UNIVERSITI PUTRA MALAYSIA

KNOWLEDGE AND PRACTICE ON TUBERCULOSIS INFECTION CONTROL AMONG HEALTHCARE WORKERS IN LEMBAH PANTAI DISTRICT, KUALA LUMPUR

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By

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Dissertation Submitted to the Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, in Fulfilment of the Requirement for the Degree of Master of Public Health

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Abstract of dissertation presented to the Department of Community Health, Universiti Putra Malaysia in fulfillment of the requirement for the Degree of Master of Public Health

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Introduction: Tuberculosis (TB) is the leading cause of mortality among infectious diseases in the world. Healthcare workers (HCWs) are among the high risk groups of getting TB and the prevalence is double that of the general population. This is due to workplace exposure to TB patients, without adequate TB infection control practices. In Malaysia, the number of TB cases among HCWs has increased from year to year, however TB infection control (TBIC) knowledge and practice remain poor.

Objectives: To assess the level of knowledge and practice on TB infection control among HCWs and to determine the associated factors and predictors of good knowledge and practice.

Methodology: A cross sectional study involving a simple random sampling from healthcare workers in Lembah Pantai district has been conducted. Self-administered questionnaire has been given to respondent after consent taken.

Results: Of 415, 320 (77%) respondents participated in this study. The percentages of respondents having good knowledge and practice on TB infection control are 70.6% and 51.6% respectively. STPM/diploma educational level (AOR=2.325, 95%CI=1.145-4.722), family history of TB infection (AOR=3.882, 95%CI=1.021-14.765), doctor/specialist (AOR=5.022, 95%CI=1.224-20.600) and health clinic (AOR=4.504, 95%CI=2.050-9.892) are the significant predictors of good knowledge while STPM/diploma educational level (AOR=2.055, 95%CI=1.065-3.964), married/widow status (AOR=2.616, 95%CI=1.487-4.603) and maternal and child health clinic (AOR=3.479,

95%CI=1.700-7.118) are the predictors of good practice on TB infection control.

Conclusion: One third and half of the respondents have poor knowledge and practice on TB infection control respectively. Training that emphasizes on hands-on skills need to be strengthen to ensure good knowledge and practice on TB infection control among HCWs.

Keywords: *Tuberculosis, knowledge, practice, tuberculosis infection control, healthcare worker.*

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PENGETAHUAN DAN AMALAN KAWALAN JANGKITAN PENYAKIT TUBERCULOSIS DI KALANGAN PEKERJA PENJAGAAN KESIHATAN DI DAERAH LEMBAH PANTAI, KUALA LUMPUR

Oleh

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Pengerusi: Huda Binti Zainuddin, Sarjana Kesihatan Masyarakat (USM)
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Latar belakang: Tuberculosis adalah merupakan penyebab utama kematian di kalangan penyakit berjangkit di dunia. Pekerja penjagaan kesihatan merupakan di kalangan golongan berisiko tinggi untuk dijangkiti TB dan prevalennya adalah dua kali ganda berbanding populasi umum. Ini disebabkan oleh pendedahan kepada pesakit TB di tempat kerja tanpa amalan kawalan jangkitan TB yang baik. Di Malaysia, bilangan kes TB di kalangan pekerja penjagaan kesihatan meningkat dari tahun ke tahun, namun pengetahuan dan amalan kawalan jangkitan TB masih kurang.

Objektif: Untuk menilai tahap pengetahuan dan amalan kawalan jangkitan TB di kalangan pekerja penjagaan kesihatan dan untuk mengenalpasti faktor-faktor yang berkait dan peramal kepada pengetahuan dan amalan yang baik.

Metodologi: Sebuah kajian rentas melibatkan pensampelan rawak daripada pekerja penjagaan kesihatan di daerah Lembah Pantai telah dijalankan. Borang kaji selidik telah diberikan kepada responden setelah persetujuan diambil.

