TUBERCULOSIS SCREENING AND EDUCATION

IN THE URBAN PUBLIC SCHOOL DISTRICT

By

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Abstract

Tuberculosis (TB) is the world's deadliest curable communicable infectious disease. The eradication of TB is a significantly important intractable global public health challenge for health agencies at all levels. Global migration, cultural-socioeconomic factors and increase of multidrug-resistance tuberculosis (MDR-TB) affect the epidemiology of TB in the United States and other countries worldwide. Studies have shown that increase in TB knowledge and understanding contributes to early TB screenings/diagnosis, interventions and treatments, result in reducing MDR-TB, rates of TB transmissions, relapse, morbidity and mortality. The purpose of this project is: (1) to develop a TB screening risk assessment protocol for the Urban Public School District. This protocol will help identify, assess, test, monitor, control and prevent TB disease by screening high-risk populations for TB infection in the community and sending newly infected TB cases for treatment. (2) Also to create an educational module for the Urban Public School District's website to help educate, promote awareness and understanding of active TB disease and latent TB infection, TB transmission, symptoms, diagnosis, treatment, control and TB prevention programs to all students, faculty, administrators, staff and parents. The Self-Care Nursing Theory and Self Care-Deficit Theory of Nursing by Dorothea E. Orem and the Culture Care: Diversity and Universality Theory by Madeline Leininger were utilized as theoretical frameworks for the development of this project. Four content experts with knowledge and expertise with tuberculosis, cultural competence, nursing care, education and counseling will be asked to voluntarily participate in the review and evaluation the project's screening risk assessment protocol and educational module.

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Chapter I

Tuberculosis (TB) is the single leading cause of global death of all the curable infectious diseases (Gebeyehu, Azage, & Abeje, 2014). TB is the leading cause of death in HIV/AIDS co-infection cases (Li et al., 2013, p. 2). Tuberculosis affects people from all races, color, gender and age. Active TB disease is transmitted from person-to-person via infected lung air particles inhaled through coughing, laughing, sneezing, and singing (p. 2). Nearly 1/3 of the global population had contracted Latent TB infection (LTBI) with *Mycobacterium tuberculosis (Mtb),* TB causative agent (p. 2). It is speculated that without early TB treatment about 5 -10% of LTBI cases will convert to active TB disease cases (Chuke et al., 2014, p. 1). TB disease has caused an estimated 1.5 million deaths in 202 countries and territories in 2013 (Oxlade, Platek, Vincent, & Menzies, 2015, p. 2). This is a result of delayed health seeking behavior, increase in multi-drug resistance (MDR-TB), and TB transmission. The global incidence rate of TB in 2013 was estimated at 9 million (Oxlade et al., 2015. p. 1). Nearly 95% of the total global TB cases occur in developing nations (Gebeyehu, Azage, & Abeje, 2014). In 2013 the highest prevalence of global TB cases were in 22 TB–high burden geographical regions/ countries: *South-East Asia Region* – India (#1), Indonesia, Bangladesh, Myanmar, and Thailand; *African sub-Saharan Region* – Nigeria (#3), South Africa, Democratic Republic of Congo, Ethiopia, Mozambique, Kenya, UR Tanzania, Zimbabwe, and Uganda; *West Pacific Region* – China (#2), Philippines, Vietnam, and Cambodia; *Eastern Mediterranean Region* – Pakistan (#4) and Afghanistan; the *European Region* – Russian Federation (#13), Russia; and in *the Americas* – Brazil (#16) (The Henry Kaiser Foundation, 2014).

The eradication of TB is an extremely important public health issue, goal and intractable health challenge for global, national, state and local public and private health agencies. The rise in global migration of people (traveling for pleasure or business) from high-burden TB countries to middle to low burden countries makes it difficult for public health agencies TB surveillance programs to accurately monitor the epidemiology of TB within their communities. In most TB cases whether it be on a global, national, state or local level the main risk factors for a person developing TB is an individual's exposure to TB is TB infection (due to density and duration of TB exposure), and the TB disease. At-risk groups whether US-born and foreign-born/newcomers includes immunosuppressed individuals, recent arrivals traveling from high burden areas, intravenous drug users, individuals from specific socioeconomic status, living conditions (overcrowding) and occupation (high-risk group, high-risk settings) such as health workers, migrant workers, county personnel, care takers, volunteers who live and work in close quarters in overcrowded housing conditions, homeless shelters, correctional facilities, schools, low-income communities housing, long-term care resident, hospitals, clinics, workers in day-care centers, factories, homeless shelters, and soup kitchens among others (Jit, Stagg, Aldridge, White, & Abubakar, 2011, p. 2).

Statement of Purpose

The purpose of this project was to develop a TB screening risk assessment protocol for the Urban Public School District that would help identify, assess, test, monitor, control and prevent TB disease in the community by screening high-risk populations for TB infection and send newly active TB cases for treatment. The second purpose of this project was to create an educational module for the Urban Public School

District's website to help educate, promote awareness and understanding of TB transmission, symptoms, active TB disease and latent TB infection, diagnosis, treatment, control and TB prevention programs to all students, faculty, administrators, staff and parents.

Theoretical Framework

The Self-Care Nursing Theory and Self Care-Deficit Theory of Nursing by Dorothea E. Orem and the Culture Care: Diversity and Universality Theory by Madeline Leininger were utilized as theoretical frameworks for the development of this project. A brief overview of Dorethea E. Orem's theory of self-care, theory of self-care deficit and Madeline Leininger's culture care: diversity and universality theory are presented as well as a discussion regarding how the theories were utilized to guide the development of the educational module. In addition, both Orem's and Leininger's theoretical definitions for nursing's four metaparadigm concepts (nursing, health person, and environment) as well as the Project Author's operational definitions for nursing metaparadigm concepts are presented.

Overview of Dorothea E. Orem's Theory of Self-Care, Theory of Self Care Deficit

Nursing theorist Dorothea E. Orem, in 1956 developed the Self-Care Nursing Theory and Self Care-Deficit Theory of Nursing to help provide guidance, meaning and structure to the nursing practice and the emerging theoretic nursing sciences (Taylor & Renpenning, 2011). *Self-care,* self-agency and self-requisites are the conceptualized components of this theory (p. 23). According to Taylor and Renpenning (2011) in the theory of Self-care, Orem viewed a person, as human beings, individuals who could care for and manage him or herself. The individual as a person has the capability to act as his

or her own agent with purpose towards a set goal. Self-care was seen as an enduring system of actions and consequences where actions are being initiated and performed generated for or by the individual throughout his or her lifespan to 'maintain life, health and well-being.' Taylor and Renpenning (2011) indicated that Orem referred to self-care as skills acquired through life experiences with guidance, teaching and support from family, household (living conditions), education, occupation, physical and psychological development, social environment and acting for and doing for another (p. 23).

Self-care agency refers to the ability of a person to care for and manage themselves through his or her own power and capabilities (p. 23). Taylor and Renpenning (2011) noted that self-agency requires operational powers to perform specific targeted self-care operations and having the desire and the capabilities necessary to perform targeted tasks. If the desire to perform set tasks is present but the capability is not, the desired task can be achieved through proper education and training (p. 23). *Self-care requisites* refer to actions that are needed to maintain human function and development through the development and activation of self-care agency (p. 23). The effectiveness of the theory of self-care in this instance requires a person to be honest and truthful with self through, self-appraisal and self-management. *Theory of self-care deficit* refers to an individual experiencing short-term or long-term deficit in two or more elements with insufficient resources that make it challenging to achieve required life goals (p. 24). The cause of this deficit must be found before a specific nursing care plan can be developed to treat the deficit.

Orem's Theory of self-care, 'theory of self-care deficit' is the nursing theory of choice for nurses managing the nursing care of people with curable infectious diseases

like Tuberculosis. This is because the majority of people who acquire latent TB infection or TB disease do so due to identified behavioral actions performed that deviate from maintaining optimal health and well-being resulting in 'a self-care deficiency to exist' creating the need for nursing care. The nurse's role in this instance is to respond to a known need. The nursing professional is there to help enable the adult, the maturing adolescent TB client and their families to recognize and understand how to control factors that cause and allow self-care deficiencies to exist. And also to learn how to develop, adopt, and perform predetermined therapeutic self-care activities that improves and maintains proper self-care capabilities to realize better health, well-being and quality of life. A comprehensive approach strategy must be used involving physio-pathological, psychosocial (emotional intelligence) and educational and evidence-based best practices of self-care in nursing practice, sophisticated communication, teaching and interpersonal skills for the individual with TB and nurse's role to meet the self-care requirements.

Theory of Self-Care, Theory of Self-Care Deficit' and Nursing's Metaparadigm. In Orem's the Theory of self-care, 'theory of self-care deficit', (Taylor & Renpenning, 2011), nursing's four metaparadigm concepts (nurse, health, patient and environment) are defined as follows. *Nursing* was described as a practical science essential for human service through deliberate actions or sequences of actions to promote health and well-being (p. 9-10). For the purpose of this project, nursing was operationally defined as responding to a known need. *Nursing* assists to enable the client and their families to recognize and understand how to control factors that causes self-care deficits to exist and to learn how to adopt, and perform predetermined therapeutic self-care activities that maintains proper self-care capabilities to improve health, and well-being.

Health was defined as a state of wholesome of structure and function of a living person (p. 3). *Health*, operationally defined for the purpose of this project, was a person who has adhered to TB treatment regimen and free of TB disease signs and symptoms. *Person* was defined as a human being (the caregiver and the recipient) (p. 8). *Person* was operationally defined for the purpose of this project as an individual(s) confirmed with either latent TB infections or active TB disease. Finally, *environment* was defined as a conditioning factor, and a place where the individual exists "inseparable but factors about the environment and human relationship can be isolated and described" (p. 9). *Environment* was operationally defined for the purpose of this project as the social and cultural environment of a client or community that greatly influences a patient's perception, views, and beliefs on adherence to treatment, health and well-being.

Overview of Madeline Leininger's Culture Care: Diversity and Universality Theory. Nursing theorist Dr. Madeline Leininger developed the Theory of Culture Care Diversity and Universality in the 1960s with the goal of helping nurses to develop and provide culturally congruent care within their own nursing practices (McFarland & Wehbe-Alamah, 2015, p. 320). Leininger's Theory of Culture Care Diversity and Universality, was inspired by her professional nursing experiences observing behavioral differences in diverse children based on culture. Dr. Leininger observed the lack of cultural competence care and understanding by nursing personnel that impacted the type of care provided, the health care outcomes and well-being of patients from diverse cultures. The Theory of Culture Care was also influenced by the anthropological insights gained from Dr. Leininger's 2-year research study on the Gadsup people in Papua New Guinea (p. 320). Dr. Leininger believed that the Sunrise Enabler and the tenets of the

theory she developed could be used as a framework and a cognitive guide by which advance practice nurses (APNs), registered nurses and other health care providers could apply this theory within their own respective practices by understanding the cultural influences of generic, professional care expressions and patterns of individuals resulting in learning the values and meanings of information concerning human care and well-being (p. 320).

According to McFarland and Wehbe-Alamah (2015) Leininger saw the nursing profession as a unique dynamic discipline that uses knowledge and caring to serve the needs of people worldwide. Therefore, the nursing practice should take into account that whether a person is ill or well, he or she is an extension of the environment they came from and thus is influenced by culture, religion and social changes. These various factors will significantly influence the diverse care needs of a person, and their health and well-being. Thus the Theory of Culture Care is holistic and broad, with culturally based values, that respect beliefs, customs and personal practices while nursing care and caring is being provided to promote well-being and increase health outcomes (p. 6-7).

There are four major theoretical tenets and predictions that Leininger conceptualized to develop the theory of culture care and they are: (1) culture care expressions, meanings, patterns and practices although different are common and universally shared by many diverse people and groups; (2) key influencers of cultural care patterns that predict the way people view health, wellness, sickness, disability and death are environmental context, ethno-history, generic and professional care, language, society structure factors, and worldview; (3) health and wellness is also greatly influenced by factors in different environmental contexts such as generic emic

(traditional learning, passed down, folklore) and etic professional (formal learned knowledge and practices)nursing care health; and (4) three major theoretical culture care modes of decision and actions that are essential factors necessary to help guide nurses to deliver culturally congruent, safe, meaningful health to diverse cultures and beneficial care within their nursing practice Leininger's identified as *culture care preservation and/or maintenance, culture care accommodation and/or negotiation, and culture care re-patterning and/or restructuring*.

McFarland and Wehbe-Alamah (2015) described Leininger's first decision and action modality, *culture care preservation and/or maintenance,* as the "assistive, supportive, facilitative or enabling professional acts or decisions that help cultures to retain, preserve, or maintain beneficial care beliefs and values or to face handicaps and death" (p. 323). McFarland and Wehbe-Alamah (2015) described Leininger's second decision and action modality, *culture care accommodation and/or negotiation*, as the "assistive, supportive, facilitative or enabling of healthcare professional acts or decisions that help cultures adapt to or to negotiate with others for culturally congruent, safe, and effective care for their health, well-being, or dealing with health outcomes (p. 324). McFarland and Wehbe-Alamah (2015) described Leininger's third and final decision and action modality, *culture care re-patterning and/or restructuring,* as the *"*assistive, supportive, facilitative or enabling of healthcare professional acts and mutual decisions that would help people to reorganize, change, modify or restructure their lifestyles and institutions for better health care patterns, practices, or outcomes" (p. 324).

Leininger's used several key central cultural constructs believed to be essential components of the culture care theory which would help provide those in the transcultural

nursing profession practicing with the necessary guideline to obtain in-depth knowledge of care and practice to help human beings achieve culturally based meaningful and therapeutic health care practices when dealing with health, wellness, dying and disabilities (p. 9). The central constructs in the culture care theory are the following:

Care a major construct of the theory, is described as an abstract and or a concrete phenomenon. Care is a powerful, dominant, distinct and dynamic force used in nursing to better understand the complete human behavior in the context of global health and illness (p. 4). *Caring* is described as an action, attitude, or a practice used to help people with healing and wellness (p. 9).

Culture, a major central construct of the Theory of Culture Care Diversity and Universality*,* is a conceptualized synthesized phenomenon that is interrelated with care, as in culture care. Leininger, defined culture as the "learned, shared and transmitted value, beliefs, norms, and lifestyles of a particular culture that guide thinking, decisions and actions in patterned ways" (p. 10). *Culture* is described not as a symbol or social interaction but as the 'blueprint for guiding human decisions and actions" (p. 10).

Emic and *Etic* are major constructs of the theory, is used to discover contrasting culture care phenomenon with the theoretical perspective of the theory of culture care. *Emic* refers to the generic, traditional, local, and indigenous, insider's cultural knowledge and point of view of a specific phenomenon (p. 14). *Etic* refers to the outsiders' point of view conceding a specific phenomenon, such as a professional nursing care knowledge or practices acquired based solely on formal education teachings (p. 14).

Culturally congruent and therapeutic care, refers to the use of culturally based knowledge obtained appropriately, sensitively, and meaningfully with people of diverse

or similar culture in accordance to the person's culture care values, beliefs, expressions, and patterns (p. 14).

Care diversity, the difference or variables among human beings with respect to culture care meanings, patterns, values, lifestyle, symbols or other features related to providing beneficial care to clients of a designated culture (p. 14).

Culture care universality, refers to common or similar shared culture care phenomenon (cyclic meanings, patterns, values, life-ways or symbols) by human beings or other cultures that can help health providers to better assist m support facilitate and enable positive health outcomes for people (p. 15).

Health is a state of wellbeing that is culturally defined, valued and practiced. Health reflects individuals, families, groups, or communities' ability to perform their daily role activities in culturally expressed, meaningful, beneficial, and patterned life-way (McFarland & Wehbe-Alamah, 2015, p. 15).

Ethnohistory is considered another major construct of the theory of cultural care that help guide the nursing professional to attain culturally congruent care. According to McFarland and Wehbe-Alamah (2015), Leininger defined *ethnohistory* as:

> the past facts, events, instances and experiences of human beings, groups, cultures and institution that occur over time in particular contexts that help explain past current lifeways about culture care influencers of health and well-being or death. (p. 15).

Environment context, refers to an event, situation or experience that provides meaning to a person based on self or others expressions, interpretations, social

interactions depending on a specific geophysical, ecological, spiritual, sociopolitical and technologic factors associated with cultural settings (p. 15).

Worldview, describes the way people view their world to create a picture or view their worth in relation to the world around them.

