E-ISSN: 2476-9606
Abstract Proceedings International Scholars Conference
Volume 7 Issue 1, October 2019, pp. 129-154

https://doi.org/10.35974/isc.v7i1.806

Relationship of Perceived Susceptibility and Threats to Prevention Practices of Pulmonary Tuberculosis Among Indonesians as Moderated by Cultural Beliefs

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ABSTRACT

Pulmonary Tuberculosis (PTB) appears to lead in the worldwide unending battle of health problems. This study sought to determine the relationship of perceived susceptibility and threats to Pulmonary Tuberculosis (PTB) prevention practices as moderated by cultural beliefs. Descriptive evaluative and correlational research designs were utilized. The study employed 393 respondents (20-55 years old) from five provinces in Indonesia with the highest incidence of PTB, selected through the multi-stage and purposive sampling technique. The data analyzed through the SPSS program, utilized statistical methods: Mean and Standard Deviation, Correlation Analysis, and Structural Equation Modelling (SEM) using AMOS. The respondents had high perceived susceptibility and threats (mean = .755, SD = .421), and practiced the PTB prevention sometimes (mean = 3.347 and SD = .826). This implies that Indonesian adults understand that certain conditions an d practices would lead them or put them at risk to be infected with PTB. Perceived susceptibility and threats have a positive weak significant correlation ($r = .320^{**}$, $\rho = .000$) with PTB prevention practices. The higher the perceived susceptibility and threats, the better is the PTB prevention practices. The perceived susceptibility and threats has influenced over their prevention practices. Cultural beliefs have a moderating role (estimate value of - .053, $\rho = .000$) in the relationship of perceived susceptibility and threats to PTB prevention practices. The stronger the respondents hold on to their cultural beliefs, the weaker is the impact of perceived susceptibility and threats. Further study from other provinces that excluded in this study and on another specific culture related to PTB prevention practices with a comparison of different population groups (urban and rural), and with a bigger sample size. Also, may employ a qualitative research method to explore in depth understanding of the phenomenon.

Keywords: Perceived Susceptibility and Threats, PTB, Cultural Beliefs, Prevention Practices.

INTRODUCTION

Pulmonary Tuberculosis (PTB) appears to lead in the worldwide unending battle of health problems. World Health Organization (WHO) has publicized a raising incidence of tuberculosis, as a universal emergency that is responsible for one out of ten mortality factors

in the world (WHO, 2018a). Statistics released by WHO (2018a) showed that in 2016 there were 10.4 million people who were estimated to have been infected by Mycobacterium Tuberculosis, equivalent to 140 cases per 100,000 populations. Moreover, WHO (2018a) stated that the mortality rate due to PTB among developed countries almost reached 96 percent. A statistical analysis by United States Agency for International Development (USAID, 2016) stated that in year 2015, Indonesia was one of the countries worldwide with the high incidence of PTB over one million cases and 100,000 deaths per year.

Indonesia has 33 provinces with many cultural beliefs and ranks second for PTB incidence after India (WHO, 2018a). PTB is one of the top four factors that caused mortality in Indonesia. In 2015, the incidence of PTB in Indonesia was estimated 395 cases per 100,000 population and 40 death cases per 100,000 populations. It has been reported that the incidence of PTB has increased in 2016, with 351,893 PTB cases compared to 330,729 PTB cases in 2015 (DEPKES, 2017a). PTB incidence can be avoided through application of prevention practices. As stated by the United Nation (2015) the prevention, diagnosis, and treatment intervention has saved an estimated 37 million lives between years 2000-2013 and has reduced the prevalence rate. Therefore, there is a need to fight Tuberculosis and its causes need primary attention and application of preventive measure in action.

Some studies clearly indicated that some factors such as environmental and socioeconomic factors play an imperative role for PTB prevention practices. It is obvious that PTB information aimed for the community, is still necessary, as a significant action recommended to be done regularly and must be enhanced for the best outcome of community prevention practices. However, cultural beliefs were not included in all those previous studies. Therefore, it is necessary to conduct this research study to determine the relationship of perceived susceptibility and threats to prevention practices. Further to find out the impact of cultural beliefs on the relationship of perceived susceptibility and threats to the prevention practices.

LITERATURE REVIEW

Tuberculosis is known as a universal infectious disease through the chronicles of history and as a primary cause of endemic outbreaks in numerous parts of the world. It is the leading cause of adult deaths in Indonesia. PTB is spread in the crowded population and is a common disease among adults. North Sumatra, West Java, East Java, Central Java, and DKI Jakarta, are the five provinces with the highest PTB incidence and silently penetrates other population group in Indonesia during the years 2016 - 2017 (DEPKES, 2017b).

Huether and McCance stated that tuberculosis is an infectious disease that could radiate into other parts of the body and is induced by an organism called Mycobacterium Tuberculosis (2017). Though PTB is a serious bacterial disease, PTB can be avoided and can be treated. However, without treatment, possible outcomes will range from recovery to death. The information related to indication and infection of PTB establishes the prevention practices of Pulmonary Tuberculosis.

