

Pharmacist's Knowledge of Pulmonary Tuberculosis in a Cross Sectional Survey at Primary Health Care Centers in Surabaya, Indonesia

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Abstract

Objective: In Indonesia, tuberculosis (TB) cases rank third in the world. In 2017, East Java Province is ranked second with 48,323 total TB cases. Surabaya ranked first in East Java with 5,428 TB cases in 2016. Pharmacist could play an important role in antituberculosis drug therapy of TB patient. Pharmacist always begins to provide pharmaceutical care by making an assessment of the patient's drug-related needs at the time. The pharmacist's knowledge is fundamental to the implementation of pharmaceutical care. This study explored the TB-related knowledge of pharmacist at primary health care centers in Surabaya, Indonesia.

Method: This cross-sectional study applied a questionnaire that was administered to a total of 63 pharmacists at primary health care centers in Surabaya, Indonesia. Data collection was carried out for 3 months from July to September 2018. The research instrument was in the form of questionnaire for pharmacists, consisting of questions on the characteristics of the diseases, drug characteristics, and patient characteristics knowledge.

The data analysis using Statistical Product and Service Solutions (SPSS) version 18 for Windows. **Results:** The number of primary health care center pharmacists who did not perform pharmaceutical care was still high, ie. 37 (58.7%) from a total of 63 pharmacists. The knowledge of pharmacists regarding the characteristics of TB had the lowest value of 4.67 (46.67%) of the maximum value on the knowledge of antituberculosis drug characteristics and knowledge of patient characteristics. The topic of the question about the characteristics of TB includes the symptoms of tuberculosis, the classification of tuberculosis, the natural course of pulmonary tuberculosis, the nature of the acid-resistant bacilli, and the therapeutic response. **Conclusion:** The pharmacist's knowledge regarding the characteristics of tuberculosis needs to be improved to support the pharmacist's ability in pharmaceutical care for tuberculosis patients.

Keywords: *Pharmaceutical care, Pharmacist's knowledge, Tuberculosis patient, Primary health care center*

Introduction

The World Health Organization (WHO) reports that tuberculosis (TB) is a single infectious disease that is more severe than HIV (Human Immunodeficiency

Virus) infection and is still one of the top ten causes of death in the world in 2017.⁽¹⁾ TB is still the highest priority in the world and is one of the goals in the Sustainability Development Goals (SDGs). The vision that is built on this disease is that the world is free from TB, zero death, and there is no disease and suffering to someone caused by TB. TB is growing rapidly in people living in poverty, marginalized groups, and vulnerable populations.⁽²⁾

Globally, in 2017 there were 10 million people suffering from TB with 5.8 million of the patients were male, 3.2 million female, and 1 million children. There are many cases of TB in all countries with 90% of TB

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cases suffered by adults over the age of 15 years and 9% of TB cases suffered by people with HIV. In Indonesia, TB cases rank third in the world. The biggest TB cases in the world are in India 27%, China 9%, Indonesia 8%, Philippines 6%, Pakistan 5%, Nigeria 4%, Bangladesh 4%, and South Africa 3%. These eight countries, and 22 other countries, are included in 30 countries with a high burden of TB, comprising 87% of TB cases in the world. A total of 6% of TB cases in the world also occur in Europe 3% and America 3%.⁽¹⁾

Of the total TB cases in 2017 in all provinces in Indonesia, it turns out that East Java Province is ranked second with 48,323 total TB cases after West Java Province with 78,698 TB cases.⁽²⁾ Surabaya ranked first in East Java with 5,428 TB cases in 2016.^{(3),(4)} Therefore, this study was conducted in the city of Surabaya.

The government's role in controlling TB disease is indicated by the provision of Fixed Dose Combination (FDC) antituberculosis drugs at each primary health center in Indonesia. The primary health care center is the first level health service for the people in Indonesia.^{(5),(6)} According to Republic of Indonesia Government Regulation number 51 of 2009, drug is one of the pharmaceutical preparations.⁽⁷⁾ The prescription management and service of medicine is one of the pharmaceutical jobs carried out by pharmacy personnel, i.e. the pharmacists and pharmaceutical technical personnel.^{(8),(9)} Active role of health workers, including pharmacists, is needed for the successful management of TB⁽⁸⁾ Pharmacy is defined as the art and science of preparing and dispensing medications and the provision of drug-related information to the public. The American Pharmacists Association describes the pharmaceutical mission by providing services to the community as the profession responsible for the appropriate use of medications, devices, and services to achieve optimal therapeutic outcomes.⁽⁹⁾