Leininger's Sunrise Enabler, shows how the nursing care practice (generic and professional care) can effectively provide clients through the three culture care modes of decision and actions culturally congruent care for health, well-being or death (p. 358). According to McFarland and Wehbe-Alamah (2015) it was Leininger's intent for the three culture care modes of actions and decisions to be the means by which nurses applied culture constructs in the care of diverse people from culturally holistic perspective for culturally congruent care and beneficial outcomes, the primary objective of the culture care theory (p. 321). The APNs use of the theory of culture care three modes of decisions and actions (including client participation and education) help to facilitate health promotion and disease prevention to treat acute and chronic illness (p. 321).

Theory Culture Care Diversity and Universality and Nursing's Metaparadigm

McFarland and Wehbe-Alamah (2015) noted Leininger's criticism of the nursing's four metaparadigm concepts (nurse, health, patient and environment), in the *Theory Culture Care Diversity and Universality*. Leininger saw the nursing metaparadigm concepts as being too limited for excluding care and culture from the metaparadigm. According to McFarland and Wehbe-Alamah (2015), Leininger argued that it was theoretically illogical and inappropriate a violation of scholarly research and discovery principles to 'use nursing to explain or predict nursing (p. 20).

McFarland and Wehbe-Alamah (2015), Leininger defined *nursing* as a learned humanistic and caring science with a societal mandate to serve people in order to maintain or regain health and wellbeing in a culturally meaningful and beneficial manner (p. 324). For the purpose of this project, *nursing* was operationally defined as the use of the three culture care modes of decisions and actions using care and caring to become culturally competent to provide superior quality and culturally congruent care that will promote well-being and increase health outcomes to individuals, vulnerable populations and communities at–risk for developing latent TB infection and active TB disease.

Health was defined as, a state of wellbeing that is culturally defined, valued and practiced. Health reflects individuals, families, groups, or communities' ability to perform their daily role activities in culturally expressed, meaningful, beneficial, and patterned life-way (McFarland & Wehbe-Alamah, 2015, p. 15). *Health*, operationally defined for the purpose of this project, as a person considered healthy from active tuberculosis disease, once after the completion of TB treatment, two consecutive Acid-fast bacilli smears sputum cultures taken after treatment are negative. A healthy person is considered free of the TB disease and no longer in danger of spreading the disease to others in the community.

Leininger argued that transculturally for some cultures the word *"person"* has no central cultural dominant meaning, thus prefers the use of linguistic terms that are used often and more transculturally meaningful to people to define a *"person,"* as *human beings, families, clans and collective groups* (p. 21). *Person* was operationally defined for the purpose of this project as an individual or a group of individuals who are either U.S.-born or foreign-born from various cultural socioeconomic backgrounds who are at-risk

for latent TB infection or active TB disease who will be treated with human dignity, autonomy and respect.

Finally, *environment* was defined as the "totality of geophysical situation(s) or the lived-in geographic and ecological settings of cultures that contextually includes multiple factors: care expressions, meanings, patterns of living, physical, ecological, spiritual, sociopolitical, kinships, or technological dimensions that influenced culture care, health and well-being" (p. 22). *Environment* was operationally defined for the purpose of this project as the social and cultural environment of a client or community that greatly influences patient perception, views, and beliefs on adherence to treatment, health and well-being.

Initial Review of Literature

A review of nursing and health related literature was conducted exploring developing a TB screening risk assessment protocol for the Urban Public School District to help identify, assess, treat and monitor individual with high-risk to develop TB in the community and to help create for the school district a TB educational module to help promote education and understanding of TB by all its students, faculty, administrators, staff and parents using the following keywords both singularly and in multiple combination: active TB, asylees, barriers to health access, care-seeking behavior, Center for Disease Control and Prevention, community-based participatory research, communicable diseases, direct observed therapy, developing countries, evaluation of immigrants, foreign-born, global migration, global TB, health assessment, immigrants, industrialized countries, high-risk population/groups, latent tuberculosis, LTBI, patient delay in TB treatment, pulmonary TB, refugees, TB awareness, TB stigma, TB

education/counseling, TB education videos, TB high burden countries, TB incidence, TB knowledge and attitudes, TB noncompliance, TB prevalence, TB public-private collaboration, TB screening and testing, TB treatment, Tuberculosis, TB prevention, TB symptoms, United States, Urban school districts, and World Health Organization. Databases searched, limited to the years 2006 and 2015, included AMED, Alt Health Watch, CINAHL Plus with Full Text, and EBSCO. The search was limited to the years 2006 to 2015 to ensure the current evidence-based literature was reviewed and summarized for the purpose of this project. A summary of the reviewed TB screening risk assessment protocols for urban school districts to help identify, assess, treat and monitor individuals with high-risk for developing TB in the local community. Also to help create a TB educational module to help promote education and understanding of TB by students, faculty, administrators, staff and parents within the Urban Public School District.

Overview of tuberculosis. Tuberculosis is one of the deadliest communicable infectious diseases known to mankind, causing major global morbidity and mortality throughout human history (Stout, 2013). The causative agent of TB is *Mycobacterium tuberculosis.* A slow growing rod shaped aerobic bacterium requiring a human host for growth, reproduction and causes disease in order to be transmitted to another human host to continue its transmission and progression cycle (p. 415). Active TB disease is transmitted easily through air from person-to-person via infected lung air droplet nuclei inhaled through coughing, sneezing, laughing and singing (Li et al., 2013). Not every person who becomes infected with the TB bacteria becomes sick, therefore TB is referred to exists in two TB-related conditions: latent TB infection (LTBI) (asymptomatic,

inactive, non-infectious to others) and active TB disease (symptomatic, active, and extremely infectious to others).

Symptoms of pulmonary TB disease includes persistent coughing for three or more weeks, coughing up blood or sputum, chest pain, chills, difficulty breathing/ shortness of breath, fatigue, fever, loss of appetite/ anorexia, night sweats, and unexplained weight loss (Ukwaja, Alobu, Nweke, & Onyenwe, 2013). TB primarily affects an infected person's lungs (pulmonary TB), and other areas of the body like the brain, kidneys, spine and bones (extra-pulmonary TB) (Biya et al., 2014). Signs and symptoms of extra-pulmonary TB disease depend on the affected body part. People with LTBI are given treatment to prevent TB disease from developing in the future. People with active TB disease are given immediate treatment therapy and isolation to keep the disease from spreading to others. Left untreated, an individual with active TB disease can infect between 10 to 15 people a year (M'Imunya, Kredo, & Volmink, 2012, p. 5). Although a curable disease, delayed treatment of TB can lead to increased TB transmissions, morbidity and mortality.

Prevalence and incidence about tuberculosis. *Statistical Global Facts About Tuberculosis.* TB is a significant public health issue on a global scale for industrialized countries. WHO declared TB a global emergency in 1993, as the global incidence rate of TB was nearly as high as the global incidence rate for the HIV/AIDS epidemic (Oxlade et al., 2015). A third of the world's population was reported to have contracted TB (Chuke et al., 2014). The global incidence rate of TB in 2013 was an estimated 9 million, with an estimated 1.1 million HIV/TB co-infection cases and caused an estimated 1.5 million

deaths (Oxlade et al., 2015, p. 2; Chuke et al., 2014, p. 1). Nearly 95% of the total global TB cases occur in developing nations (Gebeyehu, Azage, & Abeje, 2014).

The World Health Organization (WHO) reported that in 2013 there were 22 TB–high burden countries (HBCs) located in the 6 major global geographical regions with the highest prevalence of TB cases globally, were the countries has more than 100 new confirmed TB cases per 100,000 population. The 22 HBCs combined totaled 7.383,000 of new TB cases, an estimated 82% of the total global TB cases (World Health Organization, 2014). The 22-HBC geographical regions/ countries are the following (highest prevalence total new TB cases for its region): *South-East Asia Region* – India (#1), Indonesia, Bangladesh, Myanmar, and Thailand; *African sub-Saharan Region* – Nigeria (#3), South Africa, Democratic Republic of Congo, Ethiopia, Mozambique, Kenya, UR Tanzania, Zimbabwe, and Uganda; *West Pacific Region* – China (#2), Philippines, Vietnam, and Cambodia; *Eastern Mediterranean Region* – Pakistan (#4) and Afghanistan; In the *European Region* – Russian Federation (#13), Russia had the highest prevalence for its region with 130,000 total new TB cases; *the Americas* – Brazil (#16) (The Henry Kaiser Foundation, 2014; World Health Organization, 2014).

Continuous global migration of foreign-born person or repatriating persons to and from high burden region where TB is most common has significantly affected the epidemiology of TB worldwide (Pareek et al., 2011). In particularly in low-burden and high incomes countries like the U.S., Canada, and United Kingdom. The rise in multi-drug resistance (MDR-TB) of TB combined with the rise in global migration made it difficult to promptly diagnose and treat individuals with TB (Oxlade et al., 2015, p. 1).

Statistical National Facts of TB in the United States. A review of the United States TB Surveillance Data, Behavioral Risk Factor Surveillance System (BRFSS) showed that the total number of new TB cases reported in the U.S. in 2013 was at 9,588 (Alami et al., 2014, p. 229). A historic low with National TB incidence rate of 3.0-cases/100,000 populations. Represented a consecutive 20-year decline, a 4.2% reduction from 2012 (at 3.6%) (p. 229). Of the 9,588 total TB cases, 88% were reported to be HIV/TB cases (p. 230). In 2013, a record of 64.6% of all reported TB cases in the U.S. were among foreign-born individuals (a 13x greater TB incidence rate) than US-born individuals (p. 229). In the U.S. amongst racial/ethnic groups: Asians (non-Hispanics) have higher TB incidence rate at 26x than whites (non-Hispanics). In 2013 California, Texas, New York and Florida were four states with the highest (51.3%, total of 4,917 TB cases (>500 cases per state)) TB incidence cases in the US. In 2013, the top 5 countries of foreign–born persons in US with the highest rate of active TB cases were from Mexico (20%), the Philippines (12.6%), India (8%), Vietnam (7.4%) and China (6.1%) (p. 229).

High-risk groups and risk factors for acquiring tuberculosis. The risk factor for high-risk groups whether it be on a global, national, state or local level acquiring TB is dependent on the density and duration of TB exposure by an individual, if he or she develops TB infection or TB disease. At-risk groups whether US-born or foreign-born/ newcomers are individuals who are immunosuppressed due to medical illness or condition, those who have recently traveled or resided in high burden TB areas for more than 5 consecutive years, illicit drug users, individuals from specific socioeconomic status (high-risk racial/ethnic minority populations living in low-income and medically underserved communities). Individuals living conditions (overcrowding) and occupation

(high-risk groups and high-risk settings for more than 2 years can exposed a person to contracting TB from TB infected person) (Jit et al., 2011; Pareek et al., 2011). At- risk groups for TB by occupation or living condition includes healthcare workers, migrant workers, county personnel, care takers, teachers, volunteers who live and work in close quarters in overcrowded housing conditions, homeless shelters, correctional facilities, low-income communities housing, long-term care resident, schools, hospitals, clinics, workers in day-care centers, factories, homeless shelters, and soup kitchens among others (Jit et al., 2011, p. 2).

Screening and diagnosis for TB. *Medical and Physical Examination*. According to Pareek et al. (2011) A screening risk assessment based approach is critical to identifying which individuals require testing for Tuberculosis. Worldwide effective TB screenings have been instrumental in reducing the risk of TB transmission, increasing TB diagnosis and improving TB treatment outcomes. The WHO recommends the initial TB screening period of 21 days after 1st onset of TB signs and symptoms in order to increase the efficacy of TB treatment and decrease multiple drug resistance TB and TB transmission rate to others (Kaur, Sodhi, Kaur, Singh, & Kumar, 2013, p .219). A complete medical history and physical examination of an individual suspected of being exposed to or having TB must be performed by a certified and licensed heath care professional trained in TB (at the local department of health or at a private clinic). A complete TB medical examination includes obtaining an individual's medical history, country of origin, date of arrival to the U.S., gender, age, foreign and domestic travel history, previous and current medical conditions/illnesses and treatments, socio-demographic data, TB exposure risk, TB symptoms, BCG vaccination status, HIV status,

living conditions, occupation, alcohol intake history and recreational drug usage. A complete TB physical examination generally includes a TB Mantoux tuberculin skin test (TST), the interferon gamma release assay (IGRA) (blood tests), chest x-ray, bacteriologic test and determination of HIV status.

Tuberculosis screening tests are used to screen all people who are at high-risk for TB exposure. This includes both US-born and foreign-born/newcomers people who are: immunosuppressed due to medical illness or condition; people who are recent arrivals or who have recently traveled or resided in high burden TB areas for more than 5 consecutive years; individuals from specific socioeconomic status (i.e. the homeless, those residing in low-income and medically underserved communities); illicit drug users, and; individual who live and or work in overcrowded conditions, high-risk group, and high-risk settings (i.e. healthcare workers, migrant workers, county personnel, caretakers, teachers, volunteers, overcrowded housing conditions - correctional facilities, low-income communities housing, long-term care residents, schools, hospitals, clinics, workers in day-care centers, factories, homeless shelters, and soup kitchens among others (Jit et al., 2011, p. 2).

TB Skin Test. The Mantoux Tuberculin Skin Test (TST) is the preferred TB skin test to be used in people suspected of having LTBI and active TB. The TST will indicate if a person was previously exposed to TB infection (Chuke et al., 2014). *Blood Tests*. The Interferon-gamma release assays (IGRAs) blood tests such as QuantiFERON – TB Gold Test (QFT-G) and QuantiFERON – TB Gold – In Tube (QFT-GIT), are used to diagnose the mycobacteria specie in LBTIs and active TB disease (Chuke et al., 2014). *Chest X-rays*. A chest x-ray cannot confirm TB disease however if either the TST or the

IGRA test is positive a chest x-ray is required to rules out pulmonary TB (Ukwaja et al., 2013). *Analysis of Sputum tests (Bacteriologic Examination)*. Only bacteriologic cultures can confirm *M. tuberculosis* for TB disease, as the bacteriologic cultures assess a patient's infectiousness and patient's response to treatment (Dewan et al., 2006, p. 2).

Initial Pre-migration overseas medical examination. In efforts to ensure that TB transmission risk are reduced, and increase improvements to TB screening, diagnosis and TB treatment outcomes prior to entry into the U.S. all visa applicants >/- 15 years old living outside the U.S., or foreign-born and US-born individuals who reside within the US but have traveled and resided in high-TB burden regions for more than 5 years, or all individuals suspected with TB or who have been exposed to active TB patients are required to have medical and physical examination by a trained qualified TB health care personnel to TB screening using Mantoux tuberculin skin test (TST), the interferon gamma release assay (IGRA) (blood tests), chest x-ray, and bacteriologic examination (sputum test) to screen for LTBI and active TB.

Screening of Foreign-born Overseas. In effort to prevent the importation of TB by migrating foreign-born people from HBCs into the US, changing the TB incidence rate, in 2007 the CDC mandated overseas TB screening for all foreign-born people bound for the US from countries the WHO determined TB incidence rates to be 20 TB cases per 100,000 people per year. Using the CDC recommended implementing culture-based screening algorithm that would screening and identify LTBI and a revision of the smear-based screening algorithm to include the *M. tuberculosis* culture, a drug susceptibility testing, direct observed therapy for TB (Liu, Posey, Cetron, & Painter, 2015). This model effectively screened, diagnosed (smear-negative/culture positive TB) and treated a

substantial number of US bound foreign-born persons overseas with LTBI from HBCs, thus contributed to the decline of new TB cases incidences of newly migrated foreign-born people to the U.S. (p. 425).

Treatment. TB is a curable disease. The main goal of each treatment strategy is to prevent TB infection and TB disease by reducing TB transmission, morbidity and mortality rates in communities at-large. Generally, the duration of TB treatment regimen lasts 6- 9-months. Prior to starting treatment for each TB disease case, a person's HIV status most be known, as the treatment regimen for a person with an HIV-TB co-infection differs from a person with only TB disease. In all LTBI cases the recommended treatment regimen is 9 months with the drug Isoniazid (INH). In patients with active TB disease with or without HIV the recommended treatment is a 6-month regimen with the 1st line anti-TB drugs which forms the core of standard TB treatment regimens which consists of taking isoniazid (INH), rifampin (RIF), pyrazinamide (PZA), and ethambutol (EMB).