People who were diagnosed with PTB are clinically divided into two groups, active tuberculosis and latent tuberculosis infection (LTBI) or have been exposed but the illness is not manifested yet or can be reactivated later. When the body's immune system fails, the disease will emerge, particularly with people diagnosed with PTB (Jeager et al., 2013). In the same way, LTBI is a hidden illness that is revealed in a case of an immunocompromised condition. Since LTBI do not show any clinical manifestations, the indication of the active illness unconsciously occurs gradually until the illness proceeds to a dangerous stage (Huether & McCance, 2017). WHO (2017a) explained that about one-third of the world's population has latent PTB, which means people have been infected by PTB bacteria but are not yet ill with the disease and cannot transmit the disease. However, WHO (2017a) chronicled that people infected with PTB bacteria have a 10% lifetime risk of falling ill with PTB, and people with active PTB can infect 10–15 other people through close contact over the course of a year. Notably, PTB persists at greater incidence rates in crowded populations.

Perceived Susceptibility and Threats

Engaging in a health promoting behavior may be influenced by one's perception and understanding of an illness on being aware of the possibility of becoming ill is known as perceived susceptibility (Glanz, Rimer, & Lewis, 2002). According to Weinstein (1984) there are two factors that may cause the susceptibility. They are the hereditary and environmental risk factors. An enhance perceived susceptibility, will support the person to engage in prevention practices. Consequently, low perceived susceptibility, denying own health risks may result to an unhealthy lifestyle (Weinstein, 1984). Since the risk is thought to be controllable or can prevented by personal action, establishing the sensitivity to susceptibility and threats is an imperative movement.

According to Yuliwulandari et al. (2010) stated that no single mutation of the human genome can explain the pathogenesis of TB; however, several candidate genes have been reported to

be linked with the disease, including HLA genes that appeared to be associated with a more severe form of TB rather than general PTB.

A recent study from Morroco and China brought an explanation of genetic factors that has been accountable of PTB occurrence. Qrafli, Imane, Asekkaj, Bourkadi, El Aouad, and Sadki (2018) investigated about the new variant identified as a major susceptibility locus to tuberculosis on chromosomal region 8q12-q13 in Moroccan, population found out that a particular genetic played a role in Moroccan residents to develop PTB. Qrafli et al. (2018) study suggests that there is one kind of gene in NSMAF gene that is able to regulate a chance of someone to experience PTB where the rs1050504 C > T genotype was observed to be significantly associated with an increased risk for developing pulmonary TB (41.8% vs 27%, OR 1.95, 95% CI 1.16-3.27; p = 0.01), however, the TT genotype was significantly associated with resistance to PTB (4.1% vs 15.6%, OR 0.23, 95% CI 0.08-0.63; p = 0.002).

Meanwhile, the study of Zhou et al. (2017) provides further evidence supporting the host genetic variability in TB susceptibility, especially in different types of TB infection which is the TNF-α -238 A allele indicates a protective effect against STB, but not against PTB, whereas the SP110 SNPs (rs722555 and rs1135791) and TNF-α -308G>A (rs1800629) showed no association with susceptibility to PTB and STB in southern China. In the same way, there was a susceptible genetic factor and the possible outcome of PTB infection. Although findings might render a fact of genetic factor for PTB, however, these findings have just been merely proven or had been studied only for a particular population. Obviously, it may increase the Moroccan's susceptibility for PTB prevention practices. However, the other factors that may develop the susceptibility, which is environmental risk factor, is likely to demonstrates a more significant role.

Indeed, in Indonesia, a study done for Western Javanese population by Yuliwulandari et al. (2010) to investigate the genetic factor HLA class I and II alleles and haplotypes to ascertain their role in susceptibility and resistance to new and recurrent PTB among 257 PTB patients (216 new and 41 recurrent PTB patients) and 236 healthy controls that stated the frequency of HLA-A, -B, and -DRB1 allele positivity in new and recurrent PTB patients and controls. Moreover, they chronicled that HLA-B*4006 was associated with new PTB (p = 0.044, padj = ns), whereas HLA-B*1802, HLA-B*4001 and HLA-DRB1*1101 were associated with recurrent PTB (p = 0.013, padj = 0.016; p = 0.015, padj = 0.028; and p = 0.008, padj = 0.027 for new PTB vs recurrent PTB, respectively).

The researchers reported that by logistic regression analysis after adjustment of age and gender it showed a relationship; however, after having undergone some more examinations, a no more significant associations resulted (Yuliwulandari et al., 2010). Further, "Haplotype HLA-B*1802-DRB1*1202 was associated with susceptibility to recurrent PTB ($p = 0.014$, odds ratio = 3.8, 95% confidence interval = 1.18–12.27). In contrast, HLA-DRB1*1202 in the absence of HLA-B*1802 showed a significant association with resistance to recurrent PTB ($p = 8.2 \times 10{-}4$, odds ratio = 0.32, 95% confidence interval = 0.16–0.64), suggesting that stronger susceptibility effect of HLA-B*1802 masked the protective effect of HLA-DRB1*1202" (Yuliwulandari et al., 2010). In addition, another study in Wori, North Sulawesi stated that the male has a tendency to contract PTB six more times higher compared to the female (Puspitasari, Nurlaela, Hadi, & Setio 2018).

Perceived threat predicts the behavioral intention to take preventive health actions. According to Glanz, Rimer, and Lewis (2002) the perceived threats are the affiliation of perceived susceptibility and perceived severity. The health belief model describes perceived severity as a belief about how severe the illness that may cause disability and pain, financial problems, future social roles dysfunction, and non-productive condition (Glanz, Rimer, & Lewis, 2002). For this reasons, people probably will implement a change in their health behavior to prevent the occurrence of the disease. The study concludes that as perceived threats increase, the prevention practices also intensify.

