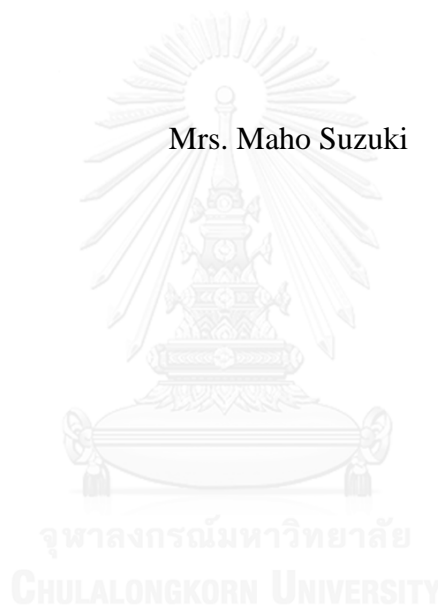The differences of characteristics between smokers and non-smokers among
TB patients in a socio-economically underprivileged area in the Philippines

Mrs. Maho Suzuki

A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Public Health Program in Public Health
College of Public Health Sciences
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ลักษณะที่แตกต่างระหว่างผู้ป่วยวัณโรคที่สูบบุหรี่และไม่สูบบุหรี่
ในพื้นที่ด้อยทางสังคมเศรษฐกิจในประเทศฟิลิปปินส์

นางมาโฮ ซูซุกิ

Thesis Title	The differences of characteristics between smokers and non-smokers among TB patients in a socio-economically underprivileged area in the Philippines
By	Mrs. Maho Suzuki
Field of Study	Public Health
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มาโฮ ซูซุกิ : ลักษณะที่แตกต่างระหว่างผู้ป่วยวัณโรคที่สูบบุหรี่และไม่สูบบุหรี่ในพื้นที่ด้อยทางสังคมเศรษฐกิจใน ประเทศฟิลิปปินส์ (The differences of characteristics between smokers and non-smokers among TB patients in a socio-economically underprivileged area in the Philippines) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: ผศ. ดร. อุษณีย์ พึ่งปาน, 64 หน้า.

บทคัดย่อ

ภูมิหลัง: การสูบบุหรี่เป็นสิ่งหนึ่งที่ทำให้เกิดโรคไม่ติดต่อที่ร้ายแรง ปัจจุบันนี้ร้อยละ 80 ของผู้สูบบุหรี่ในโลกนี้อาศัย อยู่ในประเทศที่มีเศรษฐกิจระดับต่ำและระดับกลาง ประชากรประมาณ 6 ล้านคนตายเนื่องจากการสูบบุหรี่ทุกปี และมากกว่า 600,000 คน ตายเนื่องมาจากการเป็นผู้สูบบุหรี่มือสอง นอกจากนี้ โรคติดต่อ อาทิ วัณโรค เป็นโรคที่ยากแก่การรักษา โดยเฉพาะอย่าง ยิ่งในประเทศด้อยพัฒนา สหพันธ์นานาชาติเพื่อต่อต้านวัณโรคและโรคปอด และองค์การอนามัยโลก แนะนำว่า การแนะนำให้หยุด สูบบุหรี่โดยเจ้าหน้าที่สาธารณสุขมีผลต่อผู้สูบบุหรี่ และยังแนะนำให้บรรจุโปรแกรมการเลิกบุหรี่ไว้ในโปรแกรมสุขภาพอื่นๆ อาทิ โปรแกรมวัณโรค สหพันธ์นานาชาติเพื่อต่อต้านวัณโรคและโรคปอดแนะนำให้บรรจุโปรแกรมการเลิกบุหรี่ไว้ในโปรแกรมวัณโรค เพราะการรักษาวัณโรคใช้เวลาอย่างน้อย 6 เดือนซึ่งเป็นโอกาสดีที่จะได้รับคำแนะนำการเลิกบุหรี่ ซึ่งเป็นที่รู้จักกันว่า การรักษา ภายใต้การสังเกตโดยตรง (DOTS) อย่างไรก็ตาม ยังไม่มีข้อมูลในกลุ่มประชากรรักษาวัณโรค ที่ด้อยทางเศรษฐกิจและสังคม การศึกษาครั้งนี้ ต้องการที่จะเปรียบเทียบลักษณะของผู้ที่สูบบุหรี่และ ไม่สูบบุหรี่ ในกลุ่มประชากรรักษาวัณโรคที่ด้อยทางเศรษฐกิจ และสังคม ผลของการศึกษาจะเป็นประโยชน์ในการเป็นข้อมูลการวิจัยต่อไปสำหรับองค์กร หรือรัฐบาลในการทำโปรแกรมการเลิก บุหรี่ในโปรแกรมวัณโรค วิธีการ: การวิจัยเชิงพรรณนาแบบตัดขวางในกลุ่มคนไข้วัณโรค จำนวน 263 คน เก็บข้อมูลระหว่างเดือน มกราคม 2557-มกราคม 2558 โดยใช้แบบสอบถามแบบมีโครงสร้าง ซึ่งประกอบไปด้วย 6 ส่วน ได้แก่ ข้อมูลส่วนตัวคนไข้ ลักษณะ ประชากร สังคม อาการวัณโรค แรงจูงใจในการสูบบุหรี่ สถานภาพการสูบบุหรี่ และความรู้ความเข้าใจการสูบบุหรี่ การศึกษานี้จะใช้ เครื่องวัดการสูบบุหรี่ (Smokerlyzer) เป็นตัววัดระดับปริมาณคาร์บอน เพื่อแยกแยะการสูบบุหรี่ของคนไข้ การวิจัยนี้วิเคราะห์ข้อมูล ด้วยการใช้ไคสแควร์ (Chi-square) ผลการศึกษา: จากข้อมูลพบว่าลักษณะของผู้สูบบุหรี่และไม่สูบบุหรี่ไม่มีความแตกต่างกัน ใน เรื่องของลักษณะประชากรและสังคม อย่างไรก็ตาม พบความแตกต่างของการสูบหรือไม่สูบบุหรี่ใน 2 ประเด็นของแรงจูงใจในการ สูบบุหรี่ กล่าวคือ คำถามแรก ที่ว่าเพื่อนสนิทสูบบุหรี่หรือไม่ กลุ่มที่สูบบุหรี่จะมีเพื่อนสนิทสูบบุหรี่มากกว่ากลุ่มที่ไม่สูบ (chi-square=10.2402, p=.0372) ข้อ 2 ครอบครัวห้ามเรื่องสูบบุหรี่หรือไม่ กลุ่มที่สูบบุหรี่จะไม่ห้ามการสูบบุหรี่มากกว่ากลุ่มที่ไม่สูบ (chi-square=38.3368, p=.0000) อัตราการสูบบุหรี่ของครอบครัวอยู่ที่ 61.7% ในกลุ่มผู้สูบบุหรี่ และ 48.3% ในกลุ่มผู้ไม่สูบบุหรี่ และ เพื่อนสนิทอยู่ที่ 83.3% ในกลุ่มผู้สูบบุหรี่ และ 61.1% ในกลุ่มผู้ไม่สูบบุหรี่ นอกจากนี้ยังพบว่ากลุ่มที่สูบบุหรี่ (73.3%) พยายามจะ เลิกบุหรี่แต่ไม่สามารถหยุดสูบบุหรี่ได้ แต่ 96.7% ระบุว่าอยากจะเลิกบุหรี่ สรุปและข้อเสนอแนะ: การศึกษานี้ไม่สอดคล้องกับ การศึกษาในอดีตอื่นๆ เท่าใด อาทิ ความชุกของการสูบบุหรี่สูง ในพื้นที่ด้อยทางสังคมเศรษฐกิจ และพบความไม่แตกต่างของ ลักษณะของผู้สูบบุหรี่และไม่สูบบุหรี่ แต่ก็พบเรื่องแรงจูงใจของการสูบบุหรี่ที่แตกต่างกัน ผู้สูบบุหรี่อาจจะได้รับอิทธิพลจาก ครอบครัวและเพื่อน ดังนั้นการแทรกแซงเพื่อให้เลิกบุหรี่คงมิใช่แต่เฉพาะผู้สูบบุหรี่ อาจจะต้องรวมเอาบุคคลเหล่านี้เข้ามาในกลุ่ม ด้วย เพื่อลดการสูบบุหรี่ การควบคุมการสูบบุหรี่ในกลุ่มผู้เป็นวัณโรค เป็นความจำเป็นอย่างยิ่งในการดูแลสุขภาพ ทั้งนี้เพราะแต่ละ โรคมีผลในเชิงลบต่อสุขภาพ และค่าใช้จ่ายในเรื่องสุขภาพ จึงเป็นความจำเป็นที่จะต้องดำเนินการเรื่องวัณโรคและการสูบบุหรี่

สาขาวิชา สาธารณสุขศาสตร์   ลายมือชื่อนิสิต _____

ปีการศึกษา 2559   ลายมือชื่อ อ.ที่ปรึกษาหลัก _____

5578841253 : MAJOR PUBLIC HEALTH

KEYWORDS: TUBERCULOSIS / SMOKING / SMOKERLYZER / ECONOMICALLY-UNDERPRIVILEGED AREA / SMOKING CHARACTERISTICS

MAHO SUZUKI: The differences of characteristics between smokers and non-smokers among TB patients in a socio-economically underprivileged area in the Philippines. ADVISOR: ASST. PROF. USANEYA PERNGPARN, Ph.D., 64 pp.

Background: Smoking is one of the serious non-communicable health issues. Currently, 80% of the smokers in the world live in low- and middle income countries and many people die as a result of smoking or exposure to smoke. In terms of infectious diseases, tuberculosis (TB) still poses a serious threat. However, the relationship between smoking and TB. Smoking increases the risk of TB. Thus, International Union Against Tuberculosis and Lung Disease (IUATLD) and World Health Organization (WHO) recommended that smoking cessation programs are added into TB program. Effective smoking cessation programs require evidence based tailoring materials but there is a lack of the information about the community. This study aims to obtain data about the characteristics of smokers and non-smokers in urban economically underprivileged areas. The finding will be essential to guide further research for integrating smoking cessation program into TB programs. Methods: A cross-sectional study was conducted with 263 TB patients from January 2015 to January 2016. A structured questionnaire was used in this study. The questionnaire is composed of six sections: patient profile, socio-demographics, TB symptoms, smoking motivation, smoking situation and Smoking Knowledge test. All respondents had their CO level measured using a Smokelyzer when they were recruited as an inclusion criteria to specify smoker or non-smoker. The data was analyzed Chi-square test. Results: The Smoking rate in males was 19.0% and 3.8% in females. This rate was lower than the national data. Moreover, the data obtained indicated that there were no significant differences in the characteristics between smokers and non-smokers on their patient's profile, socio- demographics, TB symptoms and smoking knowledge test. However, there were significant differences in their smoking motivation which were the questions: 1. Does your close friend smoke? (χ^2=10.2402, p=0.0372), 2. Have you received smoking prohibit information from your friend? (χ^2=10.2402, p=0.0372) and from your family? (χ^2=7.6099, p=0.005805). Interestingly, the smoking rate of family members and friend among smokers were higher than non-smoker. In addition, many smokers (73.3%) tried to quit smoking but almost all of them were unable to stop smoking. However, 96.7% of them were still willing to stop smoking. Conclusion and recommendation: This study was not consistent with the previous studies showing high smoking prevalence rate in socio-economically underprivileged areas and there were no different found characteristics between smokers and non-smokers. However, the data showed significant differences in their smoking motivation which means that the smokers might be influenced by the smoking behaviors of their friends and family members. Therefore, smoking cessation intervention for not only smokers themselves but also their family members and their friends is also one of the keys to reduce smoking rate in the community. To control on the monograph on TB and smoking is strongly demanded in a current public health field.

Field of Study: Public Health

Academic Year: 2016

Student's Signature _____

Advisor's Signature _____

ACKNOWLEDGEMENTS

CONTENTS

LIST OF FIGURES

Page

LIST OF TABLE

Page

CHAPTER I

INTRODUCTION

1.1.Background

The fights against a both communicable disease, and non-communicable diseases (NCDs) are the largest issues in public health field worldwide, especially in developing countries. Smoking is one of the big health issues contributing to NCDs. Tobacco kills nearly 6 million people a year and it has the negative impact on economic productivity, living standards, development and human health. (Organization, 2015b) Most of the smokers in the world (84% or 1 billion people) live in developing countries and nearly half of men in low-income countries. (W. bank, 2011)

Nowadays, AIDS, tuberculosis (TB), and malaria are known as serious communicable diseases. Approximately 6 million people are dead as a result of those three major diseases. Among them, about one – third of the world's population has latent TB and 1.3 million died from the disease in 2012. Over 95% of cases and deaths are happened in developing countries. (Organization, 2013 2016b).

It is well known that tobacco smoking causes a variety of harmful consequences to health such as respiratory disease, cardiac disease, cancers, fetal deaths and so on, however, the relationship between tuberculosis and tobacco smoking is not widely well known It has been revealed extensively for the past decade. There is enough evidence to conclude that smoking casually associated with TB. The recent studies show that smoking is one of the most important risk factors such as increasing the probability of relapse after treatment, TB death and so on. (Chiang CY, 2007; Maruya V, 2002). In fact, more than 20% of global TB incidence may be attributable to smoking increasing the risk of contracting TB by more than two and half times. Thus, the World Health Organization Framework Control on Tobacco Control (WHO FCTC) was established in response to the globalization of the tobacco epidemic. (Organization, 2000). In order to reduce the smoking prevalence rate, WHO FCTC introduced tobacco control measures such as laws, regulations, and administrative decisions. One of those tobacco control measure is integrating tobacco cessation interventions into other health care programs. Therefore, coordinate national TB and tobacco control programs and integrating brief tobacco interventions into TB program activities, especially for people are at risk of TB infections are recommended by WHO. (Organization, 2009).

