

CHAPTER II

ESSAY

How to Increase the Cure and Complete Treatment Rates Among Tuberculosis Patients in the Zonal Tuberculosis Center 3, Chon Buri

2.1 Introduction

2.1.1 Background of TB (U.S. CDC, 1995)

Tuberculosis was a disease which was understood as an immoderate and wasting disease. This white plaque has affected humans for several centuries. Until the middle of the 1800s, most people believed that TB was a hereditary disease. Though this disease could be spread from one person to another by air. By no means, during the 1940s and 1950s, there was no healing for TB patients. To the majority of people, a diagnosis of TB was considered as a slow death sentence.

In 1865, a French surgeon named Jean-Antoine Villemin, proved that TB was contagious disease. Afterward, a German scientist named Robert Koch, discovered the bacteria which caused TB in 1882. However, a half of century have passed before drugs which could cure TB were discovered. Yet many people contacted with TB were sent to the sanatoriums, 'the special rest home' where they had to follow a prescribed routing each day. Albeit TB patients who could not afford to go to a sanatoriums have died at their home. No one discerned whether sanatoriums could really help TB patients.

The breakthrough of TB has reached in 1943 when An American scientist named, Selman Waksman, discovered Streptomycin. Streptomycin is a drug that could kill TB bacteria. After this discovery, TB patients were cured and the death rates for TB in the United States had dropped dramatically. Since then, not many

people contacted with TB from the middle of the 1980s. Nonetheless, TB cases had recently started to grow once more. This has urged several factors which motivated many health departments and other organizations attempt to prevent and control the disease. And without procrastination, TB can be a fatal disease if patients is not treated instantaneously.

2.1.2 Transmission of TB (U.S. CDC, 1995)

Tuberculosis (TB) is generally caused by a bacterium called *Mycobacterium tuberculosis*. TB mainly affects lungs, which is called this pathology “Pulmonary TB”: PTB constitutes 80% of cases. It also attacks other parts of the body such as the lymph nodes, meninges, intestines, joints, kidneys and bone originating the term of extra-pulmonary TB.

TB is spread from one person to another by air. When a person with infectious TB disease (TB that can be spread) coughs or sneezes, tiny particles containing *M. tuberculosis* may be expelled into the air. These particles, called droplet nuclei, dwelled of 1 to 5 microns in diameter- less than 1/5000 of an inch. Droplet nuclei can remain suspended in the air for several hours, depending on the environment. If another person inhales air that contains these droplet nuclei, transmission may occur. Transmission is the spread of an organism, such as *M. tuberculosis*, from one person to another. Not everyone who is exposed to an infectious TB patient becomes infected with *M. tuberculosis*. The probability that TB will be transmitted depends on three factors:

- How contagious is the TB patient?
- What kind of environment did the exposure happen?
- How long did the exposure last?

2.1.3 Pathogenesis

When a person inhales air that contains droplets, most of the larger droplets become lodged in the upper respiratory tract (the nose and throat), where infection is

unlikely to be developed. However, the droplet nuclei may reach the small air sacs of the lung (the alveoli), where infection begins. At first, the tubercle bacilli multiply in the alveoli and a small number enters the bloodstream and then spreads throughout the body. Bacilli may reach any parts of the body, including areas where TB disease is more likely to be developed. These areas include the upper portions of the lungs, as well as the kidneys, the brain, and bone. Within two to ten weeks, the body's immune system yet commonly intervenes, halts the multiplication and prevents of further spread. The immune system is the composition of cells and tissues of the body that prevents of foreign substances.

TB infection means that the body has contained tubercle bacilli though the body's immune system is keeping the bacilli under control. The immune system is operating by producing the special immune cells, which encircled the tubercle bacilli. The cells will form a solid case that restrain the bacilli to be contained and under the control. People who have a TB infection are not considered infectious persons. In another term, they cannot spread the infection to other people.