Moreover, another study in Korea by Bae, Hyun, and Ra (2014) found out that perceived threat has shown a relationship with the intention of the physical injury, the study stated that the severity of physical injury was positively related to an increase in perceived threat, and increased perceived threat was positively correlated with a greater number of post trauma stress disorder (PTSD) symptoms.

Cultural Beliefs

Indonesia, a nation with hundreds of ethnic groups with various religious beliefs, cultural, and social diversity, is holding a distinctive sociocultural environment that influences both the individual and the community health perspectives and behaviors (Iskandarsyah et al., 2013; Mirpuri, Cooper, & Spilling, 2012). Moreover, every culture has its own systems of beliefs, points of view, concepts and intentions regarding wellbeing and diseases (Iskandarsyah et al, 2013). Therefore, it is important to uncover the culture beliefs that affected the health behaviors, particularly the prevention practices of PTB.

Ancient migration and colonization had inhabited the Indonesian archipelago. Indonesian population almost reach one-fourth billion people, ranked fourth for the most populated nation in which majority are Muslims (Mirpuri, Cooper, & Spilling, 2012). Most of the traditions observed are based on Muslim's beliefs and traditions. This include some cultural beliefs that had affected many aspects of health for a long time in Indonesia. For example, treatment beliefs such as traditional healers, traditional medicine, village traditions, etiquettes such as coughing and sneezing, greetings by shaking hands, spitting, eating habits, and feeding manners are a norm. These traditional beliefs and practices have affected health and impacted health care services too.

According to Mirpuri, Cooper, and Spilling (2012), the lifestyle of Indonesia is determined by adat or custom that are unwritten code of traditional behaviors that contains rules of conduct for almost every situation. Although Indonesia has many differences in lifestyles and traditions, however, Indonesia has also experienced various challenges of modern cultural integration with a modernity that might improve the prevention practices.

Treatment Beliefs.

Some treatment beliefs had caused the delay in the diagnosis and treatment of PTB. Treatment beliefs include beliefs in traditional healer and beliefs in traditional treatment. These practices may lead to delay treatment and intervention of the health practitioners. Delay in seeking care has been caused by some beliefs both in the family and in community. One study done in China done by Li et al. (2013) found out that aside from sociodemographic and economic factors resulting to the delay in seeking care, another individual factor that also lead the community to delay care is due to first seeking treatment from the Traditional Chinese Medicine (pooled OR (95% CI): 5.75 (3.03, 10.94)). In other words, they prefer to visit or called the traditional healer rather than go to the health facility. Indeed, the delay in diagnosis of PTB might lead to the severity of the illness.

Moreover, submitting to traditional healers such as witch doctors, herbal therapists, acupuncturists, and spiritual therapists had been practiced in Indonesia way back in history until today. During the researcher's working period in the rural community, in a remote area of West Borneo, a province in Indonesia, (2008 – 2013) the researcher has observed these practices habitually manifested in the community. In addition, the family undergoing the treatment procedures by the traditional healer will display a hanging package as an offering made from coconut leaves and some flowers, this was a sign that they cannot be disturbed until

several days of treatment is done. However, if they will not recover, they will seek for health care service from the health facility. This practice obviously destroys and delays the early treatment and diagnosis of healing process.

The fact about health seeking behavior from a traditional healer was supported by a recent study done by Iskandarsyah, de Klerk, Suardi, Sadarjoen, and Passchier (2014) that investigated the practice of consulting a traditional healer and negative illness perceptions that associated with non-adherence to treatment in Indonesia by a female breast cancer patient. The researchers concluded that by using multivariate regression analysis, consulting a traditional healer before diagnosis ($\beta = 1.27$, $p = 0.04$) had caused treatment delay and after diagnosis ($\beta = 1.67$, $p = 0.03$) was related to the loss of consultation period with the health provider. Iskandarsyah et al. (2014) chronicled that most of the respondents strongly relied on the traditional healer. In addition, some respondents from their qualitative study stated that, the non-invasive treatment by the traditional healers were more acceptable compared to the invasive procedures they may get from the health facility (Iskandarsyah et al., 2014).

The use of traditional medicine also has been an option by Indonesian people. Mirpuri, Cooper, and Spilling (2012) stated that herbal tonics called jamu is made of herbs, spices, and other plant such as roots, barks, grasses, and animal parts, that is believed and used as a medication for everything. In the past, the community with low income preferred traditional medicine such as jamu due to its availability. However, nowadays, both people in the rural and urban areas are consuming traditional medicine for therapy. It has been commonly done by herbal therapists. Recent study from Nepal by Thoursen and Pouliot (2016) regarding traditional medicine as a challenging assumption about treatment seeking behavior concluded that herbal medicine was dominating the health care preference both in rural and peri-urban populations that lead the community to self-manage their care when illness occur.

Further, the use of saliva as a wound treatment or cure for a bruise had been a common practice among Indonesians. Indeed, the researcher has experienced a traditional treatment method by her own parents, who carried out traditional ways to heal the open wounds, bruises, or a bump by applying their saliva on the affected area, including the practice of blowing red and painful eye. They had believed that saliva has a curative capability, of which this belief has been inherited too from their parents. Certainly, though they might not be able to explained in a scientific way the belief of saliva cure, however, this conviction and belief has been inherited and adopted as a curative practice from generation to generation.nOne study from Pakistan by Ul-Hag et al. (2016) about antimicrobial and wound healing properties of human saliva had

investigated the capability of human saliva for healing the wound. The researchers concluded that there is a natural antimicrobial component in human saliva from healthy people, therefore, human saliva is able to treat the wound though only effective for some bacteria such as Candida Albicans, Staphylococcus Aureus and AIV H9N2 (Ul-Hag et al., 2016). Furthermore, the result of the cure was depending on one's age such as age range between 25-35 which contributed a better cure, meanwhile, human saliva from people with older ages has low capability for treatment. These findings have given an evidence for the curative effect of human saliva, however, a proper treatment from a professional discipline is constantly suggested to prevent any other complication or contamination from other diseases. Indeed, when someone apply saliva or blow the red or painful eye, they are supporting the transmission process of bacteria, particularly PTB causative agents.