The previous studies show the association with low socio-economic status and smoking prevalence rate. The smoking rate is high among people with working class jobs, low incomes (Alan J Fkint, 1997) and low educational levels. (B P Zhu, 1996).

Smoking rate is decreasing in developed countries but increasing in developing countries. (Martin Bobak, 2000). In response to this, WHO Tobacco Free Initiative (WHO TFI) was established in 1998 to take measures the global tobacco epidemic. The TFI published 'Policy recommendation for smoking cessation and treatment tobacco dependence' in 2003. Smoking is the second major cause of death in the world. Tobacco is killing 5.4 million smokers and another six hundred thousand people by Second Hand Smoke (SHS) each year. It especially affects middle - aged men who are 35-69 years old, and has a great effect on the economy because of the lost productivity and excess of health care costs. (World Health Organiation, 2003).

There are six regional offices of WHO in the world and the Western Pacific Region (WHO/WPR) has the biggest number of smokers. Moreover, the number of female and young smokers is increasing. Approximately, 430 million of smokers, which means one third of the smokers in the world are in this region. The highest prevalence of premature deaths (86%) are caused by NCDs in developing countries. This data shows that people including the children in those areas are affected SHS occasionally.

The tobacco Industry shifted their target from high income countries to low - or middle - income countries because the knowledge of harm by smoking has disseminated among developed countries. The regulation of tobacco in developing countries is behind developed countries. Moreover, the industry has been continuing attractive sales campaign which focuses on the developing countries, thus, the smoking prevalence rate is increasing in those countries. Citizens of low- or middle- income countries spend much money on smoke tobacco rather than their education or health cost. It makes they are in property. (Organization, 2016a).

Tondo in Manila and Payatas in Quezon, in the Philippines are the big urban economically unprivileged communities in Metro Manila and located near the huge dump sites. Most of the people in those areas came from provincial areas to seek better jobs. However, due to their poor educational background and work experience, majority of them cannot find secure job with good pay and usually work in informal sector such as garbage scavengers, tricycle drivers or vendors and they earn the lowest guaranteed wages which below the poverty line. There are no distinct data regarding their socio - economic status and

smoking rate in the study sites but it is predicted that the smoking prevalence rate is high with low-income and less educational background.

Some specialist recommended according to the previous studies that smoking cessation into health system because every patient is screened for tobacco use and tobacco use status is documented, and patient who use tobacco are advised to quit and provided with options for evidence – based treatments. Smokers can take smoking cessation intervention at every their visit.(Health, 2014). Therefore, WHO and the International Against Union Against Tuberculosis and Lung Disease (IUATLD) recommended the smoking cessation program into TB program. (CBissell K, 2010). TB treatment is known as Directly Observed Treatment Short course, which is known as 'DOTS'. DOTS is the best curative and most cost effective TB treatment. which was advocated by WHO. It takes at least 6 months for the medication, so, the patients can take their smoking cessation support during the treatment by health professionals with evidence based, anytime they want.

Smokers who live in underprivileged area are not able to take pharmacotherapy or NRT even if they are willing to obtain those methods because of financial difficulties. Some studies show the effectiveness of the interventions by health professional. For instance, Raymond said 'Self-programs provide a modest but significant benefit in smoking cessation'. Moreover, he said 'Opportunistic interventions by health care providers have the potential to significantly reduce the prevalence of smoking'.(Niaura, 2008). This is a good opportunity the smoking cessation when TB patients who are smokers during the TB treatment. DOTS.

Previous studies indicated that the strong association with lower income [9], lower educational level (B P Zhu, 1996). Global Adult Tobacco Survey was conducted in 2009 by Department of Health, the Philippines (t. P. Department of Health, National Statistic Office the Philippines et al., , 2009). WHO TFI indicated that evidence-based background material tailored to their specific local needs but there are limited researches in study sites and no distinct data regarding smoking rate and the characteristics of smokers. WHO TFI evidence-based background material tailored to their specific local needs. (World Health Organiation, 2003). However, there are only limited researches were done regarding the smoking rate and smoking characteristics by socio economic status are not available in low income countries.

The number of TB case has been still increasing slowly but surely. It is well known that the risk is high to develop TB among the people living with HIV, however, the tobacco smoking is significantly associated with TB infection, disease or recurrent TB are not generally known.

WHO/IUATLD recommends the integrating smoking cessation program into TB program for the smokers with TB to encourage and provide to overcome the tobacco addiction during their 6 month's TB treatment. Moreover, WHO/IUATLD suggested that population-based polices is the effective in order to reduce the prevalence of smoking rate.

Generally, the prevalence rates of TB and also, HIV/AIDS are high in socio-economically underprivileged areas but the government or health organization have not focused on this population. Tailored materials which are based on information collected from the patients in the target area are required in terms of designing effective policies relevant to different smoker's characteristics. This study is the first step toward intervening in this population to search out the characteristics of TB patients who are currently smokers, as well as non-smokers who live in underprivileged areas.

1.2.Rationale

The important goal of health policy for many governments in developing countries, and for international agencies, is to reduce inequalities in health between the rich and poor. Moreover, less educated people in underprivileged are less likely to attempt to quit smoking. (Organization, 2009). It means, smoking people in poverty tend to smoke and cannot stop smoking.

The reason of the gap is lack of awareness of dangers of tobacco smoking due to their socio-economic background. To stop smoking make a good impact on their health in the long time and also, household expenses. Each government needs to take measures in order to eliminate the state of inequality cause by injustice in the economic structure.

The purpose of this study is to identify the characteristics of smoker and non-smoker among TB patients in underprivileged area as a pilot study of evaluating the effectiveness of smoking cessation into TB program. Some studies strongly recommended that smoking cessation program into TB program is required for the TB patients in order to reduce the risk of TB. (A.S. Pradeepkumar, 2008; Carlson.LE., 2000; Shen, 2009). Actually, many studies show the gap of smoking rate between rich and poor in developed countries but there is no data in developing countries. IUATLD said that 'By reducing smoking in the community, tuberculosis programs will make greater progress towards their goal of reducing tuberculosis infection and disease'. (Organization, 2016a). In the Philippines, there are smoking section and tuberculosis section in Department of Health (DOH). The both sections are understanding that smoking cessation into TB program is one of the keys to reduce the risk of TB, however, tobacco control law had acted in 2003 in the Philippines. (Republic Act 9211), and currently

smoking cessation policy is not completely established in the Philippines, and the two sections are not yet collaborating, so, they still need the data in order for the people who are in charge of administrative unit of government.

Giglotti said 'Tailoring materials to individual patients resulted in a small but significant benefit' (Analice Gigliotti, 1988), so, it is required more data to create the evidence-based materials which are suitable for the people in underprivileged area.

Therefore, as the first step of smoking cessation for TB patients that requires further research in terms of obtain the characteristics of smokers and non-smokers among TB patients. The research should be done within the context of a comprehensive tobacco – control strategy employing a broad range of evidence based.(World Health Organiation, 2003). WHO TFI proposed that to ensure sustainability of smoking cessation policies and programs need to incorporate these into other basic health care services. The obtained data will be used as the one of the essential sources when the government makes the smoking policy or regulation.

1.3.   Research Questions

Are there any differences of characteristics between smokers and non-smokers in the study area.

1.4.Research Hypothesis

There are the differences of the characteristics between smokers and non-smokers in underprivileged area

1.5.Research Objective

1.5.1. General Objectives

To identify the characteristics between smokers and non-smokers among TB patients in economically underprivileged area.

1.5.2. Specific Objectives

1) To identify the socio- demographic characteristics of smokers and non-smokers

2) To determine the TB status between smokers and non-smokers among TB patients

3) To determine the smoking motivation factor between smokers and non-smokers

among TB   patients

1.6.Operational Definitions

- Smoker : A person has smoked in the last 3 months, even a puff..

- Non-smoker: A person who has never smoked or who used to smoker but has not smoked in the last 3 monthes, not even a puff

- Tuberculosis (TB): Tuberculosis which is known as TB is caused by bacteria that most often affect the lungs, but it also may affect any other organs of the body such as the brain, the kidneys, or spine.

- Tuberculosis Patients: Patient who is infected by TB bacteria and developed active TB and on the treatment.

- Underprivileged area: Having less money, education, etc., than the people in the society: Having fewer advantaged, privileges, and opportunities than most people.

1.7.Biological measurement (Smokerlyzer)

Smokerlyzer is a range of breath Carbon monoxide (CO) monitors and testers which measure the small amounts of CO in exhaled breath. When a smoker inhales smoke from a cigarette, CO is absorbed into their blood through their lungs. Breath carbon monoxide is measured in parts per million (ppm) and blood carboxyhaemoglobin is measured in percentages (%COHb). The piCO$^+$Smokerlyzer which was applied in this study can display both measurements. The amount of carbon monoxide in a person's breath (ppm CO), which is a measure of blood carboxyhaemoglobin (%COHb). It also acts as an indicator of the possible level of around 4,000 toxic substances in cigarette smoke, 60 of which can cause cancer. ppm shows parts per million, it means one part of CO in one million parts of air (breath). This might not seem like very much, but ppm has a direct correlation with %COHb (the percentage of CO combined with hemoglobin in the blood)

Thus, in order to clarify the smoking status of TB patients, Smokerlyzer was used in this statudy as a biomedical measurement.(bedfont, 2014).

1.7.1. What is Carbon monoxide (CO)? How to use Smokerlyzer?

CO is a poisonous is a toxic, odorless, colorless, tasteless gas. CO is dangerous because it binds to hemoglobin in red blood cells about 200 times more readily than oxygen, depriving the body of vital oxygen.

1.7.2. How to use the Smokerlyzer?

1) TB patient inhale and hold the breath for 15 – second. However, if a patient may not be able to achieve the 15 seconds breath-hold, the interviewer should inhale and hold their breath when the breath test is started, and exhale.

 If necessary, before the count dawn has completed because the respondents in this study were TB patients and they have had the lung disease when they did the Smokerlyzer. In addition, all interviewers were Nurses. They could observe well the patient's condition and well know how to use the measurement.

2) Blow slowly into mouthpiece of Smokelyzer

3) Smokerlyzer shows the ppm level and equivalent % carboxyhaemoglobin (COHb) levels on the screen.

1.7.3. Classification of CO level

The CO level was classified in this study was 0-10ppm as Non-smoker and 11pm above as Smoker. In addition, Bedfont Scientific Ltd., which is make of Smokerlyzer classified Co level 0-6ppm as Non-smoker, 7-10ppm as Danger zone, 11-125ppm as Smoker, 16-25ppm as frequent smoker, 26-35ppm as addicted smoker, 36-50ppm as heavily addicted smoker and 51ppm and above as dangerously addicted smoker.

1.8.Conceptual Framework

Figure 1: Conceptual Framework

Smokers and Non-smokers among TB patients

Independent valuables	Dependent valuables

- Socio-demographic background
  - Gender
  - Age
  - Educational Background
  - Occupation
  - Income
  - Knowledge on smoking

- TB status
  - Symptom

- Smoking motivation
- Peer education
- Information

SMOKING STATUS

- Smoking
- Non-smoking

*Using 'Smokerlyzer' to check CO level in order to verify their smoking status.
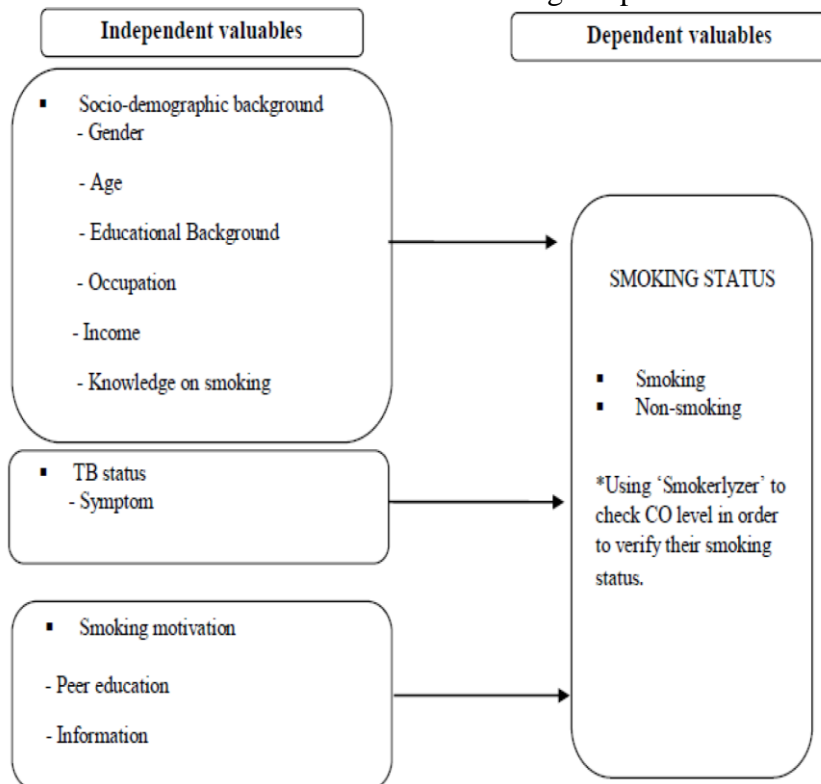
CHAPTER II
LITERATURE REVIEW

2.1.   Smoking situation in the world

There are estimated 1.3 billion smokers in the world and around 82% those smokers are living in low and middle income countries. It is well known that tobacco smoking and use tobacco products are the important behavioral risk factors on human health. It is estimated that 31% of men and 8% of women are smokers and nearly 6 million people are killed by tobacco related illnesses, and 12% of male death and 6% of female death in the world. The disparity of smoking rate between male and female is attributed to cultural traditions and gender inequalities. However, tobacco industry is targeting to female smokers using colorful designs for the package, or offering free promotional tobacco package and so on. Basically, the smoking prevalence rate is higher the men's than women's but the rate has been increased among women and young people recently.

