The Relationship Between Family Support and Health Behaviors Among Patients with Pulmonary TB

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ABSTRACT

This study aimed to 1) identify the level of family support and the level of health behaviors among patients with pulmonary TB; and 2) to examine the relationship between family support and health behaviors among patients with pulmonary TB. A descriptive correlational study was conducted at the Out-patient Department (OPD) and Directly Observed Therapy (DOT) Center of the National Institute of Diseases of the Chest and Hospital, Dhaka Bangladesh. One hundred and twenty six pulmonary TB patients were selected by using the purposive sampling method. Data were collected by using self report questionnaires. The set of questionnaires consisted of three parts: 1) Demographic Characteristics, 2) Family Support Questionnaire (FSQ); and 3) Health Behaviors Questionnaire (HBQ). The Cronbach's alpha coefficients of the FSQ and HBQ were .82 and .76, respectively. Descriptive statistics and Spearman's rho were used to analyze the data.

The results of this study showed that patients with pulmonary TB received a high level of family support (M =3.26, SD = 0.35), and the health behaviors of TB patients was also at high level (M = 3.04, SD = 0.31). In addition, all dimensions of family support were at high level, except 'informational support' which was reported

at the moderate level (M=2.85, SD = 0.12). Similarly, three dimensions of the health behaviors were at high level. These were ‘following healthy diets’ (M=3.01, SD=0.45); ‘complying with anti-TB medication’ (M=3.71, SD=0.50), and ‘avoiding the risk factors’ (M=3.47, SD=0.48). The rest of them were at the moderate level. Furthermore, the study results showed that there was a statistically significant positive correlation between the two variables (rho = .47, p<.01).

This study confirms the significant role that family support plays in health behaviors of patients with pulmonary TB. Assessing the support from the family and encouraging them to provide continuous support to patients would enable the patients to maintain adequate and appropriate health behaviors.

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Mrs. Bethika Rani Biswas

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CHAPTER 1

INTRODUCTION

ackground and Significance of the Problem

Tuberculosis (TB) is a global health problem with an estimated 8.9 million new cases worldwide in 2004 (Dye, 2006). The number of people suffering from this disease has been increasing alarmingly throughout the years. Of the 7.89 million cases of tuberculosis (TB) reported in 1997 about 1.86 million ended in deaths. Therefore, tuberculosis is responsible for .8 of the world's daily burden of deaths. Furthermore, the World Health Organization (WHO) stated that 8% an incidence occurred in 22 high burden listed countries. Of these 50% occurred in five South Asian countries with 75% cases occurring among the most economically productive age group (15-60 years of age) of the population (TDR, 2002). TB is a health crisis that is neglected and out of control in many parts of the world (WHO as cited in Tornee et al., 2005). Moreover, in developing countries the control of TB continues to be one of the major public health problems (Tornee et al., 2005).

Bangladesh, as a developing country, is also concerned about this infectious disease. Bangladesh is facing TB as a major public health problem. About 70,200 people die of TB each year. Bangladesh is one among the TB burden countries ranking the sixth among the 22 high burden countries listed by the WHO. The average TB related mortalities in Bangladesh are 33 percent higher than the Southeast Asian region (USAID, 2009). Furthermore, the WHO estimated that the incidence of new smear-positive persons to be 111 per 100,000 for all forms of TB and the prevalence of all TB cases at 490 per 1000, 000 persons (Begum, van der Werf, Becx-Bleumink,

& Borgdorff, 2007). The National TB Control Program notification of data showed that there were 18 per 100,000 in 1995, and this increased to 46 per 100,000 smear positive patients in 2004 (Begum et al., 2007).

Moreover, since 1993, the Bangladesh National TB Programme has operated the Directly Observed Therapy (DOTs) Short Course strategy that has been implemented at the thana level (many villages together make up a thana). This covers the population of 250,000 thana patients who attended the National TB control Programme. They received free medication and were monitored when attending DOTs for six to eight months for the regular treatment method (Islam, Wakai, Ishikawa, Chowdhury, & Vaughan, 2002). Even though the Government of Bangladesh has put much effort in managing TB cases, the implementation of the DOTs is still ineffective due to several factors. These include system factors, such as poor drug supply and insufficient information on spread of the disease given to the patients and their families. (TDR, 2002). They also include personal factors, such as health behaviors, and family factors such as family support.

Conner (2002) reviewed the literature about health behaviors and concluded that health behaviors are any activities undertaken for the purpose of preventing or detecting disease or for improving health and well being. In addition, health behaviors should lead to improved health through increasing physical activity, following a nutritional diet and reducing tobacco, alcohol and drug use. These are important for promoting health and the prevention of disease (USDHHS as cited in Conner, 2002). Furthermore, the treatment of patients with pulmonary diseases needs to emphasize the importance of infection control (such as hand washing and tissue disposal), strictly

adherence to drug regimens, close monitoring for adverse drug effects and follow up screening of all household members (Pinto, Matteucci, & Pravikoff, 2008).

The health behaviors of pulmonary TB patients and support from their family members are of interest. This present study explored how TB patients behaved in order to control and manage the disease as well as to maintaining environmental hygiene. Previous studies confirmed that the following behaviors were necessary: following a healthy diet; do physical exercises; have enough sleep; take vitamin supplements; and avoid intake of alcohol (Marra, Marra, Cox, Palepu, & Fitzgerald, 2004). TB patients should wear masks to minimize the spread of TB bacilli, cover mouths and noses during coughing and sneezing, dispose of tissues properly, wash the hands properly, and comply with medication (Brooks-Brunn, 2004). The success of TB treatment requires compliance with medication and excellent patients' participation as most treatment regimens last at least 6 months (Robles & Efferen, 1999).

A previous study stated that family support can empower the TB patients during the treatment period by providing support. This includes reminding the TB patients to taking the medications and being sensitive to the TB patients if they experience adverse effects of the TB medication (Nasution, 2007). Family support refers to support to a person's perceived need for moral, emotional and intimate support, as well as the need for information and feedback provided by the family. Family support might influence an individual's self-care behavior through enhancing motivation, providing information and providing feedback. The findings of a study showed that a significant positive relationship existed between family support and self-care behaviors ($r = .25$, $p = .012$) (Procidano & Heller as cited in Xiaolian et al.,

2002). Furthermore, one previous study stated that family involvement is essential for the control of patients' blood pressure, as lack of family support can destabilize the whole treatment plan (Costa & Nogueira, 2008). Family support appeared to be a positive influence on patients' adherence to treatment, whereas non-adherence to treatment may occur when family support is weaker (Munro et al., 2007)

Therefore, family support as part of social support plays a role in recovery from physical illness. Family relationships influence health behavior with implications for health that cover diet, exercise, smoking, alcohol intake, sleep and compliance with medication regimens (Cohen, Gottlieb, & Underwood, 2000). According to House (1981) social support is conceptualized as four dimensions that reflect four types of supports. These include emotional, instrumental, informational, and appraisal support. Family support as an interpersonal transaction involves emotional support which refers to the demonstration of caring, empathy, love, and trust. It also involves tangible assistance or aid such as providing help in specific tasks, including the preparation of nutritious meals, and arranging transport and recreational activities. In informational support, advice is provided as well as personal information or suggestions. Lastly, appraisal support consists of constructive feedback that is useful for self-evaluation.

In addition, family support might influence the adopting and maintaining of health behaviors. In Bangladesh, the family structure is usually an extended family and family members are expected to take care of sick persons in the family. Therefore, it would be expected that for pulmonary TB patients, family support would help improve the patients' health behaviors. For the present study, ouse's conceptualization of social support (1981) was used to guide and determine four types

of family support. These were emotional, instrumental, informational, and appraisal support. The researcher was also interested in exploring the relationship between family support and health behaviors among patients with pulmonary tuberculosis in Bangladesh.

□bjectives of the Study

The objectives of this study were as follows:

1. To identify the level of family support among patients with pulmonary TB

2. To identify the level of health behaviors among patients with pulmonary TB

3. To examine the relationship between family support and health behaviors among patients with pulmonary TB

□esearch □uestions of the Study

1. What is the level of family support among patients with pulmonary TB?

2. What is the level of health behaviors among patients with pulmonary TB?

3. Is there any relationship between family support and health behaviors among patients with pulmonary TB?

Conceptual Framework of the Study

The aim of this study was to explore the relationship between family support and health behaviors among patients with pulmonary TB. In this study social support proposed by House (1981) was used to guide the conceptualization of family support. The family is the core unit and an integrated part of society and is a major source of support in the time of illness. Family support is the type of social support that is

obtained from the family. According to House (1981), there are four functional dimensions of social support: emotional, instrumental, informational, and appraisal support. These were used to construct four dimensions of family support.

The family provides care to its members at the time of illness. TB patients receive support from their family and this includes emotional support, instrumental support, informational support, and appraisal support. Emotional support refers to the demonstration of caring, love, and trust (such as being with patients when needed). Instrumental support includes material support or actions, including providing goods or services (such as preparing food, cleaning houses, taking patients to the hospital, giving money). Informational support refers to information and advice related to health behavior activities and/or daily problem-solving or coping strategies (such as the benefits of taking anti-medication, methods of transmission and prevention of transmission, environmental management). Appraisal support refers to the provision of affirmative support or constructive feedback to help an individual realize his or her strengths and potential and the transmission of information relevant to self evaluation.

Health behaviors are actions taken by a person to maintain, attain, or regain good health and to prevent illness (Mosby's Medical Dictionary, 2009). The related literature suggests that patients with pulmonary TB should maintain the following health behaviors: take medication as prescribed; consume healthy diets; maintain safe hygiene; perform appropriate levels of activity and physical exercise; take enough sleep; take vitamin supplements; and the avoid the risk factors of TB (Brooks-Brunn, 2004; Marra et al., 2004). In this study the researcher dealt with the following behaviors: complying with anti-TB medication; following healthy diets; performing

physical exercises; maintaining environmental hygiene; preventing disease transmission to others; and avoiding the risk factors of TB.

Family support might influence an individual's health behaviors through enhancing, motivating, provision of information and feedback (Xiaolian et al., 2002). The family is the most important source for support a person. Thus family support has a positive influence on adopting and maintaining health behaviors (Dunbar, Clark, Quinn, Gary, & Kaslow, 2008). The conceptual framework of this study is shown in Figure 1.

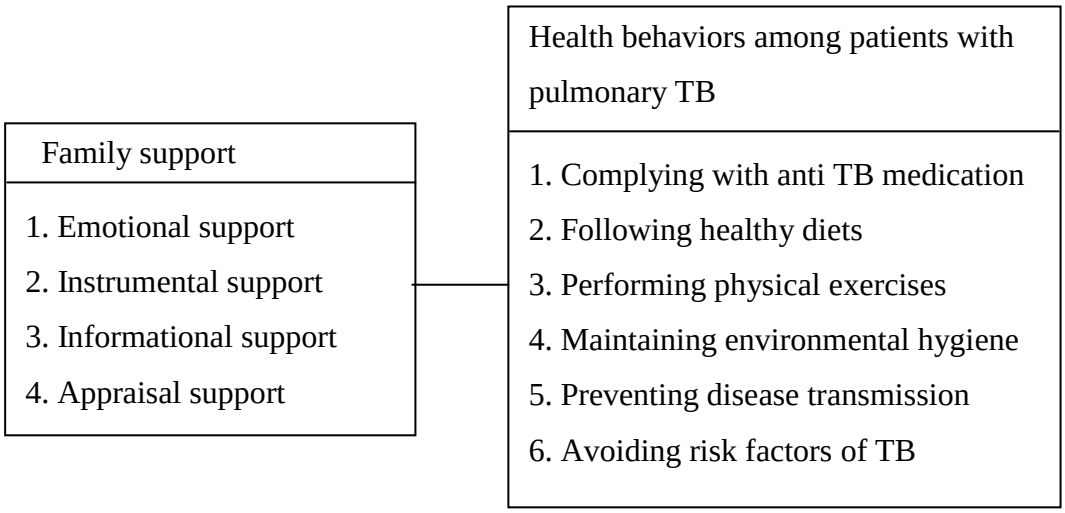

Figure 1

Conceptual Framework of the Study

ypothesis

There is a positive relationship between family support and health behaviors among patients with pulmonary TB.

*efinition of Terms

Family support refers to the support perceived by the patients with pulmonary TB that they received from their family members. These included emotional support (such as caring, empathy, love and trust), instrumental support (such as action, good services by the family members), informational support (such as advice, providing information about disease transmission), and appraisal support (such as give constructive feedback which is helpful for tuberculosis patients). It was measured by the Family Support Questionnaire developed by the researcher.