Traditions.

Traditionally, rural area or villages in Indonesia were called as kampong, meaning a home where the community lives in a territory with very close ties, where dwellers could count on each other for help from neighbors or even from another village to extend help (Wiryomartono, 2014). Moreover, Wiryomartono (2014) explained that as a traditional dweller in kampong, there was a strong life principle by the kampong population called rukun. In other words, kampong is similar to living together with harmony, share their properties as a communal property. For this reason, the settlement of their social environments trigger a tradition of tolerating the sharing of the table wares, clothes, and home spaces for other family members that is common in an overcrowded house. In addition, the public facility in kampong is mostly of poor condition. This may result to poor hygienic practices of the community. Wiryomartono stated that despite its poor environment, the kampong dwellers in Indonesia are probably the socially dominating sustainers of the Indonesian urban reality (2014).

Etiquettes

According to Bertens (2001) ethic is the science of what is usually done or the knowledge of customs values and norms of morality norms that become a guideline for a person or group in regulating their behavior. Moreover, etiquette can be relative, what is considered impolite in a culture can be considered polite in other cultures, one examples is eating with bare hands. Several practices related to Indonesian cultures and traditions also might be affecting the PTB prevention practices. Indonesians hold a tradition that has shown a lack of personal hygiene

practices particularly when they are coughing, sneezing, greetings by shaking hands, spitting, eating with bare hands, and feeding manner. Those habits have close relationship with the transmission of PTB. Certainly, if these traditions wil not be properly corrected, it will not support the PTB prevention practices. Remarkably, when sneezing or coughing Indonesians will merely cover their mouths with their clothes or sleeves. However, this practices may be because of their lack of understanding of the information about PTB transmission. In addition, proper attention should be given directed toward the practice particularly among domestic helpers and drivers. Indeed, covering mouth with hands when sneezing without washing their hands afterwards can spread the germs when in contact with other things or persons. Literally, the Indonesian greetings of hand shaking distinctly also support the transmission of the PTB, because salam or greeting by hand shaking is the standard greeting practice of Moslems.

In Indonesia when it is time for Ramadhan, fasting is observed for a month, and spitting is commonly done anywhere. Some opinion brought a thinking that they may invalidated the fasting; on the contrary, others were understood that saliva is allowed to be swallowed. Indeed, mucus or phlegm would be better to be spitted out for medical reasons. However, if it is not done in a proper place, it will cause also another medical problem, PTB particularly. Unfortunately, with the habit of spitting in open area, it also promotes the transmission of PTB germs easily. Instead of preventing the spread, it will promote the existence of the germs in many places that could remain for a long time and infect whoever gets in contact with these germs.

Meliono and Boedianto (2004) chronicled that pattern of relationships between community behavior and cultural behavior is a structured pattern by the awareness of each individual, through the influence of the environment and his outlook on life, the consciousness (way of thinking) of the individual is formed thus giving rise to various perceptions or patterns of ideological thinking. In her study, she concludes that a person's eating behavior is related to the ethical dimension. Table manners also has an application to the preventive practices of PTB. Since Indonesia mostly inherited and adopted Moslem religious practices, therefore, the population adopted and followed the Moslem traditions. For example, a tradition that enforce a manner of having meal only with one’s hand, which is the right hand, as the proper hand to serve the food since the left hand is believed only to be use for the toilet. This is a noted practice common in Sumatra and West Java. Indeed, most people agreed with the opinion that the dish tastes better, when they eat with hands compared with using spoon or fork (Mirpuri, Cooper, & Spilling, 2012). However, the imperative issues with eating using the hands is

personal hygiene. First, it cannot be assured that parents might transfer some diseases when feeding their children with using their bare hands if they do not practice proper hygiene. Second, the tendency of blowing the food before giving food to their children is another possibility to transfer the PTB germs.

In addition, since Indonesia's culture magnify the generosity and hospitality, as a respectful attitude should be manifested, handshaking slowly and with sincerity as an initial greeting is practiced (Kwintessential, 2018). Indeed, the greetings by kissing parent's hand or parents kissing child on face show essential respect and good relationship between parents and child. Those practices could promote the transmission of PTB when the parents have active PTB or have latent PTB, or have been exposed to the microorganisms.

PTB Prevention Practices

One of the health target, highlighted in goal number three of the Sustainable Development Goals (SDGs), as continuing program of Millenium Development Goal (MDGs) for the next 15 years is to end the epidemic of Tuberculosis (UNDP, 2018).

Indonesia government has a PTB program known as Temukan Obati Sampai Sembuh Tuberkulosis (TOSS TB) or Find and Treat Tuberculosis Until Recovery which was established on April 2, 2016 during the culmination of the commemoration of World TB Day which is celebrated every March 24 (DEPKES, 2016). The TOSS TB health professionals' activities included the Door Knock activity, a home visit done by health care practitioners to locate and identify TB suspected cases and provide counseling on TB prevention and control (DEPKES, 2016).