Bennett, Brodine, Waalen, Moser and Rodwell (2014), reported that newly arrived foreign-born people, in particularly refugees with postsecondary education were more likely to seek LTBI treatment. Those with little to no education with LTBI required public health control strategies to increase treatment rates. According to Li et al. (2013), failure of foreign –born persons with LTBI and active TB cases from getting or completing the required TB treatment in a timely manner has led to an increase in the TB incidence rate (at 36.9%) in Multi-Drug Resistant TB to 1st-line drugs like isoniazid + rifampin have increased since 2010.

Patient Monitoring Measures. TB patients under treatment therapy are monitored through required Directly Observed therapy (DOT) by TB trained public health

nurse/case manager from the local department of health to ensure that each TB patient adheres to and completes their entire TB treatment regimen. After an active TB disease patient has been verified as being TB infectious, that person must be isolated from others until he or she is determined non-infectious after 40 observed DOT dosages and the TB patient's smear sputum is negative.

Public and private health sector's role and responsibilities to monitor, control and prevent TB. *Public Health Sector (Federal, State and Local Department of Health).* The main objective of the public health sector (global, federal, state, local and tribal department of health (DOH)) TB control programs is to monitor, control and prevent transmission of TB infection and TB disease through early TB detection/ diagnosis, and prompt TB treatment in accordance with the World Health Organization (WHO) and nationally by the Center for Disease Control and Prevention's guidelines for the eradication of TB disease morbidity and mortality rates at the local, state, national, and global levels through early detection of TB cases and DOT treatment protocols (Gebeyehu, Azage, & Abeje, 2014). Public health agencies are required to electronically report all verified active TB cases (country of origin, race and ethnicity, TB risk factors, HIV status and drug-susceptibility test) to the CDC's electronic Disease Notification database (EDN) to ensure accurate measuring and monitoring the prevalence, incidence, morbidity and mortality rates of TB in the U.S. (Alami et al., 2014, p. 229).

In the U.S. by law TB screenings and testing is mandatory for all active TB cases and their contacts and must be reported to local areas department of health TB programs. This process allows the local DOH the ability to provide the appropriate medication and

treatment to infected TB disease cases, their close contacts and to closely monitor and report all local, state and national active TB cases to the CDC, as required.

Employers and TB Screenings. Most employers where employees are working in close proximity of others require TB screenings to be taken prior to the first day of employment (Pareek, Baussano, Abubakar, Dye, & Lalvani, 2012). *Health Care Organizations*. Healthcare workers are required to be tested regularly for TB disease. Primarily with a baseline skin test performed prior to 1st day of employment, then annually at regular intervals. If patient is positive for *M. tuberculosis,* drug susceptibility testing should occur 3 months after initial treatment or if patient is not responding to treatment regimen. *Schools Systems.* Prior to school registration students in TB high–risk groups, especially students who have resided in a foreign country for a consecutive period of 5 years are required to undergo a complete TB screening by a certified licensed physician or the local department of health and to provide their prospective school with documentation of a negative TB symptom screening and risk assessment (a negative tuberculin test (TST) or QuantiFERON TB Gold Blood test (QFT) or normal Chest x-ray).

Private Health Sector (i.e. private health care providers, hospitals, medical colleges, non-government organizations, and private laboratories, etc.) Monitoring and controlling the spread of TB infection is difficult as the majority of patients with TB generally seek medical attention from a private health care provider before seeking help from a public healthcare provider (Dewan et al., 2006). Most private sector health care providers are not adequately trained to detect, treat, monitor, control or prevent TB disease in accordance to the TB national and international standards (p. 1). Private health

care providers refer their patients suspected of having TB to the local public health department for further TB screening and testing for confirmation of TB. When TB disease is detected in a person, the department of health searches for other individuals that might have been exposed to the infected TB person and exposed persons (family, friends, co-workers, etc.) are then tested for TB (TB skin & blood test). If the individual is positive for latent TB infection, they are treated for TB. If the individual has confirmed active TB, they are isolated and provided DOT treatment protocols, until sputum test confirm they are negative for active TB disease (p. 441).

Public-Private Mix Projects. Public-private mix projects are collaborations between the private and public health sectors to increase the quality of TB diagnosis, treatment and care in HBCs that have proven to be an extremely effective strategy (Dewan et al., 2006, p. 5). The public health sector provides the private health sector (private health care providers, hospitals, medical colleges, non-government organizations, and private laboratories) with extensive training on TB identification, medical examination, blood testing, TST, chest x-ray, and bacteriologic (smear sputum) examination methods. The private health sector examines and identifies suspected TB person as a TB patient. Their confirmed TB patients/cases are then referred to the public health sector TB programs where the newly registered TB patient is provided Directly Observed Therapy (DOT) treatment until the TB treatment is completed and the patient's sputum test becomes negative for acid-fast bacilli (p. 2). Public-private mix collaborations between corporation nongovernmental organization and private practitioners in rural and urban sectors to control TB should be standardized practice as it has proven to increase case notification and improve prompt diagnoses of suspected TB

cases; to increase and maintain TB treatment outcome, and; to reduce and ultimately eliminate TB in the population (Biya et al., 2014; Dewan et al., 2006; Ford et al., 2009).

Challenges public health agencies encounter treating and preventing TB. Common challenges that public health agencies continue to face to effectively treat and prevent TB in their respective communities include: Health disparities, global and domestic migration, overcrowded occupational and living conditions, structural and internal barriers, cultural stigma, gender differences in health seeking behavior, and health agencies limited resources and capacity.

Health Disparities. Alami et al. (2014) argued that although TB cases in the U.S. is on the decline health disparities amongst the foreign-born, minorities, and vulnerable populations with increase active TB cases makes monitoring, controlling and eliminating TB across the U.S. difficult. Common determinant factors of TB test seeking and treatment delays includes a person's" socioeconomic demographics/economic status, poverty, country of origin, urban/rural residence, geographical barriers, education level, awareness (lack of) of tuberculosis, access to healthcare (no health insurance), delivery of quality care, and cost of treatment (Alami et al., 2014; Li et al., 2013).

Global and Domestic Migration. Sreeramareddy, Qin, Satyanarayana, Subbaraman and Pai (2014) systematic review of multiple literature studies indicated that at both the individual & health systems levels the rise in global migration of people (traveling for business or pleasure) from high-burden TB countries to middle to low burden countries makes it difficult for public health agencies TB surveillance programs to accurately monitor the epidemiology of TB within their communities.

Occupational and Living Conditions. Other factors that continue to create challenges to effectively and promptly diagnosis and treat TB are high-risk groups (US-born and foreign-born/newcomers) who are employed and/or live in overcrowded housing and working conditions and communities with poor ventilation such as, clinics, correctional facilities, factories, hospitals, homeless shelters, long-term facilities, low-income housing, medically underserved communities, nursing homes, schools, and other primary occupations in high risk settings (Sreeramareddy et al., 2014). Limited knowledge of TB and educational level of health care providers (private and public sector) and high-risk populations/communities make understanding the importance of recognizing the signs & symptoms of TB at early stages of the disease, the severity of TB disease and HIV/TB co-infections difficult. Thus increases poor health seeking behavior.

Structural and Internal Barriers. Navuluri et al. (2014) identified two major barriers that significantly impacted immigrants and refugees from gaining access to accessing healthcare: structural barriers (language, transportation and financing) and internal barriers (personal perceptions, beliefs, lack of trust or poor patient-provider relationships) (p. 5). Navuluri et al. (2014) determined that the public health sector must address structural and internal barriers to help improve refugee population access to healthcare services. Navuluri et al. (2014) indicate that TB programs directly observed therapy (DOT) strategies must establish accompanied programs that pair up public health nurses and other healthcare providers with the refugee population undergoing treatment in increase the effectiveness of the delivery of quality care to refugee families.

Cultural Stigma. In both U.S. born and foreign-born individuals the cultural stigma of TB is a critical factor that increases fear of isolation from family and friends.

The stigma of TB has resulted in people with suspected and confirmed TB to conceal signs and symptoms of TB, decreased seeking prompt care for TB and increase non-compliance with TB treatment regimens (p. 13).

Gender Difference in Health Seeking Behavior. Kaur et al. (2013), cross sectional study revealed that men were 87% more likely to delay seeking medical intervention for TB than women until their symptoms worsen. At onset of systems 40% of women reported to use home remedies or non-prescribed medication to treat illness then men. Common reasons for delayed diagnosis were reported by men and women were associated with: late referral by physician (more common in men); medical facility to far; self-medicating; financial constraints (more common in women); women missed more treatment prescribed dosage then men; and men sort retreatment then women (p. 220-221).

Poor Adherence to Drug Treatment. According to M'Imunya, Kredo, and Volmink (2012) review of studies indicated a majority of TB patients regardless of the treatment regimen prescribed reported it was challenging to complete their prescribed drug treatment course. The majority of the patients reviewed indicated that after the first few months of treatment they felt fine and felt they could stop taking the prescribed TB medications. Other reasons patient gave for non-adherence with drug treatment included: drug side effects, drug resistance causes long absence without TB treat, inconvenient treatment arrangement, lack of support from family or close friends, lack of understand of TB disease or treatment requirements, non-availability of drug, poverty, poor patient-health provider relationship, and stigma (p. 5). Women were most likely to show poor adherence to TB drug treatment due to family obligations and financial reasons (p. 221).

Health Agency Resources and Capacity. At the health systems level public and private health agencies' limited financing and resources, limited health services delivery capacity and support systems, limited governance community inputs and human resources to maintain its clinics in some cases have contributed to delays in TB patients' diagnosis and treatment, increase in MDR-TB and in the rate of TB transmission to others (Li et al., 2013, p. 5). Even when a public or private sector health facility has full resources and capacity, poor diagnosis and poor TB case management by health care workers leads to TB patient being provided with inappropriate TB and HIV/TB co-infections treatment.

TB educational awareness There is increase need for TB health educational awareness campaigns, intervention, and diagnosis and treatment programs in the local communities to improve the delay in TB test-seeking behavior amongst the high-risk communities (Ford et al., 2009). Early detection and treatment of TB is vital to controlling the morbidity, mortality and transmission of TB disease high-risk populations. Promoting the fact that TB is a curable disease can increase people's participation in TB control strategies. In the U.S. it is critical that state and local public and private health sectors develop creative outreach strategies to reach and provide targeted educational and counseling programs to health care providers and high-risk populations that will improve awareness, knowledge and attitudes towards TB, promote benefits of health seeking behavior, early screening and diagnosis, prevention, and encourage adherence to treatment. These efforts will help to continue to maintain and increase the gains made at the local, state and national levels in the U.S. to control and prevent the spread of TB (Biya et al., 2014; Stout, 2013).

Targeted TB population based interventions are critical to reduce cultural and socioeconomic stigmas associated with an individual having TB, have helped strengthen public-private sector partnerships, engage high risk communities, and make the public aware of government sanctioned public TB clinics located in the community (Li et al., 2013; Ukwaja et al., 2013). The implementation of TB patient education modules (written, audiovisual and computer-based education materials) to deliver patient education, individualized counseling and raise awareness about tuberculosis have proven to increase patient's knowledge and understanding of TB and the benefits of early screening and diagnosis, prevention, and the importance of adherence to treatment protocols and guidelines. Tuberculosis patient education modules has had a positive influence on patient's behavior and attitudes toward TB (Balogun et al., 2015). With the information provided by the TB educational modules, the patient will have had sufficient knowledge and understanding of TB to "make informed decisions and feel empowered to actively participate in their own health care" (M'Imunya, Kredo, & Volmink, 2012, p. 6).

As many foreign-born individuals from high risk groups are often reluctant to seek diagnosis and or treatment for TB for various common determinants previously mentioned. Wieland et al. (2013) pointed out that academic institutions like primary and secondary schools, and adult education centers that service large immigrant and refugee populations are ideal venues for TB education. The use of TB education videos as a tool is an effective method for population health education. Wieland et al. (2013) determined that the Community-Based Participatory Research approach is an extremely effective to provide health education materials to targeted population to increase acceptability,

knowledge and self-efficacy. These efforts will ensure that patients and the community feel empowered in the promotion of TB prevention and care.

Significance and Justification

Findings from the literature review revealed the lack of knowledge and understanding of TB that exists in the general population, nursing and patient care practice regarding local availability and accessibility of resources of TB educational awareness campaigns, screenings and diagnosis, intervention and treatment programs to high-risk group populations within our local communities. TB disease is a highly infectious communicable disease and deadly if the disease is not treated promptly. The rate of TB cases in the U.S. has declined significantly for past 20 years due to ongoing public and private health agencies efforts to monitor, control, and prevent TB from spreading (Alami et al., 2014). However, global migration, cultural-socioeconomic barriers, and increased multi-drug drug resistance continue to affect the epidemiology of TB in the United States and other developed countries globally, as the immigrant population from high-burden TB countries continue to travel and live in low-burden countries and geographical areas.

Foreign-born individuals (immigrants, refugees, asylees) and high-risk populations are at great risk for TB. Tuberculosis affects people from all races, color, gender and age. For both U.S.-born and foreign-born population the age groups at the greatest risk for TB exposure and having latent TB infection developing into active TB disease are children, adolescents, young and middle aged adults. Of the age groups mentioned, young children have a higher rate of developing TB amongst this group. This means that children from high risk groups (exposed to TB cases/ or foreign-born) in pre-

school, elementary, middle and high school, faculty, administrators, staff, parents and close contact relatives are at the greatest risk of developing and spreading TB to others. Confirmed diagnosis of TB in young children suggests a recent exposure to TB infection opposed to the secondary reactivation of TB found in adults, thus should be considered as a high priority (Piccini, Chiappini, Tortoli, de Martino, & Galli., 2014). Piccini et al. (2014) stated that childhood TB is a public health problem, as it is a marker of current transmission in the community and requires that all close contact relatives should be screened, tested to find the TB case source and be treated promptly before TB transmission rate increase further.

Monitoring, controlling and preventing TB amongst these age groups first requires a targeted TB screening risk assessment based approach to test high-risk children, adolescents, young and middle aged adults, including administrators, faculty, staff, parents and close contact relatives in the school setting. A critical clinical history TB risk assessment questionnaire used to identify individuals who are at risk for TB exposure. Second, individuals identified to be at risk of TB exposure will have a complete mandatory medical and physical examination to test for latent TB infection or active TB disease. Third, confirmed or suspected cases of active TB disease or latent TB infection will be reported to the Department of Public Health for appropriate and timely treatment.

People in general must be empowered with proper knowledge and understandings in order help them make proper decisions and take proper actions concerning his or her and their family's health and well-being, based on current, valid, relevant and evidence based information. The TB educational module developed will be an educational resource

tool that all Urban Public School District students, faculty, administrators, staff and parents can use freely to help educate, promote awareness and understanding of active TB disease and latent TB infection, TB transmission, symptoms, diagnosis, treatment, HIV-TB co-infection, and multi-drug resistance. The education module will educate its users on the risk factors of TB disease and to bring awareness to benefits of early TB detection, prompt start of and completing TB treatment regimens. At-risk groups and communities will have access to available local community State public health department's TB prevention and control programs. And learn about the ongoing collaborative partnerships with private and public health providers, and communities at the global, federal, state and local levels efforts to eliminated TB.

Project Objectives

The objectives of this project were to:

1. conduct an extensive review of the literature exploring developing a TB screening risk assessment protocols for the UPSD using the following keywords both singularly and in multiple combinations: Tuberculosis, global TB, active TB, latent tuberculosis, LTBI, pulmonary TB, communicable diseases, Tuberculosis prevention, TB treatment, DOTS, noncompliance, patient delay in TB treatment, Tuberculosis symptoms, TB screening and testing, Immigrants, foreign-born, refugees, asylee, evaluation of immigrants, United States, global migration, school districts, health assessment, community-based participatory research, public-private collaboration, TB high burden countries, prevalence, incidence, adult education center, TB education and counseling, TB education video, developing countries, industrialized countries, barriers to health access, cultural stigma, high-risk population/groups, Center for Disease Control

and Prevention, TB knowledge and attitudes, care-seeking behavior. Databases searched, limited to the years 2006 to 2015, included AMED, Alt Health Watch, CINAHL Plus with Full Text and EBSCO Host;

2. develop a TB educational module for the Urban Public School District website to promote knowledge and understanding regarding availability and accessibility of resources of TB educational awareness campaigns, screenings, intervention, diagnosis and treatment programs to high-risk group populations within our local communities; and

3. have a panel of four content experts with extensive knowledge and expertise in infectious disease and communicable diseases, cultural competence, high-risk groups, vulnerable populations, immigrants and foreign-born, children and adults, nursing care, and education and counseling to evaluate and critique the project for clarity, readability, applicability, quality, organization, and evidence-based clinical relevance.

