (27.9%) disagreed while 30 (7.8%) were undecided. Most of the

respondent 333 (86.7%) were of the opinion that rich people can't get TB, 39 (10.2%) disagreed while 12 (3.2%) were undecided.

The results show that less than ten percent of the respondents 33 (8.6%) believed that getting TB is a kind of punishment from God while 331 (86.2%) disagreed and 20 (5.2%) were undecided. The result further shows that 276 (71.9%) of the respondents were of the opinion that women can't get pregnancy during the treatment course, 71 (18.5%) disagreed while 37 (9.7%) were undecided. Most of the respondents 301 (78.4%) disagreed that TB is curable with traditional medicine while 285 (74.2%) indicated that they can't seek TB health services from local authorities. Majority of the respondents (70.8%) revealed that they can't seek health personnel when they felt ill because of language barrier (Table 4.3). Overall, 209 (54.4%) of respondents had negative attitude while 175 (45.6%) of the respondents had positive attitude (Figure 4.9).

Table4.3. Attitude of the respondents towards TB

Variables Statements	Agree		Disagree		Undecided	
	Freq	%	Freq	%	Freq	%
Everybody have a chance to get infection from untreated TB patient	365	95.1	8	2.1	11	2.8
Those who got TB infection can develop other disease in short time if they have low immunity (e.g. HIV/AIDs)	327	85.2	32	8.3	25	6.5
Malnutrition and poor people are risk for getting TB	209	54.4	117	30.5	58	15.1
TB is a dangerous and can lead to disability (lung fibrosis) if not early diagnosed and treated	309	80.5	42	10.9	33	8.6
TB Patients usually feeling of isolation from family as well as the society	252	65.6	106	27.6	26	6.8
TB usually lost the time from work due to the disease	247	64.3	107	27.9	30	7.8
Rich people can't get TB because it's only a disease of poor people	333	86.7	39	10.2	12	3.2
Getting TB is a kind of punishment from God	33	8.6	331	86.2	20	5.2
Women can't get pregnant during the TB treatment course	276	71.9	71	18.5	37	9.7
TB is curable with traditional medicine	45	11.7	301	78.4	38	9.9
You can't seek health as long as you ill because you are afraid of local authorities	49	12.8	285	74.2	50	13.0
You can't seek health as long as you are ill because of language barriers	272	70.8	65	16.9	47	12.3
Patients can work as usually after complete their treatment	352	91.7	17	4.4	15	3.9

A total of 384 respondents filled the questionnaire. Data are presented as number (No.) of subjects and proportions (%). TB, tuberculosis, HIV/AIDs, human immunodeficiency virus, acquired immunodeficiency syndrome.

Attitude towards TB was assessed using 13 statements the scale rating was used for the respondents were: “Agree”, “Undecided”, “Disagree”. Total score was 39, range was 0-39. There were 5 positive statements and 8 negative statements. Positive statements were scored as: +3 (Agree); +2 (Undecided); +1 (Disagree). Negative statements were scored as: +1 (Agree); +2 (Undecided); +3 (Disagree). The mean (\pm standard deviation) of the cumulative linker scores on the attitude scores on TB was 31.047 (\pm 3.082). The mean was therefore used as the cut-off for positive (values \geq mean) and negative (values $<$ mean) attitude towards TB. Thus, 209 (54.40%) of the respondents had negative attitude while 175 (45.60%) of the respondents had positive attitude.

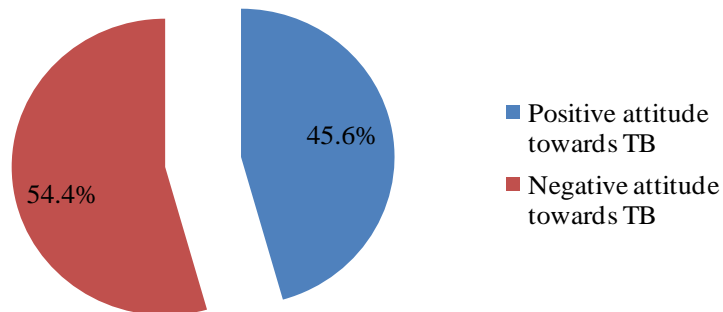


Figure 4.8 The proportion of respondents with positive and negative attitude towards TB

4.6 Practice of prevention behavior towards TB

With regards to protective or health promoted behavior among the respondents 255 (66.4%) routinely had meals containing a balanced diet while 129 (33.6%) did not eat a balanced diet to prevent TB. About 290 (75.5%) of the respondents reported always taking their children for BCG vaccination as well as whenever they saw a child less than one year old. This results showing that 353 (91.9%) of the respondents was seeking health services from health personnel. On the other hand 359 (93.5%) of the respondents were gone for examination when they suspected signs of TB. It was found that 350 (91.1%) of the respondents kept their house in good ventilation. As for health risk behavior 239 (62.2%) had never avoided TB patients while 145 (37.8%) had always avoided being in close contact with TB patients.

The result of this study revealed that 360 (93.8%) of the respondents were covering mouth and nose when coughing or sneezing. More than two third of the respondents 348 (90.6%) were able to prevent TB by hand washing after coughing or sneezing or touching items in public places. The majority of the respondents 322 (83.9) indicated they put sputum discharge in special plastic container. Most of the respondents 300 (78.1%) indicated they put face mask or paper tissue when they coughing or sneezing. More than half of the respondents 298 (77.6%) showed that they controlled private and personal utensils, drinking and eating equipments from droplet infection. On the argument of this results the majority of the respondents 307 (79.9%) indicated isolated TB patients is not kind of practice of prevention behavior on TB while 77 (20.1%) of the respondents

showed that isolation of TB patients is a kind of practice of prevention behavior on TB (Table 4.4).

Analysis of the overall good and poor practice of prevention behaviour towards TB among the respondents indicated that 258 (67.2%) had good practice of prevention behaviour while 126 (32.8%) of the respondents had poor practice of preventive behaviour towards TB (Figure 4.10).

Table4.4. Practice of prevention behavior towards TB of the respondents

Variable	Yes		No	
	Freq	%	Freq	%
Practice of Prevention behaviors statements				
Eating balance diet to prevent TB (vegetables , meat , fish, equally)	255	66.4	129	33.6
Encourage getting BCG vaccination when you see the child less than one year old	290	75.5	94	24.5
Seeking health service from health personal	353	91.9	31	8.1
Going for examination whenever you have suspected sign of TB	359	93.5	25	6.5
Keeping your house with good ventilation and sunlight	350	91.1	34	8.9
Avoiding being close to TB patients	145	37.8	239	62.2
Covering mouth and nose when coughing or sneezing	360	93.8	24	6.3
Hand washing after coughing or sneezing or touching items in public places	348	90.6	36	9.4
Putting sputum discharge in special plastic container	322	83.9	62	16.1
Putting face mask or paper tissue during coughing or sneezing	300	78.1	84	21.9
Controlling private and personal utensils, drinking and eating equipment (spoons, plate, bottles, clothes, towel bed lines, mask, thermometer and tooth brush) from droplet infection	298	77.6	86	22.4
Isolation TB patients	77	20.1	307	79.9

A total of 384 respondents filled the questionnaire. Data are presented as number (No.) of subjects and proportions (%). BCG, Bacillus Calmette–Guérin.

The levels of practice of preventive behaviour towards TB were assessed using 12 questions. The types of the questions were “Yes”, “No” the correct answer was **ONE** while the incorrect answer was **Zero**. The total score was 12; the range was 0-12. The mean (\pm standard deviation) of the cumulative scores on practice of preventive behaviour towards TB was 8.9 (\pm 1.868). The mean was therefore used as the cut-off for good (values \geq mean) and poor (values $<$ mean) on practice of preventive behaviour on TB. Thus, 258 (67.2%) of the respondents had good practice on prevention behaviour on TB while 126 (32.8%) of the respondents had poor practice on preventive behaviour on TB.