PTB incidence can be avoided through prevention practices. As stated by the United Nation (2015) the prevention, diagnosis, and treatment intervention has saved an estimated 37 million lives between year 2000 and 2013 and has reduced the prevalence rate. Therefore, there is a need to fight Tuberculosis and its causes need a serious attention and concern for prevention. Though TB cause by Mycobacterium tuberculosis has been discovered more than a decade by Dr. Robert Koch, the elevation of PTB incidence remain a major challenge that interferes in the TB end program (Fuady, Pakasi, and Mansyur, 2017). One of the worldwide target is to prevent the inactive PTB infection or latent tuberculosis infection (LTBI) to become active PTB by using PTB medication. The increasing of PTB prevalence in the community due to environmental factors and behaviors such as lack of health concern, lack of personal hygiene, and lack of hygienic practices in the surrounding where people lives (Azhar & Perwitasari,

2013). Truly, prevention practices should be encouraged earnestly in the community. Perpetual supervision, awareness and prevention practices are required for PTB prevention (Alami et al. 2014). Health care providers in both local and urban areas should be motivated to connect with the community to promote awareness. Everybody has a significant role for PTB prevention. Preventive behaviors play an effective role in reducing or slowing transmission of PTB and will complement prevention efforts.

In order to obtain the goal to defeat the pulmonary tuberculosis, the community must be equipped with proper knowledge of PTB in the action of implement the prevention practices. Continued existence of PTB may be due to being inefficient to practice the prevention of PTB. As mentioned by WHO (2018b), one of the three strategic pillars that is needed to be put in place to effectively end the epidemic is prevention.

Hygienic practices are a contributing factor to the health of an individual and play an imperative role for prevention of PTB. Not doing handwashing after coughing or sneezing, not covering the mouth during coughing or sneezing, and not properly disposing the contaminated materials will promote the transmission of PTB. It is important to ensure that hands are clean and washed and avoid touching the face and contact wtih people who are sick with PTB (Ratini, 2016).

Indonesian residents in the urban and rural areas performed a different way of hygienic practices between the wealthy family and low-income family. According to Indonesia National baseline data from 2007, only almost a quarter of the Indonesian population had demonstrated precise washing hand (Park, Laksono, Sadler, Clements, & Steward, 2015). In their study, they found out that families with and without latrine in their house do not practice cleaning their hands before having a meal, they do not use plates to have a meal, and consume fruits without washing or removing the fruit's skin. This finding supports the existence of poor hygienic practices in Indonesia. Indeed, this is consistent with the lack of prevention practices against many diseases, including PTB.

Another recent investigation by Koem, Joseph, and Sondakh (2015) among Indonesian pupils in North Minahasa, Indonesia, stated that there is a strong relationship between knowledge and behavior. When a student is equipped with proper information, the student may support proper hygiene and practice promoting health behavior. On the contrary, though Indonesia has developed a program called Clean and Healthy Living Behavior (CHLB) or Perilaku Hidup Bersih Sehat (PHBS) to promote the hygienic practices among students in a school religion-based in Indonesia, Moslem, Susanto, Sulistyorini, Wuryaningsih, and Bahtiar (2016) found out in their investigation with pupils' personal hygiene and health behavior, that the program

did not or cause a positive change in his improve to pupil's personal hygiene and health behavior. The researchers concluded that knowledge might improve one's personal hygiene and health behavior is taught; however, it seems to have no influence to change the poor behavior that may be affected by other factors. Despite those findings, a proper knowledge still essential to be taught to support prevention practices.

A study by Fitria, Sussana, and Eryando (2017) regarding personal hygiene and sanitation in the cafeterias at University X in Depok, Indonesia, found out from 83% of the participants, stating that the 99 food handlers who works in the cafeteria, did not practice appropriate hygienic routines or protocols, and 95% of the cafeteria has inadequate sanitation of facilities. Apparently, this situation might result to the spread of germs to other individuals, supported by a finding 14,1% food handlers still handling foods when they are sick (Fitria, Sussana, & Eryando, 2017). Although, the researchers did not describe the particular diseases that food handlers have experienced, it cannot conceal the fact that the disease transmission may have transpired due to poor hygienic practice.

Finally, a recent study by Wispriyono, Sari, and Kamarudin (2016) about an impact of basic sanitation and healthy behavior to healthy homes condition in Cilegon City and Kutai Kartanegara District found out that by using logistic regression, analysis showed that waste management, clean water, drainage, excreta disposal facilities, and physical condition were the variables that influenced the healthy homes condition. However, a healthy home that supports the prevention practices indicates a healthy latrine, clean water facilities, proper waste disposal management, good ventilation as well as personal hygiene. Therefore, if an individual could adopt a proper personal hygiene, a practice of disease prevention will be manifested.

METHODS

This study utilized the descriptive evaluative and descriptive correlational research designs. The investigation included Indonesians age range of between 20-55 years old as the participants. Using the multistage sampling technique, the population of the study were taken from five provinces in Indonesia with the highest PTB incidence during the year 2016-2017. It included North Sumatra, East Java, West Java, Central Java, and DKI Jakarta. Purposive sampling technique was employed in choosing the participants for the actual data gathering based on the following inclusion criteria: adults that had never experienced PTB case or have been diagnosed with PTB. An exclusion criterion for this study is applied if the participant has

exhibited any symptoms of PTB, such as coughing for two weeks or more, experienced night sweating, has significant weight loss, and fever. A three-part self-constructed questionnaire was utilized to gather data for the investigation. The questionnaire was conceptualized from related literatures and studies. The first part of the questionnaire dealt with the respondents' perceived susceptibility and threats that included 16-item questions. The second part had 7-item questions on cultural beliefs. The last part contained 15-item questions on prevention practices. Prior to the administration of the questionnaire, the instrument was submitted for content validation. Nine experts and two laymen did the content validation. The experts were composed of a statistician, two (2) methodologists, three (3) nursing experts, three (3) public health specialists, and two (2) laymen.

