Prevention and control of tuberculosis infections: a phenomenology study

DOI:10.36909/jer.ASSEEE.16067

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ABSTRACT

This study aims to determine the experience of nurses in health centers regarding the factors that affect the prevention and control of TB infection and to determine the risk of nosocomial infection transmission. This research is qualitative research using a phenomenological approach, structured interviews. The research sample was 4 Health Centers nurses in Indonesia. The sampling technique was total sampling. The interview in the confidential meeting room, conducted in Indonesian, lasted about 30 minutes. Participants' responses were recorded during the interview. We typed and examined the coded script. Interviews were recorded using a tape recorder. Four themes were found, namely the lack of health service facilities, socio-cultural factors, patient behavior in utilizing health services.

Keywords: Tuberculosis, infection prevention, and control, nurses, phenomenology approach.

INTRODUCTION

Tuberculosis (TB) is an infectious disease due to Bacillus Mycobacterium tuberculosis. TB is the leading cause of health problems and the top 10 leading causes of death worldwide. WHO estimates that there are still around nine million new TB sufferers every year, around 1.1 to 1.6 million deaths, including HIV-positive cases. In 2019, 202 countries reported suffering from TB, more than 99% of the world's population. TB cases in ASEAN are quite

high, around 4 million cases, one of which is due to the middle-low socioeconomic condition. Indonesia ranks first TB cases in ASEAN, around 1 million cases; It is estimated that 391 people per 100,000 population suffer from TB disease with a death rate of 110,000 per year (Fund, 2019). Nurses are more susceptible to TB transmission than people in general (Gehanno *et al*., 2019) especially nurses who work in health centers because they are at the forefront of infection prevention (Nishimura *et al*., 2018). Therefore they must have knowledge and attitude about the control and prevention of TB infection (Ramos *et al*., 2018) to be able to prevent the risk of TB transmission, it can be done with health education, treatment, and prevention of TB disease (Sissolak *et al*., 2011). health centers play a role in prevention by establishing a TB patient isolation policy (Unahalekhaka *et al*., 2014). Infection prevention and control are difficult due to poor nursing resources. Community nurses play an important role by providing health education. This study aimed to determine the experience of public health center nurses in controlling and preventing TB infection to identify the risk of nosocomial transmission.

METHOD

The study was conducted at four Health centers in Indonesia. Qualitative data were collected from in-depth interviews according to structured interview guidelines (Table 1) to explore nurses' experiences using a phenomenological approach (Brink et al., 2006). The interview guide is tested for content relevance and ease of application before data is collected . The number of participants was 4 people (staff nurses) in 4 health centers that had been approved by the leadership of the health center, the total sampling technique was sampling. The number of participants is considered sufficient if it has reached redundancy, meaning that the data obtained is saturated. Nurses (n = 4) work in the outpatient TB department with the criteria of nurses who have received TB training, with a minimum education of a Diploma.

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Table 1 Interview

1.	Do you usually treat patients diagnosed with TB in your workplace?
2.	What protective equipment do you use? (Surgical mask, N-95, Gloves, Curtains around the bed, Isolate room of the patient)
3	If a TB patient is under treatment – what is done to the patient, and when?
4	Will the actions be different when only TB suspicion?
5	If the patient is transferred to another room or treatment - are there measures to protect the suspected case?
6	If so, what are the actions? If not, why not?
7	Which of the TB management tasks do you think is the most difficult to perform? (Providing information about TB - If yes, why?, Counseling - If yes, why?, DOTS treatment - If yes, why?, TB management - If yes, why?, TB patient care at the Puskesmas - If yes, why? Supervision health worker - If yes, why?, TB risk procedures - If yes, why? are there other tasks, mentioned - why?)
8	Are you afraid of contracting TB while at work? - If yes, why, if not, why?
9	Are there any problems while treating TB patients? If so, why?
10	What do you think when the patient is on treatment for more than a week? explain
11	Can you refer a patient to a traditional doctor for TB treatment, if requested by the patient? Explain.
12	Could you refer a patient to a traditional doctor for a DOTS therapist, if requested by the patient? Explain. Are there beliefs that can influence TB patients not to come to the Cummunity healht? If yes, please explain?
13	Are there beliefs that can influence TB patients not to take TB drugs regularly? If yes, explain?
14	Have you participated in TB training or work in the past two years? If so, what?
15	Do you have access to TB care information, protective measures, and manage patients with confidence? If so, from whom, how?
16	Do you have information about the national TB guidelines for health workers? Explain.
17	Do you know the policies regarding the management of TB patients at your health center? Explain.

