UNIVERSITI PUTRA MALAYSIA

PREDICTORS OF TUBERCULOSIS AMONG PATIENTS ATTENDING GOVERNMENT HOSPITALS IN YOBE STATE, NIGERIA

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By

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

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Science

PREDICTORS OF TUBERCULOSIS AMONG PATIENTS ATTENDING GOVERNMENT HOSPITALS IN YOBE STATE, NIGERIA

By

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July 2015

Chair: Associate Professor Hejar Binti Abdul Rahman MD, Master Community Health
Faculty: Medicine and Health Sciences

Background: Numerous factors attribute to the development of tuberculosis infection however there are few studies that address the predictors of tuberculosis in Nigeria. Currently there is no research incorporating knowledge and attitude as predictors for acquiring TB among tuberculosis patients in Yobe.

Objectives: To determine the predictors of tuberculosis among cases and controls attending government hospitals.

Method: This is a case – control study. A case was defined as individual age 18-75 years with at least two positive sputum smears for mycobacterium tuberculosis. Systematic sampling was used to select cases. Control was defined as individual age 18-75 years attending the selected hospitals without clinical evidence of active TB. Controls were selected using simple random sampling. Self-administered questionnaire was administered to obtain information about socio-demographic characteristics, medical history, lifestyle behaviors, knowledge and attitude of the respondents about TB. SPSS version 21 was used to analyze data. Chi Square test was conducted to determine association between the cases and controls and logistic regression model (enter method) was employed to examine the predictors of TB.

Results: There were 346 patients with 173 cases and 173 controls in this study. Bivariate analysis showed that there were significant association between tuberculosis cases and controls regarding sociodemograhic variables, HIV status, previous tuberculosis experience, history of contact with tuberculosis patient, smoking, knowledge and attitude towards tuberculosis. Predictors of tuberculosis included being male (AOR 3.761, 95%CI:1.794 – 7.882), income per month ₦ 1,000 – 9,000 (US$ 5 – 45) (AOR 5.791, 95%CI: 2.409 – 13.922), unemployment (AOR 4.918, 95%CI: 2.233 – 10.831), rural area (AOR 3.146, 95%CI: 1.564 – 6.328), HIV/AIDS (AOR 36.483, 95%CI: 5.360 – 248.338), previous TB experience (AOR 18.398, 95%CI: 3.101 – 109.159), history of contact (AOR 6.769, 95%CI: 3.191 – 14.359), smoking (AOR 21.717, 95%CI: 2.958 – 159.445), low knowledge (AOR 4.769, 95%CI: 2.312 – 9.838) and negative attitude (AOR 2.960, 95%CI: 1.448 – 6.049).

Conclusion: Being male, earning between ₦ 1,000 – 9,000 (US$ 5- 45) per month, having low education, living in rural area, HIV/AIDS, previous TB experiences and

history of contact with TB patients were important predictors among TB patients. Others include smoking, low knowledge and negative attitude levels were considered significant predictors in the study. The existing study justifies that proper health education to be incorporated as part of modern tuberculosis control programme in the state.

Key words: Tuberculosis; predictors; government hospitals, Yobe, Nigeria

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PERAMAL-PERAMAL TUBERKULOSIS DIKALANGAN PESAKIT YANG MENGUNJUNGI HOSPITAL KERAJAAN YOBE, NIGERIA

Oleh

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Julai 2015

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Latar belakang: Pelbagai faktor menyebabkan pembangunan jangkitan tuberkulosis namun terdapat beberapa kajian yang menumpukan kepada peramal tuberkulosis di Nigeria. Pada masa ini tiada kajian yang menggabungkan pengetahuan dan sikap sebagai peramal untuk dijangkiti TB dalam kalangan pesakit tuberkulosis di Yobe.

Objektif: Untuk menentukan peramal tuberkulosis antara kes dan kawalan yang menghadiri hospital-hospital kerajaan.