These people usually acquire a normal chest x-ray. It is considerable to keep in mind that TB infection is not heeded as a case of TB. While only some people with TB infection can develop TB disease. TB disease can be developed when the immune system could not maintain and control the tubercle bacilli. Afterward, the bacilli will begin to multiply themselves rapidly. Though, the risk for TB disease to be grown in the body is much higher for some people than the others. TB disease can grow either very fast or slow, after the sudden contaminated or many years later. In the United States, about 5% of the people who have recently been infected with *M. tuberculosis* has developed TB disease in the first year or two after infected. Another 5% will develop this disease later in their lives. Hence, nearby 10% of all people who have TB infection will have been developed disease at some future date. The continuing 90% of people who are infected, will stay free of disease, nearly for the rest of their lives (US. CDC, 1995).

The most common symptoms of pulmonary TB is the respiratory problem or coughs endured pending 3 weeks or more. Coughing up blood, hemoptysis, chest pain, fever and other symptoms such as lethargy, lassitude, loss of appetite and weight loss is also signified (TB Division, 2001).

When the persons needed to be treated, they should be evaluated to confirm of their TB infected condition before given any medication. The foremost method to diagnose PTB is to see sputum AFB smears under a microscope. Germs of TB can be seen within a microscope. At least three samples of sputum should be investigated for the most precise diagnosis. Regarding TB diagnosis x-ray, it is more costly and yet less accurate than the examination of sputum. Nevertheless, chest x-ray may be essential in certain cases.

However, non-compliance pulmonary TB treatment may lead to serious complications, death, and MDR TB - TB that is unyielding to isoniazid and rifampicin. This is more difficult to be treated than the drug-susceptible TB (CDC, 1995; WHO, 1999). In extra-pulmonary TB, (EP) symptoms and complications could rely on the vital part, which is involved (CDC,2001).

2.2 TB Situation

2.2.1 Global TB situation

While TB is a common public health problem, but there is a very high infection rate of TB infected individuals around the world. WHO has estimated that in 1994; one third of the world population (approx. 1,900 million persons) of the 5,700 world population will have been infected by *M. tuberculosis*. In 1998, it is estimated that other 300 millions people will be infected by TB. Thus, among 90 millions of TB patients, 30 millions people have died from TB. Most people who died subsist from low and/or middle-income class in third-world countries. Of which 5.6 millions people of TB 14 millions persons who are infected with AIDS would be dually

impure. This dually infected population would turn to about 1.4 millions TB cases by the end of this decade. WHO has reported that 8 millions people worldwide are estimated to develop TB 3 millions deaths from TB each year. The projection indicated will be increased from 8.8 to 10.2 millions cases by 1995. The prevalence cases will be 23.2 millions in the year 2000, and up to 28 millions in the year 2005. The incident rate will equal 11.9 millions of infected people (WHO, 1998).

HIV is the most powerful factor which increases the risk of progression from TB infection to disease these days. By 1997, more than 10 millions people were dually infected TB and HIV. These people have at least 50 percent of chance to develop active TB during their lifetime. Approximately 640,000 TB cases were attributed to HIV, while any TB patients are HIV-positive (WHO, 1999).

2.2.2 TB in South East Asia Region (SEAR)

TB states a major threat to people living in South East Asia Region. In 1996, 39% of TB infected people were reported from the high burden countries in South East Asia. In 1998, this region had its 42% of TB occurred in the global incidence. While 95% of those cases are localized primarily in these five countries: India, Bangladesh, Myanmar, Thailand and Indonesia (WHO, 1999).