The interviews were conducted in a tightly guarded meeting room with confidentiality, conducted in Indonesian, and each is lasting about 30 minutes. Participant responses were recorded during the interview. After the interview, we immediately typed and checked the code script to ensure complete and accurate data retrieval. The interviews were also recorded using a tape recorder after asking the nurse for permission and the nurse giving permission.

Data reliability was guaranteed by examining interview guides to identify and correct ambiguities and/or errors, through one-on-one discussions with participants and peer reviewers. Collecting data to achieve a deeper understanding of the participants' working

context. We clarified the participant's responses to verify the contextual suitability of the coding and the themes that emerged during the data analysis. Two members of us and the principal investigator were tasked with verifying the thematic analysis, and differences of opinion were debated to reach a general agreement**.**

Data analysis with thematic analysis. Aims to identify, code, analyze and group recurring factors into common themes with each key and subtheme. The identified themes are presented along with quotes from participants to add depth and richness to the findings. Quotations from participants were used verbatim and presented in italics followed by participant statements shown in brackets which were intended to provide some context for the data.

Ethical approval for this research was obtained from Universitas Pendidikan Indonesia by applying ethics to the university. Written approval was obtained from all participants. The interview paper was coded, while personal identification details were not collected.

RESULTS AND DISCUSSION

In designing a shell and tube type heat exchanger, several assumption data are used for the calculation process of the heat exchanger design specifications, including the assumption data of the heat exchanger specifications and the assumption data of the fluid properties that work on the heat exchanger apparatus. Table 1 shows the assumptions for the dimensional specifications of the shell and tube type heat exchanger and Table 2 shows the assumptions for the fluid properties acting on the apparatus.

Participants in this study were 4 nurses, all of whom were female, with an age of about 38 years and the average length of work at the community health center to date was 8 years. The language they used was Indonesian. Data Saturation was reached. According to nurses, they are concerned about the possible risk of transmitting TB to patients and health care staff.

Factors influencing TB prevention and control and the potential increased risk of nosocomial transmission appear to be interrelated with the overall theme, with individual keywords and subthemes related to the health care system, broader contextual conditions, and patient behavior (Table 2).

Table 2 Health care system in the prevention and control of TB infection (themes, keywords & sub-themes).

Theme	Key Word	Sub-Theme
Effect of health care systems	Provisions for Infection Prevention and Control	Isolation room facilities, Personal protective equipment for health workers, Policies on TB
	TB Training	Nurses, Patient/family members
	Communication, Work Overload	
Sociocultural factors	TB anxiety and stigma, Role of traditional healers	TB
Patient behavior in utilizing health services	Community Health Center services	Poverty / economic status Traditional medicine

Four health centers in Indonesia provide TB-specific services. However, so far it has not met national standards for infection prevention and control and does not yet have inpatient facilities for TB patients.

(i) Isolation Room Facilities. All participants stated that the health center does not have special isolation rooms for TB, closed ventilation, and no air conditioning. There is only a fan, a sink for washing hands with running water, a curtain around the bed. There is general personal protective equipment (PPE) such as surgical masks and gloves. "The TB clinic is separated from another room but there is no special isolation room for TB patients, all TB patients are mixed with other patients. PPE facilities are only surgical masks, gloves, sinks, ”(P, P2, P3, P4). All participants from the health center considered their work environment to be inadequate to prevent TB transmission. The risk of TB transmission is quite high in outpatients.

(ii) Personal protective equipment. Personal protective equipment is installed and used properly to prevent contamination. The N-95 mask is useful for reducing the inhalation of air containing infectious tubercular bacilli. In surgical mask filters, only 50% of the particles are inhaled. Although not all surgical masks are available, standard PPE at the health center is available. Most of the participants stated that the lack of PPE equipment was because there were still nurses who did not wear N-95 masks. mask N-95 is used for MDR TB. (P1). Due to the willingness and lack of knowledge about the use of the N-95 mask. Likewise, the use of gloves is only used when injecting patients. "Yes, of course, we will. wear masks. For masks that we usually use for general patients. If we face TB patients, we use N-95 masks, then we also use hand scoops when injecting patients" (P3).