Definition of Terms

The following concepts are defined both theoretically and operationally for the purpose of this project:

Active Tuberculosis

Theoretical Definition: Active TB disease is a serious communicable infectious disease that can spread to other people and harm human beings, families, clans and collective groups. Operational Definition: In active TB disease the bacteriologic examination shows that AFB culture and smear of sputum are positive for mycobacteria specie, bacilli visible (+2 to +4), nucleic acid amplification (NAA) tests of the sputum is positive for *M. tuberculosis* (Dewan, et al., 2006, p.2).

Culture Care

Theoretical Definition: A subjective and objective way of learning and transmitting "values, beliefs, and patterned life ways that assist, support, or enables another individual or group to maintain their well-being, health, improve their human condition or life ways, or deal with illness, disabilities or death in primary care decisions an actions" (McFarland & Wehbe-Alamah, 2015, p. 322). Operational Definition: More than half of all TB cases in the U.S. were among foreign-born individuals. The advance nurse practice nurse practicing transcultural nursing must have the capability of creating a health care plan and continue to provide quality care, for human beings, families, clans and or a collective group that can be customized and adjusted as to not offend or dishonor the human being beliefs, customs and personal practices.

Cultural Competence

Theoretical Definition: "the ability of advance practice nurses in a primary care setting to provided culturally congruent, safe and beneficial care through the use of the culture care theory and application of the three culture care modes of decision and action" (McFarland & Wehbe-Alamah, 2015, p. 323). Operational Definition: A well develop social and cultural awareness and sensitivity competencies, with the capability to be adaptable to work in a variety of situations, varying personalities, with differing opinions, lifestyles, diverse socioeconomic and cultural backgrounds and provide superior quality of care. An attitude, knowledge, skill set necessary for TB prevention and control in the US-born and Foreign-born high-risk and at risk individuals, vulnerable populations and communities.

Education Module

Theoretical Definition: Educational components or materials used to increase staff and client competence, awareness of resources and performance by focusing on cultural competence self-awareness, the culture care theory and collaborative care, cultural assessments and practical application (p. 351). Operational Definition: An instructional unit used to bring awareness and deliver patient education on a particular issue (such as TB). In this project the information is disseminated via mass medias, audiovisual, and computer-based patient education materials by a public health nurse approaches…to ensure that people have sufficient knowledge and understanding to make informed choices and actively participate in their own health care (M'Imunya, Kredo, & Volmink, 2012, p. 5-6).

Foreign-Born/Immigrant/Refugees/Asylees

Theoretical Definition: Transculturally are known as human beings, families, clans and collective groups (McFarland & Wehbe-Alamah, 2015, p. 21). Operational Definition: a person is not considered native to the country they live in (The Free Dictionary, 2011).

High-Risk Groups/Population

Theoretical Definition: A collective group or human beings with diverse care needs experience care diversity. Operational Definition: A collective group of people within a community or population with a higher than expected risk for developing a specific disease (The Free Dictionary, 2011).

Latent Tuberculosis Infection

Theoretical Definition: The *M. tuberculosis* bacteria remain dormant (inactive) in the person's lungs. Person is asymptomatic, do not feel sick, are non-infectious and cannot spread the TB disease to other human beings, families, clans or collective group. Operational Definition: A tuberculin skin test (PPD) in a person with LTBI will show positive reaction for TB infection. The acid-fast bacteria (AFB) smear sputum for LTBIs is negative (Dewan et al., 2006, p. 2).

Screening Risk Assessment Protocol

Theoretical Definitions: To detect those individuals suspected or at risk for certain deviations, who may require further testing at the earliest stage possible in order to refer the individual for diagnosis and treatment. Operational Definition: Protocols used to identify minimum expectation of public health programs and services to prevent and reduce the spread of health diseases that could be harmful to the native population. TB pre-migration and post-migration screening risk assessment protocols are required of all U.S. bound foreign-born individuals as a requirement to determine U.S. entry eligibility, and for US-born high risk vulnerable populations, require for early diagnosis and treat of harmful communicable infectious diseases that can cause increased morbidity and mortality to the public at large that must be controlled, prevented and eliminated

Self-Care

Theoretical Definition: Human beings as people who can care for and manage themselves with purposeful action (Taylor & Renpenning, 2011). Operational Definition: A person who is able to follow health provider instructions and adhere to complete treatment regimen with needing a lot of help to do so.

Transcultural Nursing

Theoretical Definition: is defined as a discipline with a body of knowledge and practice to attain and maintain the goal of culturally congruent care for health and well-being" (p. 9). Operational Definition: The advanced practice nurse create an environment that promotes caring, respect of values, beliefs, customs, autonomy, integrity, effective and efficient communication and collaborative relationships between the client and their families, physicians and nurses to achieve set goals to obtain optimum health and promote well-being and increase health outcomes in preventing and controlling TB.

Tuberculosis (TB)

Theoretical Definition: a serious communicable infectious disease caused by a slow growing rod shaped aerobic bacterium *Mycobacterium tuberculosis* (Biya et al., 2014, p. 1). Operational Definition: Acid fast bacilli culture and smear of sputum are positive for mycobacteria specie, bacilli visible (+2 to +4), nucleic acid amplification (NAA) tests of the sputum is positive for *M. tuberculosis*.

Limitations

The Project Author recognizes the following project limitations:

1. The implementation of the educational module was not within the context of this project;
2. The educational module was limited to the following languages English, Arabic Creole Haitian, French, Japanese, Korean, Mandarin, and Spanish.
3. The educational module should have been written and made available in additional languages to reflect the culturally diverse population and other languages spoken in this school district;

4. The Project Author cannot assure that the project will be utilized in an actual clinical setting; and

5. With regard to the operational definition of terms, the Project Author understands that additional meanings/definitions may exist.

6. The educational module might be a financial burden to the school district: one, the LMS interface will require an additional server in order to be hosted; and two, the LMS server will require an administrator to run, update, and maintain the interface.

Project Development Plan

A detailed topical outline of the project content was created based on the extensive review of evidence-based literature and the theoretical framework used to support and guide the development of the develop of the TB screening risk assessment protocol and the creation of the TB educational module. After permission was granted from the D'Youville College Institutional Review Board (Appendix A), four professionals with knowledge and expertise with epidemiology, community health, vulnerable population, cultural competence, immigrant and foreign-born community, high-risk groups, education and counseling were asked if they would be interested in voluntarily participating as an expert content reviewer for the (project). The content expert panel consisted of one physician practicing in the infectious diseases field for 31 years, who also has been a doctoral prepared pharmacist for 32 years, a researcher, and a professor of medicine in the areas of microbiology, immunology, pharmacology, toxicology, gastrointestinal systems, host defense and global health with special focus on infectious diseases, and microbial pathogenesis; one registered nurse with a Master's in

public health, a Medical Care Administrator with more than 23 years of experience in healthcare with direct experience with vulnerable populations, high-risk groups and foreign-born health challenges, infectious disease, and health management education; one physician assistant with experience working with vulnerable population and infectious diseases in an urban setting for over 20 years; and one registered nurse, public health nurse with more than 20 years' experience in healthcare and works with vulnerable populations with infectious diseases. If interested, the Project Author mailed a packet containing a Letter of Intent (Appendix B), a copy of the Content Expert Project Evaluation Tool created by the Project Author specifically for the project (Appendix C), a copy of the (project) (Appendix D), and self-addressed stamped envelope. The Letter of Intent explained the project purpose and instructions for completing and returning the Content Expert Project Evaluation Tool to the Project Author. The Content Expert Project Evaluation Tool contained ten evaluative items with space for narrative comments and suggestions. Approximately 20 minutes were required to review the (product) and to complete the Content Expert Evaluation Tool. Content experts were provided a self-addressed envelope to return the Content Expert Project Evaluation Tool to the Project Author. Once all evaluation tools were returned to the Project Author, data were analyzed and reported narratively and in bar graph format. A summary of the evaluation results was provided to the content expert reviewers by postal mail.

Plan for the Protection of Human Rights

Following the approval from the D'Youville College Institutional Review Board (Appendix A), four professionals with knowledge and expertise and expertise in the area/ field of community health, high-risk groups, communicable diseases and patient

education were personally approached and asked to voluntarily participate as a content expert in the review and evaluation of the development of a TB screening risk assessment protocol and the creation of an educational module for the UPSD (Appendix D). Content experts were advised that participation or non-participation as an expert reviewer would have no effect on their employment status. The Project Author had a collegial, professional, and no-supervisory relationship with the content expert reviewers thereby protecting the participants from any risk of coercion. Content experts were guaranteed confidentiality because identifying characteristics would not be collected on the Content Expert Project Evaluation Tool and because their names would not be revealed anywhere in the project manuscript or in required project presentations, only the Project Author knew the names of the content expert reviewers. Return of the completed content to participate as a content expert Project Evaluation Tool (Appendix C) indicated implied voluntary consent to participate as a content reviewer. Content experts were advised that they would not be able to withdraw from project participation once the project evaluation tool was returned to the Project Author because the evaluation tool would be returned without identifying information. Returned Content Expert Project Evaluation Tools were stored according to D'Youville College IRB protocol in a locked drawer located in the Project Authors' home for a period of three years and then destroyed.

Plan for Project Evaluation

After obtaining Full Approval from the D'Youville College Institutional Review Board (Appendix A), the Project Author mailed a packet to each content expert reviewer containing one Letter of Intent (Appendix B), one copy of the Content Expert Project Evaluation Tool (Appendix C), one copy of the developed TB screening risk assessment

protocol and a copy of the material compiled to create the educational module for the UPSD website (Appendix D), and one self-addressed stamped envelope. The letter of Intent explained the project purpose and instructions for completing and returning the Content Expert Project Evaluation Tool to Project Author.

The Content Expert Project Evaluation Tool consisted of 10 evaluative items scored on a four point Likert Scale that ranged from (1) Strongly Disagree, (2) Disagree, (3) Agree, and (4) Strongly Agree. Space was provided for narrative comments, and suggestions following each evaluative item. Evaluative items asked reviewers to rate the TB screening risk assessment protocol and the TB educational module on clarity, readability, applicability, quality, organization, and evidence-based clinical relevance. Approximately 20 minutes were required to review the TB screening risk assessment protocol and the TB educational module and to complete the Content Expert Project Evaluation Tool. Content experts were given ten day to complete and return the Content Expert project Evaluation Tool to the Project Author via postal mail using the self-addressed stamped envelope included in the original packet. Likert scale responses were presented narratively and displayed in bar graph format. Content expert suggestions and comments were analyzed for common themes and presented narratively. A summary of results was provided to content expert reviewers by post mail.

Summary

Chapter I presented the project introduction, statement of purpose, an overview of the theoretical framework guiding project development, an initial review of the literature focusing on develop Tuberculosis screening risk assessment protocol for the Urban Public School District to identify, assess, test, monitor, control and prevent TB disease in

the community by screening high-risk populations for TB infection and sending newly infected TB cases for treatment. The other purpose of this project is also to create an educational module for the Urban Public School District's website to help educate, promote awareness and understanding of active TB disease and latent TB infection, TB transmission, symptoms, diagnosis, treatment, control and TB prevention programs to all students, faculty, administrators, staff and parents, the project significance and justification, project objectives, definition of terms, project limitations, the project development plan, the protection of human right subjects, the plan for project evaluation, and a chapter summary. Chapter II will provide an extensive review of the literature focusing on the development of the TB screening risk assessments protocols for the UPSD and the creation of the educational modules for the UPSD website and a chapter summary. Chapter III will discuss the intended project and population, the content expert participants, data collection methods, project tools, the protection of human rights, and a chapter summary. Chapter IV will discuss the evaluation of the project, implications for future advanced nursing practice, recommendations for future projects and research and a chapter summary.

Chapter II

Review of the Literature

A review of nursing and health related literature was conducted exploring TB screening risk assessment protocols for school districts and the development of TB educational modules for school districts using the following keywords both singularly and in multiple combinations: active TB, asylees, barriers to health access, care-seeking behavior, Center for Disease Control and Prevention, community-based participatory research, communicable diseases, direct observed therapy, developing countries, evaluation of immigrants, foreign-born, global migration, global TB, health assessment, immigrants, industrialized countries, high-risk population/groups, latent tuberculosis, LTBI, patient delay in TB treatment, pulmonary TB, refugees, TB awareness, TB stigma, TB education/counseling, TB education videos, TB high burden countries, TB incidence, TB knowledge and attitudes, TB noncompliance, TB prevalence, TB public-private collaboration, TB screening and testing, TB treatment, Tuberculosis, TB prevention, TB symptoms, United States, Urban school districts, and World Health Organization.

Databases searched, limited to the years 2006-2015, included CINAHL Plus with Full Text, Ovid, PubMed, ProQuest, ScienceDirect and EBSCO*host*. The search was limited to years 2006 through 2015 to ensure the current evidence-based literature was reviewed and summarized for the purpose of this project. A summary of the review of literature is presented.

An Overview of Tuberculosis

History of tuberculosis. Tuberculosis (TB) is an infectious disease that has plagued mankind throughout human history. Tuberculosis has touched every corner of the earth and has struck fear in hearts of all who hears its many names. Thomas H. Daniel's (2006) article *The History of Tuberculosis*, indicated that the classical Greeks called TB 'phthisis,' as it only infected person ages 8-35 during his time (p. 1863). TB was also known as the white plague and consumption, as the infected persons looked as if they were wasting away from within. Archeological evidence documented the tuberculi bacilli with its human hosts all throughout history. Strains of *Mycobacterium tuberculosis*, tuberculi bacilli found showed that the bacterium was present 20,000-15,000 years ago (p. 1863). Deformed skeletal remains of mummies, signified the characteristics of Tuberculosis Pott's deformities was discovered to have been present 5,000 years ago in Egypt, 3300 years ago in India, 2300 years ago in China, in South America's Andean Region and all across Europe (p. 1863).

Daniel (2006) pointed out that during the 19th century TB swept across Europe like an epidemic tsunami, with death tolls reaching over 100,000 per year across England, Sweden, Germany (p. 1864). As the prevalence of TB rose, the risk factors for the disease was discovered to be associated with poor sanitation practices, overcrowded living conditions with poor ventilation, and malnutrition. Daniel (2006) credits the decline of the TB due to the effective modern medical discoveries and accomplishments in diagnosis and treatment made by the pioneers of medicine reduce incidence rate of tuberculosis and societies acceptance of the use of best practices to manage tuberculosis.

During the 19th Dr. Rene T.H. Laennec, the inventor of the stethoscope, provided society with its first modern understanding of the pathogenesis of TB, explaining that TB existed either as a pulmonary or extra-pulmonary disease exhibiting different signs and symptoms depending on its location in the human body (p. 1864). Dr. Jean-Antoine Villemin demonstrated the mode of tuberculosis transmission, in 1865. Dr. Robert Koch provided TB's etiological agent of with the discovery of the aerobic rod shaped bacillus, and discovered that *M. tuberculosis,* an obligate pathogen can only live in human beings (p. 1865). Dr. Clemens Freiherr von Pirquet, a pediatrician, developed the tuberculin test in 1907. Dr. Pirquet also noted latent tuberculosis infection in children through the use of the tuberculin test (p.1865). Dr. Charles Mantoux, developed the tuberculin inject in 1908. Dr. Florence Seibert introduced the purified protein derivative (PPD) in the 1930s (p. 1985).

With the new discoveries in medicine and application of knowledge, understanding and self-care practices (herd immunity, improvements in social behaviors and living conditions, and intake of proper nutrition a significant decline in the rate of TB was noted across Europe and the United States, only to have incidence of TB rise again after World War I. By 1916-17 the BCG vaccination help reduce the incident rate of TB across Europe. While global regions like Sub-Sahara Africa, and Asia continue to see the incidence of TB rise. With proven TB screening, diagnostic and BCG treatment guidelines for TB in 1948 World Health Organization (WHO), created the first disease control program and began its nonstop crusade to prevent and reduce the rate of TB worldwide by identifying and treating both individuals with latent TB infection and TB disease (p. 1867).