Health behaviors refer to the activities performed by the patients with pulmonary TB to maintain their health and prevent the transmission of the disease to others. These included complying with anti-TB medication, following healthy diets, performing physical exercise, maintaining environmental hygiene, preventing disease transmission, and avoiding the risk factors of TB. It was measured by the Health Behavior Questionnaire developed by the researcher.

Scope of the Study

This study was conducted to examine the relationship between family support and health behaviors among patients with pulmonary TB who were attending the NIDCH hospital OPD and DOTs center in Dhaka, Bangladesh from December 2009 to February 2010.

CHAPTER 2

LITERATURE REVIEW

In this chapter relevant literature is reviewed which focuses on pulmonary tuberculosis patient's family support and health behaviors.

1. Overview of Pulmonary TB

    Definition of pulmonary TB

    Incidence of pulmonary TB

    Risk factors of pulmonary TB

    Signs and symptoms of pulmonary TB

    Prevention of transmission of pulmonary TB

    Treatment of pulmonary TB

    Impact of the pulmonary TB on patients and his or her family

    Management of patients with pulmonary TB in Bangladesh context

2. Health Behaviors

    Health behaviors among patients with pulmonary TB

    Factors related to health behaviors among patients with pulmonary TB

3. Family Support

    Definition of family support

    Family support for patients with pulmonary TB

4. Relationship between family support and health behaviors among patients with pulmonary TB.

□verview of Pulmonary T□

□efinition of pulmonary T□

Tuberculosis is a chronic, infectious and communicable granulomatous disease caused by Mycobacterium tuberculosis. It is an acid fast aerobic bacteria that grows slowly and is sensitive to heat and ultraviolet radiations (Brooks-Brunn, 2004). Tuberculosis primarily affects the lungs and causes pulmonary tuberculosis (Reza, 2008). A case of pulmonary TB is diagnosed if the patients have at least two sputum specimens positive for acid first bacillis (AFB) or one sputum positive for AFB and radiological abnormalities consistent with pulmonary TB (Zaman et al., 2006).

□ncidence of pulmonary T□

Bangladesh is an over populated country with a population of nearly 130 million. Less than 40% of the population has access to basic health care. The main cause of death is poverty related to infectious diseases, which are exacerbated by and contribute to malnutrition (Abedin, 1997; MOHFW, 1998; as cited in Ullah, Newell, Ahmed, Hyder, & Islam, 2006; World Bank, 1993). The burden of communicable disease, including TB in Bangladesh, is high when compared to other South Asian countries (Ullah et al., 2006). Bangladesh is ranked sixth on the World Health Organizations list of 22 high burden countries. The estimated incidence of TB in Bangladesh is around 350,641 new cases and 157,773 smear positive cases per year with TB related deaths numbering about 70,200 per year (USAID, 2009). In addition, Zaman et al. (2006) conducted a study focusing on the prevalence of sputum smear positive tuberculosis in rural areas in Bangladesh. The findings showed that the prevalence of smear positive TB was 5 100,000 population aged 15 years this was significantly higher among males compared to females (190 against 31/100,000,

p<.0001). Another study was conducted by Jimenez-Corona and Colleague (2006) with 623 patients with pulmonary TB. They found that 256 (41.1%) were women. Overall the incidence rate of pulmonary TB was 58% higher in men, (31.79 cases per 100,000 person-years) than in women (20.13 cases per 100,000 years, *p*<.001) (Jimenez-Corona et al.).

□*isk factors of* pulmonary *T*□

Tuberculosis is an airborne infection which is acquired by the inhalation of very small particles (1 to 5 mm in diameter). These are emitted in the form of droplets during coughing, talking, laughing, sneezing, or singing. Once present in the air, the infected droplet nuclei may be inhaled by susceptible persons (Black & Hawks, 2005). Furthermore, due to low immunity, persons with HIV infection, and persons who are drug abusers are also at risk of getting TB. In addition, persons inhaling air-borne nuclei from an infected person and those who spend more time in the same air space are also at risk of getting TB (Brooks-Brunn, 2004).

The risk of contracting TB increases with the frequency of contact with people who have the disease. There is also risk to those with poor living conditions, inadequate health care and who mix with immigrants from countries with a high prevalence of TB (such as South Eastern Asia, Africa, and Latin America). Living in overcrowded places with substandard housing condition increases the risks. Also at risk are the homeless and those with malnutrition, particularly children under age group of 15 years or less and adults between the ages of 15-44 years. Furthermore, being a health care worker performing high-risk activities like sputum induction procedures, suctioning, caring for immunosuppressed patients, providing home care to infected patients, also incur the risk of getting TB (Brooks-Brunn, 2004).

Signs and symptoms of pulmonary T□

According to Brooks-Brunn (2004), there are common signs and symptoms of pulmonary TB. Most the TB patients report that they have a low grade fever, limited to minor coughs, they sweat, especially during the night time, and have a loss of weight, fatigue, and appetite. They may have non-productive coughs, and mucopurulent sputum may be expectorated. Sputum may be mucoid, purulent or blood stained (haemoptysis). Both the systemic and pulmonary symptoms are usually chronic and may have been present for weeks to months. In addition, the National Tuberculosis Control Program (2006) stated that often a patient with pulmonary TB, complains that they have respiratory problems, symptoms such as difficulty in breathing, and chest pains.

Furthermore, Crofton, Horne, and Miller (1999) stated that the general condition of the TB patients may be good, in spite of advanced disease. But patients may be obviously ill. The pulse is usually raised during fever. During examinations of the chest the commonest signs are found creapitations (crackles) in the upper part of one or both lungs.

Prevention of transmission of pulmonary T□

Tuberculosis can be prevented by following two major strategies. The first strategy is to prevent transmission from patients with active and contagious forms of the disease to uninfected people. This strategy will prevent new infections. Another strategy aims to prevent disease development even after infection. The most important and effective means of preventing new infections are to eliminate the sources of transmission (Menzies, Tannenbaum, & FitzGerald, 1999). Tuberculosis is an air-borne disease that can spread through the air. Thus TB patients need to be aware

about prevention of the spread of TB through respiratory droplets or secretions. Hence the TB patients should cover mouth and nose with double tissues while coughing or sneezing and take special precautions during coughing to control the spread of infection through secretions. In addition, TB patients should not sneeze into their bare hands, should wash their hands after coughing or sneezing and dispose of tissues promptly into closed plastic bags. Moreover, it is recommended that when a TB infected patient is admitted in the hospital, care for such a patient should be provided in a negative pressure room to prevent respiratory droplets from escaping while the door is being opened (Barbara, 2006). Therefore, strict rule about wearing masks should be enforced for all staff and visitors who work in close contact with patients with active TB. High efficiency particulate masks, such as HEPA filter masks, should be used, particularly by persons who perform high risk procedures, such as suctioning and bronchoscopy. Standard precautions should be used for additional protection like gowns and gloves for direct contact with patients (Barbara, 2006).

Treatment of pulmonary T

The treatment of TB should be started as soon as possible. The standardized treatment regimes are divided into two phases: Initial (intensive) phase and the continuation phase (NTCP, 2006).

nitial intensive phase Initial regimens or intensive phases include the use of drugs daily for two months for new cases and three months for retreatment cases. The aim of this phase is to rapidly reduce and eliminate the multiplying bacilli, without developing drugs resistance. During the intensive phase, the tubercle bacilli are killed rapidly. This is the vital phase of the treatment.

Continuation phase□The continuation phase is essential to eliminate the remaining intermittent bacterial population, and treatment is three times weekly. Such treatment has proven as effective as daily treatment.

The majority of patients who received a total of 6 months of treatment for drug susceptible TB will respond completely to treatment. In general more than 90% of the patients are completely cured by standard regimens (Peloquin, 2002). The most frequently used anti-TB drugs for treatment are: Isoniazid (H), Rifampicin (R), Pyrazinamide (Z), and either Ethambutol (E) or Streptomycin (S). Isoniazid and Rifampicin are the most powerful among these drug regimens. Rifampicin has a unique property to kill the mycobacterium under various conditions. Directly observed therapy (DOT) is a part of a package of interventions to improve tuberculosis treatment and adherence to regimens (Noyes & Popay, 2007). Treatment regimens for each diagnostic category for adult patients and side effects of Anti-TB medication are presented in Table 1 and Table 2.

Table 1

Treatment □egimens for □ach □iagnostic Category for □dult

TB Diagnostic category	Type of TB patients	Initial phase (Daily)	Continuation Phase (3 times weekly)
i	New case 1. New smear-positive 2. New smear-negative Pulmonary TB 3. Seriously ill with extra-Pulmonary TB	2 (HREZ)	4 (HR)3

Table 1 (*Continued*)

TB Diagnostic category	Type of TB patients	Initial phase (Daily)	Continuation phase(3 times weekly)
ii	Previously treated >1 month Sputum smear positive PTB: Relapse Treatment after interruption/ default Treatment failure	2 (EHRZ) S/ 1 ((HREZ)	5 (HR) 3 E3
iii	New smear negative PTB (other than in Category 1); less severe from of EPTB e.g. lymph node, plural effusion, peripheral, joint, skin.	2(HRZ)	4(HR)3

*ote*From *ational uidelines and peration anual for Tuberculosis Control* (p. 24), by National Tuberculosis Control Program Directorate General of Health Services, (2006), Dhaka, Bangladesh: Author.

Before the parenthesis number of month is given. The letters inside the parenthesis indicate fixed dose combination of the drugs, and after parenthesis is the number of doses per week. Each anti-TB drug has an abbreviation: H for INH or Isoniazid, R for Rifampicin, S for Streptomycin, Z for Pyrazinamide and E for Ethambutol.

Table 2

Side ffects of nti T edication

Name of TB drugs	Side effect
Isoniazid (H)	Burning sensation in the feet, neuropathy, and nausea and vomiting, skin rash, fever may cause liver problems (hepatitis), hypersensitivity.
Ethambutol (E)	Skin rashes, optic neuritis, eye problems such as blurred vision nausea and vomiting, headaches.
Rifampicin (R)	Nausea and vomiting, diarrhea, skin rash, anemia, liver problems (jaundice), flu like symptoms.
Streptomycin (S)	Ototoxicity, nephrotoxicity, hypokalemia, pain, skin rash,
Pyrazinamide	Anorexia, nausea, abdominal pain, hepatotoxicity, hyperuricemia, skin rash, gastrointestinal irritation.

ote Modified From eeping TB in check by . M. Boutotte, 1999, *ursing* March p. 37. and From *ational uidelines and perational anual for Tuberculosis Control* (p. 27), by National Tuberculosis Control Programme Directorate General of Health Services, (2009), Dhaka, Bangladesh: Author.

mpact of pulmonary T on patients and his or her family

The impact of tuberculosis can be divided into several aspects including the physical impact, psychological impact and socio-economic impact.

Physical impact TB infection is becoming clinically important because tuberculosis is closely associated with poverty. Although anyone can get TB, poor people are at greatest risk of getting TB because of their weakened immune system,

resulting from malnutrition (Baral, Karki, & Newell, 2007). Furthermore, TB is a chronic infectious disease, which produces excessive and long term cytokines, which can affect the neuroendocrine system. This, in turn, results in the alteration of biological functions such as metabolic and immunologic processes. For this reason TB patients lose weight (Mahuad et al., 2007).

A survey study conducted by Rajeswari, Muniyandi, Balasubramanian, & Narayanan, (2005) and recruited 610 patients with cured or completed treatment of pulmonary TB at government health facilities of two tuberculosis units of south India were interviewed by using SF-36 questionnaires. In this study the researchers interviewed each patient twice, at the end of the intensive phase of treatment and at the end of the continuation phase. They found that the physical well being of these patients was affected. Before treatment, less than 10% perceived their health status to be good and this number increased at the end of the intensive phase (34%) and at the end of treatment (approximately 80%) with a significant change ($p<.05$). They also found that bodily pain was perceived to be a factor interfering moderately with daily activities in about half of patients.

TB significantly affects a person's ability to adequately carry out his or her duties at his or her workplace, home, or school. As TB is related to fatigue and malaise, it reduces an individual's ability to perform work. Armijos, Weigel, Qincha, and Ulloa, (2008) also found that TB patients suffered from various signs and symptoms with an average of 2.9 ± 1.4 (range 1-6) signs and symptoms per patient. These signs and symptoms persist and only 53% of patients were free from symptoms at the end of treatment. This number was significantly higher among patients who had delayed seeking care for more than 3 months (Rajeswari et al., 2005).