(iii) TB Policy. Almost all participants have not taken TB SOP actions according to government policies. Participants are aware of the policy, but the health center has not formulated and made action procedures and relies more on doctors' instructions. "There is no procedure for action (SPO) in our health center, it is being processed so we are still using national guidelines only" (P1, P2, P3, P4) Participants also said that patients who had not been diagnosed with TB had not implemented infection prevention and control rules. "No action is taken until the test results are available. Then treatment and education on how to cough begin. There is no isolation ”(P1).

Lack of TB Training for participants. There are several points:

(i) Nurses. None of the participants received regular training every year. All participants proposed ongoing training for professional development for nurses in continuing education as well as training on infection prevention and control. "Nurses must always be up to date with existing knowledge by participating in infection prevention and control training, as well as continuing education to the bachelor's level" (P1, P2).

(ii) Patient/family member. Patients need knowledge about TB. "There are those who don't know about TB, whether TB can be cured or not, and how TB is transmitted. There are myths and stigma attached to patients that TB is an incurable disease and a curse ”(P1). All participants supported that good knowledge of TB will affect patient adherence to infection prevention and control measures, good patient care, increase the motivation of TB family members and caregivers.

Regarding communication, participants assumed that cultural and linguistic differences between nurses and patients caused communication barriers in TB infection prevention and control practices because communication used regional languages, while some nurses were not from the same ethnicity: "Sometimes the problem is with language, sometimes I don't understand the patient's language and desire. patient ”(P2). The results of screening in many patients were not diagnosed with TB because of communication in explaining the symptoms suffered and how TB patients were treated. "but we're not sure if they understand or not" (P2).

Regarding work overload, the majority of participants not only treat TB patients but also treat other patients. If the number of visits by non-TB patients increases, sometimes services to TB patients are disrupted. “TB is not our main concern. We are always in a hurry to finish our work. There is no time to chat with our patients. ”(P3) The participants' responses also revealed the impact of overwork at the health center which also provides inpatient services.

Socio-cultural factors include:

(i) TB concerns and stigma. Participants expressed the profound and inherent impact of TB stigma on this disease, such as exclusion, rejection, criticism, or devaluation due to adverse social assumptions about individuals or groups regarding health problems.

(ii) Tuberculosis. Several participants expressed concern about the stigma in society, delayed treatment, and harmed the continuity of TB treatment as well as family members and home caregivers. TB-related treatment and side effects, workplace, stigma, and social problems.

Although there are reports of treatment, it is also a patient's concern that the community where he works is worried about contracting TB. “I eat healthy food, I have many illnesses in the hospital, but my body is strong (P4).

(iii) Role of traditional healers. All participants were confused because patients thought that TB treatment would recover quickly if they went to a traditional healer rather than a health center. Participants felt that the patient went to a traditional birth attendant when the TB symptoms appeared. "Traditional healers are often the first place for patients to treat their TB" (P3). It has been passed down from their family. If sick, they will go to a dukun or dukun for treatment. "The dukun is paid sincerely, sometimes not being paid enough to bring the garden produce" (P3). None of the participants advised the patient to seek traditional treatment. “TB is perceived as a hereditary, malignant and despicable disease by the community, so if a family is suffering from tuberculosis and coughs up blood, they go to a traditional birth attendant to cast out demons. "(P2, P4) and" TB disease; coughing up blood, shortness of breath, then people think the disease is transmitted by other people or being bothered by a demon ”(P3). However, if the dukun cooperates with medical personnel and will refer them to the nearest health center and hospital, they are treated immediately. "... they often take action against patients who are not under their authority as medical personnel" (P1). Therefore, the importance of TB and DOTS health education for traditional healers/healers before referring patients

Effects Related to Patient Behavior are

(i) Community health center/hospital services. Delays in providing care both at the health center and in the hospital for adult and child patients are a common problem.