Keputusan: Daripada 415, 320 (77%) orang responden telah meyertai kaji selidik ini. Peratus responden yang mempunyai pengetahuan dan amalan kawalan jangkitan TB yang baik masing-masing ialah 70.6% dan 51.6%. Tahap pendidikan STPM/diploma (AOR=2.325, 95%CI=1.145-4.722), sejarah jangkitan TB dalam keluarga (AOR=3.882, 95% CI=1.021-14.765), doctor/pakar (AOR=5.022, 95%CI=1.224-20.600) dan klinik kesihatan (AOR=4.504, 95%CI=2.050-9.892) merupakan peramal kepada pengetahuan

yang baik manakala tahap pendidikan STPM/diploma (AOR=2.055, 95%CI=1.065-3.964), status berkahwin/duda/janda (AOR=2.616, 95%CI=1.487-4.603) dan klinik kesihatan ibu dan anak (AOR=3.479, 95%CI=1.700-7.118) merupakan peramal kepada amalan kawalan jangkitan TB yang baik.

Kesimpulan: Satu pertiga dan separuh daripada responden masing-masing mempunyai pengetahuan dan amalan kawalan jangkitan TB yang buruk. Latihan yang menekankan kemahiran praktikal perlulah diperkukuhkan untuk memastikan pengetahuan dan amalan kawalan jangkitan TB yang baik di kalangan pekerja penjagaan kesihatan.

Kata kunci: *Tuberculosis, pengetahuan, amalan, kawalan jangkitan tuberculosis, pekerja penjagaan kesihatan.*

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I certify that a Dissertation Examination Committee has met on 3rd of August 2017 to conduct the final examination of Waramlah binti Ramlan on her dissertation entitled "Knowledge and Practices on Tuberculosis Infection Control among Healthcare Workers in Lembah Pantai District, Kuala Lumpur" 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 Degree of Master of Public Health.

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LIST OF ABBREVIATIONS

1MC	One Malaysia Clinic
AIDS	Acquired Immune Deficiency Syndrome
AOR	Adjusted Odds Ratio
CDC	Centre of Disease Control
CI	Confidence Interval
CNS	Central Nervous System
COR	Crude Odds Ratio
DHO	District health office
DOT	Directly Observed Treatment
HC	Health clinic
HCWs	Healthcare workers
HIC	High income country
HIV	Human Immunodeficiency Virus
IGRA	Interferon Gamma Released Assay
IPT	Isoniazide Prophylaxis Therapy
IQR	Inter quartile range
LMIC	Low and middle income country
LTBI	Latent Tuberculosis Infection
MA	Medical assistant
MCHC	Maternal and child health clinic
MDR-TB	Multidrug Resistant Tuberculosis
MO	Medical Officer
MOH	Ministry of Health
NTM	Non Tuberculosis Mycobacterium
OPD	Outpatient Department
OSHA	Occupational Safety and Health Association
PKA	General Health Assistant
PLHIV	People living with HIV
PPK	Health attendant
PPKP	Health Inspector
SARS	Severe acute Respiratory Syndrome

SD	Standard deviation
SPM	Sijil Pelajaran Malaysia
SRP	Sijil Rendah Pelajaran
STPM	Sijil Tinggi Pelajaran Malaysia
TB	Tuberculosis
TBIC	Tuberculosis infection control
TST	Tuberculin skin test
UVGI	Ultraviolet Germicidal Irradiation
WHO	World Health Organization
XDR-TB	Extensive Drug Resistant Tuberculosis

CHAPTER 1

INTRODUCTION

1.1 Background

A health care facility is not merely a place for receiving and giving health care services, it is also a workplace for the healthcare worker (HCWs) which has its own occupational health risk. Being at a workplace, HCWs are also exposed to various type of occupational health hazards everyday including biological hazards such as Tuberculosis (TB), Hepatitis, HIV/AIDS, and SARS. Other than that, the chemical hazards such as, glutaraldehyde, ethylene oxide and the physical hazards such as, radiation, noise, falls at workplace are also can cause risk to HCWs. Ergonomic hazards such as heavy lifting, psychosocial hazards such as shift work, workplace violence and occupational stress, fire and explosion hazards such as using oxygen, alcohol and electrical hazards such as frayed electrical cords are endangering HCWs too (World Health Organisation (WHO), 2010 & Occupational Safety and Health Administration (OSHA) and United States Department of Labor, 2016).

HCWs need protection from these occupational health hazards just as much as workers in other sectors do. Yet, because their job is to provide care for the sick and injured, HCWs are often labelled as “immune” to injuries or illnesses. The patients always come first. HCWs are often expected to sacrifice their own physical and mental wellness for the sake of their patients (WHO, 2010).

