



UNIVERSITI PUTRA MALAYSIA

***TUBERCULOSIS-RELATED KNOWLEDGE, ATTITUDE AND
PREVENTIVE PRACTICES AMONG ABATTOIR WORKERS
IN GUSAU, NIGERIA***

ISMAILA USMAN GUSAU

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By

ISMAILA USMAN GUSAU

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in
Fulfillment of the Requirements for the Degree of
Master of Science**

January 2016

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirement for the Degree of Master of Science

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Chair : Assoc. Prof. Hejar Binti Abd Rahman, PhD
Faculty : Medicine and Health Sciences

Introduction: Tuberculosis (TB) is still a major health concern worldwide. The global burden of TB is estimated to be 8.5 to 9.2 million with 1.2 to 1.5 million deaths annually. Asia and Africa are affected with 57% and 26% of the disease burden respectively. Nigeria ranked third among the world's six countries with high burden of TB and has the highest estimated number of new cases with nearly 590,000 new cases annually. Nigeria is one of the African countries where bovine TB is wide spread in both cattle and humans. Although, the current status on the actual prevalence rate of bovine TB at the national level is unknown but from the limited surveys conducted by some researchers reported that, the prevalence of TB due to *M. bovis* is up to 14%. The isolation and identification of *M. bovis* in fresh and sour milk sold at local markets, sputum and tissue samples from humans especially herdsmen, abattoir and slaughter houses has been reported. This indicates that the disease occurs both in cattle and humans in Nigeria. Thus, reason to assess the knowledge, attitude and practices of abattoir workers on TB.

Objectives: To determine the level of knowledge, attitude and preventive practices on tuberculosis among abattoir workers in Gusau, Zamfara State, Nigeria.

Methodology: A cross-sectional study was conducted in Gusau Modern Abattoir, Zamfara State, Nigeria. The abattoir was chosen because it is the only one in the state. A total of 416 eligible abattoir workers were selected using proportionate stratified random sampling. Data was collected on knowledge, attitude and preventive practices on TB among the abattoir workers from May to July 2014, through face to face interview and self-administered questionnaire, which was validated by content and face validities. Reliability was measured by checking the internal consistency using Cronbach's alpha and values above 0.7 were accepted. Descriptive analysis, chi-square and multivariate logistic regression were conducted. Significant level (p) was set at 0.05.

Results: The response rate was 91.3%, the overall mean knowledge score of the respondents was 29.76 (SD) 14.15, with 53.2% having high knowledge and 46.8% having low knowledge on TB. However, 52.9%, mean (SD) is 42.76 (6.23) of the respondents have positive attitude and 58.7%, mean (SD) is 9.13 (4.50) practices preventive measures towards TB. Predictors of knowledge, attitude and preventive practices were determined using logistic regression analysis and results from Chi-square tests with $p < 0.25$ were included. Years of working experience (AOR = 1.98; CI = 1.231 – 3.189), TB screening (AOR = 3.04; CI = 1.446 – 6.419) and family member history of TB infection (AOR = 17.35; CI = 2.274 – 132.421) were found to be the predictors of knowledge on TB. Immunization (AOR = 2.45; CI = 1.279 – 4.688) and training (AOR = 4.60; CI = 2.254 – 9.385) were found to be the predictors of attitude towards TB. For preventive practices, history of TB infection (AOR = 5.21; CI = 1.547 – 17.560) and family member history of TB infection (AOR = 3.54; CI = 1.330 – 9.429) were found to be the predictors of preventive practices regarding TB.

Conclusion: This study has identified that there is low level of knowledge, negative attitude and poor preventive practices on TB among abattoir workers in Zamfara State. However, predictors of knowledge on TB were years of working experience, TB screening and family member infected with TB. Predictors of attitude towards TB were immunization and training. Predictors of TB preventive practices were personal and family member infected with TB. The study findings will help in development of interventional programs for efficient control of TB (human and animal).