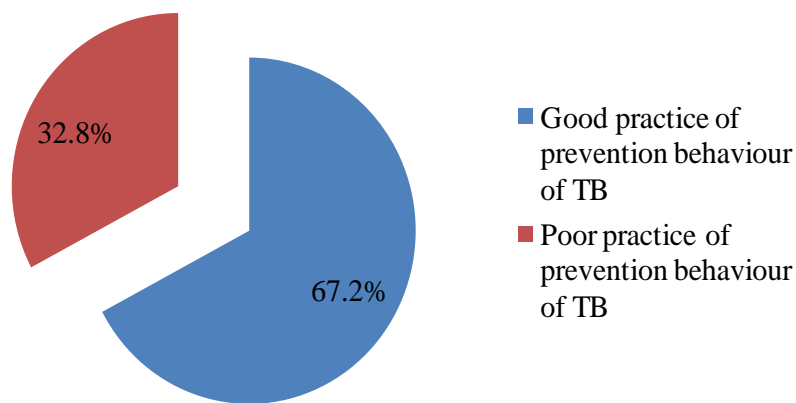


Figure4.9. The proportion of the respondents with Good and Poor Practice of prevention behaviour towards TB

4.7 Association between knowledge and socio-demographic characteristic

The association between knowledge level and socio-demographic characteristics is summarized in (Table 4.5). From the table be seen that majority of the respondents with good TB knowledge had diploma [32 (69.6%)] education compared to those having degree [9 (64.3%)] or secondary [71 (58.7%)] education (χ^2 , 25.628; df =4; p=0.001). Employed respondents [103 (57.2%)] were more knowledgeable on TB compared to those unemployed [79 (51.0%)] or [15 (31.3%)] who were housewives in the case of women (χ^2 , 10.256; df= 2, p=0.006). Christian respondents [139 (62.6%)] were more knowledgeable on TB compared to [58 (36.3%)] Muslim respondents (χ^2 , 26.932, df= 1, $P =0.001$). Most of the respondents who were Kenyan citizens [172 (57.9%)] had good knowledge compared to [25 (30.1%)] who were non-Kenyan citizens (χ^2 , 21.204; df, 1, $P=0.001$).

Table 4.5. Association between knowledge and socio-demographic characteristic

Variable	Good Knowledge, no (%)	Poor knowledge, no (%)	χ^2	df	P-value
Age					
20-29	105 (52.2%)	96 (47.8%)	4.08	3	0.253
30-39	63 (55.8%)	50 (44.2%)			
40-49	21 (57.7%)	23 (42.3%)			
50-59	9 (34.6%)	17 (65.4%)			
Gender					
Male	115 (53.2%)	101 (46.8%)	0.557	1	0.473
Female	83 (49.4%)	85 (50.6%)			
Marital status					
Not married	91 (55.5%)	73 (44.5%)	2.833	3	0.586
Married	82 (48.5%)	87 (51.5%)			
Divorced	14 (48.3%)	15 (51.7%)			
Widowed	10 (47.6%)	11 (52.4%)			
Education					
Diploma	32 (69.6%)	14 (30.4%)	25.628	4	0.001
Degree	9 (64.3%)	5 (35.4%)			
Secondary	71 (58.7%)	50 (41.3%)			
Primary	68 (49.3%)	70 (50.7%)			
No formal education	17 (26.6%)	47 (73.4%)			
Occupation					
Employed	103 (57.2%)	77 (42.8%)	10.256	2	0.006
Unemployed	79 (51.0%)	76 (49.0%)			
Housewife	15 (31.3%)	33 (68.8%)			
Religion					
Christian	139 (62.6%)	83 (37.4%)	26.932	1	0.001
Muslim	58 (36.3%)	102 (63.8%)			
Nationality					
Kenyan	172 (57.9%)	125 (42.1%)	21.204	1	0.001
Non Kenyan	25 (30.1%)	58 (69.9%)			

Data shown are number (n) of subjects and proportions (%). df, degrees of freedom. χ^2 , Pearson's chi-square. Values in bold are significant P-values.

4.8 Association between overall Knowledge level and overall attitude

Most of the respondents with good knowledge [99 (56.6%)] had a positive attitude while most respondents with poor knowledge had a negative attitude [110 (52.6%)] towards TB infections (χ^2 , 3.230; df, 1; $P=0.045$) (Table 4.6).

Table 4.6. Association between overall knowledge level and overall attitude

	Positive attitude, No (%)	Negative attitude, No (%)	χ^2	df	<i>P</i> -value
Good knowledge	99 (56.6%)	99 (47.4%)	3.230	1	0.045
Poor knowledge	76 (43.4%)	110 (52.6%)			

Data shown are number (n) of subjects and proportions (%). df, degrees of freedom. χ^2 , Pearson's chi-square. Values in bold are significant *P*-values.

4.9 Association between overall knowledge and overall practice of prevention

behaviors towards TB

Regarding knowledge of tuberculosis among the respondents, there was no significant association between overall knowledge and overall practice of preventive behavior towards TB ($P=0.157$). This finding suggests that there is no good practice of preventive behavior when knowledge about TB is low (Table 4.7).

Table 4.7. Association between overall knowledge and overall practice of preventive behaviors towards TB

	Good practice of preventive TB, No (%)	Poor practice of preventive TB, No (%)	χ^2	df	<i>P</i> -value
Good knowledge	58 (46.1%)	140 (54.3%)	2.297	1	0.157
Poor knowledge	68 (53.9%)	118 (45.7%)			

Data shown are number (n) of subjects and proportions (%). df, degrees of freedom. χ^2 , Pearson's chi-square. Values in bold are significant *P*-values.

4.10 Association between attitude and socio-demographics characteristics

The association between attitude and socio-demographic characteristics of respondents is summarized in the (Table 4.8). No significant associations was found between attitude and age groups (χ^2 , 1.081; df=3; $P=0.782$), gender (χ^2 , 0.840; df=1; $P=0.409$), marital status (χ^2 , 2.326; df=3; $P=0.676$), education (χ^2 , 1.553; df=4; $P=0.817$), occupation (χ^2 , 1.94; df=2; $P=0.379$), and nationality (χ^2 , 4.830; df=1; $P=0.089$). However, religion was associated with attitude such that most Muslim respondents [98 (61.3%)] had a negative attitude (χ^2 , 6.376; df=1; $P=0.041$).

Table 4.8. Association between attitude and socio-demographic characteristics

Variable	Positive attitude, no (%)	Negative attitude, no (%)	χ^2	df	P value
Age					
20-29	93 (46.3%)	108 (53.7%)	1.081	3	0.782
30-39	49 (43.4%)	64 (56.6%)			
40-49	19 (43.2%)	25 (56.8%)			
50-59	14 (53.8%)	12 (46.2%)			
Gender					
Male	94 (43.5%)	122 (56.5%)	0.840	1	0.409
Female	81 (48.2%)	87 (51.8%)			
Marital status					
Not Married	75 (45.7%)	89 (54.3%)	2.326	3	0.676
Married	80 (47.3%)	89 (52.7%)			
Divorced	13 (44.8%)	16 (55.2%)			
Widowed	7 (33.3%)	14 (66.7%)			
Education level					
Degree	6 (42.9)	8 (57.1%)	1.553	4	0.817
Diploma	23 (50.0%)	23 (50.0%)			
Secondary	51 (42.1%)	70 (57.9%)			
Primary	67 (48.6%)	71 (51.4%)			
No formal education	28 (43.8%)	36 (56.3%)			
Occupation					
Employed	89 (49.4)	91 (50.6%)	1.94	2	0.379
Housewife	20 (41.7%)	28 (58.3%)			
Unemployed	66 (42.6%)	89 (57.4%)			
Religion					
Christian	113 (50.9%)	109 (49.1%)	6.376	1	0.041
Muslim	62 (38.8%)	98 (61.3%)			
Nationality*					
Kenyan	144 (48.5%)	153 (51.5%)	4.830	1	0.089
None Kenyan	29 (34.9%)	54 (65.1%)			

Data shown are number (n) of subjects and proportions (%). df, degrees of freedom. χ^2 , Pearson's chi-square. Values in bold are significant P-values.