Psychological impact: Armijos et al. (2008) explored the meaning and consequences of tuberculosis at risk for an urban group in Ecuador. In this study the subjects were 212 adults undergoing diagnostic TB testing. The researchers found that 78% respondents explained that they had suffered psychological and emotional distress after knowing that they had TB. They felt specific types of distress, and feelings of isolation and loneliness. They felt sadness and shame about being TB positive. Some also mentioned they were ashamed of their chronic coughs and were also worried about the possibility of losing their job with this condition. Many of them reported that they were social stigmatized (Armijos et al., 2008; Baral et al., 2007)

Economic impact. TB pushes marginalized people from the poorer to the poorest and most hopeless as TB destroys their ability to earn money or subsist on their working abilities. Patients are left with modest social capital and are ultimately pushed into miserable poverty. In addition the diagnostic procedures and treatment processes of the TB are costly (Baral et al., 2007). It was estimated that TB corresponds to an annual loss of between US$ 1.4 and 2.8 billion in economic growth worldwide (Grimard & Harling, 2004). Tuberculosis affects the most productive age group as a result of which the economic cost for society is high. Therefore, tuberculosis has a considerable impact on patients' households in terms of income, particularly when the patient is a wage earner.

Rajeswari et al. (1999) quantified the socio-economic impact of tuberculosis on patients and their families in India. They conducted 17 focus group discussions with 304 patients at the productive age (mean age was 37.8 years, SD = 14.9). The direct costs (diagnosis and treatment cost) and the indirect costs (loss of wages or loss

of working days). They found that the mean direct cost was Rs. 2052 (Rs = Rupees, the Indian currency), indirect costs were Rs. 3934, and the total cost was Rs. 5986, equivalent to US$ 171.The mean number of working days lost was 83. More importantly, they found that the illness had a considerable impact on children's education. In a total of 276 children of TB patients, aged 6-16 years, 11% had discontinued school as a result of the burden caused by their parent's illness and 8 took up employment to support the family. The findings of this study confirms the economic impact of the disease, not only on the patients, but also other members in the family, including children (Rajeswariet al.).

In addition, the same study found that 67% of rural patients and 75% of urban patients incurred TB-related debts. Long, Johansson, Diwan, and Winkvist (2001) conducted a study and they stated that TB affected patients and their family suffer economic problems as one the biggest problems, particularly if the affected person is the sole earner in the family.

anagement of patients with pulmonary T in the angladesh context

Bangladesh is an over populated country. TB is a major public health problem in the country. The Bangladesh National Tuberculosis Programme (NTP) has published quarterly and annual reports since 2002. These reports state the main activities related to TB control and the achievements of the program, in terms of case detection and treatment success (NTCP, 2008). According to the Bangladesh Rural Advancement Committee (BRAC), the TB treatment completion rate in sputum-negative patients was 62.5% in the BRAC sector, and 87.5% in the government sector. The overall treatment success rate in both the Bangladesh government sector

and the Bangladesh rural advancement committee sector (BRAC) was 82.7% and 83.3%, respectively.

In Bangladesh, the treatment of all TB patients and follow up sputum examination were carried out according to the National TB Control Programme Guidelines (Reza, 2008). For the patients who were diagnosed with pulmonary TB, the health care professionals would suggest to them to come to the DOTs centers in government thana health complexes once a week instead of daily for observation (Islam et al., 2002). Overall, 95% TB patients were treated as ambulatory TB cases. Hospitalization may be necessary if the patients cannot receive ambulatory treatment under direct observation. Treatment may also be necessary for patients who have TB with complications or severely ill patients. The DOT ensured adherence to treatment. DOTs should be provided as conveniently as possible for the patients (NTCP, 2006).

The National TB Control Programme (NTCP) in Bangladesh is essentially a permanent country-wide programme. It has been in action since pre-liberation days. Thus TB clinics and TB hospitals were established throughout the country. In 1976 a new strategy was started on the advice of the World Health Organization (WHO) based on integrating the service with the general health service. Furthermore, the NTCP was revised 1 1 under the project Further Development of TB and Leprosy Control Services . During the fourth Five ear Plan Period (1 0-95), the project was funded by the Government of Bangladesh, the IDA/World Bank and the Government of the Netherlands. WHO was a partner in implementing the project. In January, 1995 several NGOs joined hands with the NTP, namely the BRAC, the Damien Foundation, and the Danish Bangladesh Leprosy Mission. In addition in the fifth five year plan (1997-2002), an important programme that was implemented on a priority

basis was The intensified control of TB programmes. This was implemented within the framework of primary health care under the management of Communicable Disease Control in the Directorate General of Health Services.

At the district level there are Medical officers TB & Leprosy and programme organizations. At the upazila level the Medical officer responsible for disease control looks after the programme under the supervision of UHFPO. At the community level the health workers are responsible for identifying and referring suspected TB cases, providing DOTs for patients, and tracing defaulters (Reza, 2008). In the DOTs center the patients register after being diagnosed with TB by the doctors. The health care professional fills the tuberculosis treatment card as soon as a patient is diagnosed with TB and the patient keeps the card. The most important parts of this card are the date on which treatment was started, and patient's category. The health care provider instructs the patients to bring this card each time she or he attends for anti-TB treatment. The health care provider gives information about taking medication, identifies the right anti-TB medication, the right dose, the right interval for the right period, and notes any adverse effects caused by the anti-TB drugs.

ealth ehaviors

The World Health Organization (WHO as cited in Park, 1997) stated that health is a state of complete physical, mental, and social- well-being and not merely an absence of disease or infirmity. This definition was, later, re-conceptualized to include spiritual well-being (Larson, 1996) In order for an individual to achieve health and well-being, one should have performed appropriate health-related behaviors (for simplicity, the term health behaviors is commonly used). Gochman

defined health behaviors as: those personal attributes such as beliefs, expectations, motives, values, perceptions, and other cognitive elements, personality characteristics, including affective and emotional states and traits; and overt behavior patterns, actions, and habits that relate to health maintenance, to health restoration, and to health improvement (Gochman, 1 7, p. 3).

With this definition, behaviors denote something that an individual does or refrains from doing. Heath behaviors also include analysis of specific actions, such as taking medication in an appropriate fashion, or remaining in a difficult and challenging treatment regimen that affects improvement or recovery.

ealth behaviors among patients with pulmonary T

In this section, health behaviors among patients with tuberculosis were reviewed. Previous studies confirmed that the following behaviors were necessary: following healthy diets, doing physical exercise, having enough sleep, taking vitamin supplements, avoiding taking alcohol (Marra et al., 2004). In addition, adherence to the therapeutic regimens, such as taking medication as prescribed, practicing safe hygiene, consuming a nutritious and adequate diet, and participating in an appropriate level of activity, were part of health behaviors of the TB patients. Furthermore, infection control such as proper disposal of tissues, covering the mouth during coughing, and washing the hands indicate the continuing self-care practices of TB patients (Brooks-Brunn, 2004). Therefore, based on a literature review, the current study considers that the health behaviors of TB patients consist of six dimensions. These are: complying with anti-TB medication; following healthy diets; performing physical exercises; maintaining environmental hygiene; preventing disease transmission and avoiding the risk factors of TB.

Complying with anti□T□ medication

To comply or compliance is the extent to which a patient takes medications as prescribed by their health care providers. Understanding the medications schedule, means taking the prescribed number of pills each day within the due time and the correct dosage prescribed by the physician. (Osterberg & Blaschke, 2005). There may be side effects of medication which must be noted. Compliance can be explained as the readiness to take medication within a period. Tuberculosis is a communicable disease and taking medication is the most effective means of preventing the disease being transmitted from person to person (Brooks-Brunn, 2004). In addition, TB patients may have to take anti-TB medication without interruption, and in accord with the number of pills taken per day (Dennision, 2003).

Compliance is the extent to which a person's behavior coincides with medical or health advice. This involves taking medication regularly, following up appointments with doctors, and making changes for a healthy lifestyle. One study was conducted by Khalili and colleagues with 55 subjects to evaluate the rate of compliance to anti-TB drugs. This was done by means of chemical urine tests of newly diagnosed pulmonary TB patients admitted at teaching hospitals affiliated to the Tehran University of Medical Sciences, Tehran, Iran. The researcher found that after the first month, the patients' compliance rate was 96 %. After the second, fourth and six months the compliance rates were 56%, 76% and 81% respectively. Patients were classified in three groups according to their ages: less than 25 years old, 25-35 and more than 35 years old. The most compliant patients were found in the 25-35 years old group (66% at the second month) (Khalili, Dashti-Khavidaki, Sajadi, & Hajiabolbaghi, 2008).

Following healthy diets

Patients with tuberculosis should follow a high calorie nutritional diet (such as eggs, meat, milk and milk products). High energy and high protein diets are helpful in the acute stages of the illness (Pat, 2008). However, most TB patients are often incapable of taking in food due to their prolonged chronic illness and this impairs their nutritional status. Impaired nutritional status, anorexia, weight loss, and malnutrition are common problems in tuberculosis patients. In addition, the eating habits of TB patients may be altered due to fatigue through excessive coughing, sputum production, and chest pains. Therefore, TB patients should frequently take small meals and liquid nutritional supplements which promote systemic hydration and meet the basic caloric requirements of the body (Brooks-Brunn, 2004). However, nutritional status determines the normal health and functioning of all the systems in the body which are responsible for the host's resistance to various infectious diseases. Cell mediated immunity is the key host defense against TB. Thus malnutrition is an important risk factor in the development of TB (Dodor, 2008). Therefore a well balanced diet with vitamin supplement should be taken by TB patients. Those who are poorly nourished or underweight may benefit by six small high protein meals high in calories daily, rather than three meals (Dennision, 2003).

Performing physical exercises

Yoshida and colleague (2006) stated that training and exercise is an important component in the pulmonary rehabilitation of patients with chronic lung disease. Dennision (2003) stated that during the acute phase of the illness, persons with TB experience fatigue and have difficulty completing active daily living activities (ADLs). Therefore ADLs are encouraged to increase activity tolerance and

build muscle strength. In addition, TB patients need to do daily activities, focused on increasing activity tolerance and muscle strength (Brooks-Brunn, 2004). In addition, tuberculosis patients must do regular physical activities, such as those contributing to physical fitness. Regular exercise improves enduring muscle power and elasticity, increases lung functions, reduces anxiety, reduces muscle tension and maintains normal body weight (Phromrak, 2004). Therefore, a course of medication must be paired with a proper diet, rest, and exercise in order to fully expel the bacteria from body system. Patients can do regular, moderate-intensity exercise at least five days a week for 30 minutes or more. Furthermore, TB patients should perform as much activity as they are physically able to do at any given time. For patients currently affected by tuberculosis, performing simple activities such as walking or exercise helps eliminate the bacteria (Jordan, 2009).

□ *aintaining environmental hygiene*

Direct sunlight can kill TB bacilli within five minutes, so exposing it to sunlight and air is a good and simple method for the management of environmental hygiene (Crofton et al., 1999). In addition, the National Tuberculosis Control Program (2009) has declared that tuberculosis patients should also wear masks for personal protection and minimize dispersal of bacilli while talking, coughing, and sneezing. Furthermore, good exposure to air lessens the risk of spreading the disease to others as the possibility of inhaling TB bacilli is reduced if the room is well ventilated (Lyneh, as cited in Phromrak, 2004). Therefore, TB patients should avoid staying for long hours in places crowed with people, or in poorly ventilated or dark and damp environments. Living places should be exposed to sunlight with good ventilation, because sun light effectively kills TB germs (Ngamwittayaphong, 2004)

Preventing disease transmission

Tuberculosis patients must be aware of preventing the disease from being transmitted to others. Health care professional should give instructions to patients about ways to protected others from possible infection. TB patients should cover their mouths and noses with tissue or handkerchiefs during coughing and sneezing, and wash the hands properly. In addition, they should discard the disposables properly (Brooks-Brunn, 2004). Therefore, TB patients must use handkerchiefs, tissue papers or both hands to cover the mouth and nose whenever he or she coughs or sneezes. This is desirable behavior not only for the prevention TB transmission but also for preventing the spread of other respiratory diseases, such as the common cold (Ngamwittayaphong, 2004). Furthermore, TB patients should dispose of used tissues or other disposable things properly or burn them as soon as possible (Crofton et al., 1999). Regarding, the prevention of disease transmission, TB patients should discourage spitting their secretion or saliva here and there and should only spit into a closed container.

□*voiding the risk factors of T*□

Tobacco smoking and high alcohol intakes greatly reduce the body's defense mechanisms. In contrast, less tobacco consumption will help to prevent tuberculosis as well as other lung diseases (Crofton et al., 1999). The active smoker who has started smoking at the age of 15-20 years, or who has smoked more than 10 years, has a higher risk of pulmonary TB (Niorn et al., 2004). Smoking increases the risk of developing pulmonary TB and it has been associated with latent TB infection (Leung et al., 2007).