Keywords: Knowledge, attitude, preventive practices, tuberculosis, abattoir, Zamfara State

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Master Sains

**TUBERKULOSIS BERKAITAN PENGETAHUAN, SIKAP DAN AMALAN
PENCEGAHAN DALAM KALANGAN PEKERJA ABATOIR
DI GUSAU, NIGERIA**

Oleh

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Pengenalan: Tuberkulosis (TB) masih merupakan masalah kesihatan utama di seluruh dunia. Beban global TB dianggarkan pada 8.5 hingga 9.2 juta dengan 1.2 hingga 1.5 juta kematian setiap tahun. Asia dan Afrika telah dijangkiti dengan beban penyakit sebanyak 57% dan 26% masing-masing. Nigeria menduduki tempat ketiga di antara enam negara di dunia dengan beban tinggi TB dan mempunyai bilangan anggaran kes baru tertinggi iaitu hampir 590,000 kes baru setiap tahun. Nigeria merupakan salah satu negara Afrika di mana TB bovin luas tersebar pada lembu dan juga manusia. Walaupun, status semasa kadar kekerapan sebenar TB bovin di peringkat kebangsaan tidak diketahui tetapi dari kajian terhad dijalankan oleh beberapa penyelidik melaporkan bahawa, kekerapan TB disebabkan oleh *M. bovis* adalah sehingga 14%. Pengasingan dan pengenapastian *M. bovis* dalam susu segar dan masam dijual di pasar tempatan, kahak dan sampel tisu daripada manusia terutama sekali pada penggembala, abatoir dan rumah-rumah penyembelihan telah dilaporkan. Ini menunjukkan bahawa penyakit ini berlaku pada lembu dan juga pada manusia di Nigeria. Justeru, alasan untuk menilai pengetahuan, sikap dan amalan pekerja abatoir mengenai TB.

Objektif: Untuk mengenalpasti tahap pengetahuan, sikap dan amalan pencegahan mengenai tuberkulosis dalam kalangan pekerja abatoir di Gusau, Zamfara, Nigeria.

Metodologi: Satu kajian keratan rentas telah dijalankan di Abatoir Moden Gusau, Zamfara, Nigeria. Abatoir ini telah dipilih kerana ia merupakan satu-satunya abatoir di negeri tersebut. Seramai 416 pekerja abatoir yang layak telah dipilih menggunakan persampelan rawak berstrata berkadaran. Data yang dikumpulkan adalah mengenai pengetahuan, sikap dan amalan pencegahan mengenai TB dalam kalangan pekerja abatoir dari Mei hingga Julai 2014, melalui temuduga bersemuka dan soal selidik tadbir sendiri yang telah disahkan melalui kesahan kandungan dan muka. Kebolehpercayaan diukur dengan memeriksa ketekalan dalaman menggunakan nilai alfa Cronbach dan nilai 0.7 keatas boleh diterima. Analisis deskriptif, khi kuasa dua

dan regresi multivariat logistik telah dijalankan. Aras signifikan (p) telah ditetapkan pada 0.05.

Hasil: Kadar sambutan ialah 91.3%, skor min keseluruhan pengetahuan responden adalah 29.76 (SP) 14.15, dengan 53.2% mempunyai pengetahuan yang tinggi dan 46.8% mempunyai pengetahuan yang rendah mengenai TB. Walau bagaimanapun, 52.9% min (SP) adalah 42.76 (6.23) daripada responden mempunyai sikap positif dan 58.7%, min (SP) adalah 9.13, (4.50) mengamalkan langkah-langkah pencegahan terhadap TB. Peramal pengetahuan, sikap dan amalan pencegahan telah ditentukan dengan menggunakan analisis regresi logistik dan hasil daripada ujian khi kuasa dua dengan $p < 0.25$ telah dimasukkan. Tahun pengalaman bekerja (AOR = 1.98; CI = 1.231 – 3.189), saringan TB (AOR = 3.04; CI = 1.446 – 6.419) dan sejarah ahli keluarga yang dijangkiti TB (AOR = 17.35; CI = 2.274 – 132.421) didapati merupakan peramal pengetahuan mengenai TB. Imunisasi (AOR = 2.45; CI = 1.279 – 4.688) dan latihan (AOR = 4.60; CI = 2.254 – 9.385) didapati merupakan peramal sikap terhadap TB. Bagi amalan pencegahan, sejarah jangkitan TB (AOR = 5.21; CI = 1.547 – 17.560) dan sejarah ahli keluarga yang dijangkiti TB (AOR = 3.54; CI = 1.330 – 9.429) didapati merupakan peramal amalan pencegahan mengenai TB.