If this trends persist, it is predicted that tobacco will be attributed to more than 8 million deaths each year and 80% of these premature deaths will be happened the people by 2030 who are living in low and middle income countries. (t. P. Department of Health, National Statistic Office the Philippines et al., , 2009).

Tobacco use has fallen over the past 3 decades, especially, smoking prevalence among men has 30% declined and there are greatest reduction rates in high income countries due to effectiveness of tobacco control actions. Smoking prevalence has also declined in low and middle income countries, however, many those countries have made only slight reductions or increase the rate because demanding for tobacco has fallen in developed countries, cigarette production and consumption is becoming increasingly concentrated in developing world because even the proportion of adult smokers was declined, the overall number of people smoking and number of cigarette smoked has increased since 1980. Moreover, this commentary discusses the tactics of the tobacco industry and the challenge for tobacco in middle and low income countries in the 21st century.(Organization, 2015a).

Therefore, to address the global tobacco burden, the World Health Assembly in 2003 adopted the WHO /FCTC. The objective of WHO/FCTC is to protect present and future generations from the devastating health, social, environmental and economic consequences of tobacco consumption exposure and currently around 90% of the world population is covered. (t. P. Department of Health, National Statistic Office the Philippines et al., , 2009; Organization, 2015a)

WHO aims to achieve a 25% reduction of deaths from non-communicable disease from 2008 to 2025 and to expand the smoking cessation expanding is the key to achieve the goal.

Smoking situation in ASEAN countries

Almost 599 million people or about 9% of the world population live in the 10 Association of Southeast Asian Nations (ASEAN) countries. 82% of smokers are living in low and middle income countries and 121 million smokers which correspond to 20% of current smokers are in ASEAN. (Alliance, 2014)

Accordingly increasing the smoking prevalence rate in the past half century, mortality rate which cause by tobacco smoking has risen rapidly from an estimated 0.3 million deaths in 1950 to almost 6 million in 2011 that means almost 10% of these deaths and losing one person for every 5 lives claimed by tobacco in ASEAN region.

The reason of raising the tobacco consumption in Asian countries is go back to after the second World War II. USA began exporting tobacco under the "Food for Peace Program" and the project exposed developing countries to Western-style cigarette. In the late 1960s, UK companies were also start to sell tobacco to many countries. Finally, the large multi-national tobacco companies based in Britain and the USA are largely responsible for the spread of the smoking habit to developing countries, especially, Southeast Asian countries were targeted by US tobacco companies during the 1980s. Currently, Western Pacific Region (WPR) on the WHO, the male prevalence (62.3%) and the rate of increase the highest in the world (Organization, 2016b).

Many people in ASEAN countries still believe that tobacco has a positive effective on economy. Actually, tobacco faming brings positive economic benefits to tobacco-growing countries, however, income is unstable due to drought or poor weather and farmers are at risk of health caused by chemicals or tobacco leaves. Moreover, unfortunately, child labor is common and they work on tobacco farms. However, according to cost-benefit analysis, tobacco growing in developing countries shows economic gains which are likely to be offset by long-term costs, thus, the World Bank stopped giving loans for growing tobacco in 1992.

Tobacco tax and price increases that reduce affordability of tobacco products are among the most effective measures to reduce tobacco consumption but the total tax burden of the retail price by the retail price by the World Bank and WHO tax haven't reached in almost all ASEAN countries except Singapore and Thailand. (Alliance, 2014).

Moreover, most of low smoking prevalence countries must show their identification when a person purchases cigarette or tobacco products but ASEAN countries usually easily

access to tobacco because normally able to buy tobacco without any identification and a vender sells a peace of tobacco on the street with cheap price (Alliance, 2012).

2.2   Tuberculosis situation in the world

Tuberculosis (TB) is one of the top 10 causes of death in the world. It is infectious disease caused by the bacillus which spread from person to person and normally affects the lungs but can affect other organs as well. There were an estimated 10.4 million new (incident) TB cases worldwide, of which 5.9 million (56%) were among men, 3.5million (34%) among women and 1.0 million (10%) among children. TB mostly affects adults in their most productive years which are 18 to 60 years old and it has economically negative impact on the household due to loss of income in the family. However, all ages are at risk including infant and children and 95% of TB cases happen in developing countries and the largest number of new TB cases occurred in Asia with 60% of new cases.

For diagnosis of TB, microscopy is widely used which is called sputum smear microscopy but difficult to detect in case few bacteria in sputum case and cannot detect drug resistance case. Currently, the rapid test has been expanding since 2010 and it can simultaneously detect TB and diagnosis within 2 hours but not yet fully established worldwide. TB can be cured and as an estimated 49 million lives were saved through TB diagnosis and treatment from 2000 to 2015. However, to provide medicines and take by health professionals are required for the successful treatment.

Whilst as growing burden of HIV/AIDS cases, TB/HIV co-infection cases have been increasing. People living with HIV announced for 1.2 million which correspond to 11% of all new TB cases and at least one-third of people living with HIV in the world were infected with TB bacteria. People living with HIV are 20 to 30 times more likely to develop active TB and about 0.4 million people dead of HIV-associated TB and about 35% of deaths among HIV-positive people were due to TB in 2015.

Moreover, Multidrug –Resistant TB (MDR-TB) is another problem of TB. MDR-TB is also caused by bacteria but do not respond to mainly isoniazid and rifampicin which are the first-line anti TB medicines, and also there are many Extensively Drug Resistant TB (XDR-TB) cases happens. XDR-TB is also cause by TB bacteria which do not respond to the most effective second-line TB medicines and sometimes TB patients have not option of the treatment. Around 480,000 patients developed MDR-TB and 9.5% of those cases had XDR-TB in 2015. Unfortunately, only 52% of MDR-TB and 28% of XDR-TB patients were

successfully treated. WHO approved the use of a new regimen and also rapid diagnostic test in 2015 to quickly identify those patients but some limitations are there. Early response is demanded to solve those problems on TB by health organizations.

The World Health Assembly adopted a new global strategy which is called 'End TB Strategy'. This strategy aims to 90% reduction in incidence and 95% reduction in mortality by 2035, with no families facing catastrophic costs due to TB by 2020. (Kanabus, 2016; Organization, 2015a, 2016b)

2.3.   Smoking and poverty

All socioeconomic indicators were strongly associated with smoking among both men and women. (Socioeconomic status and smoking analyzing inequalities with multiple indicators). The data shows that a strong association between economic indicators such as GDP (Gross Domestic Product) and life expectancy. It means that poverty affects health by various intermediate factors.

Smoking is more common among poor men than rich men in almost all countries, even the rate among men in low- and middle- income countries are higher than in high-income countries. Tobacco consumption rates are higher than lower socioeconomic classes and less-educated groups. (A. D. Bank, 2009). According to the data in previous studies indicated that people in poverty spend their 10-20% household income for purchase tobacco or tobacco products. These families suffer serious morbidity and mortality due to tobacco use which accentuates determinants further.(Organization, 2012). Moreover, those people start smoking early age and develop tobacco related diseases while they are young or productive age. It is caused increasing the healthcare cost. It means that not only tobacco expenditure but also healthcare cost which was occurred by tobacco related illness is pressing the family budget. Smoking is a vicious cycle that poverty and disparities of income the smokers in underprivileged area.

Poverty itself is not a cause of high smoking rate. However, in terms of reducing the smoking prevalence rate among the people in poverty, the vulnerable population are the key to lead the decreasing the morbidity and mortality in the future. The effective programs to reduce the rate which based on the information in those people are required.(Alan J Fkint, 1997)

The recent studies show that smoking cessation by health professionals is effective. In order to reduce the smoking prevalence rate in the country level, it needs to take an action on

smoking cessation by health professionals in the community that supplies correct knowledge on tobacco. (Andrew Mclvor, 2009)

2.4.   Tuberculosis and poverty

Poverty leads illness and one of the representative diseases is TB. 80% of all TB cases in the world TB is much higher among people infected with HIV and also more common among men than women. It is affected mostly adults in the economically productive age groups. (Control, 2014). The proportion of economically poor people among general population is estimated as 26.3 % in 2015 in the Philippines.(Board, 2014).

TB was highly feared and as a result patients experienced discrimination from their family, their work place and in their community even TB is curable.(National Statistics Office, 2012). Normally, patients can take free of charge TB treatment but they need additional expenses such as transportation cost. TB makes poorer for the people who are in poverty. Moreover, TB bacillus (Mycobacterium tuberculosis) easily spread within a family because people in those area most likely to be malnutrition status and they live in a small and congested room with many family members without sufficient sunlight and ventilation. This living condition also easily spread TB bacillus other family members, so, not only TB patients themselves but also family members at risk of TB especially in economically underprivileged area.

2.5.   Smoking situation in the Philippines

The Philippines is one of the ASEAN countries sovereign island which consist to more than 7,000 islands in the country in Southeast Asia
In the Philippines, it is estimated that 28.3% of adults are smoking (Male=47.7%, Female=9.0%) and, the percentage distribution of total adult smokers is second highest in ASEAN countries. Tobacco kills at least 87600 Filipinos per year (240 deaths every day) and one third of these are men in the most reproductive age of their lives. (P. Department of Health).

The Philippine is the world's twelfth most populous country with projected population estimates of 101.8 million by 2015 and over 132.5 million by 2040. Total

health expenditure per capita is estimated at US$66. (Wikipedia). The Philippines has one of the highest per capita level of cigarette consumption among the ASEAN countries. (Alliance, 2012).

The Philippines has long been an unrestricted operating environment for tobacco companies, ripe for corruption and exploitation. Political cronyism was endemic for decades, allowing companies to capitalize on their marketing freedoms to the fullest potential in order to market their products to children younger than any segment hitherto revealed in tobacco industry document research.(Organization, 2009).

The Philippines government ratified the WHO Framework Convention on Tobacco Control (FCTC) in 2005, then DOH established national Tobacco Prevention and Control program in 2007 in order to control smoking epidemic in the Philippines. (Wikipedia).

Global Adult Tobacco Survey Philippines, (GATS) was carried out in 2009. The results of the survey indicated that 28.3% (17.3 million) of the population were current smokers and 80% of them were daily smokers. (t. P. Department of Health, National Statistic Office the Philippines et al., , 2009). The Philippines is the 15th biggest consumer of cigarettes in the world and the second largest consumer among the ASEAN countries.(Alliance, 2012). In addition, the smoking prevalence rate among female is highest rate in the Philippines among ASEAN countries.

Table 1: Prevalence of tobacco use

Tobacco use data from the latest survey results available to WHO as at 31 December 2012

(WHO Report on the Global Tobacco Epidemic 2013, country profile Philippines)

Smoked tobacco prevalence	Among youth		Among adults			
	Current tobacco use	Current cigarette use	Current tobacco smoking	Daily tobacco smoking	Current cigarette smoking	Daily cigarette smoking
Male	18.8	12.9	47.6	38.2	47.3	38.0
Female	9.3	5.3	9.0	9.0	8.7	6.7
Total	13.7	8.9	28.3	22.5	…	…

Youth: Global Tobacco Survey, 2011, ages 13-15

Adult: Global Tobacco Survey 2009: National, ages 15+

Tuberculosis situation in the Philippines

2.6.   Tuberculosis situation in the Philippines

The Philippines is one of the Western Pacific Region (WPR) which is one of the six regions of the World Health Organization and there are 37 countries. TB prevalence and mortality rate have been reducing remarkably since 1990. It is estimated 9.5 million lives saved since 2000 owing to expand the national TB program as the basic TB services package and it is most cost effective and high impact that reaches to each TB patient especially in developing countries in WPR.

In the Philippines, despite this achievements, TB is still one of the common infectious diseases in the Philippines. It ranked as the sixth among the leading causes of morbidity and mortality in 2009, and also ranked 16th among 22 TB high burden countries in the world which have been given the highest priority at global levels. in 2014 which was indicated by WHO. As an estimated 250,000 Filipinos are to be infected by TB bacteria every year and approximately 75 TB patients die every day. 87% of new TB cases occurred in the country that it has the second largest number of cases in WHO/WPR. (Office, 2016). Moreover, basic TB services are available for free charge but their suffering from loss of income due to TB or transportation fee to go to the TB clinic.

Department of Health in the Philippines (DOH) started Directly Observed Treatment, Short-course (DOTS) in 1996 and has achieved full coverage of DOTS program nationwide in 2003 with active support by international and domestic agencies. The Philippines achieved the global targets, 70% case detection of new smear positive TB cases and 89% treatment success rate in 2007. (Alliance, 2012).