Kaedah: Kajian ini merupakan kajian kes – kawalan. Satu kes ditakrifkan sebagai individu berumur 18-75 tahun dengan sekurang-kurangnya dua lumuran kahak positif dengan tuberculosis mikobakterium. Persampelan sistematik telah digunakan untuk memilih kes. Kawalan ditakrifkan sebagai individu berumur 18-75 tahun menghadiri hospital terpilih tanpa bukti klinikal TB aktif. Kawalan dipilih menggunakan persampelan rawak mudah. Soal selidik ditadbir sendiri telah dijalankan untuk mendapatkan maklumat mengenai ciri-ciri sosio-demografi, sejarah perubatan, tingkah laku gaya hidup, pengetahuan dan sikap responden mengenai TB. SPSS versi 21 telah digunakan untuk menganalisis data. Ujian khi-kuasa dua telah dijalankan untuk menentukan hubungan antara kes dan kawalan dan model regresi logistik (kaedah *enter*) telah digunakan untuk mengkaji peramal TB.

Hasil: Terdapat 346 pesakit dengan 173 kes dan 173 kawalan dalam kajian ini. Analisis bivariat menunjukkan bahawa terdapat hubungan signifikan antara kes tuberkulosis dan kawalan berhubung pembolehhubah sosiodemografi, status HIV, pengalaman tuberkulosis lepas, sejarah hubungan dengan pesakit tuberkulosis, merokok, pengetahuan dan sikap terhadap tuberkulosis. Peramal tuberkulosis termasuk berjantina lelaki (AOR 3.761, 95%CI:1.794 – 7.882), pendapatan sebulan ₦ 1000 - 9000 (US$ 5 – 45) (AOR 5.791, 95%CI: 2.409 – 13.922), pengangguran (AOR 4.918, 95%CI: 2.233 – 10.831), kawasan luar bandar (AOR 3.146, 95%CI: 1.564 – 6.328), HIV/AIDS (AOR 36.483, 95%CI: 5.360 – 248.338), pengalaman TB terdahulu (AOR 18.398, 95%CI: 3.101 – 109.159), sejarah hubungan (AOR 6.769, 95%CI: 3.191 – 14.359), merokok (AOR 21.717, 95%CI: 2.958 – 159.445), pengetahuan rendah (AOR 4.769, 95%CI: 2.312 – 9.838) dan sikap negatif (AOR 2.960, 95%CI: 1.448 – 6.049).

Kesimpulan: Sebagai seorang lelaki, berpendapatan antara ₦ 1,000 – 9,000 (US$ 5- 45) sebulan, mempunyai pendidikan rendah, tinggal di kawasan luar bandar, HIV/AIDS, pengalaman TB terdahulu dan sejarah hubungan dengan pesakit TB adalah peramal penting dalam kalangan pesakit TB. Lain-lain termasuk merokok, pengetahuan rendah dan tahap sikap negatif dianggap peramal signifikan dalam kajian ini. Kajian sedia ada mewajarkan bahawa pendidikan kesihatan yang sempurna yang akan dimasukkan sebagai sebahagian daripada program kawalan tuberkulosis moden di negeri ini.

Kata kunci: Tuberkulosis, peramal-peramal, hospital kerajaan, Yobe, Nigeria.

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I certify that a Thesis Examination Committee has met on 9 July 2015 to conduct the final examination of Mustapha Yannabe Mustapha on his thesis entitled "Predictors of Tuberculosis among Patients Attending Government Hospitals in Yobe State, Nigeria" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Master of Science.

