Development of Family-Based DOTS Support Program for Enhancing Adherence to Health Behaviors of Patients With Pulmonary Tuberculosis

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Abstract

The research aimed to develop a program for enhancing adherence to health behaviors among patients with pulmonary tuberculosis (TB) using Self-care Deficit Nursing Theory as a framework. Two phases of program development were conducted: 1) situation analysis by assessing basic conditioning factors of the patients’ care system, evaluating their care requisites and calculating their care demands and reviewing relevant evidence-based practices, i.e., using family member as DOT supporter and supportive educative program for patients with pulmonary tuberculosis; 2) program designation based on the Self-care Deficit Nursing Theory. The newly developed program was designed by taking the family as the client of nursing care. Four major methods were used throughout the program implementation: teaching, guiding, supporting, and providing environment for developing their system of care. Three components of care operations were enhanced: 1) estimative operation: help the clients to gain understanding on causes and impacts of TB, TB & medications/diet/exercise and managements of symptoms and side effects of medications using teaching techniques; 2) transitive operation: assist the clients’ decision on care activities by providing choices and discussing on their benefits and limitations and 3) productive operation: encourage the clients to make action plans to care for the patients. The program protocol and TB care booklet were used for enhancing their learning to care within the family context. This program was expected to enhance the adherence to health behaviors in patients with pulmonary TB by using their families as dependent care agents within the supportive educative nursing system.

Key words: Pulmonary tuberculosis, DOTS, Self-care deficit nursing theory, Adherence, Health behaviors
Background

Tuberculosis (TB) remains as public health burden as indicated by the leading cause of death from infectious disease (WHO, 2010). WHO estimated the incidence and prevalence of TB in 2009 globally at 140 and 164 per 100,000 people, respectively. In addition, its mortality rate excluding human immunodeficiency virus (HIV) was approximately 20 per 100,000 people globally in 2009. Pulmonary TB is the most common of TB.

However, pulmonary TB is curable by having a 6-month treatment. Treatment has a pivotal role for the TB control by curing the patients and restoring their quality of life for productivity, preventing death from active TB and its late effects, preventing relapse of TB, reducing transmission of the disease to others, and preventing the development and transmission of drug resistance (WHO, 2009). The treatment of pulmonary TB still poses many challenges, i.e., inadequate diagnosis and treatment, multi drug resistant tuberculosis (MDR-TB), HIV (Human Immunodeficiency Virus) co-infection, and the need for expansion of Directly Observed Therapy, short course (DOTS) program (Murray, 2006). These challenges are caused by low adherence rate to the TB treatment regimens.

Adherence is a common problem for all chronic disease with long-term treatment (Osterberg et al., 2005), especially for the persons with pulmonary TB. In generals, the patients must adhere to the medications in order to achieve the success of treatment, i.e., increasing the chance of cure, decreasing the risk of relapse and minimizing drug resistant (Maartens & Wilkinson, 2007). WHO (2003) defined adherence as the extent to which the patient follows medical instructions. However, effective TB regimen also requires patients to follow health related behaviors. Most research has concerned on adherence to medication (Martins, Grace, & Kelly, 2008; McInerney et al., 2007; Trajman et al., 2010), however adherence need to cover health-related behaviors that are more than adherence to the medications. Therefore, the adherence for successful treatment is viewed as the extent to which a person’s behaviors–taking medication, following healthy diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider (WHO, 2003). Specifically to a person with pulmonary TB, Biswas (2010) proposed six adherent health behaviors: complying with anti TB medications, following healthy diets, performing physical exercise, maintaining environmental hygiene, preventing disease transmission, and avoiding the risk factors of relapsing.
In order to deal with the pulmonary TB challenges, several interventions were conducted to increase adherence in patients with pulmonary TB using DOTS program (Hsieh et al., 2008; Newell, Baral, Pande, Bam, & Malla, 2006), educational program (Ailinge, Martyn, Lasus & Garcia, 2010; Clark, Karagoz, Apikoglu-Rabus, & Izzettin, 2007; Dilorio et al., 2003; Hovell, Sipan, Blumberg, Hofstetter, & Slymen, 2003), technical intervention (Dulmen et al., 2007), and behavioral approaches (Morisky et al., 2001; Liu et al., 2007). However, those interventions focused on adherence to medication instead of adherence to health behaviors during TB treatment (Biswas, 2010). In addition, those interventions had been failed to integrate with DOTS, which is the standard of care for persons with TB globally.