Furthermore, a previous study was conducted by Fiske, Hamilton, and Stout (2009) with 5556 adult tuberculosis patients in North Carolina. The researcher found that people who use alcohol excessively were more likely to have pulmonary tuberculosis than those not using alcohol excessively (there were 92.5% of cases using alcohol excessively with pulmonary tuberculosis against 77.2% of cases not using alcohol excessively (p<.0001). In addition, among cases with pulmonary tuberculosis, persons who used alcohol excessively were more likely to have cavitary disease noted on chest radiographs than those without excessive alcohol use (36.8% vs. 28.2%, P<.0001). Therefore, TB patients should avoid smoking, drinking alcohol, and using drugs because these behaviors weaken immunity against infectious disease such as TB and other illness (Ngamwittayaphong, 2004).

Factors related to health behaviors among patients with pulmonary T

There are several factors that influence health behaviors such as demographic factors (age, gender, and education), knowledge, social support and accessibility. Much of the literature explored factors influencing health behaviors.

*ge*Zhang and colleagues (2007) conducted a survey study. Twenty focus group discussions were held and 105 farmers were included. Then 614 randomly selected respondents were surveyed through the use of an interview questionnaire. The researchers found that age is one factor that influences health care behaviors, with young people being given priority for health care within the family. Among the survey respondents, 86% of the people were over 50 years old and they would go to see a doctor when suspected as having TB. However, 96% of those younger than 25 years old went to the doctor. Participants stated that children with any illness were prioritized for treatment, because of the common view that children had not began

their life. Adult people may be more likely to give themselves priority for health care. A previous study provided evidence to support the idea that adult people's care seeking behaviors increased because of recent community awareness activities by a TB control program (Ahsan et al., 2004).

Age is considered as one factor influencing health related behaviors. A previous study found that factors significantly associated with non-completion of treatment included participants being over the age of 25 years. One possible explanation is that older age people assume more family responsibility and, as a result, this group of individuals may tend to stop medication when they feel they are getting better (Shargie & Lindtjorn, 2007). Another previous study found that older groups of people (aged 43 -70 years old) had TB preventive behaviors at a good level (31.48%) and higher than younger groups of people. This could be because the older generation might have been hearing more about TB education and had more concern about taking preventive measures about their health than the young (Sokhanya, 2008). A study conducted by Tin (2008) also found no significant association between age and self-care behaviors of pulmonary TB patients (p = .065). This means self-care behaviors are not dependent on age factors.

□*ender*□ Gender is one of the factors that influence health behaviors and compliance with medication. A survey study conducted by Mohamed, Yousif, Ottoa, & Bayoumi (2007) found that the proportion of males (58.0%) who had knowledge of current infection was significantly higher than that of females (48.4%), (X^2= 5411.9, p<.05). The proportion of males who used this knowledge to practice preventive measures was 60.2% compared to 55.3% of females. The males who knew the actual treatment period was 49.3% which was more than the females (46.0%).

A previous study was conducted by Sokhanya (2008) with 225 TB patients. The results of this study showed that females seemed to be more likely have good TB preventive behaviors (30.15%) than males at only 19.1%. The possible explanation is most female were assigned to take care of everything in their family including health. In contrast, Tin (2008) studied factors associated to the self-care behavior of migrant Myanmar pulmonary tuberculosis patients. In this study the researcher found that there was no significant association between gender and the self-care behaviors of pulmonary TB patients (p =.474). A possible explanation is that self-care behaviors are not dependent upon on gender factors.

□*ducation*. Education is regarded as an essential prerequisite to health behaviors for a chronic disease but the effects of education can be impaired by adverse socio-economic and psychological factors (Kolbe, 2002). Alinger & Dear (as cited in Alinger, Moore, Nguyen, & Lasus, 2006) examined adherence to appointments and medication. They estimated the influence of demographic factors, self assessment of health, and side effects on adherence to latent tuberculosis infection (LTBI) therapy. They found significantly higher adherence with higher levels of education. They also found that education was significantly related to medication adherence behaviors (r =.307, p =.034). In contrast, Tin (2008) conduct a study of factors associated with self-care behaviors of Myanmar migrant pulmonary tuberculosis patients. The results of this study shows that there is no significant association between self-care behavior and education of the pulmonary TB patients □p =.124). This mean self-care behaviors are not depend on the education of the patients with pulmonary TB.

□*nowledge*□Knowledge may contribute to individual health behaviors. This is because knowledge is one of the key processes in the ability to make decision that will affect a person's capacity in disease management and compliance with health behaviors. A previous study found that lack of complete knowledge about TB treatment is one of the factors behind non-compliance (Kaona, Tuba, Siziya, & Sikaona, 2004). Another study found that TB related knowledge was significantly correlated with TB preventive behaviors (p =.003) (Sokhanya, 2008). This finding confirmed that having good TB knowledge affected people when practicing good TB preventive behaviors.

Social support□Social support is the perceived support from family members, friends, and members of the community. An individual's family environment reinforces health behaviors. The influence of social support in families is evident in the form of the choices family members make in regard to maintaining health behaviors (Heitman, 2006). High social support was associated with better quality diet habits. High social support also appeared to prevent negative behavior (Harley & Eskenazi, 2006). A previous study of family support in the control of hypertension showed that family support is essential for patients to control the disease (Costa & Nogueira, 2008). Another previous study finding showed that TB patients are supported by the family and families encourage patients to adhere to treatment (Reyes-Guillen, Sanchez- Perez, Cruz-Burguete, & Izaurieta-de Juan, 2008).

□*ccessibility*□ Accessibility is one of the factors for improving health behaviors among TB patients. Irani, Kabalimu, and Kasesela (2007) conducted a study with 153 TB patients. The results showed that the compliance rate was 100 percent. A possible reason was the TB patients received medication from the

hospital's TB clinic. Another factor was that 90.2% out of 138 stated that they received counseling from health care providers on the importance of continuing with their treatment at the time of their diagnosis. Other factors included treatment centers being within a short walking distance (Irani, Kabalimu, & Kasesela, 2007). In addition, a previous study conducted by Bam et al. (2006) regarding factors affecting patient adherence to DOTs in urban Kathmandu, Nepal with 234 new smear-positive TB patients found that accessibility is one of the factors that influenced health behaviors. Shorter traveling time was associated with better adherence. The 73% of patients who adhered lived within 20 minutes so they could reach DOT centers from their houses.

In summary, pulmonary tuberculosis has become a major public health concern and has rapidly increased globally. Factors relating to health behaviors are age, gender, education, knowledge, social support and accessibility. Different factors contribute to health behaviors in different ways among patients with pulmonary TB. The influence of factors can affect an individual's decision to practice healthy behaviors and to adhere to the treatment recommended by providers. Therefore factors relating to health behaviors are important for patients with pulmonary TB.

Family Support

□*efinition of family support*

Family support is natural support and is one kind of social support. In order to provide appropriate support, the family must be sensitive to the needs of their members. Families must establish effective communication, respect the unique needs

of each family member, and establish family expectations of mutual help and assistance (Pender, Murdaugh, & Parsons, 2006).

Family support can be defined terminologically or syntactically as social support from the family. Family support can be defined in various ways. House, (as cited in Pender, 2002) defined it as an interpersonal transaction involving: (1) emotional concern, consisting of expression of caring, encouragement, and empathy; (2) Aid, consisting of services, money, and information; and (3) affirmation, consisting of constructive feedback and acknowledgement. Procidano and Heller, (as cited in iaolian et al., 00) stated that family support refers to a person's perception that there is need for moral, emotional, and intimate support as well as a need for information and feedback that can be fulfilled by the family. Furthermore, a previous study suggests that satisfactory social support plays a role in recovery from strokes. This is achieved through the supportive behaviors of family members that reflect three types of family support: instrumental help, emotional encouragement, and compliance with therapeutic instruction. This is needed because stroke patients themselves are usually dependent (Tsouna-Hadjis et al., 2000)

Families are the core units of society. Toljamo & Hentinen reviewed the literature and concluded that family support can be defined in many ways. This can be in terms of emotional support, instrumental support, informational support, and appraisal support. Emotional support is the type of support providing empathy, caring, love, and trust. Instrumental support means help from the family in terms of aid in terms of kindness, money, labor, giving time and modifying the environment. Informational support occurs through providing information which is helpful for a person coping with a critical situation. The information is given by the family in terms

of advice, suggestions, directives, and information. Appraisal support provides information through affirmation, constructive feedback and social comparison (Toljamo & Hentinen, 2001).

Family support is a part of social support. Cobb (1976) defined social support as the prerequisite of providing information to the people to believe that they are cared for, loved, esteemed, valued, and belonging to a network of communication and mutual obligation. Family support is defined by Pender (1996) as the subjective feeling of love and being accepted, esteemed, valued, and needed for oneself, not for what one can do for others. The following types of supports are received from family members: emotional support, material aid, information, and services. House, (1981) defines four types of family support: emotional support, instrumental support, informational support, and appraisal support.

In the present study, the conceptualization of family support is based on House‘s (1981) concept of social support. This is because this definition covers four types of family support: emotional support, (such as caring, empathy, love, and trust); instrumental support (such as action including providing goods and services); informational support (such as advice, as well as personal information and suggestions); and appraisal support (such as constructive feedback that is useful for self evaluation).

In summary, family support is a part of social support. Families provide support to each other by influencing, nurturing, and reinforcing beliefs, sharing tasks, and exchanging feelings and information. Some of the literature suggests family support includes four aspects: emotional support, instrumental support, informational support, and appraisal support.

Family Support for Patients with Pulmonary T□

Tuberculosis (TB) patients have illness related social problem which may influence their motivation to complete their treatment. The effectiveness of anti-TB drugs is 95% when prescribed medication is taken correctly for several months (WHO, as cited in Karyadi et al., 2002). Evidence supports that patients with TB who were homeless, used to drinking alcohol and had no one to remind them about taking medicine, thus lacking social support, were associated with extended periods of hospitalization (Craig et al., 2007). Having support, particularly from family members, has been acknowledged as improving health behaviors. Tornee and colleague (2005) reviewed the literature and concluded that family support covered the support that TB patients received from their family members. This included emotional support, instrumental support, informational support, and appraisal support. Family support, including financial assistance, collecting medication, and providing emotional support, appeared to be a strong influence on patients' adherence to treatment (Munro et al., 2007)

Family support means the social support that comes from family members; there are different dimension of family support. The following dimensions of social support are based on House (1981) who stated that family support consists of emotional, instrumental, informational, and appraisal support.

1. Emotional support refers to the demonstration of caring, empathy, love, and trust (House, 1981). Emotional support consists of expressions of compassion. This idea can be applied to tuberculosis patients in ways whereby family members help TB patients. This could be whenever he or she is taking medication, accompanying him or her on scheduled appointment with physicians, being with him or her when

consulting with physicians, and helping them to provide information about their health conditions. Wongyou (2005) studied factors related to adherence to medication among tuberculosis patients. The researcher found that emotional support encouraged feelings of comfort and led individuals to believe that he or she was accepted, respected, and loved.

2. Instrumental support includes tangible support or actions including providing goods and services (House, 1981). Instrumental support or aid provides help with specific tasks, such as preparing nutritious meals, or arranging transport for recreational activities. In the context of TB patients, family members can prepare nutritious food, which can maintain a food balance for TB patients. Family members help the TB patients to clean rooms, exposing the clothes to sunlight. They could provide transportation when patients need to go to hospital. Khan, Walley, Witter, Shah, and Javeed (2005) conducted a study regarding tuberculosis patients' adherence to direct observation. They found that TB patients obtained instrumental support from their family, such as accompanying the patients to the treatment center this is the most common form of support. They are given encouragement to take medication, and are provided with financial support to help with transport costs.

3. Informational support means providing advice as well as personal information or suggestions (House, 1981). This can be used for tuberculosis patients to give information about medication compliance, prevention of disease transmission, and to give information about the benefits of completing treatment. Lewis and Newell (2009) found that TB patients received informational support during treatment that was mainly about their disease, the treatment of the disease, the potential side effects of the medicine, and what they should do if side effects arise.