4.11 Association between overall attitude and overall practice of prevention behaviour towards TB

Most of the respondents with good TB knowledge had a positive attitude on practice of prevention behavior towards TB [128 (73.1%)], (χ^2 5.172; df=1; $P=0.029$) (Table 4.9).

Table 4.9. Association between overall attitude and overall practice of prevention behaviour towards TB

	Positive attitude, No (%)	Negative attitude, No (%)	χ^2	df	P -value
Good practice for prevention of TB	128 (73.1%)	130 (62.2%)	5.172	1	0.029
Poor practice for prevention of TB	47 (26.9%)	79 (37.8%)			

Data shown are number (n) of subjects and proportions (%). df, degrees of freedom. χ^2 , Pearson's chi-square. Values in bold are significant P -values.

4.12 Association between practices of prevention behavior with socio-demographic characteristics

The association between practice of prevention behavior towards TB and socio-demographic characteristics of respondents is summarized in the (Table 4.10.1 and 4.10.2). There were no significant associations found between practice of prevention behavior towards TB and age groups (χ^2 , 2.302; df=3; $P=0.512$), marital status (χ^2 , 3.781; df=4; $P=0.708$), occupation (χ^2 , 1.232; df=2; $P=0.540$), and religion (χ^2 , 3.096; df=1; $P=0.213$), nationality (χ^2 , 3.886; df=1; $P=0.143$). However, gender was associated with practice of prevention behavior towards TB. Result indicates that more males had good practice of prevention behavior towards TB [158 (71.3%)] compared to [104 (61.9%)] of female (χ^2 , 3.781; df=1; $P=0.062$).

Further analysis showed significant associations between education level and practice of prevention behavior towards TB (χ^2 , 17.804; df=4; $P=0.001$) suggesting that prevention behavior improves with increase in education standards.

Table 4.10.1 Association between practices of prevention behaviors with Socio-demographic characteristics

Variable	Good practice for preventive of TB, no (%)	Poor Practice for preventive of TB, no (%)	χ^2	df	P-value
Age (Years)					
20-29	129 (64.2%)	72 (35.8%)	2.302	3	0.512
30-39	81 (71.7%)	32 (28.3%)			
40-49	29 (65.9%)	15 (34.1%)			
50-59	19 (73.1%)	7 (26.9%)			
Gender					
Male	154 (71.3%)	62 (28.7%)	3.781	1	0.062
Female	104 (61.9%)	64 (38.1%)			
Marital status*					
Not married	108 (65.9%)	56 (34.1%)	2.151	3	0.708
Married	118 (69.9%)	51 (30.2%)			
Divorced	19 (65.5%)	10 (34.5%)			
Widowed	12 (57.1%)	9 (42.9%)			
Education level					
Degree	9 (64.3%)	5 (35.7%)	17.804	4	0.001
Diploma	34 (73.9%)	12 (26.1%)			
Secondary	83 (68.6%)	38 (31.4%)			
Primary	102 (73.9%)	36 (26.1%)			
No formal education	29 (45.3%)	35 (54.7%)			

Table 4.10.2 Association between practices of prevention behaviors with Socio-demographic characteristics

Variable	Good practice for preventive of TB, no (%)	Poor Practice for preventive of TB, no (%)	χ^2	df	<i>P</i> -value
Occupation					
Employed	124 (68.9%)	56 (31.1%)	1.232	2	0.540
Unemployed	104 (67.1%)	51 (32.9%)			
Housewife	29 (60.4%)	19 (39.6%)			
Religion					
Christian	154 (69.4%)	68 (30.6%)	3.096	1	0.213
Muslim	103 (64.4%)	57 (35.6%)			
Nationality					
Kenyan	207 (69.7%)	90 (30.3%)	3.886	1	0.143
Non Kenyan	49 (59%)	34 (41%)			

Data shown are number (n) of subjects and proportions (%). df, degrees of freedom. χ^2 , Pearson's chi-square. Values in bold are significant *P*-values.

CHAPTER FIVE: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Discussion

This study provided important information regarding TB patients' knowledge, attitude and practice about tuberculosis. Although knowledge is an important factor in the treatment, prevention and control of TB (Jaramillo, 2000), and influence health care seeking action (Hoa *et al.*, 2009). Studies from the developing world have shown that delayed care is closely related with patients' demographic characteristics, knowledge of tuberculosis and traditional beliefs the uses of multiple alternative traditional care and fear of stigmatization (Mushtaq *et al.*, 2011). Lack of knowledge of tuberculosis among the general population could contribute to prolonged delay in seeking TB care in Africa. The other explanation could be most patients have poor access to TB services in terms of distance from their residences and cost constraints in getting tuberculosis treatment under the observation of health workers (Yimer *et al.*, 2009).

5.1.1 Awareness and knowledge of the respondents about TB

Knowledge about any disease is necessary and important in order to optimize the patients' treatment and to improve their quality of life (Jaramillo, 2001). Numerous studies have proved that lack of knowledge is likely to prevent appropriate positive healthcare seeking behaviors. Like other chronic illness, appropriate knowledge towards Tuberculosis (TB) was significantly associated with positive healthcare seeking action (Hoa *et al.*, 2003). Literature indicates that TB control can significantly be enhanced if more concern is given to improve knowledge and attitudes towards disease.

The results presented in this study show that at least 95% were aware of TB indicating a high TB awareness in patients. This observation is consistent with studies in North East Libya and Ethiopia showing high levels of disease awareness among TB patients (Abebe *et al.*, 2010). Results also indicate that awareness of pulmonary TB (78%) and awareness of extra-pulmonary TB (18.8%) is largely due to the high knowledge levels on coughing as a sign of TB. Similar studies in Russia indicated 85% awareness of pulmonary tuberculosis that was linked to coughing (Eili Ruud *et al.*, 2011). The fact that health professionals and the mass media plays a vital role in disseminating TB information is supported by the results of this study which show that health professionals and the mass media were the main sources of TB information. This study is similar to studies of Tung Minh Duog (2009) in Vietnam which illustrated that information about TB from health personnel, friends and neighbors contributed to increase of positive TB prevention behavior (Duog, 2004). This reflects positive impact of health professionals and governments' initiatives on mass awareness through the media. Mass media messages can influence the way people understand the disease and the steps they need to take to prevent contracting or spreading the disease (Sokol, 2003). Thus, it is strongly suggested that health professionals and the public media should be utilized in the dissemination of TB knowledge to the public to promote prevention and treatment of the disease.

The overall knowledge levels on tuberculosis observed in this study indicate that the patients in Eastleigh division moderately understand about TB infections. The findings of this study are consistent with previous studies reporting moderate knowledge levels on TB to the different communities in Ethiopia (Yimer *et al.*, 2009). This may be indicating

that the health education to TB patients is not yet efficient or effective. This was indicated from the low frequency of the respondents who knew that TB was contagious and is transmitted through coughing or sneezing.