DOTS has become an international standard of care for TB treatment. Between 1995 and 2009, data have shown that 41 million TB patients have been treated successfully and 6 million lives were saved by using the DOTS program (WHO, 2010). Treatment outcomes (cure rate, complete rate, treatment failure, died, and default) are the indicators of the DOTS implementation. Recently, the goal of using DOTS is to achieve 90% of TB treatment success measured by cure and completed rates. One method used for maximizing the treatment outcomes is identifying observers of each TB patient. The observers include a health care provider (HCP), a family member (FM), and a community health volunteer (CHV).

A family member is a main support on being a DOT observer for the TB patients. Nasution (2007) found that the patients of successful complying with the DOTS had higher perceived family support than of unsuccessful in complying with the DOTS in Medan, Indonesia. Frieden and Sbarbaro (2007) stated that treatment observation must be performed by a person who is accessible and acceptable to the patient and family member is the most suitable. Pungrassami, Johsen, Chongsuvivatwong, Olsen, & Sørensen (2002) declared that family bonds will have more benefits in terms of general care and psychological support. Therefore, family participation during TB treatment will help patient to achieve successful treatment. Successful of treatment can be achieved by adherence to health behaviors.

Objectives/Research Questions

The purpose of this article was to develop a program for enhancing adherence to health behaviors among patients with pulmonary TB.
Research Methodology

Two methods were used to develop a program, namely situation analysis and program designation based on the Self-Care Deficit Nursing Theory (SCDNT). The situation analysis consisted of three steps: 1) assessing the basic condition factors; 2) calculating TB patients’ care demands; and 3) reviewing relevant evidence based practices. Self-care deficit nursing theory was used as a guide to direct the program designed to enhance the adherence to health behaviors in patients with pulmonary TB.

The existing studies were examined to assess the basic conditioning factors, calculating TB patient’s care demands and reviewing relevant evidence practices. Searching strategy from the available databases: CINAHL, PubMed, Proquest, Science Direct, OVID, Wiley Inter Science, Cochrane Library, Springer Link and Google including Google scholar used some keywords i.e., medication-taking behaviors, adherence, non-adherence, compliance, concordance, tuberculosis, DOTS, DOT observer, family, health behaviors, intervention for adherence, supportive educative nursing, and combination for the words. In addition, those selected articles included publication from 2000 to 2011, written in English and written by nurses, physicians and other health providers, conducted in any setting (hospital and community) with several study designs. Then, the authors read carefully the included articles and extract the given information.

Conceptualization of Orem’s SCDNT was used for designing the newly tentative program. Four related theories: self-care theory, self-care deficit theory, the theory of dependent care, and nursing system theory are learned and conceptualized to design the program. In addition, all concepts relating to this theory are included: self-care, self-care agency, and therapeutic self-care demands.

Findings and Discussion

Adherence is an element of self-care behaviors and represents Orem’s health deviation self-care requisites of performing prescribed therapeutic activities (Ailinger, Moore, Nguyen, & Lasus, 2006). Self-care is the practice of activities that individuals initiate and perform on their own behalf in maintaining life, health and, well-being (Orem, 2001). Self-care consists of universal, developmental, and health care (health deviation) needs (Orem, 2001). In addition, adherence is defined as client self-care based on deliberate action
Deliberate action means purposeful goal activity and has two related phases: 1) estimative and transitional operations; and 2) production and evaluation operations (Orem, 2001).

Situation analysis was started by reviewing the basic conditioning factors of adherence to health behaviors. These factors affect self-care and the patient variables (therapeutic care demand and care agency). Orem (2001) identified age, gender, developmental state, health state, pattern of living, health care system factors, family system factors, socio-cultural factors, availability of resources, and environmental factors as the basic conditioning factors. Of those basic conditioning factors (age, gender, socio-cultural factors, and environment) studied, only environment had correlation with adherence (Ailinger, Moore, Nguyen, & Lasus, 2006). However, other basic conditioning factors may have a stronger association with adherence.