(ii) Economic factors/poverty. Economic conditions affect the choice of treatment for TB sufferers. Difficult access to transportation to a health center and costs incurred for transportation to health facilities make it difficult for them to pay because of their relatively

limited economic capacity: “There are some patients who come with a limited/poor economy and live far away in remote areas so that access to the health center is difficult and far away. Some of them do not have proper housing, they live in huts with cubicle walls, dirt floors, sometimes live in narrow alleys that are not well ventilated and are also malnourished, do not work, and do not have money to go to the health center ”(P1).

(iii) Traditional Medicine. The majority of participants said that TB patients treated themselves with very unhealthy traditional medicines / herbal medicine. "Some sufferers come if they are sick and herbal medicine does not help to heal" (P2, P4).

Participants also said TB sufferers often fail to follow infection prevention and control measures, such as coughing etiquette by covering their mouths, wearing surgical masks, or N-95: "sufferers lack understanding and most sufferers are stubborn with uncooperative behavior," bad attitude, reluctance. eating, coughing carelessly, refusing to take medication, taking medication irregularly, the risk of disease transmission, especially MDR ”(P1, P2, P3, P4). Participants also explained why TB patients failed treatment. . "Sometimes drugs are drunk too much so that the patient forgets and gets annoyed. Medicines also have side effects" (P3). Discoloration of urine by rifampin can also lead to treatment non-adherence if the patient does not receive good health education at the start of treatment.

DISCUSSION

Experience of nurses who work in the health center and have provided TB services. The theme of the influence of the health care system and patients on infection prevention and control is the existence of isolation rooms, self-protection gaps, TB policies, and socio-cultural themed nurses, community stigma, anxiety about TB, the traditional role of healers, patient behavior towards service facilities, health consequences. poverty, and traditional medicine, this research is in line with (Mugomeri *et al*., 2015) regarding the non-compliance of nurses in implementing guidelines and controlling TB infection due to lack of facilities and

infrastructure. Health systems lack infection prevention and control, policy implementation and evaluation, infection prevention and control standards, and audits (Sissolak *et al*., 2011). Isolation facilities, poor ventilation, and room lighting, minimal personal protective equipment, the number of N95 masks, gloves, surgical masks are limited, TB training is rarely carried out (Jeffries *et al*., 2017) Because of the importance of government policies to be implemented immediately (Shrestha *et al*., 2017) because they are very effective in improving the prevention and control of TB infection (Drews *et al*., 2019) and are carried out sustainably (Backman *et al*., 2011) and are continuously updated (Ormerod *et al*., 2000). Nurses also play a role in screening to control the nosocomial transmission of drug-resistant strains to patients and healthcare workers (Maloney et al., 1995; Mayo *et al*., 1996).

Cross-cultural understanding of stigma and anxiety, as well as the role of traditional healers in communities where people do not want to associate with sufferers for fear of contracting and sufferers, are ashamed of their illness (Courtwright *et al*., 2010) so that sufferers need support because stigma can cause psychological stress, depression, fear (Jaramillo, 1999). In addition to the stigma of TB, it is also caused by supernatural powers or heredity from the family (Amoah *et al*., 2014). Some patients go to a traditional healer (Barimah, 2016), where the dukun has beliefs about diseases caused by Jin (Kpobi *et al*., 2019). While the village doctor played the role of a health educator (Harper *et al*., 2004) and also traditional doctors Peltzer *et al* (2006; Brouwer *et al*., 1998; Harper *et al*., 2004) they can all improve services in the region and cooperate with NGOs. (Banerjee *et al*., 2004; Colvin *et al*., 2003). Health problems cannot be separated from poverty, disease, and poverty such as a vicious circle, malnutrition, and unhealthy living conditions (Bhunu *et al*., 2012; Benatar *et al*., 2010; Leung *et al*., 2004; Klok *et al*., 2009), unaffordable care costs, poor access, ethnic discrimination (Greene, 2004; Waaler, 2002) so poverty alleviation becomes important (Barte *et al*., 2012). TB treatment can also be done with traditional medicines that can be made from animals and

mineral materials (Oeser *et al*., 2005) although traditional medicines are less effective (Liu *et al*., 2014) (Elkington *et al*., 2009).

CONCLUSION

The experience of nurses in public health centers in infection prevention and control discovered four themes, namely lack of health care facilities, sociocultural factors, and patient behavior in utilizing health services.

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