TB is among the occupational health diseases HCWs are at increased risk of. It is caused by Mycobacterium tuberculosis and spread from person to person by air through the droplets coughed or sneezed out from an infected person (Centre For Disease Control And Prevention, 2011). Globally, there is transmission of TB to both patients and HCWs has been reported which occur in the healthcare facilities, irrespective of local TB incidence (Baussano et al, 2011). The key factors that favouring the nosocomial TB transmission among the patients and HCWs are such as: delayed diagnosis, ineffective treatment of patients, and poor practice on TB infection control measures (World Health Organization, 2009b & Kuyinu et al, 2016).

Globally, TB has been the top infectious disease killer in the world. According to World Health Organization (2015), 9.6 million people were infected by TB in year 2014 and about 1.5 million of them who was infected died from the disease. More than 95% of the deaths occur in low and middle-income countries.

Western Pacific Region has the second highest TB incidence after the South East Asia with 85 people per 100,000 population being infected in 2014 which equal to 1.6 million people all over the region (WHO, 2015).

Malaysia, being a middle-income country with millions of immigrant workers has seen a rise in incidence of TB lately. Even though, Malaysia can be categorised as an intermediate TB burden country, 103 people per 100,000 population was on TB treatment in 2014 which comprised of 31,000 people infected with TB all over the country (WHO, 2015).

As for TB among HCWs globally, a systematic review done in 2006 showed that the prevalence of latent TB infection (LTBI) among HCWs was, on average, 54% (range from 33% to 79%). The attributable risk for TB disease in HCWs, compared to the risk in the general population, ranged from 25 to 5,361 per 100,000 per year (Joshi, Reingold, Menzies, & Pai, 2006).

Meanwhile a study done in Kuala Lumpur Hospital, Malaysia among HCWs of various unit showed that there is an overall prevalence of latent tuberculosis infection among HCWs of 46.4% (Jaafar & Krishnan, 2016). In fact, TB information system has recorded that there is significant rises in estimated incidence of active TB on treatment among HCWs since 2007 to 2010 which comprised of 80.59, 65.71, 71.42 and 97.86 per 100,000 workers per year respectively (Occupational Health Unit Disease Control Division Ministry of Health Malaysia, 2012). Even though the incidence is low as compared to 103 per 100,000 in general population in 2014, however the increase of HCWs infected with TB over years is worrisome.

This has led to a greater concern about the risk of nosocomial TB infection in health care facilities. The Occupational Health Unit, Disease Control Division in Ministry of Health Malaysia has come out with Guideline on Prevention and Management of Tuberculosis for HCWs in Ministry of Health Malaysia (2012) to provide guidance on TB infection control to the HCWs in Malaysia.

1.2 Problem statement

Multiple studies have reported the risk of TB transmission from patients to HCW and from patients to patients in healthcare settings. Among the risk factors that have been identified to contribute in transmission of TB among healthcare personnel, most are related to prolonged, unprotected exposure to patients with untreated TB with the odds ratio (OR) of 2.83 (95% CI: 1.47-5.45)(Mathew et al, 2013). While in a systematic review study, poor practice of TB infection control measures in health care facilities contribute to high TB among HCWs among those countries (Menzies, Joshi, & Pai, 2007). A combination of infection control measures such as administrative, engineering or environmental controls and personal protection equipments have been recommended to reduce nosocomial TB transmission (WHO, 2009b).

A systematic review regarding the risk of TB infection among HCWs revealed that the median prevalence of latent TB infection was 63% (Menzies et al, 2007). In Malaysia, 9.9 per 100 workers per year (95% CI: 7.9–12.3) has been diagnosed LTBI (Rafiza & Rampal, 2012). While a study in Sabah, Malaysia showed that HCWs are two times higher than in the general population to get TB (280.4/100,000 compared to 153.9/100,000) (Z = 4:893; p = 0:01) (Jelip et al, 2004). Appropriate TB infection control practices by HCWs are important to prevent TB infection among HCWs.