The low level of knowledge on the etiology of TB observed in the current study is probably due to misconception that TB was due to malnutrition or smoking. The study also established that low knowledge level on TB transmission, signs and symptoms was common among the patients further indicating that TB etiology is hardly known. Similar findings have been documented from Vietnam by Hoa *et al* (2009) and Philippines by Portero *et al*, (2002) reported poor knowledge on TB causation and modes of transmission. Teixeira *et al*. (2008) and Vandamme *et al*. (2009) in their study in Jamaica established that the level of education influenced knowledge on TB transmission. Other similar studies conducted in Zambia (Kaona *et al.*, 2004), Pakistan (Mushtaq *et al.*, 2011) and Malaysia (Liam *et al.*, 1999) reported poor knowledge among respondents on transmission of TB. Taken together, it is evident that TB patients from high burden regions are severely handicapped on TB transmission (Zhang *et al.*, 2007). However, the results in the current study that show low knowledge level on signs and symptoms of TB differs from similar studies in Tanzania illustrating 80% of respondents knew about the signs and symptoms of TB (Haasnoot *et al.*, 2010). Although the findings in this thesis research support a paradigm that good understanding of the causes, modes of transmission, signs and symptoms, and treatment enhance timely and early seeking health care behavior (Bayouni *et al.*, 2007). It is also possible that health care seeking practices is not only dependent on knowledge but also on other factors such as motivation.

A study was conducted by Westaway (1990), in South Africa where patients with tuberculosis were interviewed. The study noted that the major symptoms were cough, loss of appetite, weight loss and night sweat. The study concluded that denial of personal involvement and positive attitude towards cure and prevention may be the factors that allow tuberculosis patients to cope with the disease. Damelew (2002), conducted a study to assess Knowledge and Practice of tuberculosis patients and their caretakers. In this study 24% of patients mentioned bacteria/germs as the causes of tuberculosis and 36% of patients mentioned blow/'Nefas simeta' as the cause of tuberculosis.

5.1.2 Attitude of the respondents towards TB

Most of the respondents had negative attitude towards TB. However, majority of TB patients had feelings that they were isolated from family and society. Interestingly, some of the respondents in the current study believed that women cannot get pregnant during the treatment course thus confirming that cultural beliefs still negatively impact on attitude towards TB. This creates a challenge on TB prevention practices. Patient's attitude and likelihood of taking action can be influenced by structural variables such as knowledge about and previous contact with the disease (Dennill *et al.*, 1999). TB has been and still is often considered a 'dirty disease', a disease of the poor and marginalized people². The consequences of stigma are remarkably similar in different health conditions, cultures and public health programs. Stigma related to TB has a severe impact on individuals and their families and on the effectiveness of TB control programs.

Attitudes towards TB, which may generate stigma, can prevent people from getting tested for TB.

A risk attitude of TB can make people feel vulnerable to TB infection and avoid engaging in risky behavior. However, fear of TB does not necessarily lead to a high perception of risk of TB infection (Dennill *et al.*, 1999). Relevant knowledge and positive attitude are predisposing factors for behavioral change. People with better knowledge of tuberculosis are more likely to seek healthcare and medical treatment (Mangesho *et al.*, 2011). Patients infected with TB often endure more than physical symptoms and suffer from emotional distress because of stigma imposed by society, rejection by friends and family. They isolate themselves to avoid infecting others and to avoid uncomfortable situations such as becoming the subject of gossip (Baral *et al.*, 2007). A study on attitude of TB revealed that less knowledge and more misconceptions about TB existed among teenagers, older people and men (Promtussananon *et al.*, 2005). Therefore, there is a need to disseminate accurate information on TB in order to improve attitudes regarding TB so as to enhance uptake of the preventive measures.

5.1.3 Practice of preventive behavior of the respondents towards TB

The results of this study show that at least two thirds of the respondents had good level of practice of prevention behavior about TB which is believed to limit transmission. This finding is consistent to studies done in Bangkok by Suree (2009) which illustrated that most respondents with good prevention practice had low risk of acquiring or transmitting TB.

In the current study, more than two third of the patients (93.8%) mentioned the fact that TB can be prevented by covering ones' mouth and nose when coughing or sneezing. However, translating knowledge into practice remains the most important deterrent of TB prevention. In contrast to studies by Koay (2004) showing that avoidance of contact with TB patients can decrease transmission, results of the current study indicate that 62.2% of the respondents disagree that avoiding contact with TB patient can halt transmission of TB. Other results illustrates that most of the respondents regarded wearing face masks and keeping well-ventilated homes can prevent TB spread (HninThawad, 2008)

5.1.4 Association between knowledge, attitude and practice of prevention behavior towards TB of the respondents

The results presented in this study show an association between knowledge and education, occupation, religion and nationality thus suggesting that these socio-demographic factors influence knowledge on TB. These findings are similar to studies done in Tanzania in 2009 indicating that high levels of education promote knowledge on TB. This study is consistent with the study of Yousif, (2007) who found that knowledge about TB and its treatment significantly increased with educational level. The findings from this study shows that there was significant associated between occupation and TB knowledge. This association is possibly related to the fact that employed respondents were more educated and therefore had better knowledge on TB. Similar studies done in Thailand showed that respondents who were employed had highest knowledge level on TB, while unemployed respondents had lowest level of knowledge regarding TB (Hnin Thawad, 2008). From the results there was significant associated between nationality and

TB knowledge, Kenyan respondents had higher knowledge level on TB compared to non Kenyan. The reason for this is possibly linked to differences in literacy levels. Similar studies in Tanzania found higher TB knowledge level among residents compared to non-residents (Ghuhen, 2009).

Our findings also indicate an association between socio-demographic characteristics; religion and knowledge suggesting that religion influences people's knowledge on TB. These findings differ from findings of studies in Cambodia which showed no association between religion and knowledge level on TB (Ratha, 2009). The result from this study indicate that the proportion of Muslims with good knowledge of TB was low, thus prompting the need to integrate dissemination of TB information during religious meetings and activities. On significance to TB intervention are results presented here illustrating association between overall knowledge and overall attitude about TB. This observation indicates that knowledge level influence the attitudes regarding TB risks, health seeking and prevention behaviors. This finding agrees with studies done in Sudan showing that knowledge level on TB causes and transmission among TB patients influenced their attitude related to the misconceived believes (Mohamed, 2007).

The results of the present study also show an association between practice of prevention behavior and education, and gender suggests education and the inherent differences in gender influence practices on TB prevention behavior. These arguments are supported by studies done in Thailand in 2008 which found a significant association between gender and practice of prevention behavior and between the genders, female practice prevention behavior better than their male counterpart. It means that female paid more

attention to self care and protect themselves from getting TB and are more concerned about social consequences of the disease than male, also there were strong significant difference between education status and practice of prevention behavior. Also it was shown that as the respondents were more educated the practice of prevention behavior became higher (Hnin Thawda, 2008)

The relationship between attitude and religion of the patients suggests that religion is an important factor in shaping attitudes of individuals regarding TB prevention practice (Ghuhen, 2009). The influence of religion on attitude was previously observed among TB adults in Africa, many religious and cultural beliefs are not consistent with modern western biomedical explanations which adversely affect their motivation to adhere to modern medicine (Goercke, 2004). The findings of this study indicate that TB prevention behavior is largely influenced by knowledge and attitude. Thus, in order to improve TB prevention practices it will be important to target knowledge and advocating for attitude change. This can be achieved through health education and advocacy programs.

5.2 Conclusions

Based on the results of this study the following conclusions were drawn:

1. This study assessed knowledge, attitude, and practice of Tuberculosis patients who are new cases and follow up care at different health facilities found in Eastleigh Division. The study findings identified that there was knowledge gap in areas of disease awareness of extra-pulmonary TB, ways of transmission, and symptoms other than cough.