What is tuberculosis? Tuberculosis is a serious communicable infectious disease caused by a slow growing rod shaped aerobic bacterium *Mycobacterium tuberculosis*. As an obligate pathogen, *M. tuberculosis* requires a human host for growth and reproduction. Then the bacterium causes disease in order to be transmitted to another human host to continue its transmission and progression cycle (Stout, 2013, p. 415). *Transmission.* Active TB disease is transmitted easily through air from person-to-person via infected lung air droplet nuclei inhaled through coughing, sneezing, laughing and singing (Li et al., 2013). Tuberculosis primarily affects an infected person's lungs (pulmonary TB), and other areas of the body like the brain, kidneys, spine and bones (extra-pulmonary TB) (Biya et al., 2014). Although a curable disease, delayed treatment of TB can lead to increased TB transmissions, morbidity and mortality. *Signs and Symptoms.* General signs and symptoms of pulmonary TB disease includes persistent coughing for three or more weeks, coughing up blood or sputum, chest pain, chills, difficulty breathing/shortness of breath, fatigue, fever, loss of appetite/ anorexia, night sweats, and unexplained weight loss (Ukwaja et al., 2013). Signs and symptoms of extra-pulmonary TB disease depend on the affected body part.

Difference between latent TB infection (LTBI) and active TB disease. Not every person who becomes infected with the TB bacteria becomes sick, therefore there are two TB-related conditions that exist: latent TB infection (LTBI) and active TB disease. *Latent TB Infection* - In LTBI the *M. tuberculosis* bacteria stays in the person's lungs and remains dormant (inactive) for a prolonged period of time. However, LTBI can eventually convert to active TB disease sometime during a person with LTBI lifetime. People with LTBI's are asymptomatic, do not feel sick, are non-infectious and cannot

spread the TB disease to other people. A tuberculin skin test in a person with LTBI will show positive reaction for TB infection. Treatment is given to people with LTBI to prevent developing TB disease in the future, especially for those in high susceptible risk groups. *Active TB Disease* - In active TB disease the *M. Tuberculosis* bacteria multiply and migrate from the lungs to other parts of the body and make the person sick. Active TB disease patients are symptomatic and are extremely infectious and can spread the TB disease to other people. Treatment therapy and isolation from others is required immediately. Left untreated, an individual with active TB disease can infect between 10 to 15 people a year (M'Imunya, Kredo, & Volmink, 2012, p. 5).

Prevalence and Incidence of Tuberculosis

Statistical Global Facts About Tuberculosis

Tuberculosis disease is one of the deadliest communicable diseases known to man, second to HIV/AIDS. TB continues to be a significant public health issue on a global scale for industrialized countries. With a global population estimated at 7 billion, a third of the world's population was reported to have contracted TB (Chuke et al., 2014). The global incidence rate of TB in 2013 increased drastically to an estimated 9 million from just 1.2 million in 1995 (p. 1). Of that, an estimated 1.1 million were HIV/TB co-infection cases. An estimated 1.5 million deaths were caused by TB disease (Oxlade et al., 2015, p. 2). Three hundred and sixty thousands of these were deaths were from HIV-TB cases in 2013 (p. 2). Nearly 95% of the total global TB cases occur in developing nations (Gebeyehu, Azage, & Abeje, 2014).

In 2013, the World Health Organization (WHO) reported that there were 22 TB–high burden countries (HBCs) located in the 6 major global geographical regions with the

highest prevalence of TB cases globally, were the countries has more than 100 new confirmed TB cases per 100,000 population. The 22 HBCs combined totaled 7.383,000 of new TB cases, an estimated 82% of the total global TB cases (World Health Organization, 2014). The 22-HBC geographical regions/ countries are the following (from highest to lowest %): *South-East Asia Region* (3,190,000 total new TB cases, 56%) – India (#1), Indonesia, Bangladesh, Myanmar, and Thailand; *African sub-Saharan Region* (1,951,000 total new TB cases, 25%) – Nigeria (#3), South Africa, Democratic Republic of Congo, Ethiopia, Mozambique, Kenya, UR Tanzania, Zimbabwe, and Uganda; *West Pacific Region* (1,461,000 total new TB cases) – China (#2), Philippines, Vietnam, and Cambodia; *Eastern Mediterranean Region* (558,000 total new TB cases) – Pakistan (#4) and Afghanistan; In the *European Region* – Russian Federation (#13), Russia had the highest prevalence for its region with 130,000 total new TB cases; *the Americas* – Brazil (#16) – (with 93000 total new TB cases, Brazil had the highest prevalence for its region) (The Henry Kaiser Foundation, 2014; World Health Organization, 2014).

In 2013 of the 22 TB HBCs, India ranked #1, having had the highest TB incidence and TB mortality rate in the world with 2.1 million new TB cases. Followed by China ranking #2 with 980,000 new TB cases and Nigeria ranking #3, with 590,000 new TB cases in 2013 (The Henry Kaiser Foundation, 2014).

In 1993, WHO declared TB a global emergency as the global incidence rate of TB was nearly as high as the global incidence rate for the HIV/AIDS epidemic (Oxlade et al., 2015). The rise in multi-drug resistance (MDR-TB) of TB combined with the rise in global migration made it difficult to promptly diagnose and treat individuals with TB (p.

1). In efforts to provide the National TB Programs (NTP) the necessary support to low and middle income countries with high TB burdens, the WHO created the Stop TB Partnership and the Global TB Drug Facility (GDF) (p. 1). Since the late 1990s the NTP has received funding support from the U.S. government (p. 1). In 2006 the WHO and the Stop TB Partnership implemented a new global objective called the Millennium Development Goal (MDG). The MDG main objective was to reduce the prevalence and mortality rate of TB by 50% (p. 1). These initiatives observed a noticeable decline in the global incidence and mortality rate of TB, an overall improvement in case detection and treatment outcomes of TB. Unfortunately, global migration continues to significantly affect the epidemiology of tuberculosis (TB) worldwide.

Statistical National Facts of TB in the United States

Alami et al. (2014) review of the United States TB Surveillance Data, Behavioral Risk Factor Surveillance System (BRFSS) showed that with a total population of 360 million, the number of new TB cases reported in the U.S.in 2013, at 9,588, were at a historic low with National TB incidence rate of 3.0-cases/ 100,000 populations (p. 229). Representing a consecutive 20-year decline, a 4.2% reduction from 2012 (at 3.6%) (p. 229). Eighty-eight percent of the 9,583 total TB cases were reported to be HIV/TB cases (p. 230). California, Texas, New York & Florida combined were 4 of the 50 U.S. states with the highest (51%) total TB cases (4917) in the US in 2013, with more than 500 cases per state (p. 229).

In 2013, a record of 64.6% of all reported TB cases in the U.S. were among foreign-born individuals (a 13x greater TB incidence rate) than US-born individuals (p. 229). In 2013, at 32% Asians (non-Hispanics) represented the largest racial/ethnicity total

TB cases in the US (46% foreign-born) (p. 229). Hispanics at 29% represented the 2nd largest total TB cases U.S. (33% foreign-born) (p. 229). Blacks/African Americans at 22% represent the 3rd largest total U.S. TB cases (13% foreign-born) (p. 229). Whites at 15% represented the 4th total U.S. TB cases by race/ethnicity and Native Hawaiians or other Pacific Islanders and the American Indian or Alaska Natives were tied at 1% of total TB cases in U.S. Less than 50% of total TB cases in 34 US states were from foreign-born persons (p. 229). In 2013, the top 5 countries of foreign–born persons in US with the highest rate of active TB cases were from Mexico (20%), the Philippines (12.6%), India (8%), Vietnam (7.4%) and China (6.1%) are (p. 229).

Increase in foreign-born individuals (immigrants, asylees and refugees) resettling in the U.S. from HBCs, who are common high-risk groups and can cause significant public health implications and significantly changes the epidemiology of the TB disease within that U.S. state (Varkey, Jerath, Bagniewski, & Lesnick, 2007). Varkey et al. (2007) retrospective study pointed out that screening and treatment for latent and active TB is critical to actively and effectively manage the disease among foreign-born populations resettling in the United States. The Center for Disease Control and Prevention's (CDC) main objective in the U.S. is to have its TB control strategies and programs at the local, state, and national level focus on preventing, reducing and eradicating TB disease morbidity and mortality rates through early detection of TB cases and DOT treatment protocols and guidelines among both the foreign-born and US born high-risk groups.

High-Risk Groups and Risk Factors for Acquiring Tuberculosis

Whether it be on a global, national, state or local level the risk factor for high-risk groups acquiring TB is dependent on the density and duration of TB exposure by an individual, if he or she develops TB infection or TB disease. High-risk groups whether US-born or foreign-born/newcomers were individuals who were immunosuppressed due to medical illness or condition, recent arrivals traveling from high burden areas, illicit drug users, individuals from specific socioeconomic status, living conditions (overcrowding) and occupation (high-risk group, high-risk settings).

Immunosuppressed Individuals - Li et al. (2013) indicated that people who are immunosuppressed due to certain medical conditions were at high risk to acquire TB infection and TB disease: HIV or AIDS, HIV-TB co-infection, past treatment for TB, Lung disease, silicosis, cancer (brain, lung, neck, leukemia, lymphomas), diabetes mellitus, chronic renal failure, people with organ transplants, gastrectomy or jejunoilial bypass, alcoholics, smokers, malnutrition and children <4 yrs., children, adolescents (exposed to adults in high risk groups). Young children have a great chance of developing TB than adults. Piccini et al. (2014) reported that confirmed diagnosis of TB young children is a public health problem, as it is a marker of current TB transmission in the community. All close contact relatives of that child must be screened, tested to find the TB case source and promptly treated in efforts to reduce and control the rate of TB transmission to others. The WHO (2014) reported that the high prevalence of HIV-TB co-infection among young adults, increase transmission and morbidity and mortality rate of HIV-TB make access to anti-TB treatment programs for TB patient within communities at large extremely important.

Recent Arrivals/Traveling from High Burden Areas. According to Pareek et al. (2011) foreign-born people or new entrants who have recently traveled or resided in high burden areas for more than 5 consecutive years are at high risk for acquiring TB infection, the first 5 years after arrival. Twenty-two TB high burdens areas in South-East Asia Region (India, Indonesia, Bangladesh, Myanmar, and Thailand), Africa (sub-Saharan Region - Nigeria, South Africa, Democratic Republic of Congo, Ethiopia, Mozambique, Kenya, UR Tanzania, Zimbabwe, and Uganda), West Pacific Region (China, Philippines, Vietnam, and Cambodia), Eastern Mediterranean Region (Pakistan and Afghanistan); the European Region (Russian Federation) and in the Americas – Brazil. The constant migration of foreign-born person or repatriating persons to and from high burden region where TB is most common have increased the epidemiology of TB in low-burden and high incomes countries like the U.S., Canada, and United Kingdom.

Socioeconomic Status. Jit et al. (2011) reported that higher risk for TB is noted in high-risk racial/ethnic minority populations often located in low-income and medically underserved communities. IV drug users – homeless problematic drug users have also been associated with contracting TB (p. 2).

Occupation and Living Conditions. The type of occupation and living conditions that increase risk to acquiring TB infection or disease includes working with or residing in high-risk groups and in high risk settings for more than 2 years can exposed a person to contracting TB from TB infected person. Examples of at- risk groups by occupation or living condition includes healthcare workers, migrant workers, county personnel, care takers, teachers, volunteers who live and work in close quarters in overcrowded housing conditions, low-income communities housing, correctional facilities, long-term care

residents, schools, hospitals, clinics, workers in day-care centers, factories, homeless shelters and soup kitchens among others (p.2).

Biya et al. (2014) noted that delays in prompt TB diagnosis and appropriate TB treatment during its early stages increases the risk of TB multi-drug resistance, decreases the efficacy of drug treatments given to TB disease patient, increases patients chance of a resurgence of TB disease, increases rate of TB transmission to other and increases risk of patient deaths.

Screening and Diagnosis for TB

Medical and Physical Examination. According to Pareek et al. (2011) a screening risk assessment based approach is critical to identifying which individuals require testing for Tuberculosis. Worldwide effective TB screenings have been instrumental in reducing the risk of TB transmission, increasing TB diagnosis and improving TB treatment outcomes. The WHO recommends the initial TB screening period of 21 days after 1st onset of TB signs and symptoms in order to increase the efficacy of TB treatment and decrease multiple drug resistance TB and TB transmission rate to others (Kaur et al., 2013, p. 219). TB screenings should be performed by a certified and licensed heath care professional trained in TB (at the local department of health or at a private clinic). TB screenings consists of having a complete medical history and physical examination of an individual suspected of being exposed to or having active TB disease or LTBI. The complete TB medical examination includes obtaining an individual's medical history, country of origin, date of arrival to the U.S., gender, age, foreign and domestic travel history, previous and current medical conditions/illnesses and treatments, socio-demographic data, TB exposure risk, TB symptoms, BCG vaccination status, HIV status,

living conditions, occupation, alcohol intake history and recreational drug usage. A complete TB physical examination consists of using the Mantoux tuberculin skin test (TST), the interferon gamma release assay (IGRA) (blood tests), chest x-ray (imaging tests), and bacteriologic examination (sputum test) to screen for LTBI and active TB and tests to the determination of HIV status.

Tuberculosis screening tests are used to screen all people who are at high-risk for TB exposure. This includes both US-born and foreign-born/newcomers people who are: immunosuppressed due to medical illness or condition; people who are recent arrivals or who have recently traveled or resided in high burden TB areas for more than 5 consecutive years; individuals from specific socioeconomic status (i.e. the homeless, those residing in low-income and medically underserved communities); illicit drug users, and; individual who live and or work in overcrowded conditions, high-risk group, and high-risk settings (i.e. healthcare workers, migrant workers, county personnel, caretakers, teachers, volunteers, overcrowded housing conditions - correctional facilities, low-income communities housing, long-term care residents, schools, hospitals, clinics, workers in day-care centers, factories, homeless shelters, and soup kitchens among others (Jit et al., 2011, p. 2).

TB Skin Test. The Mantoux Tuberculin Skin Test (TST) is the preferred TB skin test to be used in people suspected of having LTBI and active TB. The TST will indicate if a person was previously exposed to TB infection (Chuke et al., 2014). During TB screenings individuals are administered a subdermal injection of 0.1ml (5TU) of tuberculin purified protein derivative – PPD, preferably in the forearm. After 72 hours a trained health care personnel will examine and measure the TST induration at the site of

the injection. An induration >/- 10mm is interpreted as positive (Chuke et al., 2014). It should be noted that individuals with BCG vaccines might show a false positive TST results as the antigens generated by the MTB can be found the tuberculin PPD.

Blood Tests. The Interferon-gamma release assays (IGRAs) blood tests such as QuantiFERON – TB Gold Test (QFT-G) and QuantiFERON – TB Gold – In Tube (QFT-GIT), are used to diagnose the mycobacteria specie in LBTIs and active TB disease (Chuke et al., 2014). Therefore, the TB blood tests for people with LTBI or active TB disease will be positive for the TB infection. Both IGRAs (QFT-G and the QFT-GIT) utilizes the TB antigens (tuberculin purified protein derivative - PPD) and control reagents (early secretory antigenic target 6 (ESAT-6) and culture filtrate protein 10 (CFP-10) to identify the *M. tuberculosis*. The results from both the IGRAs are available within 24 hours and are more specific and faster than the TST results. The QFT-G test produces less false positives, unlike the TST; the antigens in the QFT-G (ESAT-6 and CFP-10) are not reproduce cross-reactivity with the *M. avium* (p. 6).

Chest X-rays. A chest x-ray cannot confirm TB disease however if either the TST or the IGRA test is positive a chest x-ray is required to rules out pulmonary TB (Ukwaja et al., 2013). Chest x-rays in people with active TB with pulmonary TB disease is considered abnormal (positive) with the presence of infiltrates (fluid filled lung tissue) and cavities (hollow spaces within lung) (p. 5). Chest x-rays in people with LTBI are normal (negative) as the lungs are absent of cavities and infiltrates (p. 5).

Analysis of Sputum tests (Bacteriologic Examination). Only bacteriologic cultures can confirm *M. tuberculosis* for TB disease, as the bacteriologic cultures assess a patient's infectiousness and patient's response to treatment (Dewan et al., 2006, p. 2). In

active TB disease the bacteriologic examination shows that AFB culture and smear of sputum are positive for mycobacteria specie, bacilli visible (+2 to +4), nucleic acid amplification (NAA) tests of the sputum is positive for *M. tuberculosis*. The acid-fast bacteria (AFB) smear sputum for LTBIs is negative (p. 2).