2.2.3 TB in Thailand

Due to the AIDS epidemic, TB has built upon public health problem in many countries worldwide including Thailand. TB has result in not only multiplying the numbers of TB patients but also increasing the amounts of MDR-TB cases. WHO has carried out world TB Day' 1998 which has identified Thailand as a country among twenty two countries in the world experiencing difficulty in TB control. WHO has estimated that in 1996 the number of total new TB patients in Thailand would be 110,000 cases. And the annual risk of infection during 1997-1998 was predicted at 1.40%. This was equivalent to the circumstance rate of 70/100,000 for smear positive and approximately 140/100,000 toward all forms of disease. While approximately

100,000 new TB patients of whom 50,000 cases smear positive has been grown each year in Thailand. Among these only 40% of total new TB patients and 50-60% of new smear positive patients were diagnosed for treatment. The most recent TB mortality of people in Thailand was 3,000-7,000 persons each year or 20 persons per day. Approximately 15% of TB patients in Thailand are HIV infected. Before, one in 40 new TB patients previously had MDR-TB due to inappropriate uses of anti TB drugs. Prognostication of the overall TB burden has revealed that TB case numbers will be increased to 120,000 people by the year 2000 of which 20% is referred by impact of HIV epidemic (WHO, 1999 and Payanandana et.al, 1999).

In Thailand, there are intensifying rates of HIV positive specifically in Bangkok and Chon Buri (ZTC 3). The rates are approximately 12-13 times elevated in 8 years; from 2.4% in 1989 to 25.3% in 1996 for Bangkok, from 2.1% in 1989 to 26.6% in 1996 for Chon Buri. The typical country rate was 3.1% in 1989 and raised to 22.3% in 1996 which was 7 times multiple. Incidentally, there have been an interesting indication of HIV seroprevalence rates from various parts of the country since 1997. While the declination is started, but it is doubtful whether the vertex of this disease event in 1996 have passed or have reached their declining period (TB division, 1997).

Obviously, there is an immediate necessity to strengthen global TB control program in order to tackle TB problems in the situation of wide spreading of HIV. Tuberculosis is the main intricacy of the hospitalized AIDS in Thailand with the average proportion of 40%. Of which the highest proportion of overhead 60% is detected in Bangkok. We can no longer hesitate because the limited time is fixed. I suggest that appropriate measures must be done in every possible ways. There is a formulation of TB/HIV policy in the high administrative level, which national committee is settled to develop TB/HIV supervision team in the ministry level. This is also to educate all HIV counselors in tuberculosis, improving TB recording and reporting system, intensifying roles and activities of health volunteers in case-finding and reinforcing health education to the communities.

2.3 Health system of Thailand

2.3.1 Health structure in Thailand (Payanandana, V., Kladphuang, B., Somsong, W., and Jittimanee, S.,1999).

The Ministry of Public Health, Thailand is accountable for its organizing, managing and administrating of public health services. Most of the medical services of the government are located chiefly in the rural areas.

The Department of Communicable Disease Control is one of the seven departments of MoPH which is divided into 12 **Regional CDC offices**. ZTCs are a part of Regional CDC. Therefore, the **Tuberculosis Division** is held down by this department and authority which equaled the Regional CDC office.

Zonal Tuberculosis Center 3 (ZTC 3); ZTC 3 has its two main activities which functioned in the office and in field activities. The office activities are to screen, diagnose and treat TB patients while providing health education for patients and their family members about disease, transmission, treatment and side effects of anti-TB drugs. The general principle of self-health care and case holding is also provided. The field activity is to supply drugs, equipment and personal training for model provinces included; Chon Buri, Rayong, Chanthaburi, Trat, Chachoengsao, Prachin Buri and Sa kaeo. The other responsibility is to supervise and evaluate Zonal TB situation while each province has its provincial health office which is responsible for administering and supporting all medical and health facilities. In the province, it comprised of provincial and district hospitals, district health offices and health centers. Momentarily, health care matters about community participation and training for health volunteers approaching primary care are involved.

2.3.2. National Tuberculosis Program (NTP)

(Payanandana, V., Kladphuang, B., Somsong, W., and Jittimane, S., 1999).