2. The findings from this study indicated that health professionals and electronic media were the most frequent source of information about TB. It is, therefore advisable that measures should be taken to remove barriers to educational messages transmitted through the mass media in an attempt to further promote TB awareness among Kenyan communities.
3. Overall (51.6%) half of the patients had a good knowledge level on TB. The findings of this study reveal that knowledge about TB among the TB patients was not adequate.
4. The overall (54.4%) attitude of patients was negative. Some respondents indicated a feeling of being isolated from their family and the society as a whole. Some of the respondents believed that women can't get a pregnancy during the treatment course. The overall practice of prevention behavior towards TB was good. More than two third of the respondents had good level of practice prevention behavior towards TB. Overall practice of prevention behavior towards TB was high.
5. Knowledge, attitude and practice of prevention behavior towards TB among adults seeking services in TB health facilities in Eastleigh Division were influenced by their education, occupation, religion and nationality. Therefore, specific intervention strategies should be designed to improve the identified gaps and also to strengthen the positive behaviors and practices. Accordingly, the following recommendations are suggested based on the findings.

5.3 Recommendations

5.3.1 Recommendation from the study

Based on the findings of this study, the following recommendations were given to the responsible bodies:

1. Health service providers should give continuous health information regarding TB for patients and their care takers at TB clinic not only at the start of treatment.
2. At clinic level, the study suggests that health service providers could help the public to view TB infection more seriously by engaging every day with TB information, education and communication. This could be done by specifically distributing pamphlets to the public, by showing them pictures of people suffering from TB and by giving them the opportunity to share and discuss the information with infected individuals.
3. Ministry of Health should focus on strengthening and promoting implementation of mass media health education programmes directed at covering information about TB especially awareness of extra-pulmonary TB and to raise general knowledge about TB using all forms of media especially TV, newspapers and magazine. Health Care Providers should investigate the possibility to reduce negative attitude of the patients towards TB by influencing attitude and behavioral change especially to combat stigma and discrimination.
4. Members of the public should be made aware of how serious the consequences of TB infection are and be helped to understand that TB is both curable and preventable. Service could help workers view TB infection seriously by showing

them pictures of people suffering from TB and giving them opportunity to share and discuss the information with infected individuals.

5.3. Areas of further research

- 1) Further research should be conducted to determine behavior of people who are not diagnosed and started TB treatment regarding tuberculosis and its treatment in the community.
- 2) Further research should be conducted on the Professional nurses' perceptions of community knowledge, awareness and practices regarding TB in Kenya

REFERENCES

- Abebe, G., Deribew, A., Apers, L., Woldemichael, K., Shiffa, J., Tesfaye, M., Abdissa, A., Deribie, F., Jira, C., & Bezabih, M. (2010). Knowledge, Health Seeking Behavior and Perceived Stigma towards Tuberculosis among Tuberculosis Suspects in a Rural Community in Southwest Ethiopia. *PloS One*.
- Aitkhaled N., E., D.A., (1999) Tuberculosis—A Manual for Medical Students: WHO/International Union Against Tuberculosis and Lung Disease.
- Alvarez, G. G. C., Alvarez, J. F., Dorantes, J. J. E., & Halperin, F. D. (2000). Perceptions and Practices of Tuberculosis Patients and Non-adherence to Therapy in Chiapas, Mexico. *Salud Publica de Mexico*.
- Baral SC, Karki DK, Newell JN (2007), Causes of Stigma and Discrimination Associated with Tuberculosis in Nepal: a qualitative study. *BMC Public Health* 7:211. doi:10.1186/1471-2458-7-211.
- Bayouni, A., Mohamed, A.I., Ottoa, P. & Yousif, M.A. (2007). Knowledge of TB: A survey among tuberculosis patients in Ondurman, Sudan. *Sudanese Journal of Public Health*.
- Behr, M, A., Warren, S.A., Salmon de leon, A., and Delay, C.L (1999).Transmission of M. Tuberculosis from Patient Smear Negative for Acid Fast Bacilli. *Lancet*.
- Bethel, J., Goldberg, S., Hostburgh, R., Sterling, T.R., Welnfurter, P. & Yun, L. (2006). The Scope and Treatment of Latent Tuberculosis Infection in the United States and Canada. *American journal of respiratory and critical care medicine*
- Castro, K.G., Chakaya, M.J., Floyd, K., Gauhan, L.S., Glazou, P., Lönnroth, K. & Raviglione, M.C.(2010). Tuberculosis control and elimination 2010-50: Cure, care and social development. *The lancet*, 375.
- Comstock GW. (2000). Epidemiology of Tuberculosis. In Reichman LB and Hershfield BS (Eds.) *Tuberculosis: A Comprehensive International Approach* (2nd Ed). New York, NY: Marcel Dekker.
- Corbett, L., Raviglione M. (2005). Tuberculosis and the Tubercle Bacillus, Chapter 1 Global Burden of Tuberculosis. ISBN 1---55581---295---3, ed. S.T. Cole, Eisenach, K. D. McMurray, D.2005, Washington DC: ASM Press.
- Datiko DG, Yassin MA, Chekol LT, Kabeto LE, Lindtjørn B. (2008). The rate of TB-HIV co-infection depends on the prevalence of HIV infection in a community. *BMC Public Health*.
- Deborah (2011). Surveillance, Epidemiology, Outbreak Investigations Branch Updates

- Dennill, K, King, L & Swanepoel, T. (1999). Aspects of Primary Health Care. 2nd edition. Halfway House: Thomson International.
- Demelew T.Y, (2002), Behaviour of Tuberculosis Patients. Bahidar: Addis Ababa, Ethiopia.
- District Commissioner. (DC, 2011). Kamukunji Outlook Newsletter
- Division Leprosy Tuberculosis Lung Diseases. (DLTLD, 2012). Annual Report of Tuberculosis.
- Duog, T. M. (2004) Tuberculosis Prevention of Urban Community in Ca Mua Province, Vietnam. Faculty of Public Health, Mahidol.
- Dye C, Hosseini M, Watt C. (2007). Did we reach the 2005 targets for tuberculosis control? Bull WHO.
- Edginton, M.E., Sekatane, C.S. & Goldstein, S.J. (2002). Patients' beliefs: Do they affect tuberculosis control? A study in rural South Africa. International Journal of Tuberculosis and Lung disease.
- Eili Ruud and Tina Vollen. (2011). Tuberculosis - An increasing global health problem, presenting Russia as an example.
- Farmer, T.A. (2005), Prospects for reducing tuberculosis incidence and mortality, 72(2): 200-21.
- Fisher, A. A., Laing, J. E. and Strocker, J.E. (1998). Handbook for Family Planning, Operation Research Design in Sampling. Population Council, 40-45.
- Fujwara, P.I. & Small, P.M. (2001). Management of Tuberculosis in United States. Medical Progress. N.EN.J. Me.
- Faktaark. (2010) Folkehelseinstituttet. Tuberculoses--- [cited 2011July]; Available from:http://www.fhi.no/eway/default.aspx?pid=233&trg=MainLeft_5648&MainArea_5661=5648:0:15,2917:1:0:0:::0:0&MainLeft_5648=5544:50435::1:5647:66:::0:0
- Ghuhen Reuben Mataita. (2009). Knowledge, Awareness and Practice Regarding Tuberculosis among Miners in Tranzania.
- Goercke, B. (2004). The Impact of Traditional Shona Beliefs on HIV/AIDS Intervention in Zimbabwe. Pittsburg: Duquesne University.
- Govender, T. (1998/1999). Tuberculosis, DOTS cure for all, South Africa.