Factors contributing to adherence can be divided into five elements: patient related factors; social-economic factors; condition related factors; therapy related factors, and health system factors (WHO, 2003). Education (Ai, et al., 2010; Hovell et al., 2003) and knowledge (Bello & Itiola, 2010) about TB are the importance factors to facilitate the adherence. Motivation (Jakubowiak et al., 2008) to recover and available of social support (McDonnel, Turner, & Weaver, 2001; Sagbakken, Frich, & Bjune, 2008) lead the adherence as well. On the other hand, barriers of adhering to health behaviors are identified as follows: negative feelings and stigma (Munro et al., 2007; Woith & Larson, 2008), side effects of medications (Ai et al., 2010), and co-morbidity (Amuha, Kutyabami, Kitutu, Odoi-Adome, & Kalyango, 2008).

The therapeutic care demand is analyzed according to the self-care requisites. Orem (2001) divided self-care requisites into universal self-care requisites, developmental self-care requisites, and health deviation self-care requisites. The components of the therapeutic self-care demand indicate the efforts through which to meet the self-care requisites (Orem, 1991 as cited in Sharie, 1996). Fundamentally, therapeutic self-care demand is a total blueprint for action or a prescription for self-care actions to be taken (Geden, Isaramalai, Taylor, 2001). The patients are required to know what should be performed in adhering to treatment, recovering health status, and preventing transmission. Specific to the TB patients, complying with anti TB medications, following healthy diets, performing physical exercise, maintaining environmental hygiene, preventing disease transmission, and avoiding the risk factors of TB are the therapeutic self care demands.
Reviewing relevant evidence-based practices was done as part of situation analysis. Many studies have tested the effectiveness of family as DOT observer. However, the findings were vary because of the different characteristics of subjects, research methodology used, and settings of the study. The similarity of the interventions and the exposures is providing the health education before assigning family as DOT observer but there is no specific information what the contents are. In addition, follow-up and routinely traced and contacted were done as element of the interventions. The families had tasks to observe the patients for taking medications and record it (Maciel et al., 2010; MacIntyre et al., 2003; Newell et al., 2006; Wright et al., 2004). In addition, the existing research of supporting educative program on enhancing self-care practices was reviewed. The interventions consist of education session, followed-up, reinforcement for goals, and problem solving (Kauric-Klein, 2011); provided information about TB, group discussion, self-care behaviors guidance, providing psychological and economic support and coordination for supportive environment (Ngamtrairai, 2003). The commonalities of those studies (Kamsee, 2004; Kauric-Klein, 2011; Mohamed, 2005; Ngamtrairai, 2003; Rau, 2000; Wonghongkul, et al., 2008) are using four helping methods of Orem namely teaching, guiding, supporting, and providing environment.

Self-care deficit nursing theory was applied to design the program. This theory consists of the theory of self care, the theory of self care deficit, the theory of dependent care, and the theory of nursing system. Firstly, the theory of self-care is used by assessing the self-care requisites and evaluating the therapeutic self-care demands. Second, the theory of self-care deficit is used to guide identifying the self-care agency (SCA). Third, the theory of nursing system is used for identifying the type of nursing system. Orem (2001) has three nursing systems namely wholly compensatory, partly compensatory, and supportive-educative. The nursing system for TB patients is supportive educative system since the patients are independent generally and they need support during medication phase. In order to provide supportive educative program, four helping methods of Orem (2001) will be used.

Since the TB patients are required to take medication for long period of time and to follow the health behaviors for recovering well, the family as dependent care agency (DCA) can be used as the extension of the healthcare providers of the self-care agency. Orem categorizes family into three types of familial situation namely family as basic conditioning factors, family as structure for dependent care unit, and family as unit of service (Taylor & Renpenning, 1995). Taylor (2001) stated that the family has main purpose specifically to create, maintain, and promote the social, mental, physical, and emotional development of
each and all of its members and defined family as a system or unit of person-in-relations, with strong social bonds, with commitment and attachment. In this study, family is viewed as structural dependent care unit which provides the kind of care needed by TB patients. Therefore, family is prepared for meeting the TB patient’s demand by increasing the family abilities.