Initial Pre-migration overseas medical examination. Prior to being granted permission to enter the U.S. all immigrants, refugees and asylees are required to pass overseas pre-migration medical screening and physical examination by a qualified panel physician in accordance with the Centers for Disease Control and Prevention (CDC) infectious disease guidelines to ensure that the rate of transmission of infectious communicable diseases and other medical conditions by foreign-born individuals in the U.S. are reduced (Eckstein, 2011, p. 430). The initial overseas pre-migration screening medical examination consists of a full medical history (consists of current medical conditions, list of current medications, hospitalizations, socioeconomic history and complete review of systems); a complete physical examination (review of head, neck, thorax, abdominal, vertebrae, extremities, groin, lymph nodes and skin; mental status examination (assessment of intelligence, thought, cognition, judgment, affect and behavior)); Tuberculosis, HIV/AIDS, and laboratory syphilis and other sexually transmitted infection screening and appropriate immunizations (p. 431).

Based on the results of the initial overseas pre-migration screening tests, foreign-born individuals are classified as having either Class A conditions (ineligible) or Class B conditions (eligible) to be granted or denied entry into the U.S. Class A conditions: determines that an individual has a physical or mental disorder that poses a significant public health threat thus is ineligible for admission status to the U.S. Ineligible Class A

conditions include communicable diseases such as active or infectious tuberculosis, untreated sexually transmitted such as syphilis, chancroid, gonorrhea, granuloma inguinal, lymphogranuloma venereum or has proven history or currently addicted or abusing specific substances and likely to have such behaviors recur at a later date. Class B conditions: indicates that the individual has health problems that may affect his or her ability to care for self, attend school, work, and thus may need extensive treatment or require hospitalization. Class B conditioned individuals may be granted eligibility to enter into the U.S. on a cases by cases basis. Class B conditions include inactive or noninfectious tuberculosis, documented treated sexually transmitted infections (syphilis, gonorrhea, chancroid, and other STIs), pregnancy, treated tuberculoid, borderline, or paucibacillary Hansen disease, documented from qualified physician sustained full remission of abuse of specific substance, physical, or psychological disorder are determined unlikely to recur (p. 431). A prophylactic treatment is provided for individuals with latent TB infection until DOT therapy is completed.

Screening of Foreign-born Overseas. In 2007 the CDC mandated overseas TB screenings for all immigrants, asylees, and refugees bound for the US from HBCs the WHO determined TB incidence rates to be 20 TB cases per 100,000 people per year. In effort to prevent the importation of TB by migrating foreign-born people from into the US, changing the TB incidence rate. The CDC recommended implementing a culture-based screening algorithm that would screen and identify LTBI and a revision of the smear-based screening algorithm to include the *M. tuberculosis* culture, a drug susceptibility testing, and direct observed therapy for TB (Liu et al., 2015). This model effectively screened, diagnosed (smear-negative/culture positive TB) and treated a

substantial number of US bound foreign-born persons overseas with LTBI from HBCs, thus contributed to the decline of new TB cases incidences of newly migrated foreign-born people to the U.S. (p. 425). The high yielding success of the intervention of the culture-based overseas TB screening, prevented TB transmission by foreign-born refugees and immigrants in the US. As of October 2013 all countries worldwide have adopted culture-based overseas TB screening for all foreign-born people from HBCs planning to migrate to low burden countries.

Screening of Foreign-born Post Entry in the United States. Domestically every state in accordance with the CDC guidelines, implements its own post-migration screening of foreign-born individuals suspected of having a communicable infectious disease (Eckstein, 2011). The initial medical examination is required to be conducted in combination with the local department of health and a private physician (p. 430). As a public health control strategy for US infectious disease and prevention it is recommended that within 90 days of arrival to the United States all immigrants, asylees and refugees from HBCs must obtain a complete health reassessment (includes screenings for TB (CXR, if positive), hepatitis, intestinal parasites HIV/AIDS, update immunizations, etc.), at their local public health departments as this would be instrumental in helping to reduce the spread of communicable diseases and keep US communities they settle in at risk for transmitted infection low (Chai, Davies-Cole, & Cookson, 2013; Manangan et al., 2011;Varkey et al., 2007).

Wieland et al. (2011) community-based participatory research (CBPR) and focus group study determined that TB skin testing at adult education centers serving large foreign-born populations was effective. It has shown to increase the participatory process,

encourages the willingness of foreign-born individuals to participate in TB skin-testing efforts. Therefore, it can be concluded that school targeted testing of asymptomatic individuals is effective at identifying LTBI cases and cost-effective to treat. The CDC recommends Community-based participatory research (CBPR) approach where community members, academics and clinicians form collaborative partnerships to address health disparities in the community and cultural issue about health (p. 1265).

Treatment and Monitoring Measures for Latent TB Infection and TB Disease

Treatment. TB is a curable disease. The WHO (2014) has based the effectiveness of TB treatment and monitoring measures for latent TB infection and TB disease dependent on the treatment being taken as prescribed. The main goal of each treatment strategy is to prevent TB infection and TB disease by reducing TB transmission, morbidity and mortality rates in communities at-large. World Health Organization TB guidelines recommend that TB patients be expected to seek treatment within the recommended 21 days after onset of the disease (WHO, 2014). Generally, the duration of TB treatments regimens is for 6- 9-months. Prior to starting treatment for each TB disease case, a person's HIV status most be known, as the treatment regimen for a person with an HIV-TB co-infection differs from a person with only TB disease.

In all LTBI cases the recommended treatment regimen is 9 months with the drug Isoniazid (INH). In patients with active TB disease with or without HIV the recommended treatment is a 6-month regimen with the 1st line anti-TB drugs which forms the core of standard TB treatment regimens which consists of taking isoniazid (INH), rifampin (RIF), pyrazinamide (PZA), and ethambutol (EMB). The 6-months TB regimen is divided into two phases: the first 2 months (the initial phase) patients are

given isoniazid (INH) + rifampin (RIF) + pyrazinamide (PZA) + ethambutol (EMB). During the last 4 months (the continuation phase patients are given Isoniazid (INH) + rifampin (RIF).

Patient Monitoring Measures. TB patients under treatment therapy are monitored through required Directly Observed therapy (DOT) by TB trained public health nurse/case manager from the local department of health to ensure that each TB patient adheres to and completes their entire TB treatment regimen. After an active TB disease patient has been verified as being TB infectious, that person must be isolated from others until he or she is determined non-infectious after 40 observed DOT dosages and the TB patient's smear sputum is negative.

Bennett et al. (2014), reported that newly arrived foreign-born people, in particularly refugees with postsecondary education were more likely to seek LTBI treatment. Those with little to no education with LTBI required public health control strategies to increase treatment rates. According to Li et al. (2013), failure of foreign – born persons with LTBI and active TB cases from getting or completing the required TB treatment in a timely manner has led to an increase in the TB incidence rate (at 36.9%) in Multi-Drug Resistant TB to 1st-line drugs like isoniazid + rifampin have increased since 2010. As for TB vaccinations the Bacille-Calmette-Guerin (BCG) vaccine is typically used for TB disease outside the U.S.

Public and Private Health Sector's Role and Responsibilities to Monitor, Control and Prevent TB

Public Health Sector (Federal, State and Local Department of Health). The main objective of the public health sector (global, federal, state, local and tribal department of

health (DOH)) TB control programs is to continue ongoing TB surveillance in their communities to monitor, control, prevent, and eliminate the transmission of active TB cases/infection in communities across the U.S. through early TB detection/diagnosis, and prompt DOT treatment protocols (Alami et al., 2014; Gebeyehu, Azage, & Abeje, 2014).

Within the U.S. all federal, state, local and tribal public health agencies must adhere to the Center for Disease Control and Prevention's (CDC) TB strategies and the Council of State and Territorial Epidemiologist surveillance for TB cases in all 50 states including all 8 US territories and the District of Columbia. Public health agencies are required to electronically report all verified active TB cases to the CDC's Electronic Disease Notification database (EDN) to ensure accurate measure and monitor the prevalence, incidence, morbidity and mortality rates of TB in the U.S. (Alami et al., 2014). This electronic TB cases report to the CDC is to include the active TB cases: country of origin, race and ethnicity, TB risk factors, HIV status and drug-susceptibility test (p. 229).

In the U.S. by law TB screenings and testing is mandatory for all active TB cases and their contacts and must be reported to local areas department of health TB programs. This process allows the local DOH the ability to provide the appropriate medication and treatment to infected TB disease cases, their close contacts and to closely monitor and report all local, state and national active TB cases to the CDC, as required.

Pareek et al. (2011) reported that it is mandatory that all foreign-born individuals prior to entry into high-income countries like the U.S. all visa applicants >/- 15 years old living outside the U.S., and immigrants, asylees and refugees living within the US from high-TB burden regions/countries, and all individuals suspected with TB or who have

been exposed to active TB patients report to local departments of health to be screened and tested for for LTBI and active TB using Mantoux tuberculin skin test (TST), the interferon gamma release assay (IGRA) (blood tests), chest x-ray, and bacteriologic examination (sputum tests).

Employers and TB Screenings. Most employers where employees are working in close proximity of others require TB screenings to be taken prior to the first day of employment (Pareek et al., 2012). *Health Care Organizations*. Healthcare workers are required to be tested regularly for TB disease. Primarily with a baseline skin test performed prior to 1st day of employment, then annually at regular intervals. If patient is positive for *M. tuberculosis,* drug susceptibility testing should occur 3 months after initial treatment or if patient is not responding to treatment regimen. *Schools Systems.* Prior to school registration students in TB high–risk group, especially students who have resided in a foreign country for a consecutive period of 5 years are required to undergo a complete TB screening by a certified licensed physician or the local department of health and to provide their prospective school with documentation of a negative TB symptom screening and risk assessment (a negative tuberculin test (TST) or QuantiFERON TB Gold Blood test (QFT) or normal Chest x-ray).

Private Health Sector (i.e. private health care providers, hospitals, medical colleges, non-government organizations, private laboratories, etc.) Monitoring and controlling the spread of TB infection is difficult as the majority of patients with TB generally seek medical attention from a private health care provider before seeking help from a public healthcare provider (Dewan et al., 2006). Most private sector health care providers are not adequately trained to detect, treat, monitor, control or prevent TB

disease in accordance to the TB national and international standards (p. 1). This often contributes to be missed opportunities to provide patients with TB disease with appropriate access to care in a timely manner, thus leads to the unnecessary increases in TB infection rate, increase in drug resistance, inappropriate treatment and increase in TB disease relapse and other complications due to untreated TB (Gebeyehu, Azage, & Abeje, 2014).

Private health care providers refer their patients suspected of having TB to the local public health department for further TB screening and testing for confirmation of TB. When TB disease is detected in a person, the department of health searches for other individuals that might have been exposed to the infected TB person and exposed persons (family, friends, co-workers, etc.) are then tested for TB (TB skin & blood test). If the individual is positive for latent TB infection, the are treated for TB. If the individual has confirmed active TB, they are isolated and treated, until test confirm they are negative for active TB disease (p. 441).

Funding of TB Programs. Funding resources to help the fight to control TB infection is provided by the cooperative agreements State department of health (DOH), who assists in funding TB programs in all 50 states and eight US territories are funded directly by the CDC (Jit et al., 2011). Adequate funding by the CDC provides continued support for state run community TB programs and services which includes purchasing TB medication, screening for and locating active TB cases, contact investigations/TB surveillance, TB laboratory services, training and development of personnel, staff salaries and maintaining equipment, administration and community health clinics. Overall the funding of State's DOH TB programs continuously helps in the monitoring, controlling,

and prevention of TB disease in local communities in efforts to support the national and global initiatives to eliminate TB disease, as TB disease to highly contagious and the drug resistance of TB strains continues to rise.

Public-Private Mix Projects. Public-private mix projects are collaborations between the private and public health sectors to increase the quality of TB diagnosis, treatment and care in HBCs that have proven to be an extremely effective strategy (Dewan et al., 2006, p. 5). The public health sector TB programs provides the private health sector providers (private health care providers, hospitals, medical colleges, non-government organizations, and private laboratories) with extensive training and supervision on TB identification, medical examination, blood testing, TST, chest x-ray, and bacteriologic (smear sputum) examination methods (p. 2). After implementation of a public-private mix project TB case notification rates were higher. Dewan et al. (2006), literature review found that of the projects involving private practitioners, 23% of the new patients (+) for acid-fast bacilli were attributed to private providers (p.2). Corporate based and non-governmental organizations were the main source for TB program services, detecting new patients (+) for acid-fast bacilli at a far greater rate. At a success rate of treatment at 85% private providers exceeded the TB programs target treatment rate for new patients (+) for acid-fast bacilli (p. 3).

The private health sector providers examine and identifies suspected TB person as a TB patient. Their confirmed TB patients/cases are then referred to the public heath sector TB programs where the newly registered TB patient is provided Directly Observed Therapy (DOT) treatment until the TB treatment is completed and the patient's sputum test becomes negative for acid-fast bacilli (p. 2). Public-private mix collaborations

between corporation nongovernmental organization and private practitioners in rural and urban sectors to control TB should be standardized practice as it has proven to increase case notification and improve prompt diagnoses of suspected TB cases; to increase and maintain TB treatment outcome, and; to reduce and ultimately eliminate TB in the population (Biya et al., 2014; Dewan et al., 2006; Ford et al., 2009).

Challenges Public Health Agencies Encounter Treating and Preventing TB

Common challenges that public health agencies continue to face to effectively treat and prevent TB in their respective communities include: Health disparities, global and domestic migration, overcrowded occupational and living conditions, structural and internal barriers, cultural stigma, gender differences in health seeking behavior, and health agencies limited resources and capacity.

Health Disparities. Alami et al. (2014) argued that although TB cases in the U.S. is on the decline health disparities amongst the foreign-born, minorities, and vulnerable populations with increase active TB cases makes monitoring, controlling and eliminating TB across the U.S. difficult. Common determinant factors of TB test seeking and treatment delays includes a person's" socioeconomic demographics/economic status, poverty, country of origin, urban/rural residence, geographical barriers, education level, awareness (lack of) of tuberculosis, access to healthcare (no health insurance), delivery of quality care, and cost of treatment (Alami et al., 2014; Li et al., 2013).

The lack of knowledge of TB risk factors, treatment options and seeking multiple options of 'home remedies" or non-prescription medicines for TB significantly contributes to patients from high-risk TB target populations delay seeking formal medical care from the private or public health sector and complying with DOTS guidelines (Biya

et al., 2014; Sreeramareddy et al., 2014). Tuberculosis patients often do not have access to local or state quality TB healthcare facilities and therefore are hard to reach because of poverty, being underinsured or have no insurance and reside in medically underserved communities (Li et al., 2013).

Therefore, continuous efforts must be made to improve high -risk population's access to care, awareness, testing and treatment of latent TB infection and TB disease among high-risk populations in the United States (Alami et al., 2014). Public health agencies must continue ongoing TB surveillance in their communities to control and eliminate active TB cases/infection in communities across the U.S. Early detection/ diagnosis and prompt treatment of TB is critical to effectively control TB disease.

Global and Domestic Migration. Sreeramareddy et al. (2014) systematic review of multiple literature studies indicated that at both the individual & health systems levels the rise in global migration of people (traveling for business or pleasure) from high-burden TB countries to middle to low burden countries makes it difficult for public health agencies TB surveillance programs to accurately monitor the epidemiology of TB within their communities.

Occupational and Living Conditions. Other factors that continue to create challenges to effectively and promptly diagnosis and treat TB are high-risk groups (US-born and foreign-born/newcomers) who are employed and/or live in overcrowded housing and working conditions and communities with poor ventilation such as, clinics, correctional facilities, factories, hospitals, homeless shelters, long-term facilities, low-income housing, medically underserved communities, nursing homes, schools, and other primary occupations in high risk settings (Sreeramareddy et al., 2014). Limited

knowledge of TB and educational level of health care providers (private and public sector) and high-risk populations/communities make understanding the importance of recognizing the signs & symptoms of TB at early stages of the disease, the severity of TB disease and HIV/TB co-infections difficult. Thus increases poor health seeking behavior.