The impact from this problem, the transmission of TB to patients and other HCWs will increase if the HCWs were the source of infection (Baussano et al, 2011). TB among HCWs will also increase the financial burden of the country and household level (Kamolratanakul et al, 1999). Furthermore, the medical condition will not allow the infected HCW to work for few weeks which increased the work loss day and productivity loss (Mitchell & Bates, 2011). Not to forget the psychological effect such as stigmatization among the HCWs who being infected with TB will also contribute to the poor working performance later on (Courtwright & Turner, 2010).

In 2015, a study on knowledge and practices of TB infection control has been done in Addis Ababa, Ethiopia showed that there is unsatisfactory TB infection control practice among HCWs which is proportionate to 51.7% while 36.1% had poor knowledge on TB infection control (Demissie Gizaw, Aderaw Alemu, & Kibret, 2015). The similar study has been conducted a year before in Northwest Ethiopia also documented the proportion of good practices on TB infection control is only 63.3% (Temesgen & Demissie, 2014).

In Malaysia there is a study has been done in two tertiary hospitals, which are Hospital Universiti Sains Malaysia and Kuala Lumpur Hospital to assess the knowledge, attitude and practice on TB prevention among HCWs. The result of good knowledge, attitude and practice reported are 60%, 51.9% and 60% respectively from total respondents. However this study are focusing on the infection control that related to CNS tuberculosis control measures in the neurological and medical wards (Farhanah, Sarimah, & Jafri Malin, 2015).

There is no similar study done yet in Malaysia to assess the TB infection control in the primary healthcare facilities. However, as the front liners, HCWs in primary healthcare facilities exposed to yet undiagnosed TB patients and if infection controls practices are poor among them, this will lead to TB transmission among HCWs themselves. In Africa, study on TB infection control measures among primary healthcare facilities showed that the incidence of TB among HCWs in primary healthcare facilities are double than the general populations (Claassens et al, 2013). This cannot be denied as primary health care HCWs are exposed to more TB patients since the management of TB had been shifted from inpatient-based to outpatient-based. Ministry of Health has also improvised the administration and environmental control that must be taken by primary healthcare facilities such as triaging and screening,

separating the waiting area and providing different pathway to TB patient in order to reduce exposure, thus decreasing TB infection among HCWs (Occupational Health Unit Disease Control Division Ministry of Health Malaysia, 2012).

1.3 Justification of Study

This research will determine the knowledge and practice on TB infection control measures among HCWs in primary healthcare facilities. This study will benefit in decision and policy making especially on infection control aspects in order to protect HCWs from nosocomial TB infection. This will aids the Ministry of Health to plan specific program on TB infection control at workplace more efficiently. It will also facilitate the administrative part in planning modules of training focusing on the group of healthcare personnel who has more risk on getting TB at workplace.

Besides that, this study also will add to new knowledge academically and provide information for others to further conduct a research that can improve our strategies in combating TB especially pertaining to infection control measures.

1.4 Research questions

1. What are the levels of knowledge and practice on TB infection control among HCWs?

2. What are the associated factors of knowledge and practice on TB infection control among HCWs?

3. What are the predictors of knowledge and practice on TB Infection control among HCWs?

1.5 Objectives of the study

1.5.1 General objectives

To assess the knowledge and practice with regards to TB infection control among HCWs in government primary healthcare facilities in Lembah Pantai District, Kuala Lumpur, Malaysia in year 2017.

1.5.2 Specific objectives:

1. To determine sociodemographic characteristics (age, gender, ethnicity, educational status, marital status, history of TB infection, family history of

TB infection) and work-related characteristics (job position, duration of employment, workplace, experience working in TB clinic/ward/centre and training on TB infection control) of HCWs in primary healthcare facilities in Lembah Pantai District.

2. To assess the level of knowledge and practice on TB infection control among HCWs.

3. To determine the association between sociodemographic factors and work-related factors with knowledge on TB infection control among HCWs.

4. To determine the association between sociodemographic factors and work-related factors with practice on TB infection control among HCWs.

5. To determine the association between the level of knowledge and the level of practice on TB infection control among HCWs.

6. To determine the predictors of good knowledge and practice on TB infection control among HCWs.

1.6 Hypotheses

1. There are significant associations between sociodemographic factors and work-related factors with knowledge on TB infection control among HCWs.

2. There are significant associations between sociodemographic factors and work-related factors with practice on TB infection control among HCWs.

3. There is a significant association between knowledge on TB infection control with practice.

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