Kesimpulan: Kajian ini telah mengenalpasti bahawa terdapat tahap pengetahuan yang rendah, sikap negatif dan amalan pencegahan yang rendah terhadap TB dalam kalangan pekerja abatoir di Zamfara. Walau bagaimanapun, peramal pengetahuan terhadap TB adalah tahun pengalaman bekerja, saringan TB dan ahli keluarga dijangkiti TB. Peramal bagi sikap terhadap TB adalah imunisasi dan latihan. Peramal bagi amalan pencegahan TB adalah diri sendiri dan ahli keluarga yang dijangkiti oleh TB. Hasil kajian boleh membantu dalam pembangunan program intervensi bagi pengawalan TB yang berkesan (manusia dan haiwan).

Kata kunci: Pengetahuan, sikap, amalan pencegahan, tuberkulosis, abatoir, Zamfara

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Master of Science. The members of the Supervisory Committee were as follows:

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LIST OF ABBREVIATIONS

<	Less than
>	Greater than
≤	Less than or equal to
≥	Greater than or equal to
ACSM	Advocacy, communication and social mobilization
AIDS	Acquired immunodeficiency syndrome
AOR	Adjusted odds ratio
BCG	Bacillus Calmette–Guérin
BTB	Bovine tuberculosis
CDR	Case detection rate
CI	Confidence interval
COR	Crude odds ratio
df	Degree of freedom
DOTS	Directly observed therapy – short course
HIV	Human immunodeficiency virus
IQR	Inter quartile range
KAP	Knowledge, attitude and practice
LGA	Local government area
LGTBLS	Local government tuberculosis and leprosy supervisor
LTBI	Latent tuberculosis infection
MDR-TB	Multi drug resistant tuberculosis
n	Number
NASCAP	National AIDS and STDs control program
NPI	National program on immunization
NTBLCP	National tuberculosis and leprosy control program
OR	Odds ratio
p	Level of significance
PHC	Primary health care
PPE	Personal protective equipment
PPM	Public - private mix

PTB	Pulmonary tuberculosis
RM	Malaysian ringgit
SD	Standard deviation
STBLCP	State tuberculosis and leprosy control program
TB	Tuberculosis
TSR	Treatment success rate
TST	Tuberculin skin test
WHO	World health organization



CHAPTER 1

INTRODUCTION

1.1 Background

Tuberculosis (TB) has remained as a major public health concern globally, responsible for poor health condition suffered among millions of people every year. This disease is the second main causes of death from an infectious disease worldwide, after the human immunodeficiency virus (HIV). In 2013, about 9 million new TB cases and 1.5 million TB deaths were estimated. About 85% of the disease burden is found in Asia and Africa (WHO, 2014). The TB situation has worsened over the last three decades, which can be attributed to the HIV/AIDS pandemic (Getahun, Gunneberg, Granich, & Nunn, 2010).