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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

AFB	Acid Fast Bacilli
AIDS	Acquired Immune Deficiency Syndrome
BCG	Bacille Calmette Guerin
CCDR	Canada Communicable Disease Report
CDC	Centers of Disease Control and Prevention
CI	Confidence Interval
DM	Diabetes Mellitus
DNA	Di-nucleic Acid
DOTS	Directly Observed Treatment Short course
EFS	Epidemiology Fact Sheet
FMHN	Federal Ministry of Health Nigeria
HIV	Human Immunodeficiency Virus
IFRC	International Federation of Red Cross
INH	Isoniazid
IUATLD	International Union Against Tuberculosis and Lung Disease
MDG	Millennium Development Goals
MDR-TB	Multi drug-resistant Tuberculosis
NHFS	Nigeria HIV Fact Sheet
NTBLCP	National Tuberculosis and Leprosy Control Programme
NTFS	Nigeria Tuberculosis Fact Sheet
PCR	Polymerase Chain Reaction
PLWH	People Living With HIV
RMP	Rifampicin
TB	Tuberculosis
TST	Tuberculin Skin Test
USEN	United States Embassy in Nigeria
UVGI	Ultraviolet germicidal irradiation
WHO	World Health Organization

CHAPTER 1

INTRODUCTION

1.1 Background

One of the major causes of public health crisis affecting the whole world especially in developing countries is tuberculosis (TB) (Taura, Sale, & Muhammad, 2008). Even though it is an ancient disease, TB is still responsible for most cases of illness and death worldwide, predominantly in Asia and Africa. In 1993 World Health Organization (WHO) declared TB as global health emergency, stated that "TB is humanity's greatest killer and it is out of control in many parts of the world (WHO, 2010b).

It has been estimated that over 2 billion people have been infected with tubercle bacilli, with about 9 million cases of active TB reported annually (WHO, 2014; Dye, 2006; Dye, Floyd, & Uplekar, 2008; Matteelli et al., 2007). In 2006 there were more than 4 million individuals harboring active TB in the sub Saharan Africa (Kaufmann, & Parida, 2008). The region has the greatest TB incidence and prevalence rates worldwide, with 13 of the 15 countries with the highest TB cases and 9 of the 22 high burden countries are situated in Sub- Saharan Africa. WHO statistics showed that there were more than 1.7 million deaths due to TB globally, in which 25% accounted by adults (WHO, 2010b). Consequently, in Africa the estimated death rate was nearly 650,000 populations each year (Kaufmann, & Parida, 2008).

Mycobacterium infection is quite known for displeasing socio-economic development because it fundamentally affects largely young adults in their productive age group, although all age group can be affected (WHO, 2014, WHO, 2010b; Baussano et al., 2010; Kumar, Abbas, Fausto, & Mitchell, 2007).

Mycobacterium tuberculosis is an airborne pathogen mainly affects lungs (80%) and eventually spread to other organ system such as the long bones, joints, lymphatic system, central nervous system and the gastrointestinal tract. The bacteria can be transmitted from one person to another principally through respiratory route in the form of concentrated infectious droplet nuclei when infected individual coughs, sneezes, spits, laughs or talks (Hakimi, Hashemi, Mirzaie, Pour, & Kosari, 2008; Kumar et al., 2007). Several factors are involved in threatening TB control in Nigeria, however TB incidence is highest among people living with HIV/AIDS, those previously infected with TB and individual with close contact with infectious TB are the obstacle for TB control programme (Ekwueme, Omotowo, & Agwuna, 2014; United States Embassy in Nigeria (NHFS/USEN), 2011). The possibility of progression of the infection after exposure can be basically measured by exogenous factors like proximity to contact with TB patients, behavioral factors including cigarette smoking, alcoholism and indoor air pollution (Rehm et al., 2009a; Rehm et al., 2009b; Lönnroth, Jaramillo, Williams, Dye, & Raviglione, 2009; Lönnroth, Williams, Stadlin, Jaramillo, & Dye, 2008). In residence with high population (overcrowded) greater transmission will occur.