DOH provides TB training for health staffs who are in charge of TB service in order to develop the human resources. TB services such as drug supply, X-ray and sputum examination are provided for TB patients for free of charge under Global Fund. However, there are still luck of human resources and medical supply, thus, Non-government provides TB services and another kind of medical services to compensate the governmental support, especially underprivileged areas.

In addition, the Philippines still a low-HIV prevalence country that HIV positive rate is less than 0.1% of the adult population. Moreover, MDR-TB is also one

of the TB problems in this region. Annually, there are an estimated 71,000 new MDR cases as average in this region but success rate was only 52% in 2011. (Office, 2016)

2.7. Tobacco smoking and tuberculosis

Tobacco use greatly increase the risk of TB disease and death that more than 20% of TB cases in the world are attributed to smoking. There are enough evidences to conclude that smoking casually associated with TB disease. Recent study shows tobacco smoking is one of the most important risk factors that greatly increasing the risk of TB disease and death.

favors the progression from latent TB infection to pulmonary TB disease, increasing year by year, especially in low- and middle – income countries. There are increasing the population, so, tobacco industry makes them as a target to expand their market. More than 80% of the world's tobacco – related death occurs in those countries. This is the cause of the higher prevalence smoking rate tan developed countries.(Organization, 2009).

Moreover, Second-hand smoke (SHS) aggravates the problem. It is estimated that almost 50% of men are smokers and half of all women in low or middle income countries are regularly exposed to second-hand smoke. People who do not smoke but are exposed to smoking has a higher risk of being infected with TB bacilli and a higher risk of developing tuberculosis disease.(Disease, 2007).

Figure 2: Proportion of tobacco related death in ASEAN countries.
(The ASEAN Tobacco Control Atlas Second Edition, September, 2014)
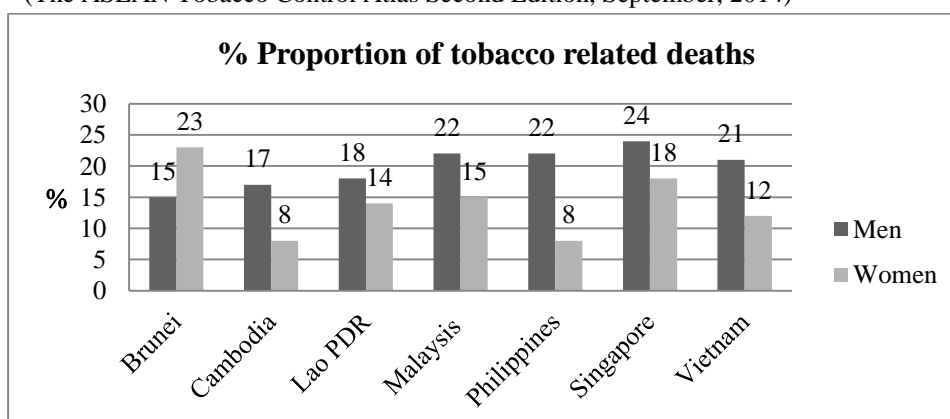
CHAPTER Ⅲ
RESEARCH METHODOLOGY

3.1.   Research Design

Cross – Sectional study was used to determine the differences of the characteristics between smoker and non-smokers among TB patients in underprivileged area, Metro Manila, the Philippines.

Study Area

Metro Manila (Metropolitan Manila) is the National Capital Region (NCR) in the Philippines. Metro Manila is the most populous areas and the 11th most populous in the world in 2010. It is composed of 16 cities which are, Manila, Caloocan, Las Piňas, Makati, Malabon, Mandaluyong, Marikina, Navotas, Pasay, Pasig, Paraňaque, Quezon, San Juan, Taguig, Valenzuel and Municipality of Pateros. Most likely due to confusion, Manila city is the capital city in the Philippines, but Manila city is one of the cities of NCR. Among them, our study sites are, 1) Tondo District 1 in Manila city, 2) Payatas A and B district in Quezon city, both cities are in Metro Manila, the Philippines. (Wikipedia).

In the Philippines, the high and middle income class groups take up about 20% of households, and others are low-income class group households. Economic growth has been averaging at about 5 percent since 2002, significantly higher than the achieved in the previous 2 decades. While, rapid economic growth benefited only for high and middle class, it does not benefit for low-income class. It is happened the economic di8sparties between urban and rural, and rich and poor, thus, people urban poor remain in poverty even metro area was rapidly developed. (Wikipedia)

3.2.   Corporative Organization

This study will be held at 2 NGOs (Non-Government Organization) clinics in Tondo, Manila city, and, 3 NGO clinics in Payatas, Quezon city. Both study sites are located near damp site and people live in urban underprivileged area. It is said that most of the people who live there are under poverty line.

Tondo and Payatas are located in urban poor area. The public health service undertaken by the governments have not been effective enough there, even in urban area. Moreover, they cannot reach those health services due to their financial difficulties.

Therefore, NGOs provide the health service in those areas, as the results of those activities, the public health situation has been improved.

Nowadays, DOH provides the technical support to private organizations, so, NGOs are working in cooperation with governments. It means, NGO is one of the keys in order to success the smoking cessation, and also, TB program. Thus, we request cooperation to the following organizations.

Two NGOs in Tondo District 1:

1)   CANOSSA

2)   Sto Niño de Tondo

Three NGOs in Payatas:

1)   Payatas Orione Foundation

2)   German Doctors

3)   St Luigi Orione Foundation

Picture 1: The Location of the study area and corporative organizations
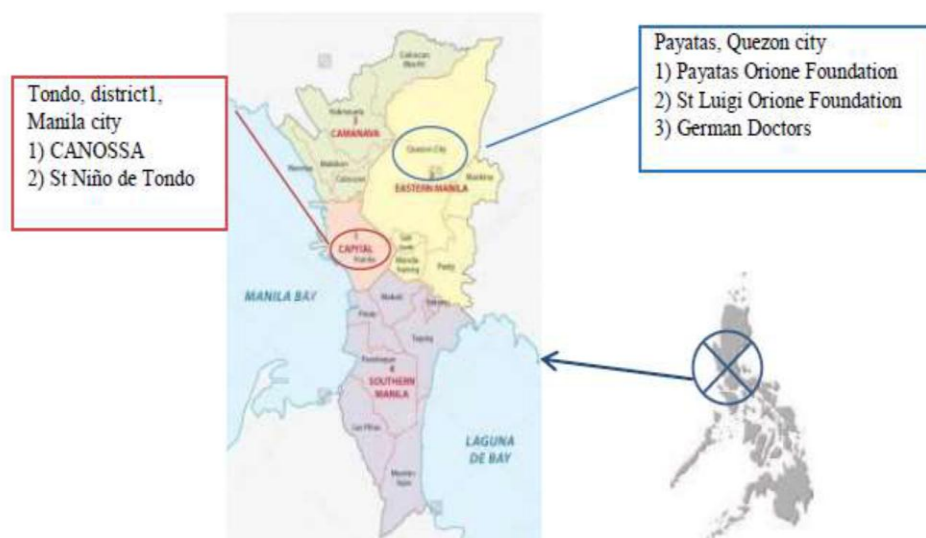
3.3.   Study Population

The target people in this this study is TB patients who come to our cooperative TB clinics which are managed by NGOs for their 6 month's TB treatment from January 2015 to January 2016. They are 18 years and above and newly diagnosed as pulmonary TB.

The reference data that the number of TB patients in the corporative organization in the past 3 year (Table 5) available TB patients who registered as TB patients only 15 years old and above, then the inclusion criteria of this study is 18 years old and above. However, this reference data can be one of the criteria for estimating the number of target number of criteria.

As a reference, the population was 407,330 in Tondo (Wikipedia, 2016b) and, 120,000 in Payatas but academic source predicted that the actual population to be almost 500,000 in Payatas (Wikipedia, 2016a). Anyhow, it is extremely difficult to estimate the real population in the area because the people in those areas do not have their permanent residence there.

Table 2: Number of TB patiennts in corporative organization in the past 3 years

Year	Payatas ( ) Under 15 yrs old	Tondo ( ) Under 15 yrs old	TOTAL (15 yrs and above)
2011	553 (19)	377 (94)	855
2012	507 (37)	312 (55)	801
2013	367 (29)	296 (45)	647
TOTAL	1427	985	2303

*15 years old and above

3.4. Inclusion Criteria

- Age: 18years old and above

- Newly diagnosed pulmonary tuberculosis patients

- TB patients who attend the corporative NGO clinics for their treatment

3.5. Exclusion criteria

- MDR (Multidrug resistant) TB patients

- TB patients who cannot well communicate with interviewer

3.6. Sampling Technique

According to the past 3 year's data, around 724 newly diagnosed TB patients who were 15 years old and above came to our cooperative TB clinics per year on average. It will be expected that more than 500 TB patients who will be the inclusion criteria will be

registered as a newly diagnosed TB patient. After the registration, the interviewer will have the interview at each clinic.

Figure 3: The categorization of smokers and non-smokers among TB patients
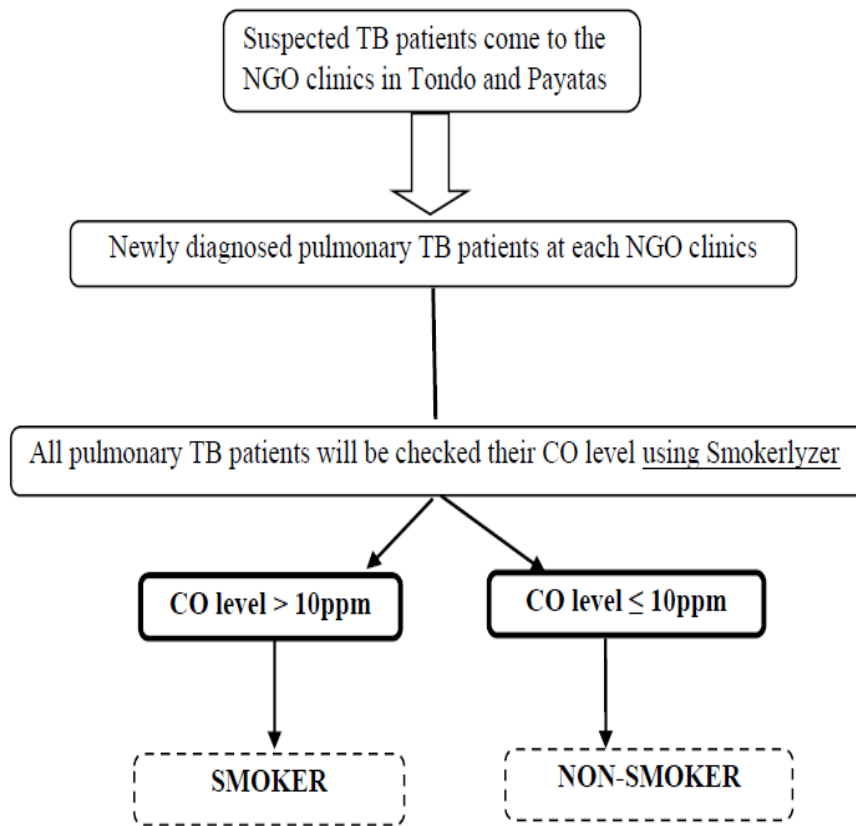
3.7.   Data collecting method

3.7.1.   Biomedical measurement

All inclusion criteria will be checked their CO level using Smokerlyzer in order to validate their smoking situation. If the patient said 'I am not smoker' but CO level is more than   11ppm, the patients will be enrolled as 'smoker'.

Interviews

One or two interviewer is at each clinic and they are working as a nurse who has experiences more than 3 years. WHO/WPRO office had dispatched a smoking cessation   trainer and our interviewers took one - day smoking cessation training

by the trainer, and also took a half day briefing about this research by a main researcher.

Total 5 researchers are involved in this study and one of them is working as a main assistant. She is a nurse and has a sufficient knowledge about TB. She supervises this study for maintaining in the quality of the research under the instruction of the researcher. The researchers are follows: CANOSSA in Tondo: 2 nurses

St Nino de Tondo in Tondo: 1 nurse

Payatas Orione foundation in Payatas: 1 nurse who is a main assistant researcher

German Doctors in Payatas: 1 nurse

St Luigi Orione in Payatas: 1 nurse

3.7.2. Structured questionnaire

A structured questionnaire was used for this study. The questionnaire composed of 6 sections which were patients profile, socio-economic background, TB symptoms, smoking motivation and, smoking situation which is for smokers.

The questionnaire is prepared in English. However, the interviewers will ask them in Filipino words which is Tagalog when they have face-to face interview with TB patients.

All interviewers are nurses at each corporative clinic, so they have knowledge about smoking and also, TB. They can speak English and Tagalog both fluently. They took one day training of smoking cessation by DOH staff.

Moreover, the patients will be checked their CO level using by Smokerlyzer in order to vilify their smoking situation. For all smokers, they will be asked nicotine dependence and hooked test to clarify the level of nicotine dependence.

The collected data must be treated as confidential and not use for another purpose.

3.8.   Sample and Sample size

According to Yamane (Yamane, 1967) with 95% confidence level and p value = 0.05, was used to calculate the sample size for this study as follows,

$$n \quad = \quad \frac{N}{1+N(e)^2}$$

The number of new pulmonary TB patients last year except the under 15 years is 647. Inclusion criteria is 18 years old and above but the data is not available.

$$n \quad = \quad \frac{647}{1+647(0.05)^2} \quad = \quad 247$$

TB patients who are currently smokers and non-smokers will be needed total 263 as a sample.