4. Appraisal support or affirmative support consists of constructive feedback to help individuals realize their own strengths and potential (House, 1981). Wongyou (2005) stated that appraisal support involves the provision of information that is useful for self evaluating purposes, such as feed-back, affirmation and information such as social comparison.

elationship etween Family Support and ealth ehaviors mong Patients with Pulmonary T

The relationship between family support and health behaviors among patients with pulmonary TB was not found in the literature review. However, one study conducted by Fithria, (2009) dealt with family support and psychological well-being among the tsunami survivors in Aceh Besar District, Indonesia. Fithria used a purposive sample of 126 tsunami survivors to study the relationship between family support and psychological well-being. It was found that there was a significantly low positive correlation between family support and psychological well-being ($r = .37$, $p<.01$). Family support is the social support that is provided by the family in an individual's family environment. It reinforces health behaviors and has a significant role in promoting and maintaining the health of an individual. Caplan (as cited in Fithria, 2009) proposed that having social support implies that the person has a continuing pattern of relationships over time. Cohen, Underwood, and Gottlieb (2000) stated that social support plays a role for the recovery from physical illness. In addition, they stated that social relationships influence behaviors and this has implications for health, such as diet, exercise, smoking, alcohol intake, sleep, and adherence to medical regimens.

Family support might influence an individual's health behaviors through enhancing motivation, providing information and feedback (Procidano & Heller, as cited in Xiaolian et al., 2002). Some studies examined adherence to medication as an important health behavior for heart failure patients. The comparison between patients with a spouse and patients without a spouse showed that 90% of heart failure patients who have a spouse took medication as prescribe by the doctors, whereas only 80% of patients without a spouse took medication (Dunbar, Clark, Quinn, Gary, & Kaslow, 2008). This study found that family support, including financial assistance, collecting medicine, and emotional support, appeared to be a strong influence on patients' adherence to treatment. In contrast in some cases patients on a treatment regimen became increasingly demoralized and more likely not to adhere as family support weakened (Munro et al., 2007).

Furthermore, Xiaolian and colleagues (2002) studied family support and self-care behavior of Chinese chronic obstructive pulmonary disease patients. The results of their study show that statistically there is a slightly significant positive relationship between family support and total self-care behavior ($r = .25$, $p = .012$). Furthermore, Costa and Nogueira (2008) found that family involvement is essential for the control of patients' blood pressure: in contrast, the lack of family support can destabilize the whole plan of treatment.

In addition, Harley and Eskenazi (2006) conducted research in the United States on social support and health behaviors during pregnancy among women of Mexican descent. The researchers found that a better quality of diet increased change in using prenatal vitamins, and decreased the possibility of smoking during pregnancy. These were associated with high social support. The negative impact of

life on quality of diets can also be prevented through higher social support in the US. Moreover, a study conducted by Nasution (2007) looked at an identified the level of family support as perceived by pulmonary TB patients. This was done to examine the differences of family support between who are successful and who are not successful in complying with DOTs programs. The results showed that there is a statistically significant difference between two groups, p <.001. Furthermore, a previous study was conducted by Dimatteo (2004) on social support and patients adherence to medical treatment. They found that adherence is 1.74 times higher in patients from cohesive families and 1.53 times lower in patients from families in conflict.

In summary, tuberculosis is not only a medical problem, but is also social problem related to the illness. Because TB is an infectious and chronic disease, in Bangladesh it is a major public health problem. Since 1993 the Bangladesh National TB Programme has promoted Directly Observed Therapy (DOTs) Short Course strategies for implementation at the Thana level. Even now some patients do not complete their treatment because they feel better after taking the medication for two or three weeks, and some patients have a lack of knowledge about disease transmission. But many patients stop taking medication because they cannot tolerate the adverse effects of the medication and some lack family support. Family support has been positively related to health behaviors. Family support is very important for TB patients to complete their treatment. Some of the literature suggests that chronic disease management and family support, and blood pressure control and family support, are positive influences for promoting better health behaviors. High levels of family support reduce the risk behaviors in relation to TB.

CHAPTER 3

RESEARCH METHODOLOGY

This chapter describes the research design, population and setting, sample and sampling, instrumentation, ethical considerations, data collection procedures, and data analysis.

esearch esign

A descriptive correlational design was used in this study to examine the relationship between family support and health behaviors among patients with pulmonary TB at National Institute of Diseases of the Chest and Hospital (NIDCH) in Dhaka, Bangladesh.

Population and Setting

The target population in the study was Bangladeshi adults who have been diagnosed with pulmonary TB. The study was conducted at the National Institute of Diseases of the Chest and Hospital (NIDCH) in Dhaka, Bangladesh. This hospital is situated in the central part of the capital city, Dhaka. The hospital was established in 1965 and currently has 650 beds. The hospital has two parts: academic and clinical services. On the clinical side there are five major departments: thoracic medicine, thoracic surgery, tuberculosis, multi-drug resistance tuberculosis, and asthma centre. A large number of TB patients come to the hospital at the out-patient department (OPD) and DOTS center daily from different parts of the city, and it has a high number of cases referred to it from the different parts of the country.

Sample and Sampling

Sampling method

The purposive sampling method was used for recruiting eligible subjects for the study. The sample of this study came from the targeted population who met the inclusion criteria of the pulmonary TB patients. These were that they were adult patients aged more than 18 years; they had been diagnosed with pulmonary TB for more than one month, and had attended the OPD and DOTs center in the NIDCH during December, 2009 to February, 2010.

Sample size estimation

The sample size of the study was estimated by using power analysis, using an acceptable level of significance ( ) .05, an expected power (1-) .80, and effect size . 5. This value of and 1- are the conventional standards for most nursing studies according to Polit and Beck (2008). The estimated population effect size was determined by available previous studies. Xiaolian et al. (2002) studied family support and the self-care behavior of Chinese patients with chronic obstructive pulmonary disease (COPD). The results revealed that the relationship between family support and self-care behaviors was significantly positive (r =.25, p = .05). Using the above identified values, (r =.25, p = .05) a minimum number of 126 subjects was needed.

nstrumentation

nstruments

The instruments for collecting data in this study were developed by the researcher. They comprising of: (1). A Demographic data and health information form; (2) a Family support questionnaire; and (3). A Health behaviors questionnaire.

Part : emographic ata and ealth nformation Form

The demographic data form was developed by the researcher. It consisted of 14 items to assess the subject's demographic data including; age, gender, marital status, religion, level of education, occupation, monthly income, residential area, family members, caregivers during TB treatment, time elapsed after TB was diagnosed, functional ability, type of treatment received, and number of symptoms during the TB treatment.

Part Family Support uestionnaire

The family support questionnaire consisted of 32 items. It was developed by the researcher based on the concept of social support proposed by House (1981) and related literature. It had four dimensions. These were emotional support, instrumental support, informational support, and appraisal support. There were 32 items including:

1. Emotional support (10 items)

2. Instrumental support (9 items)

3. Informational support (7 items)

4. Appraisal support (6 items)

Each statement of the family support questionnaire was scored on a 4- point Likert type scale: 1 = never, 2 = sometimes, 3 = most of the time, 4 = all of the time. The mean score of each item ranged from 1 to 4. For interpretation purposes, the

researcher divided the mean score of each item into three levels using well accepted criteria (Kiess, 1996). In order to determine the level of family support the level of family support was identified as being based on its average mean score as follows: 1.00-2.00 = low, 2.01-3.00 = moderate and 3.01- 4.00 = high.

Part □□□ealth □ehaviors □uestionnaire

The health behaviors questionnaire was developed by the researcher based on related literature. It was used to identify the level of health behaviors among patients with pulmonary TB. It consisted of 31 items and consisted of six dimensions including: complying with anti-TB medication; following healthy diets, performing physical exercises; maintaining environmental hygiene; prevent disease transmission; and avoid the risk factors of TB. There were 31 items including:

1. Complying with anti-TB medication (5 items)
2. Following health diets (7 items)
3. Performing physical exercises (5 items)
5. Maintaining environmental hygiene (5 items)
4. Preventing disease transmission (4 items)
6. Avoiding the risk factors (5 items)

The above were measured by a 4 - point Likert type scale: 1 = never, 2 = sometimes, 3 = most of the time, 4 = all of the time. Therefore the mean score of the health behaviors ranged from 1 to 4. For interpretation, the researcher divided the mean score of each item into three levels using well accepted criteria (Kiess, 1996). In order to determine the level of health behaviors the level of health behaviors was identified as being based on its average mean score as follows: 1.00-2.00 = low, 2.01-3.00 = moderate and 3.01- 4.00 = high.

alidity and reliability of the instruments

alidity of the instruments The content validity of the Family Support Questionnaire and Health Behaviors Questionnaire was examined by a panel of three experts. One expert was a lecturer at the College of Nursing Dhaka, Bangladesh. Two experts were at the teaching faculty of adult health nursing, Faculty of Nursing, Prince of Songkla University. The researcher modified the questionnaires as a result of the recommendations by the experts. After modifying, the instruments were translated into Bengali versions by bilingual translators in Bangladesh.

eliability of the instruments. The reliability of the Family Support Questionnaire and Health Behaviors Questionnaire was assessed by using Cronbach's alpha coefficient. A pilot study was conducted with 20 patients with pulmonary TB in the selected hospital. The yielding coefficients were .82 for the Family Support Questionnaire and .76 for the Health Behaviors Questionnaire.

Translation of the instruments

In this study, the questionnaires were translated using the back translation technique (Sperder, 1994). The questionnaires were initially developed in an English version and were translated into the Bengali language in the following steps.

1. The first bilingual translator translated the instrument from the English version into the Bengali version.

2. The second bilingual translator translated the instrument from the Bengali version into the English version.

3. The third bilingual translator identified the differences in all items of both the English versions. In fact no differences were found between the two versions of

the instrument. The Bengali version of the instrument was then used for data collection.

thical Considerations

To protect the human rights and maintain confidentiality of all the subjects the researcher obtained permission for the research from the Institutional Review Board (IRB) of the Faculty of Nursing, Prince of Songkla University, Thailand and the Director of Nursing Services in Bangladesh. The researcher also received permission for data collection from the Director of the National Institute of Disease of the Chest and Hospital (NIDCH) and the head of the OPD and the DOTs center. The researcher explained the purpose of the study to the eligible subjects. The subjects who were willing to participate in this study were asked to sign a consent form. They were assured that they had freedom to reject participation or to withdraw from participation in the study at any time. Identities of all the subjects were coded in order to keep confidentiality and anonymity.

ata Collection ethods

Data were collected at the National Institute of Diseases of the Chest and Hospital (NIDCH), Dhaka, Bangladesh during December 2009 to February 2010. The data collection procedures were divided into two phases: preparation phase and implementation phases.

Preparation phase

1. The researcher obtained a letter of permission from the Dean of Faculty of Nursing, Prince of Songkla University, Thailand.

2. The researcher obtained permission to collect data from the Director of the NIDCH, Dhaka, Bangladesh.

3. The researcher explained to the Directors of the NIDCH about the objectives, benefits, confidentially and methods of data collection, and requested their cooperation.

mplementation phase

The researcher contacted the head nurse and physician of the medical OPD and DOTS center, NIDCH, and explained the objectives and methods of the study. The researcher contacted the subjects who attended the Medical Out-Patients Department and DOTs at NIDCH. Subjects who met the inclusion criteria were approached to participate and informed about the purpose of the study. The researcher explained the instructions and asked them to completing the questionnaires given to them by the researcher, and no time limitation was given for the answers. For subjects who were illiterate, the researcher read the questionnaires for them and the subjects chose the answer themselves. After completion the researcher collected the questionnaires. After the interviews the researcher thanked the participants.

ata nalysis

All data were analyzed using a computer program. Demographic characteristics, the level of family support, and the level of health behaviors among patients with pulmonary TB were analyzed by using descriptive statistics. Descriptive statistics were used for interpreting and presenting demographic data consisting of frequencies, percentages, mean, and standard deviation.

The assumptions of Pearson product moment correlation were tested before the hypothesis testing could be conducted. It was found that several data sets, including the total family support scores, the three dimensions of family support, and the three dimensions of health behaviors were not normally distributed. Therefore, the Spearman correlation analysis (rho) was used to examine the relationship among family support and its dimensions and health behaviors and its dimensions instead.

CHAPTER 4

RESULTS AND DISCUSSION

The results and the discussion of the study findings are presented in this chapter. The findings were presented in the following sequences: subjects' characteristics; the level of family support; the level of health behaviors; and the relationships between family support and health behaviors among patients with pulmonary TB.

esults

Subjects' characteristics

The study was conducted with 126 adults who were pulmonary TB patients who attended the OPD and DOTS center at a national specialized hospital in Dhaka, Bangladesh. The demographic data of the subjects revealed that 37.3% of the subjects had age ranges from 18 to 24 years old, with an overall average mean score of 31.15 years (SD=11.04). Most of them were males (68.3%). In addition, 72.2% of the subjects were married and the majority was Muslim (92.9%). With regards to the level of education of the subjects, about one third had primary school education (34.9%). Nearly half of them were laborers (43.7%). More than half of them (54.8%) had a monthly family income of less than 5,000 Taka (approximately 70 US dollars). The majority of the subjects reported that they lived in urban areas (80.2%). Only 23% of the subjects had 2-3 family members that were living together, the rest of them had more than 4 family members. More than half of the subjects (54.0%) reported that during TB treatment their spouses took care of them.