Statistically, the African region captured one quarter of the world's cases, and the highest rates of cases and deaths relative to the population (280 incident cases per 100,000 on average, more than double the global average of 126) (WHO, 2014). The disease burden is high in this region due to the connection between the two diseases; TB and the human immunodeficiency virus as well as the acquired immune deficiency syndrome (HIV/AIDS), which Africa accounts for 78% of the global cases (Getahun et al., 2010). The totals in 2014 global TB report are higher than those reported in 2013, mainly because of upward revisions made to estimate the number of TB cases and deaths in Nigeria following the finalisation of results from Nigeria's first-ever national TB prevalence survey (completed in 2012). Given the size of the population and the high TB burden in Nigeria, these revisions made have affected the estimation globally (WHO, 2014).

Tuberculosis (TB) is caused by *Mycobacterium tuberculosis* complex species. TB mainly affects the lungs, but it can also affect other organs located in the central nervous system, lymphatic system, and circulatory system among others. The disease is airborne transmitted, depending on the degree of infectiousness of the source patient and the current situation of the environment at the time when the TB exposure took place. This initial infection (primary TB) will progress rapidly to a full blown TB disease in some individuals (especially young and immune-compromised individuals), but it will also resolves spontaneously in most individuals. This condition whereby the organism lies dormant is called as latent TB infection (LTBI) (National Tuberculosis Controllers Association & Centers for Disease Control and Prevention (CDC), 2005).

In humans, tuberculosis (TB) is a pulmonary and systemic disease primarily caused by a bacterium called *Mycobacterium tuberculosis*. Small fraction of disease is caused by *M. bovis* (LoBue, Enarson & Thoen, 2010; Thoen, LoBue, Enarson, Kaneene & Kantor, 2009). Pulmonary tuberculosis (PTB) is characterized by a series of symptoms namely fever, cough, night sweats and weight loss; and occasionally infected individual may cough up blood while the extra pulmonary tuberculosis (EPTB) is

characterized by pleural effusion, lymphadenopathy, pericardial effusion, miliary disease, and meningitis. TB patients will usually present with constitutional symptoms and local features related to the site of disease (Jamison, 2006).

On the other hand, animal tuberculosis (TB) also known as bovine TB is mostly caused by *Mycobacterium bovis*. The major reservoir of *M. bovis* is infected cattle. Cattle TB also has the ability of spreading to other domestic and wild animals through direct or indirect contact with the infected animal, inhalation of the infected droplets and ingestion of the contaminated milk in calves (Anaelom, Ikechukwu, Sunday, & Nnaemeka, 2010; Taylor, Murphy, Hopkins, Rutland, & Chistov, 2007). Bovine TB is an important zoonotic disease that is transmissible to humans through various routes such as inhalation of aerosols, which will lead to pulmonary TB. While contaminated milk and meat ingested mostly will cause extra pulmonary TB. The lesions of extra pulmonary TB are mostly present in the lymph nodes, bones and joints, genitourinary system, and the meninges. Bovine TB is also transmitted through handling contaminated meat which is a less common route of traumatic inoculation into the skin. There are rare anecdotal records shown of human to human *M. bovis* transmission. The disease caused by *M. bovis* is clinically indistinguishable from that caused by *M. tuberculosis* (Ayele, Neill, Zinsstag, Weiss, & Pavlik, 2004; Grange, 2001).

In industrialized countries such as the UK, through several initiatives such as milk pasteurization, animal TB control and elimination programmes, have managed to reduce the incidence of disease caused by *M. bovis* drastically in both cattle and humans, where control measures and herd testing have been practiced since the 1930s bovine TB accounts for less than 1% of human TB cases, and tends to be a disease that is associated with individuals being in close proximity to livestock, such as farmers, veterinary surgeons and abattoir workers (Taylor et al., 2007). However, in tropic countries, the risk factors for *M. bovis* in both animals and humans are visible. Although there is lack of data regarding the spread of bovine TB amongst the human population in the developing country, the global estimation reveals around 2.1% of population infected with pulmonary TB and 9.4% of extra-pulmonary TB cases are attributed to *M. bovis* (Anaelom et al., 2010).