The structure of the self-care agency concept is formalized into three structures specifically a set of power components enabling performance of self-care operations, five sets of foundational capabilities and dispositions, and the self-care operational capabilities, (Orem, 2001). Foundational capabilities and disposition are as baseline and context. Orem (2001) describes three self-care operations that will be enhanced namely investigative-estimative, judgment and decision-making and productive operations of self care agency.

The newly developed program was planned by having the family as the client of nursing care. Supportive educative nursing system is suitable with TB patients. Four major methods were used throughout the program implementation: teaching, guiding, supporting, and providing environment for developing of their system of care. Three components of care operations were enhanced: 1) estimative operation; 2) transitive operation; and 3) productive operation.

Firstly, estimative operations aim to know self-care requisites and mean of meeting them. The overview of TB and health-related behaviors are essential to be known by the TB patients. The overview of TB includes cause, signs and symptoms, and impacts of TB. The six of health related behaviors that are required to be adherence include TB medications, diets, exercise, healthy environment, preventing transmission, and avoiding risk factors of TB. Secondly, transitive operations assist the client to make judgments and decisions about care of TB specifically the six of health related behaviors of TB. The decision is taken after considering the benefits and the limitations of the alternatives provided. Thirdly, productive operations promote the clients to make actions plans so the TB patients perform the actions to meet care demands. This is important because it decides on the activity a person needs to do and can be used as a criterion in following-up the activity.

Four helping methods are used in the transitive and productive operations except teaching method is only used for the estimative operation. Teaching method is used to emphasize on information of TB and guidelines of health behaviors of TB. The information enhances the care capabilities and practice for controlling and managing the disease. The knowledge from teaching is carried out by the patient and the family into practice using
guiding method. The guiding method provides encouragement to the patients to make decisions of care practices. Providing the guiding techniques is used to promote behavior effectively and the patients are encouraged to ask during the guiding sessions. Suggestions and alternatives are provided and help the patient and the family to assess their choices through discussion and choose what would be suitable with them.

Providing support both emotional and information are offered in senses of ready to help, willing to listen, concerning of patient’s needs, and providing the favorable environment for the patient to share their care experiences. In addition, providing support helps in promoting the patient’s confidence to continuously perform care activities. Thorsteinson (2001) stated that listening the person’s feeling and touching their hands are examples of ways to support and empower the patients. Ensuring environmental conditions motivate the patient being helped to establish competence in care and it is helpful in facilitating interrelationship between the nurse and the patient and his/ her family. The interaction helps the patients in responding to the self-care demands and thus creating the ambience to talk and discuss their problems. In addition, the program protocol and TB care booklet were used for enhancing their learning to care within the family context. The booklet consists of information TB overview and health related behaviors. Pictures and clear explanation would make the booklet understandable by the patient and the family.

Family is important source of support for the patients who emphasize the family system and collectivism. Therefore, family members are included in treatment. Family influences the overall of patient’s health as well as the development of patient’s health behaviors. TB treatment success often depends on the family’s ability to changes in health behaviors. The role of family functioning is essential in facilitating or obstructing on the course of treatment. Family who has good function is able to manage patient’s health, to cope patient’s demand, and to create the behavioral and environmental changes required for treatment (Dalton, Kitzmann, Burghen, Mallare, & Stender, 2001). Olson and Gorall (2003) as cited in Dalton et al (2001) stated that family adaptability and family cohesion illustrate the family function.

As conclusion, family based DOTS support program consist of three phases: estimative, transitive, and operative phases involving family participation. Factors contribute to adherence was taken into the program designation. In order to implement the program, four major methods (teaching, guiding, supporting, and providing environment) and booklet were used for developing their system of care.
Recommendations

The implications of helping methods within the supportive-developmental nursing program would help the nurses to promote care abilities for disease management in persons with pulmonary TB. In addition, the nurses are required to involve in the program through performing helpful methods in the TB management. A supportive-developmental program is able to foster care practices among patients with pulmonary TB. Hence, family-based DOTS support program is expected to improve the adherence to health behaviors by using their families as dependent care within the supportive educative nursing system.

References