After the approval of the study, confirming the validity of the instrument, and finalizing the research instrument, an ethical clearance from the Ethics Review Board of the Research Office of the educational institution where the researcher enrolled was secured with the ERB protocol code 2019-ERB-AUP-005. Then, an endorsement letter from the Assistant Vice President Academics of Graduate Studies was obtained to start the data gathering. The researcher also secured an approval letter from the local government of urban village officers to gain entry to the different households. Finally, the questionnaire was administered to the respondents both in the city and rural areas. Each respondent in accomplishing the questionnaire utilized 15 to 20 minutes. Data gathering took place on March 2019. After the collection of all the questionnaires, the researcher encoded the data.

The data were tabulated, encoded, and analyzed through the Statistical Packages for Social Science (SPSS) program. The following statistical methods were utilized in this study: Frequency and Percentage were used to determine the level of Knowledge on PTB. Mean and Standard Deviation were utilized to determine the extent of perceived susceptibility and threats, perceived barriers, perceived benefits, cues to action, and prevention practices. Correlation Analysis, Pearson's Product Moment Correlation Coefficient was used to determine the relationship between the knowledge, perceived susceptibility and threats, perceived barriers, perceived benefits, and cues to action and prevention practices. Structural Equation Modelling (SEM) using AMOS was used to compute the moderating role of cultural beliefs to the relationship of knowledge, perceived susceptibility and threats, perceived benefits and barriers, and cues to action to the prevention practices. Multiple Regression Analysis was used to predict the variable for PTB prevention practices

RESULTS

Respondents' Extent of Perceived Susceptibility and Threats

Table 1 reveals the extent of Indonesians' perceived susceptibility and threats. All responses to the question revealed high perceived susceptibility and threats with a grand mean of .755 (SD = .421). The highest mean is on item number 5 which stated, Living in a neighborhood with PTB person will increase the risk of contracting PTB (mean = .842, SD = .365) followed by items numbered 2 and 14 with the same mean and standard deviation value (mean = .835, SD = .327) that stated, Children are susceptible to acquire the disease when exposed to adults with PTB and Serving food to children that has been blown by a person with PTB will allow the transmission of PTB. Next, items numbered 4 and 3 were placed on third highest perceived that stated, Direct interaction with a person with PTB will increase the chance of having PTB and Poor personal hygiene will allow the transmission PTB germs (mean = .832, SD = .374 and mean = .830, SD = .377) respectively.

Respondents have also high perceived susceptibility and threats for the next following order of statements which stated, Poorly ventilated room increases the concentration of PTB germs with mean score of .822 (SD = .383), Living together in a house with a person with PTB will make other members of family more vulnerable to have PTB (mean = .817, SD = .387), Spitting anywhere could be a way to spread PTB germs (mean = .789, SD = .409), Smoking will make a person prone to have PTB (mean = .763, SD = .426), Crowded places will increase the chance of inhaling the PTB bacteria (mean = .761, SD = .427), Kissing baby's face might transfer the PTB germs (mean = .710, SD = .454), Blowing off the food before feed the children allow PTB transmission (mean = .700, SD = .459), Poor hand washing after shaking hands will make a person contact with PTB bacteria (mean = .684, SD = .465), Poor nutrition will increase the chance of having PTB (mean = .654 SD = .476), and Blowing off a painful or red eye may allow PTB transmission (mean = .611, SD = .488). The item that got the lowest mean is on item 6 which stated, Handshaking increases the likelihood that a person will have a contact with PTB germs with mean .588 and standard deviation .508.

Table 1. **Respondents' Extent of Perceived Susceptibility and Threats (N=393)**

No.	Perceived Susceptibility and Threats	Mean	SD	Scale Response	Qualitati Descriptor
1	Spitting anywhere could be a way to spread PTB germs	.789	.409	Agree	High

No.	Perceived Susceptibility and Threats	Mean	SD	Scale Response	Qualitati Descriptor
2	Children are susceptible to acquire the disease when exposed to adults with PTB	.835	.372	Agree	High
3	Poor personal hygiene will allow the transmission PTB germs	.830	.377	Agree	High
4	Direct interaction with a person with PTB will increase the chance of having PTB	.832	.374	Agree	High
5	Living in a neighborhood with PTB person will increase the risk of contracting PTB	.842	.365	Agree	High
6	Handshaking increases the likelihood that a person will have a contact with PTB germs	.588	.508	Agree	High
7	Poor hand washing after shaking hands will make a person contact with PTB bacteria	.684	.465	Agree	High
8	Smoking will make a person prone to have PTB	.763	.426	Agree	High
9	Poor nutrition will increase the chance of having PTB	.654	.476	Agree	High
10	Crowded places will increase the chance of inhaling the PTB bacteria	.761	.427	Agree	High
11	Living together in a house with a person with PTB will make other members of family more vulnerable to have PTB	.817	.387	Agree	High
12	Poorly ventilated room increases the concentration of PTB germs	.822	.383	Agree	High
13	Kissing baby's face might transfer the PTB germs	.710	.454	Agree	High
14	Serving food to children that has been blown by a person with PTB will allow the transmission of PTB	.835	.372	Agree	High
15	Blowing off the food before feeding the children allow PTB transmission	.700	.459	Agree	High
16	Blowing off a painful or red eye may allow PTB transmission	.611	.488	Agree	High
	Grand Mean	.755	.421	Agree	High