3.9.   Measurement tools

Two measurement tools were required. One is structured questionnaire in order to collect the data on socio-economical back ground, smoking perception, smoking situation and TB situation. The smoking perception test was from the tobacco free initiative section of WHO/WPRO. The participants take this test during smoking cessation training which is held by the tobacco free WHO/WPR.

The other tool was Smokelyzer in order to vilify the smoking situation among TB patients.

All collected data will be coded to ensure the confidentially of the participants in this study. Interviewers and research assistants provide the objective and procedure of this study and the participation of this study is voluntary basis.

3.10.   Data Collection Period

Based on previous data, the average number of TB patients who come to our study sites is 64 TB patients a month. We need 263 TB patients for this study, so it is expected that

the study will takes 5-6 months including the preparation of the research materials. The data collection period was January 2015 to January 2016.

3.11. Data Analysis (Statistics)

Categorical variables such as smoking situation, socio-economic background was summarized by Chi-square test and fishers exact test with 95% confidence level in order to compare the variables between 2 groups, and interval scale such as breath CO level was summarized by mean.

3.12. Reliability

To check the reliability of the smoking knowledge te4st, the Kuder-Richardson Formula 21 (KR-21) was applied and the result was 0.412499.

The solution of KR 21 is follows,

$$KR21 = \left(\frac{k}{k-1}\right)\left[1-\frac{\bar{x}(k-\bar{x})}{ks^2}\right]$$

k	=	17
$\bar{x}$ (mean)	=	10.3333
$\dfrac{\bar{x}(k-\bar{x})}{ks^2}$	=	1.38823
$1-\dfrac{\bar{x}(k-\bar{x})}{ks^2}$	=	-0.38823
(k/k-1)	=	17/16 = 1.0625
KR21	=	-0.412499058

The value was low but this knowledge test was provided by WHO/WPRO Tobacco Free Initiative. Therefore, this test was applied in this study

3.13. Validity

To ensure the content validity, it was done by reviewing previous literature and consulting with 3 experts. IOC was 0.6 – 1.0.

3.14. Ethical consideration

3.14.1. Ethical Approval

This study was done after getting the approval from the Ethics Review Committee for Research Involving Human Research Subjects Health Science Group, Chulalongkorng University. (COA No. 099/2015). Additionally, this study was approved by Research and Ethics Review Committee of Republic of the Philippines, Department of Health (DREC Approval No, DERC201209) and also, obtained the permission the conduct of research and district level.

3.15.1. Risk to the participants and mitigation measures

No psychological and physical risks or discomforts are anticipated from participating in this study. If the patients refuse to check their CO level using Smokerlyzer, the interviewer stop the process.

3.15.2. Equity considerations

All obtained data will be used only for this study. All study participants were treated with dignity and their rights were protected.

Investigators were mindful of the social, political and human implications of the research, especially careful in the presentation of findings from the research. This principle, however, in no way denies investigators the right to purpose any area of research or the right to observe proper standards of scientific reporting.

3.15.3. Informed consent

When all PTB patients come to TB clinic, informed consent were obtained from each patient who was eligible to join this research. The informed consent was translated English to Tagalog and it was given to each eligible patient. (Please see attached the informed consent form)

3.15.4. Privacy and confidentiality

To protect the privacy, each patient was asked the questionnaire and checked CO level in a consultation room in a TB clinic where away from another patient, and the obtained data was coded and kept in the drawer with a lock in each clinic, so that only we can identify them later. All records, the documents and electric data was destroyed after completion of this research.

CHAPTER Ⅳ

RESULTS

4.1. Results

This study examined to identify the characteristics between smokers and non-smokers among TB patients in economically underprivileged area where is Tondo, Manila city and Payatas Quezon city, Metro Manila in the Philippines.

The actual duration of data collection in this study was from January 2015 to January 2016 and the data analysis was divided into 3 parts which were following by the specific objective.

Section 1: Patient profile of the sample population

Section 2: The differences of the characteristics between smokers and non-smokers

Section 3: The differences of TB symptoms between smokers and non-smokers

Section 4: Smoking Motivation of the sample population

Section 5: Smoking situation of smokers among TB patients

Section 6: Smoking knowledge test between smoker and non-smokers

4.1.1 Patient Profile

Patient profile covers the gender, age group, the results of sputum test (Positive or negative) CO level which was validated by Smokerlyzer for TB patients.

1) Gender

Smoking prevalence rate of male was 19.0% and female was 3.8% in this study. Men-female ratio among smokers was 83.3% of men and 16.7% of female.

2) Age Group

The total number of TB patients were 263, 60 of them were smokers and 203 of them were non- smokers. 55 of non-smokers were ex- smokers but they were including as non-smokers because they never smoked in the last 3 months.

The average age of smokers were 37.9 years old, the mean of 263 TB patients was 38.9 years old. Inclusion criteria in this study was 18 years old and above. 11.7% of smokers and 17.7% of non-smokers were 60 years old and above.

3) The results of sputum test

According to the results of sputum test, 65% of smokers and 71% of non-smokers were the negative.

4) CO level

Smokerlyzer was used as biomedical measurement in order to check the CO level of inclusion criteria. CO level is categorized 0-10ppm as non-smoker and 11 ppm and above as smoker in this study.

The data showed that smoker's CO level was clearly higher than no-smoker's. (Smoker, Mean: 9.6ppm, Median: 9.5ppm) (Non-smoker, Mean 3.8ppm, Median: 3ppm). CO level 49ppm was higher value in smokers.

In addition, total 5 smokers showed the high CO level when first time to check their CO level even they were not surely smoking. (3 non-smokers showed the 11-15ppm, and 2 non-smokers showed the 16-25ppm). After few days of their first visit, they were re-checked their CO level and the results showed the low CO level. Therefore, they were clarified as non-smokers.

Table 3: Number and percentage distribution of respondents by patient's profile

Socio-demographic Characteristics	Smoker		Non-smoker		Total	
	Number	%	Number	%	Number	%
1) **Gender**						

Male	50	83.3	88	43.3	138	52.5
Female	10	16.7	115	56.7	125	47.5
Total	60	100.0	203	100.0	263	100.0
2) Age Group						
< 20	5	8.3	26	12.8	31	11.8
20-29	19	31.7	54	26.6	73	27.7
30-39	9	15.0	35	17.3	44	16.7
40-49	10	16.7	28	13.8	38	14.4
50-59	10	16.7	24	11.8	34	12.9
$\geq$ 60	7	11.7	36	17.7	43	16.3
Total	60	100.1	203	100.0	263	99.8
Mean$\pm$ SD.	37.8±15.3		39.2±18		38.9±17.3	
Median	33.5		35		35	
3) Diagnosis TB Smear						
Positive	19	31.7	55	27.1	74	28.1
Negative	39	65	145	71.4	184	70
Unknown	2	3.3	3	1.5	5	1.9
Total	60	100.0	203	100.0	263	100.0
4) CO level						
0-10ppm (Non-smoker)	44	73.0	198	97.5	242	91.8
11-50ppm (Smoker)	16	27.0	(5)	3.5	21	8.2
Total	60	100.0	203	0	263	0
Mean$\pm$ SD.	9.6±7.3		3.8±2.7	99.9	263	100.1
Median	8.5		3		5.1 ±4.8	

4.1.2.   Socio-demographic

The socio-demographic variables cover gender, residence area, main language, marital status, income category, education and occupation.

1) Residential Area:

Almost 65% of smokers and non-smokers live in Payatas area and around 20% of them live in Tondo, others came from outside of those areas. There are the urban economically underprivileged in Metro Manila and both sites are located near the dumpsites. Most of the residents in the study area came from provincial in order to seek the better job but they could not find it due to their poor educational or career background. Thus, majority of people in study area are working in the informal sector as a day laborer such as a scavenger.

The data obtained indicated that patients take the treatment in their residential area. Normally, TB patients are hated or feared by people in the community and the patients don't tell that they are infected by TB in order to avoid the discrimination. One of the reasons of this is they do not have the transportation fee for taking   the treatment in the outside of the community.

2)   **Main Language**:

The official languages in the Philippines are English and Filipino which is known as 'Tagalog' but there are other 120 to 175 languages in the country. Almost all people understand Filipino language but English ability depends on educational level. Lack of English skill is poor among the people in the study area, thus all documents which were using in this study was translated from English to Filipino by the interviewer. The participants of this study could easily understand the question of contents.

3)   Marital Status

There was almost same distribution between 2 groups. Almost 40% of smokers and non-smokers never married, and also 40% of both groups were married respectably.   There were no significant differences between smokers and non-smokers.

4)   Income category

There were no significant differences between smokers and non-smoker about income category. Remarkably, 39.7% of smokers and also 57 % non-smokers were no-income. It means, 52.9% of respondents were no-income. And also, almost all respondents, regardless smoker or non-smoker whose income were under PHP 21,000, only 0.4% of their income was over PHP21,000.

5)   Education

The data shows that there were no significant differences between smokers and non-smokers. However, almost of half (46.7%) of smokers and 40% of non-smokers did not finish 10- years compulsory education.

6)   Occupation

There were no significant differences between smokers and non-smokers regarding the distribution of their occupation but the data show that around 31.7% of smokers and 44.2% of non-smokers were jobless even except students and retired persons. In more detail, 26.7% of smoker and 31.8 of non-smoker could work and others of them cannot work was caused some reasons. Around 30% of smokers and non-smokers were working as self-employment and, 33% of smokers and 20% of non-smokers were working at a private company. The respondents who were working at the government were few which distribution was 1.7% of smokers and 1.5% of non-smokers.

Table 4: Number and percentage distribution of respondents by socio-demographic.

	Smoker		Non-smoker		Total	
	Number	%	Number	%	Number	%
1). Residence						
Payatas	39	65	133	65.5	172	65.4
Tondo	10	16.7	47	23.2	57	21.7
Other area	11	18.3	23	11.3	34	12.9
Total	60	100.0	203	100.0	263	100.0
2). Main language						
Tagalog	58	96.7	192	94.6	250	95
Others*	2	3.3	11	5.4	13	5
Total	61	100.0	203	100.0	263	100.0
3). Marital status						
Never married	26	44.1	73	36.1	99	37.9
Married	21	35.6	82	40.6	103	39.5
Others**	12	20.3	47	23.3	59	22.6
No response	(1)		(1)		(2)	
Total	59	100.0	202	100.0	261	100.0
4). Income						
No income	23	39.7	113	56.8	136	52.9
P1-3,499(US$0.02-74)	5	8.6	27	13.6	32	12.4
P3,500-4,999 (US$75-105)	12	20.7	19	9.5	31	12.1
P5,000-8,999 (US$106-191)	10	17.2	17	8.5	27	10.5
P9,000-20,999(US$192-447)	7	12.1	23	11.6	30	11.7
P21,000&above	1	1.7	0	-	1	0.4
(USUS448& Above)						
No response	(2)		(4)		(6)	
(Refused +Unknown)						
Total	58	100.0	198	100.0	257	100.0
5). Education						

	Smoker		Non-smoker		Total	
	Number	%	Number	%	Number	%
No formal	0	0	2	1	2	0.8
Elementary Under	13	21.7	22	10.8	35	13.3
Elementary Gradu	7	11.7	31	15.3	38	14.4
High School under	8	13.3	31	15.3	39	14.8
High School Gradu	18	30	62	30.5	80	30.4
Post-secondary	2	3.3	3	1.5	5	1.9
College Under	8	13.3	35	17.2	43	16.3
College Gradu	4	6.7	15	7.4	19	7.2
Post Graduate	0	0	2	1	2	0.8
Total	60	100.0	203	100.0	263	99.9
6). Occupation						
Private household	2	3.3	7	3.5	9	3.5
Private Establishment	20	33.3	42	20.9	62	23.9
Government	1	1.7	3	1.5	4	1.5
Self-employed w/o salary	11	18.3	12	6.0	23	8.9
Self-employed w salary	1	1.7	2	1.0	3	1.2
Family business (w&wo)	1	1.7	9	4.5	8	3.1
Student	1	1.7	15	7.5	16	6.2
Housekeeper	0	-	4	2.0	4	1.5
Retired	4	6.7	18	9.0	22	8.5
Unemployed (able to work)	16	26.7	64	31.8	108	41.7
Unemployed (unable to work)	3	5	25	12.4		
No response (Refused +Unknown)	(0)		(2)		(2)	
Total	60	100.0	201	100.1	261	

4.1.3. TB Symptoms

To ask the question about their symptoms about strong cough, feeling very tired, sleeping well, sputum with blood and other disease. Nearly equal distribution in each symptom and, no significant differences between smokers and non-smokers.

The first question was, do you have strong cough about 80% and smokers and also non-smokers answered 'yes'. The second was, are you feeling very tired, around 75% of smokers and non-smokers felt 'yes'. The third one was you cannot sleep well and around 45% of both of them said 'yes'. The fourth question was 'Do you have sputum with blood?', 36.7% of smokers and 30% of non-smokers said 'yes', the last question was 'Do you have other symptoms' and the answer was about 70% of respondents 'yes'.