Structural and Internal Barriers. Navuluri et al. (2014) identified two major barriers that significantly impacted immigrants and refugees from gaining access to accessing healthcare they need: structural barriers and internal barriers (language, transportation and financing) a (p. 5). Structural barriers such as language (inability to adequately communicate and English or inadequate interpretation services); transportation; and financing (includes shelter, food insecurities, affordability of care) were typically more systemic in nature and tend to require direct observed therapy (DOT) intervention and community health workers pair up with patients to seek ad adhere to treatment.

Internal barriers tend to help shape each individual's personal preferences and perspectives of self and others in society are more difficult to manage. These internal barriers include perceived discrimination, cultural differences inequity of care, healthcare workers lack culturally sensitive, inadequate community and social support and mental illness (p. 6). Of the two barriers the structural barriers will most likely be easier to address by community health worker to help increase the refugee population with TB health seeking behavior with time will help reduce the internal barrier through medical accompaniment. Navuluri et al. (2014) found that through a TB program like direct observed therapy (DOT), community health workers pair up with their patients and help

them to navigate more effectively through the health care system and work to reduce individual structural barriers (p. 8).

Ford et al. (2009) cross-sectional quantitative survey, indicated that despite the progress made in the reduction of TB in the U.S. there continues to be challenges that public health agencies face and must continue to improve to effectively treat and prevent TB. These challenges include such multiple psychosocial, cultural, language and economic barriers at the high-risk individual group level and the health systems level that has made it a challenge to effectively improve the rate of early detection, diagnosis, treatment, monitoring, and prevention of TB patients and their contacts. These challenging factors have resulted in prolonged delays in early detection, diagnosis, treatment, and monitoring of TB disease, which has led to increasing the rate of TB morbidity and mortality, MDR-TB and increase in TB transmission (relapse in TB and to contacts).

At the individual level - TB at-risk groups/individuals perceptions, beliefs, attitudes that TB is a common and curable disease, often choose to wait several months before seeking medical care, passing the WHOs "recommended period of 21 days" after 1st onset of TB signs and symptoms, impacts the efficacy of TB treatment and increase drug resistance and TB transmission rate to others (Kaur et al., 2013, p. 219).

Cultural Stigma. In both U.S. born and foreign-born individuals the cultural stigma of TB is a critical factor that increases fear of isolation from family and friends. The stigma of TB has resulted in people with suspected and confirmed TB to conceal signs and symptoms of TB, decreased seeking prompt care for TB and increase non-compliance with TB treatment regimens (p. 13).

Gender Difference in Health Seeking Behavior. Kaur et al. (2013), cross sectional study revealed that men were 87% more likely to delay seeking medical intervention for TB than women until their symptoms worsen. Men were reported more likely to consult with private practitioners than women. More men were reported mean delay in seeking diagnosis at 60 days than women at 33 days. At onset of systems 40% of women reported to use home remedies or non-prescribed medication to treat illness then men. Common reasons for delayed diagnosis were reported by men and women was associated with: late referral by doctor (men 37%: women 26%); medical facility to far (men 29%: women 28%); self-medicating (men 30%: women 26%); financial constraints (men 7%: women 17%); women (20.8%) missed more treatment prescribed dosage then men (11.1%) and men (10%) sort retreatment then women (0%). Reasons given for non-adherence to TB treatment regimen: for both men and women were associated with anticipation of length of treatment regimen and isolation from others for several months. Women were most likely to show poor adherence to TB drug treatment due to family obligations and financial reasons (p. 221). Kaur et al. (2013) suggested that TB programs developing strategies to improve delayed seeking diagnosis behavior and non-adherence to treatment, must take into account gender differences.

Poor Adherence to Drug Treatment. According to M'Imunya, Kredo and Volmink (2012) review of studies indicated a majority of TB patients regardless of the treatment regimen prescribed reported it most challenging to complete their prescribed drug treatment course. The majority of the patients reviewed indicated that after the first few months of treatment they felt fine and felt they could stop taking the prescribed TB medications. The other reasons for non-adherence with drug treatment were the

following: drug side effects, drug resistance cause long absence without TB treat, inconvenient treatment arrangement, lack of support from family or close friends, lack of understand of TB disease or treatment requirements, non-availability of drug, poverty, poor patient-health provider relationship, and stigma (p. 5).

M'Imunya, Kredo and Volmink (2012) stated that although after a few months of taking the TB treatment the majority of the tuberculi bacilli are killed, poor adherence to the complete prescribed duration of the drug treatment regimen is places the local and global community at serious risk, as poor adherence to drug treatment by individuals reduces the opportunity to globally eradicate TB. Individuals with TB poor adherence to drug treatment will lead to prolonged period of infectiousness, emergence of drug-resistant *M. tuberculosis* isolate, resurgence of the disease, and increase morbidity and mortality (p. 5). Some strategies to increase patient treatment adherence include, nursing provider to provide calling reminders, directly observed therapy, defaulter action, education and counseling, community or peer assistance, incentives and reimbursements (p. 5).

Health Agency Resources and Capacity. At the health systems level public and private health agencies' limited financing and resources, limited health services delivery capacity and support systems, limited governance community inputs and human resources to maintain its clinics in some cases have contributed to delays in TB patients' diagnosis and treatment, increase in MDR-TB and in the rate of TB transmission to others (Li et al., 2013, p. 5). Even when a public or private sector health facility has full resources and capacity, poor diagnosis and poor TB case management by health care workers leads to TB patient being provided with inappropriate TB and HIV/TB co-

infections treatment. Both Stout (2013) and Li et al. (2013) studies found a direct correlation between clinician's level of experience with TB disease and delayed diagnosis, due to failure to recognize sign and symptoms of the disease, having never encountered it before (p. 416). This often leads to prolonged TB diagnosis and treatment, increases MDR-TB and TB rate of transmissions.

Sreeramareddy et al. (2014) literature review of studies demonstrated both private and public sectors of health care system need to develop a more efficient and effective standardized method for local and state health care providers in to efficiently and effectively monitor, evaluate, and report collected data from affected TB patients and their contacts from initial contact, to diagnosis, treatment and DOT protocol guidelines, follow-up visits, and the costs incurred. TB programs must find better strategies to increase patients 1st contact with health care professional to reduce the delays in tuberculosis diagnosis and treatment.

TB Educational Awareness

With the constant migration of both foreign-born (immigrants, asylees, and refugees) and U.S.-born individuals annually back and forth from HBCs countries/regions where TB is most prevalent, tuberculosis most likely will never be eliminated in America (Stout, 2013). There is increase need for TB health educational awareness campaigns, intervention, and diagnosis and treatment programs in the local communities to improve the delay in TB test-seeking behavior amongst the high-risk communities (Ford et al., 2009). Early detection and treatment of TB is vital to controlling the morbidity, mortality and transmission of TB disease high-risk populations.

Promoting the fact that TB is a curable disease can increase people's participation in TB control strategies.

In the U.S. it is critical that state and local public and private health sectors develop creative outreach strategies to reach and provide targeted educational and counseling programs to health care providers and high-risk populations to increases knowledge and care-seeking behavior for patients diagnosed with TB should include: increasing programs that increase awareness and positive attitudes towards TB disease; promote early screening; diagnosis and prevention; encourage adherence to TB DOT treatment and guidelines; make the public aware of government sanction public TB clinics in the areas, and; to train and qualified TB healthcare providers to educate patients, their families and the community (Balogun et al., 2015; Biya et al., 2014; Stout, 2013). Increased collaboration between state and local public and private health sectors in the rural and urban sectors of communities to continue to achieve the gains made at the local, state and national levels in the U.S. to control the spread of TB.

The implementation of a targeted TB community-based intervention would improve patients, their families, the community and healthcare providers' knowledge and attitudes towards TB (Balogun et al., 2015). Public health sectors utilization of a trained and qualified public health nurse certified in TB will ensure that TB patient education and counseling information provided is current, best practices and evidence based practice information. TB Patient education can be provided face to face, through brochures or by using educational modules, in a language that best fits the patients needs via interpreters (Balogun et al., 2015; Butcher et al., 2013).

M'Imunya, Kredo and Volmink (2012) defines patient education as:

> The deliberate process of influencing patient behavior and producing the changes in knowledge, attitudes and practices necessary to maintain or improve health…. it empowers patients to participate in their own health (p. 6). Patient educational modules is defined as, techniques used in delivering patient education covering a wide spectrum of means, including dissemination of information via the mass medias, provision of written, audiovisual, and computer-based patient education materials by health care providers or institutions, and individualized counseling approaches…to ensure that people have sufficient knowledge and understanding to make informed choices and actively participate in their own health care (p. 5-6).

Targeted TB community-based interventions are critical to strengthen public-private sector partnerships, engage high risk communities, improve TB education, promote early screening and diagnosis, make the public aware of government sanctioned public TB clinics located in the community and most importantly helps to reduce cultural and socioeconomic stigmas associated with an individual having TB (Li et al., 2013; Ukwaja et al., 2013). Used effectively TB educational modules would effectively deliver patient education and raise TB awareness in local urban and rural communities (M'Imunya, Kredo, & Volmink, 2012).

As many foreign-born individuals from high risk groups are often reluctant to seek diagnosis and or treatment for TB for various common determinants previously mentioned. Wieland et al. (2013) pointed out that academic institutions like primary and secondary schools, and adult education centers that service large immigrant and refugee populations are ideal venues for TB education. The use of TB education videos as a tool

is an effective method for population health education. Wieland et al. (2013) determined that the Community-Based Participatory Research approach is an extremely effective to provide health education materials to targeted population to increase acceptability, knowledge and self-efficacy. These efforts will ensure that patients and the community feel empowered in the promotion of TB prevention and care.

Summary

Chapter II presented a review of nursing and health related literature exploring developing TB screening risk assessment protocols for school districts and creating TB educational modules for the school districts website. Chapter III will discuss the intended project setting and population, the content expert participants, data collection methods, project tools, the protection of human rights, and a chapter summary. Chapter IV will discuss the evaluation of the project, implications for future advanced nursing practice, recommendations for future projects and research, and a chapter summary.

Chapter III

Project Development Plan

Chapter III will present the intended project setting and population, a detailed description of the content expert participants, data collection methods, project tools, the protection of human rights, and a chapter summary.

Project Setting and Population

The intended project will be conducted in two parts: (1) to develop a Tuberculosis screening risk assessment protocol for the Urban Public School District and (2) to create an educational module for the Urban Public School District's website. The intended project setting includes all the elementary schools (also includes preschools, magnet schools, Montessori schools, bilingual centers), high schools, charter schools, and adult education (including the occupational training center) within the Urban Public School System. The intended project population includes all students, faculty, administrators, staff and parents attending or working within the Urban Public School District. This includes TB high-risk groups such as foreign –born individuals originating from high-burden regions or countries such as: South-East Asia Region (India, Indonesia, Bangladesh, Myanmar, and Thailand), Africa (sub-Saharan Region - Nigeria, South Africa, Democratic Republic of Congo, Ethiopia, Mozambique, Kenya, UR Tanzania, Zimbabwe, and Uganda), West Pacific Region (China, Philippines, Vietnam, and Cambodia), Eastern Mediterranean Region (Pakistan and Afghanistan); the European Region (Russian Federation) and in the Americas – Brazil. It should be noted that in the Americas, foreign-born individuals from all countries in South America, Latin America and the Caribbean Islands should also be considered high-risk groups for TB.

This also includes US-born or foreign-born individuals and close family contacts who has: traveled or lived in those countries and regions mentioned above for longer than 2 weeks; those who have had extensive close contact with someone with active TB, lived in a homeless shelter, jail or prison, uses illegal drugs or has HIV infection; any person who has experienced persistent coughing lasting more than 3 weeks, shortness of breath, unexplained fever, unexplained night sweats, unexplained fatigue, unexplained loss of appetite or unexplained weight loss.

Content Expert Participation

Following approval from D'Youville College's Institutional Review Board (IRB) (Appendix A), four content experts with knowledge and expertise in establishing a tuberculosis screening and educational protocol in the Urban Public School District were contacted by the project author and asked to voluntarily participate in the review of the project for clarity, readability, applicability, quality, organization, and evidence-based clinical relevance. The first content expert was a registered nurse with a Master's in public health, a Medical Care Administrator with more than 23 years of experience in healthcare with direct experience with vulnerable populations, high-risk groups and foreign-born health challenges, infectious disease, and health management education. The second content expert was a physician practicing in the infectious diseases field for 31 years, who is also a doctoral prepared pharmacist for 32 years, a researcher, and a professor of medicine in the areas of microbiology, immunology, pharmacology, toxicology, gastrointestinal systems, host defense and global health with special focus on infectious diseases, and microbial pathogenesis. The third content expert was a physician assistant with more than 10 years' experience working with vulnerable population and

infectious diseases in an urban setting. The fourth content expert was a registered nurse, public health nurse with more than 20 years' experience in healthcare and works with vulnerable populations with infectious diseases.

Data Collection Methods

First, the TB screening risk assessment protocol guidelines were developed using extensive literature review of TB evidence-based guidelines used by the California, Connecticut, New Jersey, and Massachusetts school districts, and on feedback from four experts with knowledge and expertise in screening vulnerable populations for TB.

Second, the creation of the educational module that the Urban Public School District can implement onto their webpage was developed based on an extensive review of the literature and on feedback from four experts with knowledge and expertise in educating vulnerable populations for TB. This Project Author is familiar with a similar open sources LMS known as Moodle. After further research on how to develop my own course on Moodle, I came across the following obstacle: 1) the inability to have access to the Urban Public Schools District website's main server. I would require access to servers to host the course in order to create and implement a course on Moodle. 2) Moodle has very perplexing script software language engineering that will make it harder for a user friendly environment. Therefore, to create a course I would have to learn how to code and use the parameter of Moodle in order to successfully navigate in and around Moodle. 3) This Project Author came to the realization that once launched the Urban Public School District will need a Moodle Administrator to monitor traffic in and out of the course. After further research I tried to find an LMS system parallel to Moodle that would not create all the obstacles stated above. Upon further research on Google I discovered

Eliademy, a free online learning platform (LMS) that allows educators and students to create, share, manage and teach online course content with students that is available anywhere and at any time.

Upon receipt of the Full Approval from D'Youville College's Institutional Review Board (IRB) (Appendix A), the four content experts were contacted by the project author and asked to voluntarily participate in the review and evaluation of the screening protocol and educational module. All four content experts agreed to participate. A manila envelope containing a recruitment Letter of Interest (Appendix B), one copy of the Tuberculosis Screening and Education in the Urban Public School District Protocol (Appendix C), one copy of the Content Expert Evaluation Tool (Appendix D), and a stamped self-addressed envelope with instruction on how and when to return the evaluation tool to the project Author was provided. Content experts were asked to review and evaluate the screening protocol and educational module for clarity, readability, applicability, quality, organization, and evidence-based clinical relevance. The content experts were instructed not to place any identifying marks on the evaluation tool. Return of the evaluation tool signified implied consent to participate as content experts. Content experts returned the evaluation tool to the Project Author using a self-addressed stamped envelope.

Project Tools

The purpose of this two-part project was 1) to develop a TB screening risk assessment protocol that must be completed and documented on school health forms by the school healthcare professional; 2) to develop a TB educational module for the Urban Public School District that would be incorporated into the UPSD webpage using the

learning management system (LMS) software application. The LMS will be easy to navigate using the Modular Object Oriented Dynamic Learning Environment (Moodle) and can be operated using Unix, Linux, Windows, Mac OS X and NetWare. The LMS was used for course content delivery online TB educational training seminar, student enrollment and administration, documentation, tracking, assessment, skill gap analysis, and reporting student and staff progress, curriculum and certification management. The purpose of the educational modules is to enhance the learners understanding of TB screening, risk factors, and treatment process. Upon successful completion of the online seminar each participant will receive a certificate of completion.

The TB Screening Risk Assessment Protocol form will consist of the following three core components: A qualified health care provider will have to help the individual to complete the TB screening form, completing general information of the person's full name, country of birth and year arrived to the U.S. *Section A* asks four questions concerning a person's history of TB: exposure or infected with TB, BCG vaccinations, and prior TB treatment. Section B, consists of seven yes or no questions asking TB symptoms, HIV status, medical history, lifestyle, traveling history, living conditions, occupation, etc., If the response to all the questions above is NO, no further testing is required. If the response to any of the questions above was YES, BPS requires a health care provider to complete Section C, a TB risk assessment prior to start of classes or employment. *Section C,* requires a licensed and qualified healthcare provider to provide BPS student's proof of PPD, a QuantiFERON-TB Gold or T-SPOT, a Chest x-ray required (if PPD positive). The month, date, year required for completed INH treatment course. The health care provider completing TB screening form is required to provide

complete contact information, date and signature. A complete list of countries worldwide reported by the World Health Organization to have high risk for TB will be found on the TB Screening Form.