Relationship Between Perceived Susceptibility and Threats and Prevention Practices

Table 2 presents the correlation analysis to determine the relationship of Indonesians' perceived susceptibility and threats to PTB prevention practices. As shown in Table 14, there was a positive significant relationship between perceived susceptibility and threats and PTB prevention practices with a correlation result of $\rho = .000$ ($r = .320^{**}$). Therefore, the hypothesis that stated, There is no significant relationship between perceived susceptibility and threats and prevention practices among adults in Indonesia is rejected. The relationship between perceived susceptibility and threats and PTB prevention practices ($r = .320^{**}$) was considered a weak correlation according to Schober, Boer, and Schwarte (2018).

Table 2. **Relationship Between Perceived Susceptibility and Threats and Prevention Practices (N = 393)**

Variable		p-value	Sig. (2-tailed)	Interpretation
Perceived Susceptibility and Threats	Person r Correlation	.320**	.000	Significant Weak

Legend: 0.00-0.10 = Negligible; 0.10-0.39 =Weak; 0.40-0.69 = Moderate; 0.70-0.89 = Strong; 0.90-1.00 =Very Strong

The Moderating Role of Cultural Beliefs in the Relationship of Perceived Susceptibility and Threats to PTB Prevention Practices

The data was analyzed using Individual Model as shown in the Table 3 Figures 1, the results showed that there was a moderating role of cultural beliefs in the relationship of perceived susceptibility and threats (estimate value of - .053, ρ = .000). Therefore, the hypothesis that stated, Cultural beliefs has no moderating role in the relationship of perceived susceptibility and threats to the prevention practices of pulmonary tuberculosis is rejected

Table 3. **The Moderating Role of Cultural Beliefs in the Relationship of Perceived Susceptibility and Threats to the PTB Prevention Practices**

Path			Estimate	p-value	Significant Decision
PP	←	PST	.201	< 0.001	
PP	←	PSTCB	- .053	< 0.001	Reject Ho
PP	←	CB	.399	.018	

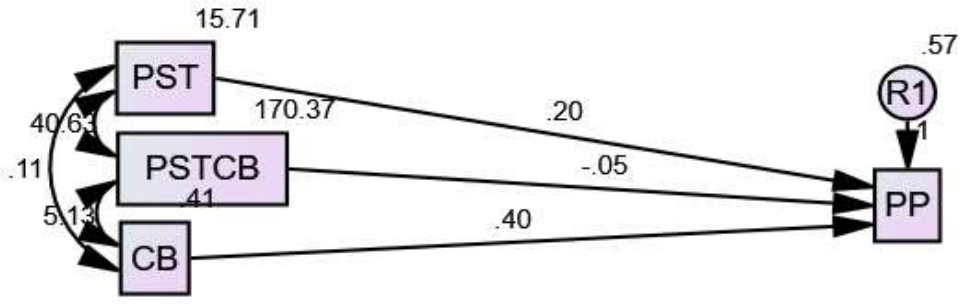

Figure 1. Individual Model of Moderating Role of Cultural Beliefs in the Relationship of Perceived Susceptibility and Threats to the PTB Prevention Practices

DISCUSSION

Respondents' Extent of Perceived Susceptibility and Threats

Since all the items revealed high responses, this implies that Indonesian adults understand that certain conditions and practices would lead them or put them at risk to be infected with PTB. As shown in the result of this study, the highest mean (.842) was the question on "Living in a neighborhood with PTB person would increase the risk of contracting PTB". The Indonesians have the culture of living together (Wiryomartono, 2014). The habit of being together was also observed in the community. Thus, if there is an undiagnosed or untreated PTB sick person among the family or community, indeed, that sick person might have the possibility to infect another healthy person.

Narashiman, Wood, MacIntyre, and Mathai (2013) argued that living together or nearby a sick person suspected with PTB would place them in a zone with a high tendency to be sick with PTB. Carter (2018) added, that one in twenty close contacts contracted TB, with three-quarters of diagnoses made within three months of the diagnosis of the index patient. Further, an investigation by Morrison et al. (2008) related to household contact from early 20th century and wide epidemiological surveys which included 41 studies that was conducted in 17 countries (49% in Africa, 29% in Asia, and 22% in Central and South America) concluded that the overall yield for all tuberculosis (bacteriologically confirmed and clinically diagnosed) was 4.5% (CI = 4.3 – 4.8) of contacts investigated; for cases with bacteriological confirmation the yield was 2.3% (CI = 2.1 – 2.5) and latent tuberculosis infection was found in 51.4% (CI = 50.6 – 52.2) of contacts investigated.

Moreover, a research done in Tangerang, Indonesia stated that many Indonesian mothers were aware and perceived the significant role of the personal hygiene in handling the food to prevent illness, transmission of bacteria, and promote wellbeing (Usfar, Iswarawanti, Davelyna, & Dylon, 2010). The study concluded that a high perception of proper personal hygiene will decrease the transmission of PTB bacteria.