Table 5: Number and percentage of TB Symptoms by smoking status

TB Symptoms	Smoker		Non-smoker		Total		p-value
	Number	%	Number	%	Number	%	
1. Do you have strong cough							
YES	50	83.3	160	78.8	210	79.8	0.44364
NO	10	16.7	43	21.2	53	20.2	
TOTAL	60	100.0	203	100.0	263	100.0	
2. Are you feeling very tired?							
YES	44	73.3	155	76.4	199	75.7	0.631827
NO	16	26.7	48	23.6	64	24.3	
TOTAL	60	100.0	203	100.0	263	100.0	
3. You can't sleep well?							
YES	27	45	90	44.3	117	44.5	0.927438
NO	33	55	113	55.7	146	55.5	
TOTAL	60	100.0	203	100.0	263	100.0	

4. Do you have sputum with Blood?

YES	22	36.7	60	29.7	82	31.3	0.307062
NO	38	63.3	142	70.3	180	68.7	
Refused	0	0	(1)		(1)		
TOTAL	60	100.0	202		262	100.0	

5. Do you have other symptom?

YES	41	68.3	132	65.7	173	66.3	0.701921
NO	19	31.7	69	34.3	88	33.7	
Refused	0	0	(2)		2()	0.8	
TOTAL	60	100.0	202	100.0	261	100.0	

4.1.4. Smoking Motivation

According to the data obtained, the question about 1. Does your close friend smoke? (χ^2=10.2402, p=0.0372, p<0.05) and 2. Have you received smoking prohibit information from your family (χ^2=38.3368, p=??, p<0.05) indicated the significant differences between smokers and non-smokers.

Others were no significant differences between smokers and non-smokers whether their family members smoking or not but 61.7% of smokers had have family members who were smoker and 48.3% of non-smokers had have family members who were smoker. And also, the question about whether close friend who was smoking or not is, 83.3% of smoker had have the friends who were smoking and 61.1% of non-smokers had have smoking friends. Both data showed that the smoker's rate was higher than non-smoker's.

Moreover, regarding the ban on smoking, there were also no significant differences between smokers and non-smokers but around 90% of smokers and no-smokers took the smoking ban at the health facility. In question about have you received smoking prohibit information from friends was 40% of smokers and 22% of non-smokers said 'yes' and in question from your family members was 71.7% of smokers and 27.6% of non-smoker answered 'yes'. Most of smokers were warned to stop or reduce the amount of tobacco by their family members for economic or health reasons. Another question for just smokers

about why do you smoke, 33.3% of smokers simply answered 'I like smoking' but 45% of smoker said 'I cannot stop smoking'.

Table 6: Number and percentage of answer of smoking motivation by smoking status

	Smoker		Non-smoker		Total		
	Number	%	Number	%	Number	%	p-value
1. Does anyone smoke inside your home?							
YES	37	61.7	98	48.3	135	51.3	0.068272
NO	23	38.3	105	51.7	128	48.7	
Total	60	100	203	100	263	100	
2. Does your close friend smoke?							
YES	50	83.3	124	61.1	174	66.2	0.01372
NO	10	16.7	79	39	89	33.8	
Total	60	100	203	100.1	263	100	
3. Have you received smoking prohibit information at health facility?							
YES	56	93.3	174	85.7	230	87.5	0.117526
NO	4	6.7	29	14.3	33	12.5	
TOTAL	60	100	203	100	263	100	
4. Have you received smoking prohibit information from your friend?							
YES	24	40	45	22.2	69	26.2	0.00586
NO	36	60	158	77.8	194	73.8	
TOTAL	60	100	203	100.0	263	100.0	
5. Have you received smoking prohibit information from your family?							
YES	43	71.7	56	27.6	99	37.6	0.0000
NO	17	28.3	147	72.4	164	62.4	
TOTAL	60	100.0	203	100.0	263	100.0	
6. Have you received smoking prohibit information from any other place?							
YES	19	31.7	45	22.2	64	24.3	0.131937
NO	41	68.3	158	77.8	199	75.7	
TOTAL	60	100.0	202	100.0	263	100.0	
7 Why do you smoke?							
I like smoking	20	33.3					
I cannot stop	27	45					

	Smoker		Non-smoker		Total		
	Number	%	Number	%	Number	%	p-value
No reason	0	0					
Offering by someone	12	20					
Other	1	1.7					
Refused	0	0					
TOTAL	60	100.0					

4.1.5.   Smoking Situation

This section applied only for smokers except question 1. The data showed that almost all (95%) smokers were daily smoker and only 5% of smokers were not daily smoker. Interestingly, 73.3% of smoker attempted to stop smoking for some reasons in the last 2 weeks and 96.7% of smokers were willing to stop smoking.

The data showed that almost all (98.3%) of smokers were smoking manufactured tobacco and 71.7% of the smokers consumed more than PHP400/month. Roughly estimate, the smokers can buy at least 7 packs (140pcs tobacco) of month and 5pcs tobaccos are smoking per day.

Table 7: The number and percentage of Smoking situation

Smoking Situation	Smoker		Non (Ex) -smoker		Total	
	Number	%	Number	%	Number	%
1. Have you ever smoked?						
YES	60	100	55	27.1	115	43.7
NO	0	0	148	72.9	148	56.3
Total	60	100.0	203	100.0	263	100.0
2. Did you smoke in the last 3 months?						
YES	60	100	0			
NO	0	0	0			
Total	60	100.0	0			
3. How often do you						

smoke?

Daily	57	95
Less than daily	3	5
TOTAL	60	100.0

4. During the past 2 weeks, have you tried to stop smoking?

YES	44	73.3
NO	16	26.7
TOTAL	60	100.0

5. Are you willing to stop smoking?

YES	58	96.7
NO	2	3.3
TOTAL	60	100.0

6. What kind of tobacco do you smoke?

Manufactured tobacco	59	98.3
Hand-rolled tobacco	1	1.7
Others **	0	0
Refused	0	0
TOTAL	60	100.0

7. How much money do you spend for your smoking per month?

P0-99 (US$0-2)	3	5
P100-199 (US$2-4.1)	5	8.3
P200-299 (US$4.2-6.4)	4	6.7
P300-399(US$6.5-8.5)	5	8.3
P400 and above (US$8.6-)	43	71.7
TOTAL	60	100.0

4.1.6.   Smoking Knowledge Test

This test was done in order to search the differences of knowledge about tobacco smoking between smokers and non-smokers. It consists of 17 questions that can be answered by yes or no except question No, 15.

According to the result, the average point of smokers was 9.2 points, non-smoker's was 9.5 points. There were no significant differences between two groups and nearly equal distribution of correct and also wrong answer rate in both groups.

The low correct answer rate of the question in both groups were about 'Just a few cigarettes a day cannot hurt', 'Light cigarette are less harmful', 'Once a smoker, always a smoker', 'Tobacco is good for the economy', 'We have already solved the tobacco problem' and 'The tobacco industry no longer markets to kinds or undermines public health efforts'. Those question's correct rate was only 10 to less than 20 percentages.

Table 8: The number and percentage of the results of the knowledge of smoking test by smoking status

	Smoker		Non smoker		p-value
	Number	%	Number	%	
1. People have free choice whether or not to smoke					
Correct answer	43	71.7	154	75.9	0.510203
2. Everyone know how bad smoke is					
Correct answer	51	85	159	78.3	0.257469
3. Just a few cigarettes a day can't hurt					
Correct answer	11	18.3	37	18.2	0.984997
4. 'Light' cigarette are less harmful					
Correct answer	15	25	52	25.6	0.923384
5. It's easy to stop smoking, if people want to quit					
Correct answer	48	80	154	75.9	0.54656
6. Cessation medication do not work					
Correct answer	33	55	106	52.2	0.704366
7. Once a smoker, always a smoker					
Correct answer	7	11.7	43	21.2	0.098882
8. Smoker may die earlier, but all they lose are a couple of unpleasant years at the end of life					
Correct answer	54	90	172	84.7	0.302234

9. Environmental tobacco smoke may be a nuisance, but it is not deadly

Correct answer   51   85   150   73.9   0.074916

10. Tobacco is good for the economy

Correct answer   8   13.3   39   19.2   0.296384

11. We have already solved the tobacco problem

Correct answer   10   16.7   31   15.3   0.793445

12. The tobacco industry no longer markets to kids or,
undermines public health efforts

Correct answer   12   20   56   27.6   0.238354

13. One out of two Filipino makes is a smoker

Correct answer   52   86.7   174   85.7   0.852127

14. Smoking only causes cancer of the lungs

Correct answer   45   75   132   65   0.14873

15. Every cigarette contains,

Correct answer   34   56.7   126   62.1   0.451339

CHAPTER V:

DISCUSSION and RECCOMENDATION

5.1.   Discussion

This study is first study to describe the characteristics of smokers and non-smokers among TB patients in underprivileged areas in Metro Manila, the Philippines. This cross sectional study has examined to show the differences of the socio-demographic characteristics, TB symptoms and smoking motivation between smokers and non-smokers. And also, Smokelyzer was used in this study in terms of clarify the actual smoking situation of respondents.

Total respondents (n=263), Smoker (n=60), Non-smoker (n=203) were in this study. The questionnaire was used to evaluate the differences of the characteristics the Smokerlyzer was applied to verify the smoking situation for each respondent. Each variable was analyzed by chi-square test and smoking knowledge test was analyzed by t-test. The findings were discussed in the context of this research questions and objectives in this section.

5.1.1.   Patient's Profile for the sample population

According to smoking prevalence rate by WHO world report on global tobacco epidemic 2015, (Organization, 2012), smoking prevalence rate over 20 years old in the Philippines 2014 was 25.5%, 44.7% in men and 7.8% in female. All data obtained in this study was lower rate than WHO reports.

The prevalence of tobacco use is generally higher among urban, less educated and low economic groups and people with less knowledge about effects of smoking. (Krishna M. et al., 20112) but this study was not consistent with those studies. High rate of smoking were not always confined to the poorest groups. For example, in Bosnia and Herzegovina, Georgia, Latvia, Philippines, Russian federation and Ukraine, even in the richest population group smoking in men was more common than not (i.e. the prevalence was above 50% (Ahmad Reza Hosseinpoor, 2012). In nine countries from both low- and middle- income groups the poorest men were at least two times more likely to smoke than the richest ones even after controlling for these factors. The magnitude and direction of socioeconomic inequality varies

substantially between countries. It is conventional wisdom that smoking levels are highest in poorest groups but his is not always the case as shown in our study. Particularly in women and in middle income countries. We observed a significant pattern of pro-poor inequality – risk of smoking was higher in the wealthiest population groups (Krishna M. et al., 20112). As a reference, interestingly, the latest data shows that female's smoking rate in the Philippines the highest in the 10 Southeast Asian countries(Organization, 2015a). Therefore, the relationship between smoking prevalence and socioeconomic status is not monotonic.

WHO indicated that Tuberculosis mostly affected adults in their most productive years (15- 64 years old). All age groups have the risk of TB infection but mostly affected among adults. (Organization, 2016b). In this study, the median of smokers were 33.5 years old and 35 years in non-smoker. 35 years old was in total. The result in this study also showed that the mean of respondents were 38.9 years old. It means, the respondents were suffering from TB in their most productive year.

Sputum smear microscopy has been the primary method for diagnosis of pulmonary tuberculosis in low and middle income countries because just simple, rapid and inexpensive techniques are required. However, it has the limitations on sensitivity when the bacterial load is less than 10,000 organisms /ml sputum sample. (USAID, 2014). Moreover, according to the report of the tuberculosis profile of the Philippines, 2003-2011: advancing DOTS and beyond, 98.9 TB cases in the total were pulmonary TB cases and 54.9% of these were new smear-positive cases and 39.3% of new smear-negative cases in 2008-2011. In this study, 65% of smokers and 71% of non-smokers were smear negative in this study. It seems that accuracy results were not obtained for some reason.

Smokelyzer (piCO$^+$ bedfont Scientific Ltd., Upchurch, UK) is a useful tool in terms of clarification of the smoking status of each patient. The CO level describe that non-smoker (0-6ppm), Danger zone (7-10ppm), Smoker (11ppm and above), In this study, the CO level was categorized 0-10ppm as a non-smoker and 11ppm and above as a smoker. The median of CO level among smokers was 8.5ppm and non-smoker's was 3ppm in this study. The data mentioned that CO levels were significantly higher in smokers than in non-smokers.

However, the Smokerlyzer showed high CO level which was more than 10ppm among 5 non-smokers. Exhaled CO was increased after inhalation of diesel exhaust particulates. (Julia A. et al., 1999). High Co level in non-smokers might be affected those factors, so, it is needed to use the Smokerlyzer under certain condition that is not affected by those factors.

5.1.2. The differences of the characteristics between smokers and non-smokes.

Regarding the marital status, nearly 40% of smokers and also no-smokers were single and 40% of both groups were married. There are various types of marriage styles and family forms in the Philippines because a divorce is not easy for reasons of religion, and legal and family member often have large extended families and move from one relative's house to another, especially people in underprivileged area likely to have such large families. There is no data about the family structure in this study but it is predicted that TB patients live in a big family and family members of them are at risk of second-hand smoke, and also TB infection.

The salary of respondents was under PHP 21,000 (≒US$390) per month and tobacco expenditure per month was PHP 326 and per year was PHP 3,916.80 (US92.27) per smoker in this study. From this, roughly 2% of family expenditure was spent for tobacco.