- Grzybowski S, Barnett GD, Styblo K. (1975). Contacts of Cases of Active Pulmonary tuberculosis.
- Haasnoot, P.J., Boeting, T.E., Kuney, M.O. & Van Roosmalen, J. (2010). Knowledge, Attitudes, and Practice of Tuberculosis among Massai in Simanjiro District, Tanzania. *American Journal of Tropical Medicine and Hygiene*.
- Harries AD, Dye C. (2006). Tuberculosis. *Ann Trop Med Parasitol*.
- Hnin Thawda Thwin. (2008). Prevention Behavior of Tuberculosis among Myanmar Migrants at Muang District, Phuket Province Thailand.
- Hoa, N. P., Chuc, K. T. N., & Thorson, A. (2009). Knowledge, Attitudes, and Practices about Tuberculosis and Choice of Communication Channels in a Rural Community in Vietnam. *Health Policy*.
- Hopewell, P.C., Jasmer, R. M., (2005) Tuberculosis and the Tubercle Bacillus. Chapter 2 Overview of Clinical Tuberculosis. ISBN 1--- 55581---295---3, ed. S.T. Cole, Eisenach, K. D. McMurray, D.2005, Washington DC: ASM press.
- International Organization of Migrants (IOM, 2011). An Analysis Migration Health in Kenya.
- Jaramillo, E. The Impact of Media-based Health Education on Tuberculosis Diagnosis in Cali, Colombia. *Journal of Health Policy and Planning* 2001; 16(1): 68-73.
- Jaramillo, E. (2000). The impact of media-based health education on tuberculosis Diagnosis in Cali, Colombia. *Journal of Health Policy and Planning*.
- Joklik, W.K., Willtet, H. P., Amos, D. B., WILfert, C.M. and Zinsser (Eds). (1995). *Microbiology* (20th ed): Mc Grow Hill.
- Kenya Aids Non Constridum Organization (KANCO, 2006). An Analysis of TB and HIV/AIDS Policy Formulation & Implementation Structures, Mechanism & Processes in the Education Sector in Kenya.
- Kenya Population Census (KPC, 2009). Population & Housing Census Results 2009.
- Koay, T. K. (2004). Knowledge and Attitudes Towards Tuberculosis among the People living in Kudat District, Sabah. *Medical Journal of Malaysia*.
- Legesse M, Ameni G, Mamo G, Medhin G, Shawel D, Bjune G, et-al. (2010). Knowledge and Perception of Pulmonary Tuberculosis in Pastoral Communities in the Middle and Lower Awash Valley of Afar region, Ethiopia. *BMC Public Health*.

- Levey, M., Reyes, H., & Connix, R. (1999). Overwhelming Consumption in Prisons. Human Rights and Tuberculosis Control. Health and Human Right.
- Liam, C. K., Lim, K. H., Wong, C. M. M., & Tang, B. G. (1999) . Attitudes and Knowledge of Newly Diagnosed Tuberculosis Patients Regarding the Disease, and Factors Affecting Treatment Compliance. The International Journal of Tuberculosis and Lung Disease.
- Lienhardt, C. (2001). From Exposure to Disease: the Role of Environmental Factors in Susceptibility to and Development of Tuberculosis. Epidemiologic Review
- Lönnorth, K., Jaramilo, E., Williams, B.G., Dye, C. & Raviglione, M. (2009). Drivers of Tuberculosis Epidemics: The Role of Risk Factors and Social Determinates. Social Science & Medicine.
- Maher, D., Chaulet, P., Spinaci, S., & Herrieo, A. (1999). Treatment of tuberculosis: Guideline for National Programs. WHO.
- Mangesho, P. E., Shayo, E. H., Makunde, W. H., Keto, G. B., Mandara, C. I., Kamugisha, M. L., Kilale, A. M., & Ishengoma, D. R. (2011). Community Knowledge, Attitudes and Practices Towards Tuberculosis and its Treatment in Mpwapwa District, Central Tanzania. Tanzania Journal of Health Research. In Knowledge, Attitudes and Practices Regarding Tuberculosis in two Districts of Pakistan's Punjab province. International Journal for Equity in Health.
- McShane H. (2005). Co-infection with HIV and TB: double trouble. STD HIV/ AIDS. Mesfin M,W/Tasew T, G/Tareke I, Mulgeta G, Richard M.J. (2005). Community Knowledge, Attitudes & Practices on Pulmonary Tuberculosis and their Choice of Treatment Supervisor in Tigray, northern Ethiopia. Ethiopian J. Health Dev.
- Ministry of Health. (MOH, 2012). Division of Leprosy and Tuberculosis Lung Disease. Annual Report
- Ministry of Public Health and Sanitation. (MOH&S, 2011). Division of Leprosy and Tuberculosis Lung Disease. Annual Report
- Mohamed, (2007).The Scope and of Treatment of Latent Tuberculosis Infection. American Journal of Respiratory and Critical Care Medicine,173: 927-930.
- Ministry of Health, (MOH/NLTP, 2006). National Leprosy and Tuberculosis Program Guidelines, Ministry of Health: Nairobi.
- Mushtaq, M. U., Shahid, U., Abdullah, H. M., Saeed, A., Omer, F., Shad, M. A., Siddiqui, A. M., & Akram, J. (2011). Urban-rural Inequities in Knowledge,

- Attitudes and Practices Regarding Tuberculosis in two Districts of Pakistan's Punjab province. *International Journal for Equity in Health*; 10(1): 8
- Nakajima, H. (1993) Tuberculosis: A global emergency. Geneva: WHO Ilongo, I. (2004). Tuberculosis Health Belief Gaps of Tuberculosis and Suspected Tuberculosis Cases in New York City. *International Journal of Clinical and Health Psychology*.
- National Tuberculosis Center. (1996, September 26). Diagnosis of Tuberculosis Infection and Disease (National Tuberculosis Center) [Online]. Available from: <http://www.umdj.edu/ntbcweb/tiddig.htm> [2008, October 20].
- Narain, JP & Lo, Y-R. 2004. Epidemiology of HIV-TB in Asia. *Indian Journal of Medical Research*, 120(4):277-289.
- Nthaita, S.O. (2009). Behavioral Barriers in Tuberculosis Control: A literature Review. The Change Project/Academy for Educational: Development.
- Petrovici, DA & Ritson, C. (2006). Factors influencing consumer dietary health preventative behaviours. *BMC Public Health*, 6:222.
- Portero Navio, J. L., Rubio Yuste M., & Pasicatan M. A. (2002). Socioeconomic Determinants of Knowledge and Attitudes about Tuberculosis among the General Population of Metro Manila, Philippines. *The International Journal of Tuberculosis and Lung Disease*.
- Promptussananon *et al* (2005). Perceptions of Tuberculosis: Attributions of Cause, Suggested means of Risk Reduction, and Preferred Treatment in the Limpopo Province, South Africa. *J Health Pop Nutri* 23(1):74-81.
- Ratha, D.,S. (2009), Beyond aid : New Sources and Innovative Mechanisms for Financing Development in Sub-Saharan Africa. World Bank Policy Research Working Paper Series, No. 4 609 , The World Bank.
- Schmidt, C.W. (2008). Linking TB and the Environment. *Environmental Health Perspective*. Sillah, D.J., Hill, P.C., Brookes, R.H., Dondor, S.A., Lugos, M.S., Fox, A., Howie, S.R.C., Fielding, K.R., Jallow, A., Lienhart, C., Corrah, T., Adegbola, R.A. & Mcadams, K.P. (2007). Screening for Tuberculosis among Household's Contacts of Sputum Smear Positive cases in the Gambia. *Transactions of the Royal Society of Tropical Medicine and Hygiene*.