In addition, Narashiman, Wood, MacIntyre, and Mathai (2013) mentioned that that the behavioral factors such as unhygienic practices had a relation to escalate the susceptibility to infection. The study of Putera, Pakasi, and Karyadi (2015) in Nusa Tenggara argued that one's point of view and understanding of PTB showed an imperative role related to treatment and motivation to seek care. The result of the study suggests that high perception of susceptibility and threats to PTB should be maintained.

Relationship Between Perceived Susceptibility and Threats and Prevention Practices

The positive correlation means that the higher the perceived susceptibility and threats of the respondents, the higher is the prevention practices. This implies that the perceived susceptibility and threats has influenced over their prevention practices. But, based on descriptive results in this study, the respondents have high perceived Susceptibility and threats but with sometimes (mean = 3.347, SD = .826) apply prevention practices. Despite the fact that Indonesian adults have high perception and have acknowledged the susceptibility and threats of PTB illness and the possibility to be ill, their health behavior to prevent PTB disease is not at its fullest. Preventive practices on PTB of adult Indonesians might have been influenced by other factors.

Along with the findings, a cross-sectional study done in Japan by Yoshitake, Omori, Sugawara, Akishinonomiya, and Shimada (2019) with a nationally representative sample (N = 911; 50.9 percent women; mean age 49.5, SD = 14.1), revealed that through path analyses the researcher found out there was a significant association of perceived susceptibility to TB preventive behavior. In contrast, a study done by Jadgal, Moghadam, Seiouki, Zereban, and Rad, (2013) contradicting the findings. Their study revealed that an elevation of behavioral skill (from mean 2.08 to 2.88) due to the increased of knowledge, will elevate perceived severity (from mean 11.08 to 12.19). Usfar et al. (2010) added that though the respondents had perceived that personal hygiene is an imperative issue to keep the body well, the majority of respondents did not use soap in hand washing after doing household chores.

The Moderating Role of Cultural Beliefs in the Relationship of Perceived Susceptibility and Threats to PTB Prevention Practices

The negative result of estimate value means that as cultural beliefs go stronger the relationship of perceived susceptibility and threats (estimate value of - .053) and PTB prevention practices become lowered. The impact of perceived susceptibility and threats on PTB prevention practices is weakened when cultural beliefs were considered. The result implies that among Indonesians even with, high susceptibility and threats, because of their cultural beliefs, their prevention practices is lowered. The findings revealed that the PTB prevention practices of adult Indonesians were influenced by their cultural beliefs.

A comprehensive literature review of 166 HIV prevention and risk reduction interventions, published between 1988 and 2010, identified 34 interventions that have varied cultural definitions and the integration of cultural concepts (Wyatt, Williams, Gupta, & Malebranche,

2012). Their study determines that HIV/AIDS prevention and risk reduction interventions that incorporated aspects of cultural beliefs. They concluded that the existence of cultural beliefs role that recognized in order to alleviate the risk of HIV/AIDS practices. Moreover, they supported a research within a contextual framework that incorporated cultural beliefs for prevention to diminish the disease, particularly in high prevalence zone (Wyatt et al., 2012).

Agus, Horiuchi, and Potter (2012), in their study about antenatal care investigated that women's traditional beliefs grounded in religion and tradition, makes it difficult for medical health care to advance in the community. The research clearly argued that cultural beliefs could not be separated from the community performance to exhibit the health behavior practices. Indeed, the cultural beliefs has an influence to the prevention practices of PTB.

Conclusion

Adult Indonesians have high perceived susceptibility and threats and practice the PTB prevention sometimes. Their PTB prevention practices have not yet reached to its maximum effort and effect. Perceived susceptibility and threats has a positive weak significant correlation to the prevention practices of PTB. The higher the perceived susceptibility and threats the better are the PTB prevention practices.

Moreover, cultural beliefs have a moderating role in the relationship of perceived susceptibility and threats to the prevention practices. The stronger the cultural beliefs, the weaker is the impact of perceived susceptibility and threats on the prevention practices of PTB. This means that cultural beliefs of adult Indonesians have a great influence on their PTB prevention practices. They have high regard of their cultural beliefs that affected their PTB prevention practices. The result of the study supported and confirmed the Health Belief Model assumptions that the likelihood of action such as health prevention practices were influenced by perceived susceptibility and threats and cultural beliefs.

Based on the findings of this study, the researcher recommends the following:

Indonesians should be educated regarding the importance of PTB prevention practices. They should not only be informed but taught to promote understanding and be able to implement the prevention practices properly. They should be encouraged to perform the right personal and environmental hygiene practices.

The government's health department and private health sectors should create programs, strategies, and approaches that would disseminate awareness on the issue that the cultural beliefs and traditional practices of Indonesians affect the health of the people in the community.

The Indonesian government must support studies focused on the culture and beliefs so that the right approach can be developed and utilized, and that preventive practices can be incorporated to daily living without much resistance, eventually, be accepted and integrated naturally into their ways of living.

Seminars at the lower level of district or urban village can be done to reach people who have very strong convictions about their culture and traditions to bridge their knowledge and understanding as they transition to adoption of health new beliefs. Moreover, training programs by native health practitioners, from higher or local government, and private sector leaders should be sought and conducted. This programs would be a way of equipping and encouraging them to support the implementation of prevention practices.

Further study can be done among other Indonesian adults from other provinces that are not included in this study or provinces of Indonesia. Other researchers may conduct related studies such as comparing of different population groups (urban and rural), and evaluation of health education intervention program, with a bigger sample size. Other researchers may also employ a qualitative research method as a follow-up to explore in depth understanding of the phenomenon.

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