According to World Bank Report 2014, the Philippines is currently classified 'Lower-Middle income country' and average family income 2014 was PHP 235,000 (≒US$5,020) per year and PHP 19,583 (≒US$418) per month. Average poverty incidence of total families was 21.1% and 26.3% in poverty incidence of population. (Authority, 2015). The data obtained shows that lower income compare to national data. Recently, the interval between wealth and poverty has been widening among the people in the country even within urban area and also, many people in this area are working in informal sector. Informal sector, work is often physically exhausting small eateries or uncomfortable and income is usually low or irregular. Work in the informal sector also perpetuates the multiple burdens of women (Lazo, 2008). Poor rural households in China were reported to spend over 10% of their total household

expenditures on cigarettes. (D. Efroymson, 2001b). Tobacco expenditure has negative impact on the household income especially for the people who live in poverty.

Regarding the education, 46.7% of smokers and 40% of non-smokers did not finish their compulsory education in this study. The educational system in the Philippines was six-year elementary school and four-year senior high school, total 10 year's compulsory education. Primary school participation net enrolment ratio in male was 87.9% and 89.5% in female, secondary school participation net attendance rate male was 55.1% and 70% in female in 2008-2012. The school attendance rate among respondents in the study site was lower than national data. It was indicated that low-educational background in the study sites. The tuition fee in the public schools are free in the Philippines but students need the transportation or meal fee when they attend the school and of course but unfortunately, children are expected to work in order to support their family in economically underprivileged area.

As a reference, the educational system was changed in 2012 in the Philippines which is called 'K-12 system'. This is a new curriculum that covers kinder garden and 12 years of basic education. (1 year kindergarten, 6 years elementary (Primary) school, 4 years junior high school and 2 years senior high school). However, this new educational system is not applying for this criteria because inclusion criteria in this study was 18 years old and above.

The results in this study showed that the high employment rate among respondents because according to the report Philippine statistics authority, the unemployment rate in this country was 6.5% in Metro Manila (NCR) was 8.2% in 2015. Most of the people in these areas basically came from outside of Manila to seek better job but the data indicated that they were not able to do.

5.1.3.   The differences of TB symptoms

The data obtained showed that there were no significant differences about their symptoms between smoker and non-smokers, however, some previous studies clearly showed that TB patients who are smoking increase the risk of TB symptoms seriously such as cough, dyspnea, cavity lesions in the lung, positive sputum culture, and drug resistance.(den Boon et al., 2005; GH, 2005). moreover, TB patients with smoking are more likely spread TB to the

others. (Organization, 2014). Thus, this study did not consistent with the study above. The following reasons were considered for the reasons, first, medical doctor's issues such as misdiagnosis or doctor's delay, second laboratory technician's issue on inspection technology and contamination problem or precision management system of clinical examination. However, the states of disease depend on the individual and be difficult to measure their symptoms just asking by a questionnaire. To use another tool for objectionably and quantitatively measuring is needed for extent of their symptoms.

The results showed that 73.3% of smokers attempted to stop smoking and also 96.7% of them are willing to stop smoking but failed which was considered caused by nicotine dependence. In cessation, quit rate are lower in the poorest groups and for those living in socially disadvantaged areas. (Bauld L, 2007). Smoking cessation intervention support by health works are recommended in the study

5.1.4. Smoking Motivation of the sample population

In this section, the result of two questions showed the significant differences between smokers and non-smokers. 1. Does your close friend smoker? (χ^2=10.2402, p=0.0372, p<0.05) and 2. Have you received smoking prohibit information from your family? (χ^2=38.3368, p=??, p<0.05) and others were no significant differences.

According to smoking prevalence rate by WHO world report on global tobacco epidemic 2015, (Organization, 2012), smoking prevalence rate over 20 years old in the Philippines 2014 was 25.5%, 44.7% in men and 7.8% in female. All data obtained in this study was lower rate than WHO reports.

The prevalence of tobacco use is generally higher among urban, less educated and low economic groups and people with less knowledge about effects of smoking. (Krishna M. et al., 20112) but this study was not consistent with those studies. High rate of smoking were not always confined to the poorest groups. For example, in Bosnia and Herzegovina, Georgia, Latvia, Philippines, Russian federation and Ukraine, even in the richest population group smoking in men was more common than not (i.e. the prevalence was above 50% (Ahmad Reza Hosseinpoor, 2012). In nine countries from both low- and middle- income groups the poorest men were at least two times more likely to smoke than the richest ones even after controlling for these factors. The magnitude and direction of socioeconomic inequality varies

substantially between countries. It is conventional wisdom that smoking levels are highest in poorest groups but his is not always the case as shown in our study. Particularly in women and in middle income countries. We observed a significant pattern of pro-poor inequality – risk of smoking was higher in the wealthiest population groups (Krishna M. et al., 20112). As a reference, interestingly, the latest data shows that female's smoking rate in the Philippines the highest in the 10 Southeast Asian countries(Organization, 2015a). Therefore, the relationship between smoking prevalence and socioeconomic status is not monotonic.

The data obtained showed that the family's smoking prevalence rate in smoker was higher than non-smoker's. Smoking behavior is usually influence by their close friend or family members especially parents or their older siblings.(Loke AY, 2010; sciences, 2013). This study was consistent with previous studies as above. If someone is smoking at home, non-smokers including infants or children are being exposed to second-hand smoke (SHS) and they are at risk to develop the disease in a future due to passive smoke. Moreover, if there are TB patients in the family, smoke to be a significant risk factor for TB patients.

The data obtained indicated that the respondents in this study did not recognized tobacco prohibit information in the public or community even the literacy rate is high (97%) in the Philippines.

A comprehensive ban on tobacco is an effective means to reduce tobacco consumption. WHO Framework Convention on Tobacco Control (Organization, 2000). is the first international treaty and adopted by World Health Assembly in 2003. The Philippines adopted the treaty as soon as it was introduced by WHO. Currently, Ministry of Health leads the smoking cessation program which is collaborating with WHO/WPRO and they put into work smoking advertising bans (Enforce bans on tobacco advertising promotion and sponsorship). Moreover, all outdoor tobacco advertising has been banned since 2007 in the Philippines, under tobacco regulations act of 2003 which is Republic Act *RA) No, 9211 and also, bans on direct tobacco advertising on national TV and radio, local magazines and newspapers and internet. However, it is difficult to say that the bans are affective in those areas according from the data in this study.

5.1.6.   Smoking situation of smokers among TB patients

The results showed that 73.3% of smokers attempted to stop smoking and also, 96.7% of them are willing to stop smoking but failed which is thought that the cause of nicotine

dependence because almost all smokers were daily smoking and they tried to quit smoking in the last 2 weeks but not able to do. It is well known widely that tobacco has high levels of the addictive chemical nicotine and smoking cessation is difficult for smokers.

Smoking cessation intervention which was delivered in just 5-10 minutes by health staff as a part of existing DOTS service. The intervention resulted in high quit rates and higher awareness of the adverse health effects of secondhand smoke, which led patients to make smoke-free homes and health providers to make tobacco-free health care.(Tara Singh Bam, 2015) It might be more feasible and cost effective for them to integrate smoking cessation into other healthcare programs such as tuberculosis and so on. Studies have shown that simple advice to quit smoking is an effective intervention: it is also one that can be effectively provided by a variety of health professionals. (A S M Abdullah, 2004). Therefore, smoking cessation into TB program is required in the study sites.

Around 70% of smokers spend more than PHP 400 (US$8.6) per month for their tobacco expenditure in this study. The average tobacco expenditure per year was PHP 3,916.80 (US$92.27) and PHP 326 (US$7) per month in the Philippines. (Organization, 2000).

Poor rural households in China are reported to spend over 10% of their total household expenditures on cigarette (D. Efroymson, 2001a). which could have indirect effect on other family members. For example, parental smoking in poor families in Indonesia has been shown to divert spending from fruits and vegetables and exacerbate child malnutrition and increase under-five mortality (Semba RD, 2001).

Tobacco expenditure Tobacco expenditure might be affected household expenditure in the study area as well. SEATCA indicated that most effective way to reduce the smoking prevalence rate is to increase the tobacco price and taxes. According to the examples in ASEAN countries clearly showed when the tobacco price was increasing, smoking prevalence rate was decreasing. For a good example of the case, Thailand could reduce the smoking prevalence rate from 32 to 21.4% in a decade by increasing the cigarette excise rate from 55 to 87%. The World Bank has recommended 66-80% and WHO recommended at least 70% of retail price tax burden [7], but burden on cigarette percentage of retail price was only 53% in the Philippines tax should be excise but only 53% of tax in the Philippines. This lower tobacco tax burden on cigarette as percentage of retail price is lower than other ASEAN countries such as Singapore (71%), Thailand (70.0%), Brunei (62%) and Indonesia (59%) in 2014.

Moreover, the price of most popular brand tobacco is also lower compere to the other ASEAN countries. For instance, US$9.60 in Singapore, US$6.47 in Brunei, US$3.70 in Malaysia, US$2.06 in Thailand but only US$1.60 in the Philippines. (Alliance, 2014)

Thus, it is necessary to revise the tobacco tax and price is required in order to reduce the tobacco consumption in the country.

5.1.7. Smoking Perception Test between smokers and non-smokers

There were no big differences between smokers and non-smokers of the percentage of correct answer. Rater, smoker's correct answer rate was higher than non-smoker's, so, even smoker had accurate knowledge, they did not or could not stop smoking.

Some results of the test show that their incorrect knowledge about smoking no matter smoker or non-smokers. For example, both of them believe that 'Just a few cigarettes a day can't hurt', 'Light cigarette are less harmful. Interestingly, more than 80 % of smoker and also non-smoker believe that tobacco make a good efficiency to the country.

5.2. Conclusion and Recommendation

The aim of this study is to identify the characteristics of smoker and non-smokers among TB patients in underprivileged area in the Philippines. TB is still one of the serious infectious diseases in the developing countries and also, tobacco smoking has a significant negative impact to those countries. Tobacco smoking to be a significant risk factor for TB and more than 20% of TB cases in the world are attributable to smoking (Semba RD, 2001). and monograph on TB and smoking disease make a burden of medical expenses.

According to the results, there were no differences of the characteristics between smokers and non-smokers on patient's profile, socio-demographics, TB symptoms and smoking knowledge and the data did not show the high smoking rate in economically underprivileged area. It was not consisting with the previous studies but the data indicated the low-educational background, low-income and high unemployment rate in the study areas.

Consequently, it can be said that majority of the residents in this area are suffering from their financial and physical problems. Ahmad RH said that in the poorest population groups can have additional effects that go beyond the direct health efforts, further

exacerbating health-related inequality. According to the results indicated that smoking and tuberculosis make poor people poorer.(Ahmad Reza Hosseinpoor, 2012)

Remarkably, the data showed that the smoking behavior tend to influenced by their parent's and close friend's smoking habits. If a family member is smoking, other family members are also at risk of tobacco. Therefore, smoking cessation intervention by health professionals who have a knowledge on smoking cessation are needed for not only TB patients who are smokers but also their family members and friends.

According to the result of the smoking knowledge test, there were no differences of their knowledge about tobacco between smoker and non-smoker. It means, to provide the accurate knowledge of the smoking regardless smoker or non-smoker is one of the keys in order to quit the smoking.

Majority of the smokers were willing to quit smoking and tried to do but almost all them failed. Smoking cessation intervention by health professionals especially evidence based intervention is needed for those smokers because one of the reasons of the failure of smoking cessation is unaware of the danger of smoking.

WHO mentioned that the keys for reducing the smoking rate are 1) Awareness of the dangers of tobacco, 2) Graphic warnings pack warnings, 3) Bans on tobacco advertising, 4) Taxes discourage tobacco use, 5) Illicit trade of tobacco products and good monitoring tracks the extent and character of the tobacco epidemic and indicates how best to tailor policies (Organization, 2016a). In order to reduce the smoking prevalence rate without pharmacotherapy, the tailoring materials which based on the information collected from the patients are needed when the governments or health organization design the different policy on smoking and TB.

Those comprehensive approaches as above by the government and health organizations are needed for reducing the smoking rate among TB patients. Some studies show that the smoking cessation intervention by health care professionals are effective (Andrew Mclvor, 2009) and some previous studies or health organization such as WHO strongly recommended to intervene the smoking cessation program into TB program

Moreover, there are some issues on tuberculosis such as difficult diagnosis and long period treatment. The microcopy smear test is commonly used for diagnostic TB but it is difficult to detect the low levels of TB bacteria in the specimen, and also, it takes at least 6 months nths TB treatment and there are some treatment faire cases during the period. Thus, to develop and improved techniques are required which is simply, inexpensively and accuracy method even at the insufficient facility establishment.

Both tobacco and TB are threat to human beings. Therefore, to control the monograph on TB and smoking is strongly demanded in a current public health field. Each disease has negative impact on human health and health cost in the country, thus urgent action is needed, accordingly,

a longitudinal intervention study is also required in terms of evaluate the effectiveness of smoking cessation intervention for TB patients who are smoking.

5.3.   Limitation

-    Some participants who currently smoke refuse to check their CO level with Smokerlyzer.   This may lead a selection bias. In that case, interviewer explain purpose of this research   in order to get the understanding because this research is not harmful for the patient, instead, they can have an opportunity to stop smoking during the TB treatment.

-    TB patients who have strong symptoms such as strong cough or shortness of breath will

    not be able to hold the breath for 15 – second. However, in that case, the patients just exhale without hold the breath because Smokerlyzer can measure if the patient cannot inhale 15 seconds.

-    Heavy air pollution might affect ppm level, sometimes the machine shows the incorrect

    Value.