- Somoskövi, Á. L.M. Parsons, and M. Salfinger.(2001). The Molecular basis of Resistance to Isoniazid, Rifampin, and Pyrazinamide in Mycobacterium Tuberculosis.
- Suree Jirapaiboonsuk. (2009) .Knowledge Attitude and Practice towards Childhood Tuberculosis in Guardians of Patients Visiting the Pediatric Out Patients Department Sirindhorn Hospital, Bangkok.
- Teixeira-Sá, D. M. A., Reicher, F., Braga, R. C., Beltramini, L. M. & de Azevedo Moreira, R. (2009). Isolation of a lectin and a galactoxyloglucan from *Mucuna sloanei* seeds. *Phytochemistry*, Vol. 70, No. 17-18, (December 2009), pp. 1965-1972, 0031-9422
- Teklu. B. (1993). Symptoms of Pulmonary Tuberculosis in Consecutive Smear-Positive Cases Treated in Ethiopia. *Tuberculosis Lung Diseases*.
- Van Damme, E. J. M., Peumans, W. J., Pusztai, A. & Bardocz, S. (February 25, 1998). *Handbook of Plant lectins: Properties and Biomedical Applications* , John Wiley & Sons, 978-047-196-445-2, New York.
- Westaway M.S, (1990), Knowledge and Attitude of Tuberculosis of black hospitalized tuberculosis patients. *Tubercle* (1990) 7(1):55-9.
- World Health Organization (WHO, 2004). WHO Report 2004, Global Tuberculosis Control, Surveillance, Planning, Financing, World Health Organization, Geneva.
- World Health Organization (WHO, 2006). Tuberculosis Facts Sheet N.140. Geneva World Health Organization.
- World Health Organization (WHO, 2008a). Global Tuberculosis Control, Surveillance, Planning, Financing: WHO Report 2008. WHO/HTM/TB/2008.23. Geneva, Switzerland.
- World Health Organization. (WHO, 2008b). Anti-tuberculosis Drug Resistance in the World. Report No.4. WHO/ HTM/TB? 2008. 394. Geneva, Switzerland.
- World Health Organization. (WHO, 2008). Implementing the WHO Stop TB Strategy: a Handbook for National Tuberculosis Control Programmes.
- World Health Organization, (WHO, 2009). The Stop TB Strategy, Case Reports, Treatment Outcomes and Estimates of TB Burden". *Global Tuberculosis Control: Epidemiology, Strategy*.

- World Health Organization. (WHO, 2011). Global Tuberculosis Control 2011. WHO/HTM/TB/2011.16, Geneva, Switzerland.
- World Health Organization. (WHO, 2012). Global Tuberculosis Report 2012. WHO/HTM/TB/2012.6. Geneva, Switzerland.
- Yimer S, Holm-Hansen C, Yimaldu T, Bjune G. (2009). Health Care Seeking among Pulmonary Tuberculosis Suspects and Patients in Rural Ethiopia: a Community-Based Study. BMC Public Health.
- Yousif R.K (2007), Fear and Social Isolation as Consequences of Tuberculosis in Vietnam: a Gender Analysis. Health Policy 58: 69–8.
- Zhang, T., Liu, X., Bromley, H., Tang, S. (2007). Perceptions of Tuberculosis and Health Seeking Behaviour in Rural Inner Mongolia, China. Health Policy .

APPENDICES

Appendix I: Informed Consent

My name is Farhia. I am a postgraduate student at Kenyatta University, Nairobi. I am here to carry out a study on the Assessment of prevention behavioural practices among adult tuberculosis patients in Eastleigh Division Kamukunji District, Nairobi County, Kenya. I want to ask some questions on, knowledge, attitude and practice of preventive behaviour towards tuberculosis. Your response was used for academic and research purposes only. Your participation in this interview is voluntary. If you decide not to participate, you will not be penalized. Also, you can change your mind during the interview and choose not to participate. This interview is private and confidential. I am not asking for your name, and your name will not be disclosed or used for any other purpose other than this study. You can also skip any questions that you do not want to answer.

Your responses will help us make recommendation on prevention behaviour modification and adults' attitude as one of the prevention of tuberculosis so may I ask you a few questions?

Yes: _____ **No:** _____

If client responds "yes," the respondent should sign and date the statement below and continue with the interview.

Respondent's Signature: _____ **Date of interview:** _____

Site: _____

Name of interviewer: _____

In case of any complaints contact Farhia Mohamud Yusuf (Principle investigator) on Cell phone: 0705206141 or Chairman KU-ERC: P.O. Box 43844, Nairobi-00100; Tel: 8710901/12.

Supervisors

- | | |
|--|---|
| <p>1. Dr. Tom Were
Department of Pathology
School of Health Sciences</p> | <p>2. Dr. Justus Osero
Department of Community Health
School of Public Health</p> |
|--|---|

Appendix II: Questionnaires

Questionnaires form for adult TB patients attending TB Health Facilities in Eastleigh Division, Kamukunji District Nairobi County.

Assessment of prevention behavioural practices among adult tuberculosis patients in Eastleigh Division Kamukunji District, Nairobi County, Kenya

Questionnaires consist of 4 parts:-

1. Socio -demographic Characteristics of the patients
2. Awareness of patients towards TB
3. Knowledge of patients about TB
4. Attitude of patients about TB
5. Practices of prevention behavior towards TB

Part I: A: Socio-Demographic Characteristics

1. Age in Years.....?

2. Gender?

a) Female b) Male

3. Marital Status?

a) Single b) Married c) Divorced
d) Widowed

4. Educational Level

a) No formal education b) Primary c) Secondary
d) Diploma e) Degree and Above

5. Occupational Status

a) Employed b) House wife c) Unemployed

6. Religion?

a) Muslim b) Christian
c) Others (specify)

7. Nationality

- a) Kenyan Citizen b) None Kenyan

8. What is your relationship to the household head?

- a) Head of the household b) Spouse of household
 c) Son/daughter d) Alone

9. How many family members are in your household (including yourself)?

- a) 1-3 members b) 4-6 Members c) Above 6 members

10. How long have you been in Eastleigh?

- a) Less than 2 yrs b) 2-5 yrs c) 5-10 yrs
 d) Above 10 yrs

11. With whom do you stay?

- a) Alone b) With families c) With friends
 d) Spouse e) Relative
 f) Others (specify).....

PART II: Awareness of the patients towards TB**12. Have you ever heard about a disease called TB?**

- a) Yes b) No

13. Which form of tuberculosis did you aware?

- a) Pulmonary TB b) Extra-pulmonary TB

14. What is your source information about TB?

- a) Public Media b) Health professional c) Family members
 d) Neighbor e) Friends

15. Has anybody in your family ever had TB?

- a) Yes b) No

16. Have you ever lived with someone who has TB?

- a) Yes b) No

17. Is there anybody who has TB in your surroundings areas?

- a) Yes b) No

Part III: Knowledge of patients about TB

Please fill in the blanket or check (✓) in the appropriate box to answer the questions:

18. What is tuberculosis?

- a. TB is contagious
- b. TB is a hereditary condition
- c. TB is an ancient disease that has been eradicated
- d. TB is a symptoms of HIV
- e. TB is an infectious disease that usually affects the lungs

19. What do you think are causes of tuberculosis?

- a. Virus b) Bacteria c) Smoking
- d) Chewing Kat e) Bacilli/germs f) Hard work
- g) Malnutrition
- i) Others (specify)

20. TB can be spread out and transmit to other people through:

- a. Having meal together
- b. Sleeping in the same net
- c. Drinking with the same glass
- d. Through airway when a person with TB coughing, sneezing without cover
- e. By kissing with TB infected person

21. Who are the susceptible people to get TB infection when the parents got TB and become untreated him /her?

- a) Spouse b) Neighbour
- c) People living in the same roof d) all above

22. What are the sign and symptoms of tuberculosis?

- a) Chest pain b) Persistence cough for more than 3 wks
- c) Coughing up blood d) Loss of appetite
- e) Unexplained weight loss f) Fever and night sweats
- g) Shortness of breath h) Severe headache
- i) Nausea j) All above

23. In your opinion who can be infected with TB?

- a) Anybody b) Only alcoholic people
 c) Only homeless people d) Only poor people
 e) Only drug users f) Only people living with HIV/AIDs

24. In your opinion which one of the following are the most useful methods to diagnose tuberculosis?

- a) Sputum examination b) Tuberculosis skin test
 c) Blood test d) Urine test
 f) Chest X-Ray

25. How do you think TB can be treated?

- a) Recovery itself b) Antibiotics
 c) Traditional medicine d) Anti TB drugs combination
 e) Avoiding sex
 f) Others (specify).....