Regarding health-related characteristics, the average time that elapsed after TB diagnosis ranged from 1 to 9 months. Most of them were able to take care of themselves independently (80.2%). Two-thirds (65.9%) received 4fdc formula (Rifampicin, Isoniaziad, Pyrazinamide, and Ethambural). Most of the subjects were reported to have no symptoms during TB treatment (60.3%), but some of them did (see Table 3). For those who developed symptoms related to TB medications, most of them (30 out of 50 subjects) had only one symptom. Among 50 subjects, fever and headache were reported by many of them (40% and 34%, respectively).

Table 3

Frequency and Percentage of Subjects' Characteristics of Patients with Pulmonary T□ □□ □□□□□

Subjects' Characteristics	Frequency	Percentage
Age (year) M = 31.15, SD = 11.04, Min = 18, Max = 60		
18-24	47	37.3
25-34	35	27.8
35-44	19	15.1
45-54	18	14.2
55-64	7	5.6
Gender		
Male	86	68.3
Female	40	31.7
Marital Status		
Unmarried	33	26.2
Married	91	72.2
Widowed	2	1.6
Religion		
Islam	117	92.9
Hindu	9	7.1

Table 3 (*Continued*)

Subjects' Characteristics	Frequency	Percentage
level of education		
No schooling	35	27.8
Primary school (up to class 5)	44	34.9
High school(up to class10)	27	21.4
Secondary School Certificate (SSC)	9	7.1
Higher Secondary Certificate (HSC)	7	5.6
Bachelor degree	4	3.2
Occupation		
None	7	5.6
Farmer	7	5.5
Business	21	16.7
Private employee	31	24.6
Government employee	5	3.9
Laborers	55	43.7
Monthly income (Taka) M = 6523.81, SD =5315.207, Min =2,000, Mix =50,000		
< 5000	69	54.8
5,001-10,000	47	37.3
10,001-15,000	5	3.9
15,001-50,000	5	4.0
Residential Area		
Urban	101	80.2
Rural	25	19.8
Family Member (person)		
2-3	29	23.0
4-5	52	41.3
6-7	40	31.7
> 8	5	4.0

Table 3 (*Continued*)

Subjects' Characteristics	Frequency	Percentage
Time elapsed after TB diagnosis M = 2.87 months, SD = 2.22, Min=1, Max= 9		
Caregiver during TB Treatment		
Father and/or mother	47	37.3
Brother and/or sister	8	6.3
Spouse (husband or wife)	68	54.0
Son and daughter	2	1.6
Aunt	1	0.8
Functional Ability		
Dependent care	2	1.6
Partial care	23	18.2
Independent care	101	80.2
Type of Treatment Received		
4fdc (Rifampicin+Isoniaziad+ Pyrazinamide+Ethambural)	83	65.9
2fdc (rifampicin+Isoniaziad)	43	34.1
Number of Symptoms During TB Treatment (Min=0, Max=6)		
None	76	60.3
1	30	23.8
2	16	12.7
> 3	4	3.2

Table 3 (*Continued*)

Subjects' Characteristics	Frequency	Percentage
List of Symptoms		
Fever	20	15.9
Headaches	17	13.5
Vomiting	16	12.7
GI irritation	4	3.2
Skin rash	3	2.4
Nausea	3	2.4
Jaundice	3	2.4
Dizziness	3	2.4
Burning	2	1.6
Joint pain	1	.8
Eye problems	2	1.6

Family Support

There were 126 adult patients with pulmonary TB who participated in this study who received support from their family members. Overall, the subjects in this study received a high level of support from their family members (M=3.26, SD=0.35). All dimensions of family support were at the high level, except 'informational support', which was reported at a moderate level (see Table 4).

Table 4

□ean□Standard □eviation and □evels of Family Support □mong Patients with Pulmonary T□ □□□□□□

Family support	Mode	Median	M	SD	Level
Emotional support	3.60	3.55	3.47	0.43	High
Instrumental support	3.11	3.33	3.33	0.55	High
Informational support	2.29	2.85	2.85	0.12	Moderate
Appraisal support	3.67	3.50	3.48	0.45	High
Total	3.28	3.31	3.26	0.35	High

□*ealth behaviors*

Overall, for the health behaviors the mean score of subjects in this study was at a high level (M=3.04, SD=0.31). Three dimensions were at the high level. These included ‘following healthy diets’ (M =3.01, SD =0.45), ‘complying with anti-TB medication’ (M=3.71, SD=0.50), and ‘avoiding the risk factors’ (M=3.47, SD=0.48). The rest of them were at the moderate level. (see Table 5).

Table 5

□ean□Standard □eviation□and □evels of □ealth □ehaviors among Patients with Pulmonary T□ □□□□□□□

Health Behaviors	Mode	Median	M	SD	Level
Complying with anti-TB medication	4.00	4.00	3.71	0.50	High
Following healthy diets	2.86	2.85	3.01	0.45	High
Perform physical exercise	2.20	2.20	2.19	0.76	Moderate
Maintaining environmental hygiene	3.00	2.90	2.87	0.62	Moderate
Prevent disease transmission	3.00	3.00	2.96	0.65	Moderate
Avoid the risk factors	4.00	3.60	3.47	0.48	High
Total	2.74	3.48	3.04	0.31	High

□elationship between family support and health behaviors

The relationship between family support and health behaviors is presented in Table 6. The findings showed that there was a positive relationship between health behaviors and family support (rho =.47, $p<.05$). In addition, a significant positive correlation was also found among the dimensions of health behaviors ($p<.01$ and p .05), except for 'Performing physical exercises,' where the relationship was small and not significant (rho = .15, $p>.05$). All the dimensions of family support were significantly correlated with health behavior (p .05), except 'appraisal support' where the relationship was small and not significant (rho =.14, $p>.05$).

Table 6

elationship etween Family Support and ealth ehaviors among Patients with Pulmonary T tested by Spearman's Correlation rho

Health Behaviors	Family Support				
	ES	InsS	InfS	AppS	Total
Complying with anti-TB medication	38**	.00	.10	.34**	.27**
Following healthy diets	.13	34**	37**	.01	.32**
Performing physical exercises	.03	22*	.17	.01	.15
Maintaining environmental hygiene	.19*	.22*	.33**	.09	.34**
Preventing disease transmission	.12	.13	.17	.07	.18*
Avoiding the risk factors	.18*	.22*	.19*	.00	.28**
Total	.27**	.34**	.43**	.14	.47**

*$p<.05$, ** $p<.01$

ES-Emotional support; InsS-Instrumental support;

InfS- Informational support; and AppS-Appraisal support

iscussion

This study was conducted at a national specialized hospital in Dhaka, Bangladesh. This is one of the biggest teaching hospitals which specialize in chest diseases. The finding of the study revealed that most subjects were living in urban areas. This may help subjects in this study as they had greater accessibility to health care facilities which contributed to their ability to maintain health. They were at a

young and active stage of life with a mean age of 31.15 years. Young people may be more likely to give priority to health care. This finding was consistent with the previous study that 96% of younger people aged 25 years old were more likely to see a doctor when they suspected TB than older people over 50 years. This indicated that younger people gave priority to health care (Zhang et al., 2007). Another study provided evidence supporting that younger people's care seeking behaviors have increased because of the recent community awareness activities of the TB control program (Ahsan et al., 2004).

The demographic data showed that most of the subjects (68.3%) were male. The possible explanation for more male patients may be because of contact with people when working. This is especially so for laborers who experience poor hygiene. Another cause was gender differences in social and economic roles and activities may lead to differential exposure to tuberculosis bacilli. For example, greater migration by men may put them at a higher risk of contact with other TB infected individuals. Males may stay with other foreign workers in crowded areas, and this causes the spread of TB. A previous study conducted by Jimenez-Corona et al. (2006) dealt with gender differentials for pulmonary tuberculosis transmission and reactivation in an endemic area. They found higher rates of pulmonary TB with its severe clinical consequences among men than women. Men get more TB because of some risk factors that have been associated with exposure to TB, such as crowded areas, and poorly ventilated settings. Men also use alcohol and tobacco more, behaviors that may influence contracting TB.

In the Bangladesh context, socio-religious factors play important roles. In Bangladesh female TB cases have to face greater cultural barriers than males in

gaining access to TB care. Ahsan and colleagues (2004) conducted a study they found that females in the rural communities in Bangladesh do not feel free to seek care from male health care providers because of socio-religious reasons. Regarding the level of education, most subjects with TB had no schooling (7.8) or primary school education (34.9%) and is this a common picture with Bangladeshi people. In another pervious study conducted the researchers found that 47% of Bangladeshi people are literate (Ullah et al., 2006).

Family support

The finding showed that, overall, subjects in this study received high levels of family support from their family members with a total mean score of 3.26, (SD = 0.35). This finding may be explained by the following. The majority of the subjects had more than 4 family members living together. This kind of family structure represents family ties among the members. Caring for family members was an accepted and expected part of familial duties (Merrell et al., 2005). When family members get sick, the other family members try to provide their best care to bring about recovery from the disease. Such practices have been well-recognized, not only among Bangladeshi families, but also among other Asian families as shown in the statement Asian people will look after their own (Atkin Rollings as cited in Merrell et al., p. 550). The family was the most significant source of support especially with the chronic diseases, such as pulmonary TB. Family members help improve the health of patients and reduce the severity of the disease by encouraging the patient to care for themselves. The family takes care of the care needs that the patient was unable to self-manage, and also provided psychological support (Pierce & Lutz, 2009).

In addition, the highest score for family support fell in the emotional support dimension (M =3.47, SD = 0.43). This may be because the family perceived that emotional support was most important. TB patients needed encouragement, love and affection from their family members. TB is not only a physical problem but is also a psychological problem. This can be seen in the following three items of emotional support which had the highest mean scores among all items: My family is loving and affectionate to me even though I have TB (M = 3. 8, SD = 0. 8); My family helps me to build trust that disease will be cured (M= 3. , SD = 0. 3); and My family listens to me when I want to talk about anything (M =3.55, SD = 0. 7). Another reason may be that family members can provide emotional support at no cost, either tangible (such as money or equipment), and intangible (such as knowledge or cognitive ability).

However, the findings of the current study showed that the pulmonary TB patients received a moderate level of informational support from their family (M = 2.85, SD = 0.12). This may be because family members get little information from health care providers. The current study finding is consistent with the study by TDR (2002) which noted that a major problem and challenge for disease control was insufficient information about the spread of the disease.

ealth behaviors

The finding revealed that the mean total score of health behaviors was at high level (M = 3.04, SD = 0.31). This finding was not surprising. The National TB Control Programme (NTP) that introduced the DOTs throughout Bangladesh from 1993 may now start working with support from WHO, Bangladesh. There have been recent developments, including the expansion of DOTS in Dhaka and other

metropolitan cities. After detailed preparation and training of staff, the number of diagnostic and treatment facilities in Dhaka and other city corporations has been increased (WHO, 2010). This may contribute to more education being given to the patients. This could result in greater compliance to the medication regimen of subjects in this study who mostly lived in the urban area around Dhaka city. During the visit to the DOTs center and outpatient clinic, they can be informed how to prevent the disease transmission and to avoid risk factors. Furthermore, the findings of the study showed high scores in the health behaviors of the pulmonary TB patients and the highest score was in complying with anti-TB medication (see Table 5). This might be explained by most of the subjects (80.2%) living in urban areas (in Dhaka city). Thus subjects in this study had more accessibility to health care facilities and this contributed to their ability to maintain health.

This can be seen in two items of compliance with anti-TB medication which had the highest mean scores among all items. These were I take anti-TB medication regularly ; and I meet with doctors according to scheduled appointments (see Table 7; see Appendix C). This result is consistent with one previous study conducted by Irani et al. (007) who found that the patients' medication compliance rate was 100%. A possible explanation is that they received counseling from health care providers. In addition the patients' own motivation to improve their health was the main driving force in seeking treatment and taking daily medication.