NTP is a program to prevent TB diffusion in Thailand. It was established in 1966 by TB division, following the WHO's recommendation. The NTP has been implemented through the existing health facilities since 1967. Preferably, BCG vaccination in the newborns and none BCG scar pre-school children were integrated as the regular functions of the provincial general health services to direct vaccination with out prior tuberculin testing. In case of treatment, it is targeted to the contagious TB patients (smear positive) as the first prior task. This will be posted to two or three trained health workers for each province in order to initiate and demonstrate symptomatic case detection by sputum microscopy and ambulatory treatment. With the support from ZTC in technical supervision and logistic of the hospital in the district level and provincial hospital.

The objectives of NTP

Individual: to cure the disease.

to improve the standard of living in general.

Public: to reduce diffusion of TB in the community for lessening the chain of the transmission by handling on the human reservoir of tubercle bacilli, in advance of this problem being eliminated.

2.4 DOTS program for TB

2.4.1 DOTS: Definition and Theory

Directly Observed Treatment Short-Course (DOTS) is a technical and managing presence of a TB control program. As TB patients are detected by microscopy examination of their sputum. In addition, treatment works under the direct observation by a qualified health person. In company with the cure, counseling

supports and follow-on confirmation throughout the medication period are offered. This is to certify that the patients will accomplish their healing (WHO, 1999).

World Health Organization (WHO) declares TB as the “Global Emergency” and the DOTS strategy is its solution. It is the only approach to date that can ensure the WHO target of 70% case detection and 85% cure rate in the world (WHO, 1998). Any plan of TB treatment, which has failed this target, could even now not control the problem of TB. Though, this DOTS strategy has been proven of its adequacy since a high success rate in several countries such as Peru, Vietnam, Bangladesh and China. Furthermore, it is the most cost-effective intervention, which is implemented nowadays.

Five DOTS Key Components (WHO, 1999)

1. Political commitment to sustained TB control activities.
2. Case detection by sputum smear microscopy among symptomatic patients and self-reporting to health services.
3. Standardized treatment regimen of six to eight months for at least all confirmed sputum smear positive cases, with directly observed treatment (DOT) for at least the first two intensive months.
4. A regular, uninterrupted supply of all essential anti-TB drugs.
5. A standardized recording and reporting system that allows assessment of treatment results for each patient and overall of the TB control program.

2.4.2 Treatment strategy in DOTS

In DOTS, TB patients will be diagnosed by microscopy examination of sputum and chest x-ray. Each patient has such different symptoms, which means in the site of infection and in laboratory results. This will cause the difference of ability of anti TB drugs regimen to prevent the emergence of drug resistance. In addition, in order to shorten the period of treatment, the bacterial population must be straightway

cleared. Table 2.1 The Category regimens for treatment of TB patients demonstrated the recommendation about the clearance of bacterial (WHO, 1997).

Table 2.1 The Category regimens for treatment of TB patients (WHO, 1997).

TB treatment category	TB patients	Alternative TB treatment regimens	
		Intensive phase	Continuation Phase
1	New smear-positive PTB		
	Seriously ill:	2 HRZE	4 HR
	Extra-pulmonary or smear-Negative pulmonary (severe TB)	2 HRZS	4 HR
2	Sputum smear-positive:		
	Relapse, Treatment failure Return after default	2HRZES/ 1HRZE	5 HRE
3	Smear-negative PTB		
	Extra-pulmonary TB (less severe)	2HRZ	4HR

DOTS observers are persons who are accountable to the health servicing. They have an access to the patients, which information was prepared while completing a full course of treatment. Regularly, a health worker could be a social worker or a health volunteer. The compulsion for a health worker is the experienced workshop to perform the treatment. The significant task of this service is to record the system practiced by health care worker to orderly monitor of patient progress and of TB program's performance. The conformed result from this system will enable the quality assurance of the implementation and treatment program for TB patient. Data

collecting is the part of TB management, which also is a useful indicator of accessibility and quality of general health system.

2.4.3 Implementing DOTS

DOTS implementations are contained with three phases included: a pilot project phase, an expansion phase and a maintenance phase. The different phases of implementation of DOTS in a particular setting require a different emphasis on the technical, logistical, and operational aspects of the strategy. The pilot stage will emphasize the technical and operational aspects of the policy. Then the comprehensive stage highlights the logistical aspects. The maintenance or sustained effect of TB control accentuates all above three aspects. Though future political commitment from governments is expected (WHO, 1999).