26. The duration for completing TB treatment successfully is?

- a) 6 Months b) 8 Month
 c) 12 Months d) More than 12 Months
 e) I don't know

27. In general when the TB patients taken anti-TB drugs he/she would have some common side effects such as:

- a) Oliguria
 b) Diarrhea
 c) Skin rash/mild fever; nausea; vomiting and change color of urine
 d) Blindness
 f) None

Part IV: Attitude of TB patient's towards TB

28. In the following statement please check (√) in the appropriate box to make the correct answers of the question.

Statement	Agree	Disagree	Undecided
1 Everybody have a chance to get infection from an untreated TB patient			
2 Those who got TB infection can develop the disease in short time if they have low immunity (eg.HIV/AIDS)			
3 Malnutrition and poor people are risk for getting TB			
4 TB is a dangerous and can lead to disability (lung fibrosis) if not early diagnosed and treated			
5 Patients usually feeling of isolation from family as well as the society			
6 TB usually lost the time from work due to the disease			
7 Rich people can't get TB because it's only a disease of poor people			
8 Getting TB is a kind of punishment from God			
9 Women can't get pregnant during the TB infectious patient			
10 TB is curable with traditional medicine			
11 You can't seek health as long as you are ill because you are afraid of local authorities			
12 You can't seek health as long as you are ill because of language barriers			
13 Patients can work as usually after complete their treatment			


Part V: Practice of preventive behavior towards TB

29. What would you practice to prevent TB if someone of your household gets TB?
(Check all that apply).

Contents		Yes	No
1	Eating balance diet to prevent TB (vegetables, meat, fish, equally)		
2	Encourage getting BCG vaccination when you see the child less than one year old		
3	Seeking health service from health personal		
4	Going for examination whenever you have suspected sign of TB		
5	Keeping your house with good ventilation and sunlight		
6	Avoiding being close to TB patients		
7	Covering mouth and nose when coughing or sneezing		
8	Hand washing after coughing or sneezing or touching items in public places		
9	Putting sputum discharge in special plastic container.		
10	Put face mask or proper tissue during coughing or sneezing		
11	Controlling private and personal utensils and drinking and eating equipment (spoons, plate, and bottles, clothes, towel bed lines mask, thermometers and tooth brush) from droplet infection		
12	Isolation TB patients		

Thank you very much for participating in our survey.

Appendix III: Ethical Approval Letter



**KENYATTA UNIVERSITY
ETHICS REVIEW COMMITTEE**

Fax: 8711242/8711575
 Email: kuerc.chairman@ku.ac.ke
 kuerc.secretary@ku.ac.ke
 Website: www.ku.ac.ke

P. O. Box 43844
 Nairobi, 00100
 Tel: 8710901/12

Our Ref: KU/R/COMM/51/194 Date: July 2nd, 2013

Farhia Mohamud Yusuf
 School of Public Health
 Kenyatta University
 P. O. Box 43844, Nairobi.

Dear Ms. Farhia,

APPLICATION NUMBER PKU/119/1105 OF 2013 – ‘ASSESSMENT OF KNOWLEDGE, ATTITUDE PRACTICE AND PREVENTIVE BEHAVIOURS TOWARDS TUBERCULOSIS AMONG ADULTS IN EASTLEIGH DIVISION, NAIROBI COUNTY, KENYA.’ – VERSION 2.

1. IDENTIFICATION OF PROTOCOL

The application before the committee is with a research topic, ‘Assessment of knowledge, attitude practice and preventive behaviours towards tuberculosis among adults in Eastleigh Division, Nairobi County, Kenya version 2 dated June 28th, 2013 received on 1st July 2013.

2. APPLICANT

Farhia Mohamud Yusuf
 School of Public Health
 Kenyatta University
 P. O. Box 43844, Nairobi.

3. SITE

Eastleigh, Nairobi County, Kenya

4. DECISION

The committee has considered the research protocol in accordance with the Kenyatta University Research Policy (section 7.2.1.3) and the Kenyatta University Ethics Review Committee Guidelines, and is of the view that against the following elements of review,

- (i) Scientific design and conduct of study,
- (ii) Recruitment of research participant,
- (iii) Care and protection of research participants,
- (iv) Protection of research participant’s confidentiality,
- (v) Informed consent process,
- (vi) Community considerations.

AND APPROVED that the research may proceed for a period of ONE year from July 2nd, 2013

5. ADVICE/CONDITIONS

- i. Progress reports are submitted to the KU-ERC every six months and a full report is submitted at the end of the study.
- ii. Serious and unexpected adverse events related to the conduct of the study are reported to this board immediately they occur.
- iii. Notify the Kenyatta University Ethics Committee of any amendments to the protocol.
- iv. Submit an electronic copy of the revised proposal to KU-ERC.


When replying, kindly quote the application number above.

If you accept the decision reached and advice and conditions given please sign in the space provided below and return to KU-ERC a copy of the letter.



PROF. NICHOLAS K. GIKONYO
CHAIRMAN: KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE


I am Farhia Mohamud Yusuf, I.....
accept the advice given and will fulfill the conditions therein.

Signature..........Dated this day.....2..... of.....JUL..... 2013.

cc. Vice-Chancellor
Director: Institute for Research Science and Technology

Appendix IV: Research Permit

REPUBLIC OF KENYA



NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Telephone: 254-020-2213471, 2241349, 254-020-2673550
 Mobile: 0713 788 787 , 0735 404 245
 Fax: 254-020-2213215
 When replying please quote
 secretary@ncst.go.ke

P.O. Box 30623-00100
 NAIROBI-KENYA
 Website: www.ncst.go.ke

Our Ref: **NCST/RCD/12A/013/135** Date: **30th August 2013**


Farhia Mohamud Yusuf
 Kenyatta University
 P.O Box 43844-00100
 Nairobi.

RE: RESEARCH AUTHORIZATION

Following your application dated **12th August, 2013** for authority to carry out research on "*Assessment of Knowledge, Attitude, Practice and Preventive behaviours towards tuberculosis among adults in eastleigh division, Nairobi County, Kenya.*" I am pleased to inform you that you have been authorized to undertake research in **Nairobi County** for a period ending **31st March, 2014**.

You are advised to report to **the County Commissioner, County Director of Education and Coordinator of Health, Nairobi County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.


SAID HUSSEIN
 FOR: SECRETARY/CEO
 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Copy to:

The County Commissioner
 The County Director of Education
 The Coordinator of Health
 Nairobi County.

Appendix V: Map of Kenya and Nairobi County showing Eastleigh Division