Another three dimensions of health behaviors were rated at the moderate level. Among them, 'performing physical exercises' had the lowest mean score. This finding was expected. Poverty and hard labor make people pay less attention to physical exercise as they may think that their work is already exercise and they do not

need to do any additional exercise. Another explanation is because of the physical impact of TB on patients. Most of the TB patients feel tired, fatigued and unwell, and experience loss of body weight difficulty in breathing. For these reasons TB patients perform low in terms of level of physical exercise. This finding is similar to a previous study. Armijos and colleagues also found that bodily pain was perceived to be a factor moderately interfering with daily activities. TB significantly affects a person's ability to adequately carry out his or her duties at his or her workplace, home, or school. As TB is related to fatigue and sickness, it reduces an individual's ability to perform work (Armijos, Weigel, Qincha, & Ulloa, 2008).

'Maintaining environmental hygiene' was rated as the second lowest mean score. This finding was also not surprising. The majority of subjects in this study were living in an overcrowded environment as evident by the number subjects who had more than three family members (77%). It would not be easy for them to maintain their environmental hygiene on top of their poverty. These latter two behaviors would further contribute to the poor control of TB (Abed, 2002).

elationship between family support and health behaviors among patients with pulmonary T

The relationship between family support and health behaviors are presented in Table 6. Family support had a moderately significantly correlation with health behaviors (rho = 47, $p<.01$). The findings about the relationship between family support and health behaviors can be explained as follows. Family support has a positive influence on the adoption and maintenance of health behaviors (Dunbar et al., 2008) and plays a role in recovery from physical illness (Cohen, Gottlieb, & Underwood, 2000). A moderate relationship (rho =.47, $p<.01$) between family

support and health behaviors of patients with pulmonary TB was found in this present study. This supports the expected hypothesis and is consistent with a previous study. Xiaolian et al., (2002) conducted a study to examine the relationship between family support and the self-care behaviors of Chinese chronic obstructive pulmonary disease patients. They found that family support had a significantly positive correlation with total self-care behaviors (r =.25, p<0.05).

In addition, socio demographic factors also related to health behaviors among patients with pulmonary TB. Different factors were related differently to health behaviors. Education could explain this as education has a significant association with adherence to drug regimens. One previous study reported that a high education level tends to be related to good adherence among tuberculosis patients. This result shows that the more educated a patients is, the better understanding they have of the state of the disease and their comprehension of instructions given about drug usage. These could enhance adherence (Bello & Itiola, 2010).

Furthermore, it was revealed that family support was significantly correlated with all dimensions of health behaviors, except 'performing physical exercises'. This may be due to the fact that the whole family may not give priority to exercise. All members in the family may need to work and earn more income to live their daily lives instead of supporting the patients to do exercise. Personal data showed that their occupation was mainly laboring and they had to do work too hard and thought they had no need to do additional exercise. The present study is consistent with a previous study that showed that the majority of subjects had poor levels of doing exercise regularly. One statement given was I do exercise at least 3 times per week and 30 minutes at a time . In response to this statement 72.5 % subjects gave the answer

never because they did not do exercises regularly (Tin, 2008). Another possible explanation is religion. In developing countries religion plays a most important part in determining the role and behaviors of men and women, and of behavioral roles are learned from an early age. Bangladesh is a deeply religious country with 90% of the population being Muslim. In the Bangladesh context females do not feel free about mixed sex physical activities. The practice of purdah restrict women's contact with men and with strangers. There is no exercise sport for females, and for this reason females do limited physical exercise.

In addition, it was evident that all dimensions of family support, except appraisal support, were positively correlated with health behaviors. Patients who received more emotional, instrumental, and informational support reported higher health behaviors. Emotional support might be a motivating factor in improving adherence to recommendations about health (Toljamo & Hentinen, 2001). In addition, a previous study found a higher relationship between emotional support and adherence to medication (average, = .19). The same study also stated that there was a significant difference as to who received emotional support and who did not receive emotional support from their family. There was a 1.35 time higher risk of non-adherence developing for those who did not receive emotional support compared with those who did (Dimatteo, 2004). However, instrumental support and informational support help patients to be able to show better health behaviors.

More than half of the subjects in this study had their spouse as the major source of family support (54%). A previous study supported that the spouse was a significant person to provide all kinds of support, particularly emotional support (Tsouna-Hadjis, Vemmos, Zakopoulos, & Stamatelopoulos, 2000). In addition, a

previous study conducted by Dunbar and colleagues made a comparison between patients with spouse and patients without spouses. The results showed that 90% of heart failure patients who had a spouse took medication as prescribe by the doctors, whereas of those without a spouse only 80% patients took medication (Dunbar, Clark, Quinn, Gary, & Kaslow, 2008).

In contrast, appraisal support had a small and non-significant relationship with health behaviors. This may be because, in this present study, the family themselves had limited understanding about the disease. They were unable to provide constructive feedback to the subjects or to appraise about their health conditions to the level that allowed them to change their health behaviors.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

This descriptive correlational study was proposed to describe the level of family support and health behaviors, and to examine the relationship between family support and health behaviors among patients with pulmonary TB. One hundred and twenty six patients were recruited with pulmonary TB, who were attending the OPD and DOTs center of the national specialized hospital in Dhaka, Bangladesh. Data was collected from December 2009 to February 2010. The subjects were requested to fill one set of questionnaires which consisted of three parts: a Demographic and Health Information questionnaire; a Family Support Questionnaire; and a Health Behaviors Questionnaire. The instrument was developed by the researcher. The family support questionnaire developed was based on four dimensions of family support and consisted of 32 items. The health behaviors questionnaire consisted of 31 items. It was evaluated for its content validity by three experts. A pilot study was conducted for the reliability of the instruments and the desired alpha coefficients of .82 (family support) and .76 (health behaviors) were reached. The data were analyzed by using descriptive and Spearman's Correlation statistics.

Summary of the Study Findings

The majority of the subjects were Muslim (92.9%), the subjects age was 18-24 years (37.3%), and average mean score of age was 31.15 years. More than half of the subjects were male (68.3%). In all 72.2% subjects were married and their level of education was mainly primary school (34.9%). Only a small number of them had

a bachelor degree (3.2%), most (54.8%) had a monthly family income of less than 5,000 Taka. The majority of the subjects reported they stayed in an urban area (80.2%). Regarding the number family members, (41.3%) had 4-5 family members. Furthermore, the subjects stated they had good relations with their family member and (54.0%) of the subjects reported that during the TB treatment their spouse took care of them. The average time that elapsed after the diagnosis of TB as a minimum of 1 month and a maximum of 9 months. A majority of them reported they were able to take care of themselves independently (80.2%). Furthermore, (65.9%) subjects received 4fdc formula (Rifampicin, Isoniaziad, Pyrazinamide, and Ethambural). Most subjects reported no symptoms during their TB treatment (60.3%), but some did. For those who developed symptoms related to TB medication, most (30 out of 50 subjects) had only one symptom, and fever and headaches were reported by many of them.

The total mean score of family support was at a high level (M = 3.26, SD = 0.35). The total mean score of health behaviors also at a high level (M = 3.04, SD = 0.31). There were positive relationships between family support and health behaviors. Therefore the findings of the study indicate that family support had a statistically significant moderate correlation relationship with health behaviors (rho = .47, p<.01).

Strengths and □imitations of the Study

The strength of this study is, the finding of this study would be used an evidence to further study in Bangladesh. The data were collected by the researcher only and all participants received full information from the researcher. The research

instrument was translated by using back translation methods with cultural sensitivity in order to enhance subjects' understanding and to adjust to the instruments. However, in this study have some limitations. Most of the subjects in this study stayed in urban areas because this study was conducted at a specialized national chest disease hospital in Dhaka, Bangladesh. This may limit the results of this study in terms of generalizing the findings to all patients with pulmonary TB in Bangladesh. Another limitation of this study was that it was conducted in only one setting and only in DOTs center. This certainly limits the result of this study as they may not be generalized to all general hospitals.

□mplications and □ecommendations

The finding of the study provides supporting evidence that family support has a significant positive relationship with health behaviors among patients with pulmonary TB. Furthermore, the finding suggests that clinical practitioners should be aware of the importance of family support, especially for pulmonary TB patients. The recommendations are:

□ursing practice

The finding of the study provide valuable information for nurse in clinical practice for them to gain better understanding related to family support and health behaviors among patients with pulmonary TB. The findings can be used as guidelines for nursing practitioners. Nurses should educate family member about critical information related to caring for pulmonary TB patients. The findings of this study provide evidence that TB patients get moderate levels of informational support from their families. Nurses can use this knowledge, particularly those who work in clinical

areas. They should encourage family members to provide informational support to TB patients because information is a most significant support for TB patients. Nurses should enhance the healthy behaviors of TB patients through informational supports. They should encourage them to performing physical exercises and maintain environmental hygiene.

- *ursing education*

The finding can be used by nurse educators to teach nursing students about the importance of the family support to the health behaviors of pulmonary TB patients. They should encourage family members to support patients with TB.

- *ursing research*

This study finding provides more knowledge about family support and health behaviors among patients with pulmonary TB. The findings of the study could be used for further research to gain in depth information about family support and health behaviors among patients with pulmonary TB and the factors that influence family support and health behaviors. An interventional study should be considered for conducting in rural area with a large sample included in the intervention program.

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APPENDICES

APPENDIX A

Informed Consent Form

My name is Bethika Rani Biswas, I am a master degree student of the adult nursing program, Faculty of Nursing, Prince of Songkla University. I am conducting nursing research on the relationship between family support and health behaviors among patients with pulmonary tuberculosis. The information will help nurses to develop an educational program for tuberculosis patients and their family members. You are invited to participate in this study. If you agree to participate in this study you will be asked to answer interview questions and give information about your demographic data, and the relationship between family support and health behaviors. To complete the data will take 30 - 45 minutes. Please ask me if you have any difficulties in understanding any question.

All the information will be kept confidential and this data will only be used for the purpose of the study. The study will cause no harm to you and your family. Your personal identity and the informational data will not be revealed and will remain confidential. Thank you for your cooperation.

Signature of investigator	Signature of participant
……..	……
Date ----------	Date ----------

APPENDIX B

Code …….

Date and Time ……..

Part □□□emographic Characteristics and □ealth □nformation □uestionnaire

The following items are some information about yourself and your family. Please answer the best choice with put tick ( ) in the square box that you think as appropriate.

1. Age…… years old

2. Gender ☐ (1) Male ☐ (2) Female

3. Marital status ☐ (1) Unmarried ☐ (2) Married
☐ (3) Widowed

4. Religion ☐ (1) Islam ☐ (2) Hindu

5. Level of education
☐ (1) No schooling ☐ (2) Primary school (up to class 5)
☐ (3) High school (up to class 10) ☐ (4) Secondary School Certificate (SSC)
☐ (5) Higher Secondary Certificate ☐ (6) Bachelor degree

6. Occupation
☐ (1) None ☐ (2) Farmer
☐ (3) Business ☐ (4) Private employee
☐ (5) Government employee ☐ (6) Others, please specify

7. Monthly family incomes (Taka)
☐ (1) <5000 ☐ (2) 5,001 -10,000
☐ (3) 10,001 -15, 000 ☐ (4) 15,001-50,000

8. Residential area

☐ (1) Urban ☐ (2) Rural

9. Family members (persons)

☐ (1) 2-3 persons ☐ (2) 4- 5 persons

☐ (3) 6-7 persons ☐ (4) > 8 persons

10. Caregiver during TB Treatment

☐ (1) Father and /or Mother ☐ (2) Brother and / or Sister

☐ (3) Spouse (husband or Wife) ☐ (4) Son and Daughter

☐ (5) Aunt

11 Time elapsed after diagnosed of TB ……..(Month)

12. Functional ability

☐ (1) Dependent care ☐ (2) Partial care

☐ (3) Independent care

Item 13 -14 filled by the researcher.

13. Type of treatment received

Categories	Medications	Others (if any)
i	☐ 1. 4FDC (1st 2 month) Rifampicin+ Isoniazid Pyrazinamide +Ethambutol ☐ 2. 2FDC (next 4 month) Rifampicin +Isoniazid	
ii	☐ 1. 4FDC (1st 3 month) Rifampicin+ Isoniazid Pyrazinamide +Ethambutol Streptomycin (2month) ☐ 2. 2FDC (next 5 month) Rifampicin +Isoniazid +Ethambutol	

14. List of problems after taking medication.

Name of Problems	No	Yes	If yes, what did you do to deal with it.
1. Nausea			
2. Vomiting			
3. Skin rash,			
4. Fever			
5. Headaches			
6. Burning sensation in feet			
7. Jaundice			
8. Gastrointestinal irritation			
9. Dizziness			
10. Joint pain			
11. Eye problem			

APPENDIX C

Part □□Family support □uestionnaire

This questionnaire based on your experience and the feelings which occur between you and your family. Please select one number, 1 to 4, which best corresponds to your opinion. Please respond to each item as correctly as possible and do not skip any items. If you have selected any number please circle that item. The meaning of each number is: (1) = never; (2) = sometimes; (3) = most of the time; and (4) = All the time. There is no right or wrong answer.