Pilot Programs

1. Projects phase: Circumspect arrangement is very necessary since it implements the DOTS strategy. The application of the existing health infrastructure will facilitate initial implementation. Firstly, it is the step to implement the strategy in a widely spaced presentation for instructed districts. The implementation is fully schemed as to demonstrate the high cure rates. This will forward the training sites for staffs from other districts but in the same region. The demonstration and training districts will examine the feasibility of implementing at all aspects of DOTS, by connected inside general health services.

2. Expansion phase: Expansion throughout the whole country takes place in stages which requires the importance of training, monitoring and supervision. Establishment and instruction are the improvement in training particular for staffs from districts. There upon, they will move the demonstration and training sites to other regions. The regional demonstration and training districts, in that case, will be assisted in training sites for staffs throughout the same region. In this way, the strategy will be expanded specifically throughout the whole country supposing for

over 5 years. Latterly, the utmost uses of the existing health infrastructure is done, the emphasis shifts will be recruited of the community to contribute of implementation for nationwide.

3. Maintenance phase: The task is to maintain effective performance capture apprehensively following the expansion in nationwide. In the maintenance, phase training is important training for new staff because of better invigorating training. The training approached the innovation. Politicians and decision-makers must be persuaded by the economic returns that vindicate for long-term investment, which promising of funding-in TB control.

2.4.4 Indicators for DOTS success (MoPH,1999); training for health personnel and persons dealings with DOTS at every level included the support of;

1. Regular and sufficient supervision adhered in every level,
2. Gradual DOTS expansion to cover every province by 1-2 districts per year,
3. Sufficient sputum conversion to the expansion to other districts,
4. Trimester report which is completed and afterward forwarded orderly and on time,
5. The present of sputum conversion rate at the end of intensive phase more than 80%,
6. Cured rate more than 85%.

2.4.5 DOTS and Treatment Compliance

Compliance of treatment is the successive key in the DOTS strategy. Non-compliance of patients including ages, genders, education levels, ethnicity and all social groups is consent. Many patients would receive the self-administered treatment which disconnected with the treatment. It is impracticable to summon the persons who would or would not comply with the treatment (WHO, 1997).

According to WHO (1998), 30% of the patients would be receiving self-administered treatment in the initial phase adhering to the treatment. Many TB patients will stop treatment before completing the course due to different reasons. WHO has approved of direct observation regarding the treatment as the only way to ensure of the compliance (WHO,1997).

2.4.6 Global situation of DOTS

In spite of the effectiveness of DOTS strategy, only a few people worldwide have access to DOTS for TB. WHO states that 45% of world's population have been protected by DOTS program though only 21% of the pulmonary sputum positive patients have been treated under DOTS. The remainders are patients who are under other treatment programs. Only 192 countries who are WHO members have adopted DOTS in their national health program though the countries using DOTS, accomplishment is disproportionate (WHO, 1999-2000) The numbers of the passage to DOTS is expanding every year though at a slower rate as planned. In SEAR countries, where all TB cases exists 42% of world population, the highest numbers of TB patients have no access to DOTS. (WHO, 2000) Only 10% of the population in SEAR countries have access to DOTS (WHO, 1998). Therefore, it is a critical situation that though the effective package of TB control is open, the majority of the TB patients in the world are not accessible to DOTS. Because of this reason, TB epidemic would be remained in the same condition worldwide.

2.4.7 Situation of DOTS in Thailand

Since 1995, the Ministry of Public health and WHO teams cooperatively have reviewed the situation and preparation for mechanism of anew reformed of TB control strategy. There has included of many training workshops for health center's staffs from both DOTS demonstration areas and Drug Resistance Surveillance areas in 8 demonstration districts of Thailand. The implement of DOTS was started from June-October, 1996. People from World Health Organization/Global Tuberculosis (WHO/GTB) and South East Asia Region Organization (SEARO) had visited

Thailand every 6 months for monitoring, observing of DOTS progress and providing evaluation. Consequently, the result of DOTS in demonstration areas was acceptable, with 84% smear conversion rate and 80 % cured rate. Thereupon, DOTS is expanded to cover every province under “Five -Year Development Plan” in fiscal year 1997-2001 (Payanandana, et.al, 1999).