-    Feeling of the TB symptoms is depend on the personal. It is difficult to measure their symptoms just using by questionnaire. Measurement tool is required.

-    The data obtained this study is not always consisting with other economically underprivileged area.

5.4.   Expectation of beneficial of this study

Some specialist or health organization recommended to develop the smoking cessation materials which is based on the information from the community but there are not enough evidences to develop the tailored materials in developing countries.

The data obtained in this study will be the useful data will be one of the useful data when the government or health organization establish the smoking cessation into TB program, especially for people in poverty because the study site is a representative example of urban economically underprivileged area worldwide.

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APPENDIX

6.   APPENDIX

6.1.   Research Budget

EXPENSES			Unit cost	Quantity	Total
1	PERSONNEL (allowance/salary/consultation fees to be paid. For each personnel, unit cost and time-effort required should be described. Full-time government staff should not receive allowance but per diem (logging and subsistence allowance) necessary to carry out the research work can be included.				
	1.1	Professional staff [P40x 263 TB patients]	P40	263pts	P10,520
		Main research Assistant	P2000	10months	P20,000
		Sub research Assistant	P1000	10months	P10,000
		Peso total			**P40,250**
	Sub-total (US$)				**US$915.24**
2	Transportation fee and Communication allowance for assistants (*Assistants need to move to each NGO clinic because only 1 smokerlyzer in each study site)				
	2.1	Transportation (Payatas) [P50x4times/month x10monthsx2persons]	P50	80	P4,000
	2.2	Transportation (Tondo) [P50x4times/monthx10monthsx2 persons]	P50	80	P4,000
	2.3	Transportation (From Payatas to office) [P200x2times/monthx2person]	P200	4	P800
	2.4	Transportation (From Tondo to office) [P50x2times/monthx2person]	P50	4	P200
	2.5	Communication allowance for assistant [P50x10monthsx2person]	P50	18	P900
	2.6	Food allowance for assistant [P40x4times/monthx10monthsx2person]	P40	80	P3,200
	Peso total				**P13,100**
	Sub-total				**US$297.88**
3	MISCELLANEOUS EXPENSES				
	3.1	Printing cost	P5,000	1	P5,000
	3.2	Paper (A4 size 500sheets)	P250	10	P2,500
	3.3	*Postage (From Research assistant to Researcher)	P3,371	4 (Every quarter)	P13,488
	3.4	Smokerlyzer materials (D-piece)*12pcs/box	3,600	11	¥39,600
	3.5	Smokerlyzer materials (Flat mouthpiece) 250pcs/box	4,050	1	¥4,050
	3.6	VAT of 3.4 and 3.5			¥3,492
	Peso total				**P20,988**
	Yen total				**¥47,142**
	Sub-total				**US$477.24**
	Grand total (Peso)				**P74,338**
	Grand total (Yen)				**¥47,142**
Grand TOTAL (US$)					**US$2,086.26**

6.2.   Time Schedule

TASK	MONTH												
	2015 1	2	3	4	5	6	7	8	9	10	11	12	2016. 1
Ethical Review			→										
Distribute materials	→												
Briefing for each organization	→												
Data collection and monitoring												→	
Data Analysis						→							→

P=Philippine Peso / P1=0,0274 (OANDA rate. 11. Sep.2014)

¥=Japanese Yen/ ¥1=US$0,0084 (OANDA rate 8th Jan, 2015)

*3.3 Postage fee is calculated based on international EMS rate in Philippine peso

(URL: http://www.xend.com.ph/EMSRates.aspx)

6.3. Questionnaire

6.3.1. Questionnaire (English version)

Section 1: Patients Profile

Date:
Patient Code:
Age:
Center:
Diagnosis: PTB smear (+) or (-)
TB reg. No, :
Breath CO level:

Section 2: Socio-demographic

1. Sex	1	Male
	2	Female
2. Residential area	1	Payatas A
	2	Payatas B
	3	Payatas C
	4	Tondo Distriuct1
	5	Other : Specify
	20	Unknown
	21	Refused
3 Main Language	1	English
	2	Tagalog
	3	Ilocano
	4	Ilongo
	5	Cebano
	6	Waray
	7	Bicolano
	8	Other: Specify
	21	Refused
4. Marital Status	1	Single
	2	Married
	3	Annulled
	4	Window/Windower
	5	Other: Specify
	21	Refused
5. Which category your month income?	1	No income
	2	P1-3,499
	3	P3,500-4,999
	4	P5,000-8,999
	5	P9,000-20,999
	6	P21,000 and above
	20	Unknown
	21	Refused

6. Educational Background	1	No formal schooling
	2	Elementary undergraduate
	3	Elementary Graduate
	4	High school undergraduate
	5	High school graduate
	6	Post -secondary
	7	College undergraduate
	8	College graduate
	9	Post graduate degree
	20	Unknown
	21	Refused
7. Occupation	1	Private household
	2	Private establishment
	3	Government
	4	Self-employed w/o employee
	5	Family business as an employer
	6	Own Family business
	7	Family business w/o salary
	8	Student
	9	Housekeeper
	10	Retired
	11	Unemployed, able to work
	12	Unemployed, unable to work
	20	Unknown
	21	Refused

Section 3: TB Symptoms

1. Do you have strong cough?	1	YES
	2	NO
	21	Refused
2. Are you feeling very tired?	1	YES
	2	NO
	21	Refused
3. You can't sleep well?	1	YES
	2	NO
	21	Refused
4. Do you have sputum with blood?	1	YES
	2	NO
	21	Refused
5. Do you have other symptom?	1	YES: Specify
	2	NO
	21	Refused

6.3.2. Questionnaire (Tagalog ver.)

Date:	
Code:	
Age:	
Center:	
Diagnosis: PTB smear (+) or (-)	
TB reg. No, :	
Breath CO level:	

Section 2: Socio-demographic

1.Kasarian	1	Lalaki
	2	Babae
2. Residential area	1	Payatas A
	2	Payatas B
	3	Payatas C
	4	Tondo Distriuct1
	5	Other : Specify
	20	Unknown
	21	Tumangging sumagot
3 Main Language	1	English
	2	Tagalog
	3	Ilocano
	4	Ilongo
	5	Cebano
	6	Waray
	7	Bicolano
	8	Other: Specify
	21	Refused
4. Marital Status	1	Single
	2	Married
	3	Hiwalay sa asawa
	4	Balo
	5	Wala sa nabanggit: tukuyin
	21	Tumangging sumagot
5. Sa anong kategorya naayon ang iyong buwanang sahod?	1	Walang sahod
	2	P1-3,499
	3	P3,500-4,999
	4	P5,000-8,999
	5	P9,000-20,999
	6	P21,000 pataas
	20	Hindi alam
	21	Tumangging sumagot

6. Educational Background	1	No formal schooling
	2	Elementary undergraduate
	3	Elementary Graduate
	4	High school undergraduate
	5	High school graduate
	6	Post -secondary
	7	College undergraduate
	8	College graduate
	9	Post graduate degree
	20	Hindi alam
	21	Tymangging sumagot
7. Trabaho	1	Pribadong bahay
	2	Pribadong establiyemento
	3	Gobyerno
	4	Sa sarili nagtatrabaho
	5	Empleyado ng kanilang family business
	6	May sariling family business
	7	Family business ngunit walang sahod
	8	Estudyante
	9	Kasambahay
	10	Retirado
	11	Walang trabaho, pero may kakayanan magtrabaho
	12	Walang trabaho dahil walang kakayanang magtrabaho
	20	Hindi alam
	21	Tumangging sumagot

Section 3: Sintomas ng TB

1. Meron ka bang matinding pag-ubo?	1	Oo, MERON
	2	WALA
	21	Tumangging sumagaot
2.Para ka bang hinahapo?	1	OO
	2	HINDI
	21	Tumangging sumagao
3. Hindi ka makatulog ng maayos?	1	OO
	2	HINDI
	21	Tumangging sumagaot
4. May bahid ba ng dugo ang iyong plema?	1	Oo, MERON
	2	WALA
	21	Tumangging sumagaot
5. Meron ka pa bang ibang nararamdaman maliban sa nabanggit?	1	Oo, MERON. TUKUYIN:
	2	WALA
	21	Tumangging sumagot

6.4.   Basic Smoking Knowledge Test
    6.4.1.   Basic Smoking Knowledge Test (English Version)

Code: _____   Treatment Center: _____

Smoking status: Smoker / Non-smoker (please make a circle)

Score: _____   Date: _____

1. People have free choice whether or not to smoke
    a) YES
    b) NO
2. Everyone know how bad smoking is
    a) YES
    b) NO
3. Just a few cigarettes a day can't hut
    a) YES
    b) NO
4. "Light" cigarettes are less harmful
    a) YES
    b) NO
5. It's easy to stop smoking, if people want to quit.
    a) YES
    b) NO
6. Cessation medications do not work
    a) YES
    b) NO
7. Once a smoker, always a smoker
    a) YES
    b) NO
8. Smokers may die earlier, but all they lose are a couple of unpleasant years at the end of life
    a) YES
    b) NO
9. Environmental tobacco smoke may be a nuisance, but it is not deadly
    a) YES
    b) NO
10. Tobacco is good for the economy
    a) YES
    b) NO
11. We have already solved the tobacco problem
    a) YES
    b) NO

12. The tobacco industry no longer markets to kids or undermines public health efforts
    a) YES
    b) NO
13. One out of two Filipino males is a smoker
    a) YES
    b) NO
14. Smoking only causes cancer of the lungs
    a) YES
    b) NO
15. Every cigarette contains
    a) 7000 chemicals and 70 known carcinogens
    b) 700 chemicals and 7 known carcinogens
    c) 70 chemicals and 70 known carcinogens
16. Smoking is the fastest way to deliver nicotine to the brain. It is faster than the intravenous route
    a) YES
    b) NO
17. Within 20 minutes of quitting, heart rate and blood pressure drops
    a) YES
    b) NO

4.4.2.   Basic Smoking Knowledge Test (Tagalog)
Mga Pangunahing Kaalaman Smoking pagsubok

Code: _____   Paggamot Centre:
_____

Katayunan Smoking: Naninigrilyo / Non-naninigrilyo
Iskor: _____   Petsa: _____

1.   Ang lahat ay may karapatan mamili kung sila ay maninigarilyo o hindi.
    a) Oo
    b) Hindi
2.   Ang lahat ay nakakaalam na masama ang paninigarilyo.
    a) Oo
    b) Hindi
3.   Hindi nakakasama ang ilang paninigarilyp sa isang araw.
    a) Oo
    b) Hindi
4.   Ang hindi masyadong paninigarilyo ay hindi nakakasama.
    a) Oo
    b) Hindi
5.   Napakadaling itigil ang paninigarilyo lalo na kung gusto ng tao.
    a) Oo
    b) Hindi
6.   Ang pagpapagamot para mahinto ang paninigarilyo ay hindi nakakatulong.
    a) Oo
    b) Hindi
7.   Ang taong naninigarilyo ay habang buhay ng maninigarilyo.
    a) Oo
    b) Hindi
8.   Ang mga naninigarilyo ay maaaring mamatay ng maaga.
    a) Oo
    b) Hindi
9.   Ang paggamit ng tabako ay maaaring magdulot ng pagkaligalig o pagkaadik
    ngunit hindi nakamamatay.
    a) Oo
    b) Hindi
10.   Ang tabako ay mabuti sa ekonomiya.
    a) Oo
    b) Hindi
11.   Nalutas na natin ang problema sa tabako.

a) Oo

b) Hindi

12. Ang industriya ng tabako ay hindi na naibebenta sa mga minor de edad o sa mga publikong lugar.

a) Oo

b) Hindi

13. Isa sa dalawang lalaki ay naninigarilyo.

a) Oo

b) Hindi

14. Tanging ang paninigarilyo lamang ang nagdudulot ng kanser sa baga.

a) Oo

b) Hindi

15. Ang bawat sigarilyo ay naglalaman ng :

a. 7,000 kemikal at 700 na kilalang carcinogen

b. 700 kemikal at 70 na kilalang carcinogen

c. 70 kemikal at 70 na kilalang carcinogen

16. Ang paninigarilyo ay mas madaling paraan upang maihatid ang nicotine sa utak ng tao keysa ipadaan ito sa ugat na daluyan ng dugo.

a) Oo

b) Hindi

17. Sa loob ng 20 minuto ng pagtigil ng paninigarilyo. Ang heart rate at blood pressure ay bababa.

a) Oo

b) Hindi

VITA

Curriculum Vitae

PERSONAL DETAILS

Name: Maho SUZUKI

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Date of Birth: 28th Febraury, 1976

Nationality: Japanese

Marital Status: Married

Health: Good without any treatment

EDUCATION

1993-1995:   Hokkaido Atsubetsu High School, Hokkaido Japan

1996-1999:   Hokkaido Medical Welfare Technical School, Nursing Course

2006-2008:   Nihon Welfare University, Welfare management course

2012-   Chulalongkorn University, Public Health of Sciences, MPH course

WORKING EXPEARIENCE

1999-2004:   Ebetsu city Hospital, Medicine unit. Nursing staff. Ebetsu city, Japan

2004 Jan-Aug: Association of Medical Doctors of Asia (AMDA) Medical staff. Quetta, Pakistan

2005-2007:   International Children's Action Network, Medical staff. Manila, the Philippines

2007-2012:   Japan Anti Tuberculosis Association/Research Institute of Tuberculosis, the Philippines. Medical Coordinator. Manila, the Philippines