Statements	Never	Sometimes	Most of the time	All the time
Emotional support				
1. My family encourages me when I am afraid about my long term treatment regimen.	1	2	3	4
2. My family is concerned about symptoms related to the disease that happened to me.	1	2	3	4
3. My family cheers me up when I feel bore to maintain my health.	1	2	3	4
4. My family encourages me to maintain religious activities such as praying.	1	2	3	4
5. My family encourages me to relax such as watching television, listening to the radio, and telling me funny stories.	1	2	3	4
6. My family helps me to build trust that disease will be cured.	1	2	3	4

Statements	Never	Sometimes	Most of the time	All the time
7. My family is loving and affectionate to me even though I have TB.	1	2	3	4
8. My family asks me about my feeling throughout the treatment period.	1	2	3	4
9. My family is sensitive about my emotional change.	1	2	3	4
10. My family listens to me when I want to talk about any thing.	1	2	3	4
Instrumental support (Aids)				
11. My family helps me to pay for my medication, treatment, and transportation.	1	2	3	4
12. My family gives me money to use in case of emergency.	1	2	3	4
13. My family accompanies me when I go to see the doctor.	1	2	3	4
14. My family helps me in my daily activities.	1	2	3	4
15. My family helps me to clean my room.	1	2	3	4
16. My family helps me to clean my sheets and cloths and expose them to sunlight.	1	2	3	4
17. My family helps open the window to maintain good ventilation in my house.	1	2	3	4
18. My family provides me with well balanced food and adequate nutrition (such as rice, meat, eggs, vegetables and fruits, and sugar).	1	2	3	4
19. My family supports me with transportation when I go to hospital.	1	2	3	4

Statements	Never	Sometimes	Most of the time	All the time
Informational support				
20. My family helps me to find information about how to maintain health.	1	2	3	4
21. My family helps me to ask information from doctor.	1	2	3	4
22. My family helps me to understand information regarding disease and treatment.	1	2	3	4
23. My family provides information to me about the importance of taking medicine timely and regularly.	1	2	3	4
24. My family provides information to me about the way to prevent the spreading of TB	1	2	3	4
25. My family collects information from health care professionals when I need it.	1	2	3	4
26. My family tells me the importance of follow up visits to the TB clinic which is very important for getting further information.	1	2	3	4
Appraisal support				
27. My family ensures that I have the ability to deal with my health related problems.	1	2	3	4

Statements	Never	Sometimes	Most of the time	All the time
28. My family is very open in discussing different things with me.	1	2	3	4
29. My family is happy when I continuously maintain my health.	1	2	3	4
30. My family gives me feedback when I do some thing.	1	2	3	4
31. My family allows me to participate in decision making about my treatment.	1	2	3	4
32. My family assures me that I am still important to them.	1	2	3	4

APPENDIX D

Part □□□ealth behaviors questionnaire for T□ patients

The Questionnaire is about your health behaviors. Please select one number, 1 to 4 regarding to how much of the time you have performed the behavior. Please respond to each item as correctly as possible and do not skip any items. If you have selected any number please circle that item. The meaning of each number is (1) = never; (2) = sometimes; (3) = most of the time; and (4) = All the time. There is no right or wrong answer.

Statements	Never	Sometime	Most of the time	All the time
Complying with anti TB medications				
1. I take anti TB medication regularly	1	2	3	4
2. I take anti TB medications timely as prescribed by physicians.	1	2	3	4
3. I visit a doctor when I have any sever health problem related to anti TB medication.	1	2	3	4
4. Even though I feel better I continue taking anti TB medication as prescribed.	1	2	3	4
5. I meet with doctor according to scheduled appointments.	1	2	3	4
Following healthy diet				
6. I eat at least 3 meals per day.	1	2	3	4

Statements	Never	Sometime	Most of the time	All the time
7. I eat egg, meat or fish every day.	1	2	3	4
8. I drink one glass of milk every day.	1	2	3	4
9. I drink a glass of fruit juice or some fruits every day.				
10. I eat vegetables in every meal.	1	2	3	4
11. I drink water 6-8 glass per day.	1	2	3	4
12. I eat enough nutritious food for maintain my health.	1	2	3	4
Performing physical exercise				
13. I do breathing exercise.	1	2	3	4
14. I do physical exercise at least 3 times per week.	1	2	3	4
15. I do exercise at least 30 minutes per day.	1	2	3	4
16. I do normal physical activity such as walking.	1	2	3	4
17. I avoid heavy working such as lifting heavy weight items.	1	2	3	4
Maintaining environmental hygiene				
18. I avoid staying or working in the smoking environment.	1	2	3	4
19. I avoid being in crowded environments.	1	2	3	4
20. I avoid dust and polluted air.	1	2	3	4
21. I throw tissue paper in trash cans that have lids.	1	2	3	4
22. I open the windows of my room to get good air flow and good exposure of sunlight.	1	2	3	4

Statements	Never	Sometime	Most of the time	All the time
Preventing disease transmission				
23. I cover my mouth and nose while coughing and sneezing.	1	2	3	4
24. I avoid sharing any personal items with others such as spoons, towels, and glasses etc.	1	2	3	4
25. I dispose of the tissues with sputum immediately into trash can with covering bag.	1	2	3	4
26. I avoid spitting here and there.	1	2	3	4
Avoiding risk factors of TB				
27. I try to stay away from stressors**.**	1	2	3	4
28. I avoid unhealthy food.	1	2	3	4
. I don’t smoke cigarette.	1	2	3	4
30. I don’t drink alcohol or beer.	1	2	3	4
31. I avoid close contact with someone who has influenza or common cold.	1	2	3	4

APPENDIX E

Additional Analysis

Table 7

□ean□Standard □eviation□and □evels of Family Support by □each □tems □mong Patients with Pulmonary T□ □□□□□□

No	Family Support	M	SD	Level
Emotional support				
1.	My family encourages me when I am afraid about my long term treatment regimen.	3.49	0.797	High
2.	My family is concerned about symptoms related to the disease that happened to me.	3.44	0.806	High
3.	My family cheers me up when I feel bored to maintain my health.	3.52	0.654	High
4.	My family encourages me to maintain religious activities such as praying.	3.57	0.638	High
5.	My family encourages me to relax such as watching television, listening to the radio, and telling me funny stories.	3.39	0.669	High
6.	My family helps me to build trust that disease will be cured.	3.62	0.631	High
7.	My family is loving and affectionate to me even though I have TB.	3.68	0.602	High
8.	My family asks me about my feeling throughout the treatment period.	3.21	0.803	High
9.	My family is sensitive about my emotional change.	3.19	0.766	High
10.	My family listens to me when I want to talk about anything.	3.55	0.677	High

Table 7 (*continued*)

No	Family Support	M	SD	Level
Instrumental support				
11.	My family helps me to pay for my medication, treatment, and transportation.	3.30	0.822	High
12.	My family gives me money to use in case of emergency.	3.33	0.866	High
13.	My family accompanies me when I go to see the doctor.	3.22	0.893	High
14.	My family helps me in my daily activities.	3.25	0.935	High
15.	My family helps me to clean my room.	3.14	0.901	High
16.	My family helps me to clean my sheets and clothes and expose them to sunlight.	3.20	0.930	High
17.	My family helps open the window to maintain good ventilation in my house.	3.37	0.865	High
18.	My family provides me with well balanced food and adequate nutrition (such as rice, meat, eggs, vegetables and fruits, and sugar).	2.83	0.892	Moderate
19.	My family supports me with transportation when I go to hospital.	3.12	0.806	High
Informational support				
20.	My family helps me to find information about how to maintain health.	2.76	0.871	Moderate
21.	My family helps me to ask information from doctor.	2.73	0.871	Moderate
22.	My family helps me to understand information regarding disease and treatment.	2.79	0.900	Moderate
23.	My family provides information to me about the importance of taking medicine timely and regularly.	2.88	0.864	Moderate

Table 7 (*continued*)

No	Family Support	M	SD	Level
Informational support				
24.	My family provides information to me about the way to prevent the spreading of TB	3.08	0.845	High
25.	My family collects information from health care professionals when I need it.	2.83	0.874	Moderate
26.	My family tells me the importance of follow-up visits to the TB clinic which is very important for getting further information.	2.89	0.887	Moderate
Appraisal support				
27.	My family ensures that I have the ability todeal with my health related problems.	3.44	0.775	High
28.	My family is very open in discussing different things with me.	3.58	0.708	High
29.	My family is happy when I continuously maintain my health.	3.53	0.653	High
30.	My family gives me feedback when I do some thing.	3.15	0.682	High
31.	My family allows me to participate in decision making about my treatment.	3.45	0.700	High
32.	My family assures me that I am still important to them.	3.71	0.549	High

Table 8

□ean□Standard □eviation□and □evels of □ealth □ehaviors by □ach □tems □mong Patients Pulmonary T□ □□□□□□

No	Health Behaviors	M	SD	Level
Complying with anti-TB medication				
1.	I take anti-TB medication regularly	3.89	0.477	High
2.	I take anti-TB medications timely as prescribed by physicians.	3.87	0.490	High
3.	I visit a doctor when I have any sever health problem related to anti-TB medication.	3.49	0.910	High
4.	Even though I feel better I continue taking anti-TB medication as prescribed.	3.65	0.673	High
5.	I meet with doctor according to scheduled appointments	3.65	0.661	High
Following healthy diets				
6.	I eat at least 3 meals per day.	3.57	0.625	High
7.	I eat egg, meat or fish every day.	2.74	0.841	Moderate
8.	I drink one glass of milk every day.	2.5 6	0.872	Moderate
9.	I drink a glass of fruit juice or some fruits every day.	2.60	0.821	Moderate
10.	I eat vegetables in every meal.	3.70	0.569	High
11.	I drink 6-8 glasses of water per day.	3.20	0.681	High
12.	I eat enough nutritious food to maintain my health.	2.74	0.850	Moderate
Performing physical exercise				
13.	I do breathing exercise.	1.58	0.898	Low
14.	I do physical exercise at least 3 times per week.	1.63	0.901	Low
15.	I do exercise at least 30 minutes per day.	1.61	0.885	Low

Table 8 (*continued*)

No	Health Behaviors	M	SD	Level
Performing physical exercise				
16.	I do normal physical activity such as walking.	2.99	1.262	Moderate
17.	I avoid heavy working such as lifting heavy weight items.	3.14	1.157	High
Maintaining environmental hygiene				
18.	I avoid staying or working in the smoking environment.	2.90	0.884	Moderate
19.	I avoid being in crowded environments.	2.85	0.913	Moderate
20.	I avoid dust and polluted air.	2.94	0.865	Moderate
21.	I throw tissue paper in trash cans that have lids.	2.48	0.874	Moderate
22.	I open the windows of my room to get good air flow and good exposure of sunlight.	3.21	0.891	High
Preventing disease transmission				
23.	I cover my mouth and nose while coughing and sneezing.	3.37	0.944	High
24.	I avoid sharing any personal items with others, such as spoons, towels, glasses.	3.49	1.033	High
25.	I dispose of the tissues with sputum immediately into trash can with covering bag.	2.20	0.980	Moderate
26.	I avoid spitting here and there.	2.79	0.968	Moderate
Avoid the risk factors of TB				
27.	I try to stay away from stressors**.**	3.24	0.804	High
28.	I avoid unhealthy food.	3.33	0.736	High
29.	I don’t smoke cigarette.	3.28	1.129	High
30.	I don’t drink alcohol or beer.	3.67	0.849	High
31.	I avoid close contact with someone who has influenza or common cold.	3.89	0.404	High

APPENDIX F

List of Experts

Three experts validated the content validity of the Family Support Questionnaire and the Health Behaviors Questionnaire, they were:

1. Dr. Charuwan Kritpracha

   Nursing Lecturer, Faculty of Nursing. Prince of Songkla University.Thailand.

2. Dr. Luppana Kitrungrote

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3. Salina Chowdhury

   Lecturer, College of Nursing, Mohakhali Dhaka 1212

APPENDIX G

List of Translators

Three persons worked on the translation of the instrument: Demographic Data Form, Family Support Questionnaire, and Health Behaviors Questionnaire.

They are

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