In Thailand, DOTS in association with family supervision has observed anti TB drug swallowing every day under health provider’s observation weekly. This nationwide invention was supported by the study project of Kasetjaroen, Paungrudsamee, Manesang, Hudsapak, Tunsawaii, and Tongheam (1995). Kamolratanakul, et al assert that the decentralization of treatment service to health center level and the individual treatment service for all patients were provided. Supervisors are chosen from health center staffs, village health volunteers, family or community members, depending on individual patients’ preferences. The study of effectiveness of DOTS and Self Administration in the treatment of Pulmonary Tuberculosis in Thailand has resulted of;

DOTS’s significant improvement and outcomes in treatment outcomes toward tuberculosis patients (cured 76.1%in DOTS and 67.1% in Self Administration, completed 83.8% in DOTS and 75.8% in Self Administration),

The method especially suited the decentralized facilities of treatment,

Further decentralization of treatment services is recommended,

The basic condition was detected, DOTS can be tailored to specific countries which are conditioned of exploring multiple observation, without decreasing of its effectiveness (Kamolratanakul, et al, 1999).

2.4.8 The obstacles of DOTS in Thailand (CDC and WHO, 1999)

1. Policy: Administrator did not concern of TB problem and took this problem as low priority.
2. Personal: Health providers have no job training, so they have insufficient knowledge and skill.

3. Practice in specific areas: Capital insufficiency accounted for no intensive, lack of supervision, lack of local leadership, poor organization, and weak of the association to support DOTS.

4. Form of DOTS: this were unreliable family observers in some cases and the lack of the development in DOTS to Thai society.

5. Information and record in the report: lack of information review, some report is biased cohort, uncompleted and unconcluded report is submitted, delay of information and the data base and improper computer program in DOTS.

2.4.9 DOTS situation in Zonal Tuberculosis Center 3

In 1997, ZTC3 used DOTS followed WHO's recommendation. Before DOTS, ZTC 3 had cured rate at 50% while compared with DOTS cured rate which increasing to 70% but still lower than target standard of TB division at 85% (TB division, 2001). In 2001, ZTC 3 had DOTS 51 districts and will cover 100% (65 districts) in 2002 (CDC 3, 2001).

DOTS situation in ZTC 3 was regarded of many problems such as economic problem of patient and family, lack of appointment response, lack of family support and lack of observers during the treatment. Therefore, non-compliance treatment is outgrowth (CDC, 2000).

2.5 Home visit

2.5.1 Definition of Home Visit (Pongsanit, K., 1997)

Home visit is a public health service by health workers who visit patient's home that composed of fragments included; nursing care, social welfare in order to promote health, prevention, treatment and care and rehabilitation. To provide health education about environmental management is important for patient to acknowledge about disease, economics and society.

2.5.2 The benefits of Home visit (Tuntitaveechok, 1996)

1. This evaluates patient and family's needs through contacting family member relationship and regarding economic status.
2. This allowed the individual and group health education at easier level.
3. This establish the confident relationship between patient and family member and visitor.
4. This provides appropriate nursing care for health and family problems.

2.5.3 Role and functions of visitor (Stanhope,L., 1984)

Home visit is a part of public health nursing that included 7 significant persons such as;

1. Health provider: administrating in health care nursing for ill patient, providing care of post-discharge and chronic patient.
2. Health monitor: observing clinical signs and symptoms and evaluating self health care of chronic case such as chronic renal failure, hypertension, and communicable disease.
3. Teacher: informing about nursing care, persuading the concern of patient health status and sharing thought to improve the quality of life.
4. Counselor the health problem: listening carefully to patients' problems and being consultative.
5. Coordinator: coordinating with patients and/or families and health workers.
6. Referrer: directing patients to bio-psycho-economic helpers.
7. Facilitator: eliminating of all health problems and giving access to patients to more facilities.