1.2 Problem statement

As in other developing nations, TB was the third among 1LJHULD¶V KHDOWK V\VWHP challenging illness after HIV and malaria (Ezechi, Odberg Petterson, & Byamugisha, 2012; Wagstaff, Claeson, Hecht, Gottret, & Fang, 2006). In 2006 the country declared TB as an emergency during which the government initiated the International World Health Organization (WHO) Directly Observed Therapy Short Course (DOTS) Policy. In 2010, Nigeria ranked 10th among the 22 high TB burden countries in the globe and second largest TB infected country in Africa, with TB incidence rate of 133/100,000 people and prevalence rate of 199/100,000 (NTFS/USEN, 2011). However, according to the recent world TB day held in Abuja (Federal Capital), Nigeria ranked 3rd out of 22 countries with high TB burden in the globe and highest in Africa, with over 600,000 new cases of tuberculosis in 2014 (NTBLCP, 2015). $OWKRXJK 1LJHULD¶V 7% GHDWK rates has been declined from 11% in 2006 to 5% in 2010 (NTFS/USEN, 2011). Yobe is one of the 36 states of Nigeria with nearly 1500 TB case notification rates annually (NTFS/USEN, 2011), nevertheless, currently there is no study conducted about factors that increase vulnerability to TB infection in Yobe. Moreover, TB situation has been elevated by several factors which include rise in HIV/AIDS, emergence of resistant strains MDR-TB (NTFS/USEN, 2011), lifestyle behaviors which include smoking and alcohol intake (Ibrahim et al., 2014; Bigwan, Ohaeri, David, Wakjissa, & Sheyin, 2014), lack of good knowledge and negative attitude towards TB (Ibrahim et al., 2014; Tobin, Okojie, & Isah, 2013). Other socio-economic and environmental factors and insecurity particularly in the North-eastern part that continue to be bottle neck for successful TB control in the country (Ogboi, Idris, Olayinka, & Junaid, 2010).

1.3 Significance of the study

Even though, there is increasing number of mycobacterium infection in Nigeria, little is known about who acquires the infection and who progresses to the disease (NTFS, 2011). In 2015, over 600,000 new smear positive was reported in the country (NTBLCP, 2015). In order to achieve Millennium Development Goal (MDG), international strategy to reduce incidence of TB by half by 2015, it is worthwhile to investigate and analyze predictors and other factors associated with TB among the stated population as amendable factors in the TB control program. Lack good knowledge and negative attitude towards TB are two important factors hasten TB transmission which previously not been incorporated. The existing study will assist to determine the relationship between socio-economic, medical history and behavioural determinants and their impact on the development of TB. This can help us better understand the factors in individual patient that lead to the disease and how these factors could be improved. It also provides information regarding these factors (predictors) to improve areas of health care service concerning TB prevention and case management in the community. In addition, the study can benefit the policy makers, hospital management board, Federal Ministry of Health and future study for researchers. Therefore this study would be the first attempt to determine the predictors of TB among patients attending government hospital in Yobe.

1.4 Objectives

1.4.1 General objective

1.4.1.1 To determine the predictors of TB among patients attending government hospitals in Yobe state, Nigeria.

1.4.2 Specific objectives

1.4.2.1 To determine the socio-demographic characteristics (gender, age education level, employment status, monthly income, place of residence, number of household and number of people per room) among patients attending government hospitals in Yobe state.

1.4.2.2 To determine the medical history (HIV status, previous TB experience, diabetes status, cancer status and history of contact with TB patient) among patients attending government hospitals in Yobe state.

1.4.2.3 To determine lifestyle behaviours (smoking status and alcohol intake) among patients attending government hospitals in Yobe state.

1.4.2.4 To determine the level of knowledge (on TB cause, transmission, sign/symptom, treatment and prevention) and level of attitudes toward (TB cause, transmission, treatment and stigmatization) among patients attending government hospitals in Yobe state.

1.4.2.5 To determine the association between the socio-demographic characteristics, medical history, lifestyle behaviors, levels of knowledge and attitude, and TB among patients attending government hospitals in Yobe.

1.4.2.6 To determine the predictors of TB among patients attending government hospitals in Yobe state.

1.5 Research hypothesis

1.5.1 $\mathbf{H_A}$: There is significant association between socio-demographic characteristics, medical history, lifestyle behaviours, levels knowledge and attitude and TB infection.

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