Pharmaceutical care is a philosophical foundation in the responsibility of drug therapy by pharmacists to improve the life quality of the patients.⁽¹⁰⁾ Pharmaceutical care is defined as the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve a patient's quality of life.⁽¹¹⁾ Pharmaceutical care is the relationship between therapeutic communication between pharmacists and patients⁽¹²⁾ to meet the needs of the patients related to drugs (drug-related needs) identified by pharmacists through

information seeking related to disease characteristics, drug characteristics, and patient characteristics.⁽¹³⁾ Pharmacist always begins to provide pharmaceutical care by making an assessment of the patient's drug-related needs at the time. During the pharmaceutical care process, the pharmacist provides education about the rules for taking medicines which include indications, effectiveness of drugs, safety of taking medication, and the patient's compliance.⁽¹³⁾ The achievement of pharmaceutical care is indicated by the patient's expression of response which includes the patient's understanding of drug use, the patient's expectations for treatment effectiveness, the patient's concerns for treatment safety and the patient's compliance behavior to drug therapy regimen.^{(12),(13),(14)} Implementation of pharmaceutical care is done through giving counseling to patients. The pharmacist's knowledge is fundamental to the implementation of pharmaceutical care.

In private retail pharmacies in Dera Ismail Khan City, Pakistan, knowledge of professionally qualified staff about TB seemed sufficient to identify presumptive TB patients. However, their knowledge about National Tuberculosis Control Programme's (NTP) and

Directly Observed Treatment Short-Course (DOTS) was poor, and referral practices to NTP and DOTS centers were suboptimal. Almost 66% of the pharmacy staff did not know multi-drug resistance TB as a consequence of improper treatment.⁽¹⁵⁾ Other cross-sectional study applied a questionnaire that was administered face to face using smartphones with one pharmacy worker at each of 45 randomly selected pharmacies in the El Agustino district of Lima, Peru. The pharmacy worker's knowledge was adequate. However, workers had important knowledge gaps and myths regarding prevention of TB transmission. Most pharmacy workers (77%) reported they would send a client with a history of cough for more than two weeks to a healthcare center, while 23% reported they would offer them antitussive medication or antibiotics.⁽¹⁶⁾ Other studies at 20 primary health care centers and pulmonary hospitals in Yogyakarta City, Indonesia, showed that the role of pharmacists in providing counseling to TB patients was still not optimal because the role of pharmacists was limited to the preparation of antituberculosis drugs while many antituberculosis drug therapy counseling was carried out by nurses.⁽¹⁷⁾ Based on this background, this study explored the TB-related knowledge of pharmacist and was to determine the

profile of the implementation of pharmacists counseling to tuberculosis patients at primary health care centers in Surabaya, Indonesia.

Materials and Method

Research permit were submitted to Surabaya City Health Service and the permit was obtained on July 6, 2018 for research data collection for three months starting July 2018 until September 2018.

This study was an observational analytic study using cross-sectional design with analysis unit of all pharmacists in primary health care center in the city of Surabaya. Data collection is carried out for 3 months from July to September 2018. Data source of this research was primary data, ie the data collected by the researchers based on the results of the study. The study population was all pharmacists who served on 63 primary health care center in the Surabaya City during the study period. The study sample was a total population of 63 primary health care center pharmacists. The inclusion criteria for pharmacist respondents are pharmacists who work permanently at the primary health care center, willing to fill out a questionnaire and informed consent. The questionnaire was independently developed based on the literature. The research instrument was in the form of questionnaire for pharmacists, consisting of questions on the characteristics of the diseases, drug characteristics, and patient characteristics knowledge. The topic of the question about the characteristics of TB includes the symptoms of tuberculosis, the classification of tuberculosis, the natural course of pulmonary tuberculosis, the nature of the acid-resistant bacilli, and the therapeutic response. The topic of the question about the characteristics of antituberculosis drug

includes administrative aspects, pharmaceutical drug aspects, and clinical aspects of the drug. Administrative aspects of medicine includes drug identity, patient's identity, doctor's identity. Pharmaceutical drug aspects includes active ingredient, dosage form, strength of drug, routes of administration, how to take medicine, duration of therapy, storage, stability, combination of antituberculosis drugs. The clinical aspects of the drug are indications for medication, the mechanism of action of the drug, dosage, time to take medicine, drug side effects, symptoms of drug allergy, drug interactions, and contraindication. Patient characteristics are the characteristics of tuberculosis patients and the patient's medical conditions related to the characteristics of antituberculosis drugs, namely the biological aspects (body weight), psychological aspects (perception, motivation), sociocultural aspects (education), and spiritual aspects (health recovery desires). The method of measuring the knowledge questionnaire is that each correct answer is worth 1 and the wrong answer is 0. The total value with this data ratio scale is the value of knowledge from the pharmacist. Data analysis of the study was carried out using SPSS for Windows.