2.5.4 The process of home visit for TB patients

To visit the TB patient, **firstly** the preparation of the patient data such as identifying data, in detail of intra or extra pulmonary TB, size of lesion, result of sputum AFB smear, sign and symptoms at first look and drug category of treatment, is

compulsory. These information for the planing in health education is due, though not to forget to prepare health advice in paper as well. **Secondly**, we should establish patients' home map, which is beneficial to the other visitors. **Thirdly**, to sequence the proper time following the names of patients so the visit will comfort both patients and visitors. **Forth**, "surprise home visit" must be introduced. **Finally**, we record the information.

The "**Surprise home visit**" is the most important point in the process of home visit. To exercise, we visit all patients 4 times a month (every week) for 10 – 15 minutes per visit, excepting 20 – 30 minutes the first visit. For the excellent first impression, visitors must be friendly equal to patients. In Thai culture, it is the joining hands (wai) to pay respect, following by exchanged greeting. This is the best way to make patients - visitor relationship goes forward. Plus, the patients will be talked about their symptoms such as cough, dyspnea and hemoptysis.

Patient-self cares during treatment.

Asking about the medication regarding the taking of drugs in patients. This makes sure that patients have right drugs and right dose at the right time though rechecking with pill counting. The visitors must be upright so the medication will be insistent. If it is not equitable, visitors should be requested for their mistake and advised to correct and given reason of their incorrect medication. Incorrect medication will bring the side effect of anti TB drugs. Thus visitors must ask about the effect such as neasea, vomiting, dizziness, arthalgia, etc.

DOT card record is one duty provided by the observer, under other conditions to prepare the medication and look for patient swallow the drugs day by day. Observer needs to make clear in the DOT record card that this will remind patients and observers to have medication daily.

Asking for observers about the suffer of symptoms, getting advice and knowledge to decrease the suffers, about the care of patients in DOT card recording,

sputum destroy method – rinse sputum into it including water closet, set fire to destroy sputum is another alternative method.

During the conversation, visitors must notice the behavior when patients sneeze or cough whether patients closed their noses with handkerchief. This behavior is very important to stop the spread of bacterial to other member in the home. For this reason, ZTC give 2 – 3 handkerchiefs per one patient to start this behavior in every TB patients.

The visitors should observe the environment, which is a good ventilation to dilute bacterial concentration by open the door and windows. Bedding should be basked in the sun to kill TB. The general utensils should not be separated to patients or other family members but should be cleaned in regular with soap or detergent powder.

During the conversation, visitors must obtain many information from patients and care takers as much as possible. Hence, they could share opinions regarding health education and reminding patients about the next follow up of further medication and sputum correction. This included of the advice to patients to collect sputum in morning at the date of follow up. After rinsing patients' mouths with purified water set and hold it for a moment, then visitors must force the expiration to be a force cough to expectorate high quality in sputum collection. Then, rinse sputum into sputum collector and sealed. Finally, visitors must insist patients to void urine in a pot to look for the color. If it came out as red orange in color, this would indicate that patients had rifampicin, and the anti-TB drug would be excreted via kidney.

The patient visit is not done until we finish and if we do not take any leave, we could always render assistance in all patient's problems. Patient can ask for advice and receive medication before empty at ZTC, Monday – Friday, 08.30 am – 16.30 pm except holidays. After visiting patients, we must record data about changed signs and symptoms, problems in compliance and side effects of anti – TB drugs, DOT card recording, sputum destroy methods of environment, and our advice in each problems.