The role of human behaviour has been increasingly recognized as part of the contributing factors in health and illness. Health is no longer considered simply as a biomedical problem; rather, it is also influenced by other factors such as social, cultural, physiological, economic and political factors that determine the behaviour of the people concerned (Suleiman, Sahal, Sodemann, Elsony, & Aro, 2014). In social and behavioural sciences, several models have been developed to explain and enhance health behaviours and sustained behavioural changes, also in different cultural contexts (Petrie, Jago & Devcich, 2007; Whitehead, 2001). Some of the models widely used that support program planning processes in health promotion and education are health belief model, social learning theory, social cognitive theory, theory of reasoned action, theory of planned behavior and the transtheoretical model (Glanz, Rimer & Viswanath, 2008).

The task of health behavior and health education is both to understand health behavior and to transform the knowledge about the behavior into effective strategies that will improve health, to close the gap between what is known about ideal health practice and what is actually practiced. Application of effective health behavior interventions can reduce substantial suffering, premature mortality and medical costs. Changes in the lifestyle can be facilitated by a combination of efforts to enhance awareness, change behavior and create environment that support good health practices (Glanz et al., 2008).

Knowledge, Attitude and Practice (KAP) surveys in TB can identify factors that may facilitate understanding and action, as well as pose problems or create barriers for TB control efforts. Among the factors are knowledge gaps, cultural beliefs, or behavioural patterns. They can identify factors influencing behaviour that are not known and, reasons for the attitudes. Communication processes and sources also assessed by the KAP survey as the key to define effective activities and messages in TB prevention and control. These surveys may be used to identify problems, need, as well as barriers in program delivery and solutions for improving quality and accessibility of services. From the data collected, this will allow program managers to determine TB program priorities, to calculate resources needed for various activities, to choose the most effective communication channels and messages, to set up baseline levels and to ascertain change that results from the interventions. For advocacy purposes, KAP data provides national TB program managers and their staff with key information that is required in order to make strategic decisions (WHO, 2008).

Knowledge and perception among the community members in regards to the causes of TB is very important and it may reduce or increase the transmission of the disease. In developing countries like Nigeria, among the factors that may delay the diagnosis of TB are practices and beliefs by the community such as high stigma attached to the disease, poor sanitation, crowded dwellings and failure to recognize symptoms early hence increasing the spread of the disease in the community. Due to that, it increases the spread of the disease in the community.

Other factors would be due to close proximity between animals and humans as large proportion of the populations of this settings are depending on agriculture as their livelihoods, the practice of drinking unpasteurised milk and eating uncooked or partially cooked meat, and social as well as economic challenges that limit use of effective control measures such as poverty and low health literacy. The high HIV infection rates and the associated increase in vulnerability to TB and other disease infections is also a critical factor in these settings (Abubakar et al., 2011; Shitaye, Tsegaye & Pavlik, 2007; Woith & Larson, 2008).

1.2 Problem Statement

Tuberculosis has been portrayed as a complex, long standing problem in Nigeria as it is embedded in deep social, economic and cultural determinants such as high stigma of the society that is attached to the disease, low awareness and low health knowledge,

poverty, poor hygiene, and crowded dwellings. The disease is exacerbated due to poor knowledge, negative attitude and social and economic challenges that constrain use of effective control measures (Ayele et al., 2004; Grange, 2001; Mangtani et al., 2014; Shitaye et al., 2007).

The World Health Organisation reported that Nigeria has a population of over 170 million people and ranked 3rd among the world's six countries with high rate of TB burden. This report also revealed that among all African countries, Nigeria has the highest estimated number of new TB cases, with nearly 590,000 new TB cases annually (WHO, 2014). While there is shortage of data with regards to the contribution of animal TB to the total overall human TB prevalence in Nigeria, molecular analysis of mycobacterial strains isolated from both pulmonary and extra pulmonary TB cases have shown that up to 14% of them belong to *M. bovis* and it is associated with individuals in close proximity to livestock (including abattoir workers) (Abubakar et al., 2011; Taylor et al., 2007).