Findings

Of the total 63 pharmacist respondents who served in the primary health services, 26 (41.27%) pharmacists prepared TB drugs with pharmaceutical care counseling, 16 (25.40%) pharmacists only prepared TB drugs without care, and 21 (33.33%) pharmacists not preparing TB drugs or pharmaceutical care because it was done by other health workers. Based on this mapping, it was concluded that 37 (58.73%) pharmacists did not provide pharmaceutical care for tuberculosis patients at the primary health services.

Table 1. Demographic data of primary health care center pharmacist respondents

Characteristics of pharmacist	Frequency (%)
Sex	
- Female	54 (85.71%)
- Male	9 (14.29%)
Age	
- 21 – 30 years	19 (30.16%)
- >30 – 40 years	41 (65.08%)
- > 40 – 50 years	3 (4.76%)

Cont... Table 1. Demographic data of primary health care center pharmacist respondents

Occupation other than in the health service	
- Pharmacist in charge of a pharmacy	2 (3.17%)
- Pharmacist in a pharmacy	8 (12.70%)
- Non-pharmaceutical	8 (12.70%)
- None	45 (71.43%)
Type of practices in the health service	
- TB drugs preparation with pharmaceutical care counseling	26 (41.27%)
- TB drugs preparation without pharmaceutical care counseling	16 (25.40%)
- No TB drugs preparation and no pharmaceutical care counseling	21 (33.33%)

Table 2. Knowledge of primary health care center pharmacists related to pharmaceutical care

Pharmacist's Knowledge	Achievement Score (N=63)				Maximum Knowledge Score	Percentage
	Min.	Max	Mean	SD		
Characteristics of TB Disease	1	8	4.67	1.55	10	46.67%
Characteristics of TB Drugs	5	17	11.67	2.81	20	58.33%
Characteristics of The Patients	0	10	7.00	1.81	10	70.00%

Mapping in this study showed that the average knowledge of the pharmacists regarding the characteristics of tuberculosis had the lowest value of 4.67 or 46.67% of the ideal maximum knowledge, so the improvement of the pharmacist's knowledge is necessary.

Discussion

Pharmaceutical care is the relationship between therapeutic communication between pharmacists and patients⁽¹²⁾ to meet the needs of the patients related to drugs (drug-related needs) identified by pharmacists through information seeking related to disease characteristics, drug characteristics, and patient characteristics.⁽¹³⁾ Implementation of pharmaceutical care is done through giving counseling to patients. The pharmacist's knowledge consisting of questions on the characteristics of the diseases, drug characteristics, and patient characteristics knowledge, is fundamental to the implementation of pharmaceutical care.

Knowledge on the characteristics of tuberculosis consists of symptoms of the disease, classification of diseases, natural course of pulmonary tuberculosis, the nature of acid-resistant bacilli, and therapeutic response. Symptoms of the disease includes Coughing up phlegm for more than 3 weeks, sweating at night, and losing weight. Classification of tuberculosis can be differentiated according to infected body organs, based on the results of examination of acid-resistant bacilli in

microscopic phlegm, and a history of antituberculosis drug treatment. The natural course of pulmonary tuberculosis (TB) in humans consists of four stages including the stages of exposure, infection, illness and death due to tuberculosis. The intensive therapeutic response of antituberculosis drugs with drugs taken daily will soon occur in the form of an improved fever within 1-2 weeks, the frequency of coughing decreases in one month, improvement of x-ray image in 3 months, and the presence of sputum conversion.^{(5),(6)}

The improvement of the pharmacist's knowledge regarding the characteristics of tuberculosis is necessary. However, pharmacists also need to optimize the knowledge of patient characteristics. Patient characteristics are the characteristics of tuberculosis patients and the patient's medical conditions related to the characteristics of antituberculosis drugs, namely patient's body weight for determining the amount of drug taken, patient's perception of the suitability of the drug with the patient's disease, giving an explanation of drug therapy regimen according to the patient's education level, and explore patient spiritual information for health recovery.

Conclusion

The number of primary health care center pharmacists who did not perform pharmaceutical care was still high, ie. 37 (58.7%) from a total of 63 pharmacists. The pharmacist's knowledge influences the pharmacist's ability to perform pharmaceutical care to tuberculosis patients. The average value of the pharmacist's knowledge regarding the characteristics of tuberculosis had the lowest value of 4.67 or 46.67% of the ideal maximum knowledge, so the improvement of the pharmacist's knowledge is a necessity.

Additional Information

Ethical Clearance: The Ethical Approval for this research was published by the Health Research Ethics Commission, Faculty of Public Health, Airlangga University (No.200-KEPK dated April 25, 2018).

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