2.5.5 Home visit in foreign countries

The factors of the relationship between the health workers and the defaulters could not inform the disease to a doctor. Claiming that having received insufficient explanations, informed of the duration of treatment by the health team, workers could not ask as many questions as wish. Home visit is a useful method to reduce these factors by building patient-health worker relationship and giving more information. Though it is difficult to contact patients and their observers at all the visit. In Singapore, home visit did not result on contact with the patients (or other persons) 41% of the time (Chee, Boudville, Chan, Zee, and Wang, 2000).

During home visit, health workers must find out risk factors of defaults. In Denver, risk factors are the alcohol abuse and homelessness, age, gender, Asian ethnicity, born in the United States, Residence in the inner city, HIV positive, drug resistant isolate, injection drug use, prior therapy for active tuberculosis, and toxicity from therapy are not (Burman, Cohn, Rietmeijer, Judson, Sbarbaro, and Reves, 1997). In Singapore, there was a significant association to defaulting the age, sex marital or employment status, disease characteristics, or treatment related factors. (Chee, Boudville, Chan, Zee, and Wang) In addition, health workers observe patient ingestion of anti-TB medications and re-educate patients and family members about the disease, and side effects of medications. A nursing diagnosis care plan is conducted. The Nursing Diagnosis is designed to enhance quality of care through improved communication among members of the multi-disciplinary patient care team. The Nursing Diagnosis identifies problems and formulated specific factors to address barriers to treatment which encountered by patients with tuberculosis. During follow-up visits, diagnoses are modified to address new or unresolved issues.

2.6 Health Education and Communication (WHO, 1998)

TB health education is the plan to give knowledge about disease, transmission, treatment and side effects of anti-TB drug, and the general principle of self-health

care to patients individually and in group. This is to increase patients and their family's responsibility referring to the compliance of treatment and cured rate, the overall health education will make patients more wellness. So, health education in group health will focus on group discussions as one technique to share experiences and psychological support amid TB patients which empower patients to the adherence of treatment in regular.

Healthcare workers and patients and their families will use verbal and non-verbal expression to communicate to each other and accompanying with sending kindness and knowledge. To forward knowledge in the printed text, picture, pamphlet and poster is the useful method to improve the interest and understanding among patients and their families.

2.7 Principle of responsibility for taking care TB patients is designed as;

(CDC 3,1996)

1. To take medication follow to prescription,
2. To have enrich nutrients diet,
3. To not drink and smoke,
4. To sneeze or cough by closing the nose and mouth with handkerchief,
5. To destroy sputum by rinse sputum into water closet, no set fire to destroy sputum which is alternative method,
6. To ventilate for dilute bacterial concentration by opening the door and windows,
7. To bask the bedding in the sun to kill TB,
8. To clean general utensils in regular with soap or detergent powder.

2.8 The causes of low cure rate problem of TB treatment in ZTC 3, Chon Buri : (CDC 3, 1994)

The registered PTB patients in ZTC3 had one or more obstacles following;

1. The denial process of patients to defense that they do not have stigmatized TB disease.
2. Inadequate health education and principle to take care TB patients and provide general self-health care.
3. Since patients misunderstood about the absent of symptoms which is the cure, they stop the treatment.
4. Unable to tolerate with the side effect of anti-TB drugs.
5. Discontinued treatment caused by migration, no care takers, chronic alcohol drinking and drug addict.
6. Boring treatment and symptoms of disease.
7. Other socio-economic problems.

2.9 Conclusion

At the present TB situation, new TB cases are trained to increase the constant success. Non-compliance is the major problem since long standing course of treatment will take about 6-8 months to discomfort side effects. The socio-economic problem such as low socio-economic status and fear of social separation are the causes of MDR-TB. This created the more complicated and expensive way to treat the simple TB. DOTS is the strategy to manage the compliance of TB patients yet the results of implemented DOTS in Thailand was lower than the standard of WHO's recommendation. WHO has suggested of 85% cure rate which is lower than TB division. Additionally, Thailand has recommended 85% completed treatment rate. To strengthen the DOTS with home visit is the way to increase cure rate and complete treatment rate above than standard which WHO has recommended.

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