Prevalence of the disease among abattoir workers has not been documented in Nigeria; however prevalence of the disease among livestock traders who are among the high risk group due to their close proximity to livestock was reported to be 10%. Among which 7.1% was caused by *M. tuberculosis* and 2.9% due to *M. bovis* (Adesokan et al., 2012).

Prevention of spread of TB can only be achieved with high level of knowledge on various modes of transmission, treatment and preventive measures, positive attitude towards the disease and preventive practices especially among the high risk group such as the abattoir workers. Although, high awareness about TB was reported among meat handlers in Nigeria (80%), knowledge on transmission of the disease from animals to humans and consumption of meat infected with TB as a source of BTB in humans was low (31% and 34.1% respectively) (Hambolu et al., 2013).

Similarly, 36.7% and 34.7% among meat handlers do not agree that they have an increased risk of contracting the BTB because of their work and the disease is treatable respectively. About 21.5% among them reported eating the visible infected parts of the lung in-order to convince customers to buy meat (Hambolu et al., 2013). It has also been reported in another study conducted among butchers in Nigeria that, only 15.5% practice hand washing, 14.4% wear personal protective equipment (PPE) and 12.6% were immunized against TB (Rosiji & Adesokan, 2012).

Despite this, currently there is no study that assessed the level of knowledge, attitude and preventive practices on tuberculosis among abattoir workers in Guasu, Zamfara State, Nigeria.

1.3 Significance of the Study

The significance of this study is to determine the level of knowledge, attitude and preventive practices on TB among abattoir workers in Gusau, Zamfara State, Nigeria. The study is necessary as no research has been conducted in this area and other studies revealed low level of knowledge, negative attitude and little or no compliance with TB preventive practices among different study populations.

Therefore, the results from this study if proven positive would provide evidence base information which would help to enhance the development of effective interventional programs between veterinary and medical professions for efficient control of TB in the state and Nigeria as a whole.

1.4 Objectives of the Study

1.4.1 General Objective

The aim of this research is to determine the level of knowledge, attitude and preventive practices on tuberculosis among abattoir workers in Gusau, Zamfara State.

1.4.2 Specific Objectives

- i. To determine the socio-demographic characteristics (such as age, gender, marital status, occupation, ethnicity, level of education and monthly income), personal and medical histories (working experience, training on meat handling, TB screening and immunization) of the abattoir workers.
- ii. To determine the level of knowledge on human and animal TB (in terms of clinical signs, mode of transmission, treatment and preventive measures) among abattoir workers.
- iii. To determine the level of attitude towards human and animal tuberculosis with respect to risk of contraction and preventive measures among abattoir workers.
- iv. To determine the preventive practices of abattoir workers about human and animal TB.
- v. To determine the relationship between socio-demographic characteristic, personal and medical histories and knowledge of abattoir workers on TB.
- vi. To determine the relationship between socio-demographic characteristics, personal and medical histories and attitude of abattoir workers towards TB.
- vii. To determine the relationship between socio-demographic characteristics, personal and medical histories and preventive practices of abattoir workers regarding TB.
- viii. To determine the predictors of knowledge, attitude and preventive practices of abattoir workers in Zamfara State, Nigeria towards TB.

1.5 Research Hypotheses

- i. There is a significant association between socio-demographic characteristics, personal and medical histories and knowledge on TB among abattoir workers in Zamfara State, Nigeria.
- ii. There is a significant association between socio-demographic characteristics, personal and medical histories and attitude towards TB among abattoir workers in Zamfara State, Nigeria.
- iii. There is a significant association between socio-demographic characteristics, personal and medical histories and preventive practices regarding TB among abattoir workers in Zamfara State, Nigeria.



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