The online TB educational modular LMS will consist of the following core components: acknowledgments; TB introduction & history, epidemiology, transmission and pathogenesis, diagnosis, treatment, TB screening questionnaire and possibly some interactive presentation via Prezi and quick synopsis overview link through YouTube video (Appendix D). The above will be available in multiple languages including Arabic Creole Haitian, French, Japanese, Korean, Mandarin, & Spanish. The development of TB screening risk assessment and testing protocols and development of an educational modular LMS that the Urban Public School District can implement to their health related services webpage was guided by Dorethea Orem's Self-Care Theory and Madeline Leininger's Culture Care: Diversity and Universality Theory. The screening protocol and educational module (Appendix D) that consisted of theoretical frameworks, TB risk assessment and testing tools, awareness of risk factors of TB infection among the high-risk groups and foreign-born individuals from TB high –burden countries were developed based on findings obtained from the review of current evidenced based literature.

A Content Expert Evaluation Tool (Appendix C) was developed by the Project Author specifically for the purpose of having three content experts with knowledge and expertise in tuberculosis screening and education for high –risk population and foreign-born individuals originating from TB high-burden countries evaluate the screening protocol and educational module on clarity, readability, applicability, quality, organization, evidence-based clinical relevance. The content experts were asked to rate

the six evaluative items using the following four point Likert Scale: Strongly Disagree (1), Disagree (2), Agree (3), and Strongly Agree (4). The content experts were instructed to circle one response for each item indicating their appraisal for that particular item. Space was made available immediately following each evaluative item to provide the content experts with opportunity to comment or make further suggestions if needed. Data from the Content Expert Evaluation Tool were collated, analyzed, and resented in narrative and tabular/bar graph format. Content expert written comments and suggestions were analyzed for common themes and presented in narrative format.

The Protection of Human Rights

Following approval from the D'Youville College IRB (Appendix A), four experts with knowledge and expertise in Tuberculosis screening and education were approached and personally asked to participate as a content expert reviewer for the screening protocol and educational module developed for the purpose of this project. The Project Author had a collegial, professional, and non-supervisory relationship with the content expert reviewers thereby protecting the participants from any risk of coercion. The content expert participants were advised that participation or non-participation as a content expert reviewer would have no effect on their employment or evaluate status. The participants were guaranteed confidentiality as identifying characteristics would not be displayed on the Content Expert Evaluation Tool (Appendix C) and all data would be reported in aggregate form. Return of the completed Content Expert Evaluation Tool would indicate implied consent to participate as a content expert. All four content experts were advised that their participation was completely voluntary and that they would not be able to withdraw from project participation once the completed Content Expert Evaluation Tool

was returned to the Project Author as there would be no way to identify them. Returned Content Expert Evaluation Forms will be kept in a locked file cabinet drawer located in the Project Author's home for a period of three years and then destroyed as per IRB protocol.

Summary

Chapter III discussed the intended project setting and population, a detailed description of the content expert participants, data collection methods, project tools, the protection of human rights, and a chapter summary. Chapter IV will discuss the evaluation of the project, implications for future practice, and recommendations for the future projects and research.

Chapter IV

Project Evaluation, Implications, and Future Recommendations

Chapter IV will discuss the evaluation of the project, implications for future practice, and recommendations for future projects and research.

Project Evaluation

After permission was obtained the D'Youville College's Institutional Review Board (IRB) (Appendix A), 4 content experts with knowledge and expertise in (project topic) were approached in person and asked to voluntarily review and evaluate the (project) using a Content Expert Evaluation Tool developed by the Project Author. The Content Expert Evaluation Tool included 10 items asking content experts to evaluate the (project) on clarity, readability, applicability, quality, organization, and evidence-based clinical relevance. The content experts were asked to rate the 10 evaluative items using the following four point Likert Scale: Strongly Disagree (1), Disagree (2), Agree (3), and Strongly Agree (4). Space was made available immediately following each item to provide the content experts with opportunity to comment or make further suggestions if needed. Following is a discussion of the results of the content expert evaluation.

The first question on the Content Expert Evaluation Tool asked the content experts if they felt the information content of the Screening Risk Assessment Protocol was clearly presented. Two out of four content expert (50%) strongly agreed that the information was clearly presented and two content experts (50%) agreed.

The second question on the Content Expert Evaluation Tool asked the content experts if the Educational Module content was presented in a logical sequence and easy to follow. Two out of the four content experts (50%) strongly agreed that the educational

module content was presented in a logical sequence and easy to follow and two content experts (50%) agreed.

The third question on the Content Expert Evaluation Tool asked the content experts if the content reading level was appropriate for the target audiences. Two out of four content experts (50%) strongly agreed that the content reading level was appropriate for the target audiences and one content expert (25%) agreed and one content expert (25%) disagreed.

The fourth question on the Content Expert Evaluation Tool asked the content experts if the visual aids were used whenever possible, to ensure presented content was easily understood. All four content experts (100%) strongly agreed that the visual aids were used whenever possible, to ensure presented content were easily understood.

The fifth question on the Content Expert Evaluation Tool asked the content experts if the content was relevant and clearly supported the purpose of the project. Two out of four content expert (50%) strongly agreed that the content was relevant and clearly supported the purpose of the project and two content experts (50%) agreed.

The sixth question on the Content Expert Evaluation Tool asked the content experts if the content of the Educational Module was relevant and realized the purpose of the project. All four content experts (100%) strongly agreed that the educational module content was relevant and realized the purpose of the project.

The seventh question on the Content Expert Evaluation Tool asked the content experts if the content well developed and professionally presented. Three out of four of the content experts (75%) strongly agreed that the content was well developed and professionally presented and one content expert (25%) agreed.

The eighth question on the Content Expert Evaluation Tool asked the content experts if the content was well organized. Three out of the four content experts (75%) strongly agreed that the content was well organized and one content expert (25%) agreed.

The ninth question on the Content Expert Evaluation Tool asked the content experts if the content of education module facilitates learning, encourages self-care, transcultural care practices to promote health and positive patient outcomes. All the content experts (100%) strongly agreed that the content of education module facilitates learning, encourages self-care, transcultural care practices to promote health and positive patient outcomes.

The tenth question on the Content Expert Evaluation Tool asked the content experts if the information content of the screening risk assessment protocol is relevant and applicable to issues faced in current patient-care and the nursing practice. Three out of the four content experts (75%) strongly agreed that the information content of the screening risk assessment protocol was relevant and applicable to issues faced in current patient-care and the nursing practice and one content expert (25%) agreed.

Written comments and suggestions given by the four content experts to strengthen the development of the Screening Risk Assessment Protocol and the educational module are summarized as follows with examples. Regarding the appropriateness of the content reading level for the target audiences, the first content expert stated that the material was, "appropriate for faculty, professionals, etc., maybe too complex for some parents and definitely for students." In reference to the ninth question pertaining to whether 'the content of the education module facilitated learning, encourages self-are, transcultural care practices to promote health and positive patient outcomes,' the second content expert

stated, “Yes, educators need to know this material.” Third content expert stated, “If intended for students to participate from the Urban Public Schools,” there is a large audience to choose from. Therefore, age/grade considerations should be reviewed for content to be comprehended.” Regarding the visual aids in the educational module content, the final and fourth content expert stated, “Add picture of sputum.”

Implications for Future Practice

This project highlighted the need for effective yet strategic public-private collaborative partnerships between local public health departments, private health care providers and local urban school districts to provide centralized surveillance within local communities to be able to reach targeted high-risk groups and utilize targeted community-based intervention programs to provide standardized TB screening risk assessment protocols and find ways to increase patient’s use of TB educational module to improve TB awareness. This strategy will be help the public-private collaborative partnership in its efforts to identify, assess, test, monitor, control and to prevent the spread of TB disease in the local community by screening high-risk populations for TB infection and send newly active TB cases and LTBI cases for treatment. It is imperative that only highly trained and qualified public health nurse certified in TB (with acquired cultural competence and emotional intelligence skills set) provide DOT TB treatments to confirmed active TB disease cases and LTBI cases. The nursing TB control interventions strategies included engaging and empower clients to be active participants in his or her care. Thus each plan of care must be tailored based on specific needs of each individual patient, their families and the communities being treated for TB. This will ensure that each patient comply with DOT treatment guidelines and improve TB outcomes.

Future Recommendations

The purpose and intention of this project was to address a current gap in nursing and health related knowledge, regarding the educational resource tools needs to bring TB awareness, promote the benefits of early screening and diagnosis, encourage prevention and adherence to DOT treatments and guidelines to foreign-born and US-born individuals from communities who are at high-risk for developing TB. Future projects and research should focus on exploring and examining from the perspective of students, faculties, administrators, staff and parents from an Urban Public School District with a large foreign-born community at high-risk for TB, how effective and influential are the targeted TB community-based intervention programs educational modules at changing their families and community belief system, attitudes and behaviors towards TB and increasing self-efficacy. Furthermore, future research and projects should focus on the feasibility of the public-private health sector's partnership with Urban School Districts to use TB screening protocols and TB health education modules to reach a large foreign-born (immigrants, asylees and refugees) and US-born high-risk populations to not only provide current, relevant and evidence-based practice TB information but to ensure that all individuals, families and the community with increase TB knowledge and understanding of TB feel empowered in promoting TB prevention and self-care. Finally, Dorothea Orem's Theory of Self-Care, Theory of Self-Care Deficit of Nursing and Madeline Leininger's Theory of Culture Care Diversity and Universality fit well as the two theoretical frameworks to support the development of this projects TB screening risk assessment protocol and the TB educational module, and should be considered as

theoretical frameworks to support future projects and research related to patient care practice in tis particular area of interest.

Summary

Chapter IV discussed the evaluation of the project, implications for future advanced nursing practice, and recommendations for the future projects and research.

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Appendix A

Institutional Review Board Full Approval Letter

D'Youville COLLEGE
320 Porter Avenue
Buffalo, New York 14201-1084

TO: **Nikolaos Moraros**

FROM: Dr. Roger Fiedler RCF/EB
Institutional Review Board

DATE: January 20, 2016

SUBJECT: **IRB FULL APPROVAL**

I am pleased to inform you that your application to the D'Youville College Institutional Review Board entitled: *"Tuberculosis Screening and Education in the Urban Public School District"* has been granted **FULL APPROVAL** with respect to the protection of human subjects. This means that you may now begin your research unless you must first apply to the IRB at the institution where you plan to conduct the research.

Please note that you are required to report back to this IRB for further review of your research should any of the following occur:

1. a major change in the method of data collection
2. unanticipated adverse effects on the human subjects
3. unanticipated difficulties in obtaining informed consent or maintaining confidentiality
4. the research has not been completed one year from the date of this letter

Congratulations and good luck on your research!

eb

cc: Director of Graduate Studies
Dr. Lisa Rafalson
file

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Appendix B

Content Expert Letter of Intent

Letter of Intent

Dear _____,

My name is Nikolaos S. Moraros. I am a graduate student at D'Youville College pursuing a dual Master's degree in Health Services Administration and in Community Health Nursing. For my Graduate Project I have developed a Tuberculosis (TB) screening risk assessment protocol for the Urban Public School District. This protocol will identify, assess, test, monitor, control and prevent TB disease, treat newly infected TB cases and screen high-risk populations for TB infection in the community. I also created a TB educational module for the Urban Public School District's website to help educate, promote awareness and understanding of TB transmission, symptoms, active TB disease and latent TB infection, diagnosis, treatment, control and TB prevention programs to all students, faculty, administrators, staff and parents.

I am writing to you to seek your assistance with this project based on your expertise in your field. Your participation will involve reviewing, evaluating and rating the enclosed TB screening risk assessment protocol and the TB educational module presentation based on clarity, readability, applicability, quality, organization, and evidence-based clinical relevance. Please provide your feedback on the enclosed Content Expert Evaluation Tool form. It should take approximately 20 minutes to review the TB screening risk assessment protocol and the TB educational module and to complete the Content Expert Project Evaluation Tool. Your responses will be confidential. There will be no identifying characteristics displayed on the evaluation form and all data will be reported in aggregate form. Return of the completed evaluation form indicates your implied informed consent to participate in reviewing the Content Expert Evaluation Tool. Your participation as a Content Expert is completely voluntary. Once the completed evaluation form has been returned to the Project Author, you as the content expert reviewer will not be able to withdraw from participating in the project. Enclosed you will find a copy of the TB screening risk assessment protocol, access to an open search engine to view the TB educational module content, a copy of the Content Expert Evaluation Tool form and a self-addressed stamped envelope.

If you have any questions concerning your participation as a content expert reviewer, please contact me by email at or you can also contact my Project Committee Chairperson Dr. Lisa Rafalson, Chair of the Graduate Department of Health Services Administration Program at D'Youville College, a . Please return the evaluation form to me via USPS postal mail in the stamped, self-addressed envelope provided, and please do so within 10 days of receiving this letter.

Thank you for your assistance and participation in this project.

Sincerely,

Nikolaos S. Moraros, R.N., B.S.N., P.H.N.

Appendix C

Content Expert Evaluation Tool

Content Expert Evaluation Tool

Instructions:

Please rate the following statements based on the Tuberculosis educational module as the product. Using a 4-point Likert Scale ranging from (1) Strongly Disagree, (2) Disagree, (3) Agree, (4) Strongly Agree, please circle the choice that best represents your response to each statement of the assessed content area. Please provide any comments or suggestions in the space provided. *Please do not leave any personally identifying marks on this evaluation form.*

Criteria: Clarity

Questions	Strongly Disagree	Disagree	Agree	Strongly Agree	Comments/Suggestions
Item 1: The information content was clearly presented	1	2	3	4	
Item 2: The educational module content was presented in logical sequence, easy to follow.	1	2	3	4	

Criteria: Readability

Questions	Strongly Disagree	Disagree	Agree	Strongly Agree	Comments/Suggestions
Item 3: The reading level for the target audiences was appropriate	1	2	3	4	
Item 4: Visual aids were used whenever possible, to ensure the presented content was easily understood.	1	2	3	4	

Criteria: Applicability

Questions	Strongly Disagree	Disagree	Agree	Strongly Agree	Comments/Suggestions
Item 5: The information content presented was relevant, clearly supported the purpose of the project	1	2	3	4	
Item 6: The content of educational module was relevant and realized the purpose of the project	1	2	3	4	

Criteria: Quality

Questions	Strongly Disagree	Disagree	Agree	Strongly Agree	Comments/Suggestions
Item 7: The information content was well-developed and professionally presented	1	2	3	4	

Criteria: Organization

Questions	Strongly Disagree	Disagree	Agree	Strongly Agree	Comments/Suggestions
Item 8: The content was well organized	1	2	3	4	

Criteria: Evidence-Based Clinical Relevance.

Questions	Strongly Disagree	Disagree	Agree	Strongly Agree	Comments/Suggestions
Item 9: The content of the education module facilitates learning, encourages self-care, transcultural care practices to promote health and positive patient outcomes	1	2	3	4	
Item 10: The information content of the screening risk assessment protocol is relevant and applicable to issues faced in current patient-care and the nursing practice	1	2	3	4	

The space below is provided for additional Comments / Suggestions

Thank you for your evaluation of this project.

Your participation is greatly appreciated.

Appendix D

Project

Tuberculosis Screening Risk Assessment Protocol
Urban Public School District
Tuberculosis Screening Form to be Completed by Health Care Provider

Full Name: _____ Birthdate: _____ Male/Female
(Print) Last First MI month/day/year

Country of Birth: _____ Date/Year Arrived in U.S.A.: _____

Section A. History of Tuberculosis (TB)? (*Please circle **yes** or **no** to the following questions)*

1. Have you ever been sick with Tuberculosis?	**YES**	**NO**
2. Have you ever had close contact with a person sick with infectious TB disease?	**YES**	**NO**
3. Have you ever had a positive TB skin test (PPD), TB QuantiFERON test, or T-SPOT?	**YES**	**NO**
4. Have you ever been vaccinated with BCG?	**YES**	**NO**

Section B. At Risk for Tuberculosis (TB)? (*Please answer all following questions)*

1. Were you born in any of the following regions: Africa, Asia, Central America, Eastern Europe or South America (see full list of TB high-risk countries below) and did you arrive in the U.S in the past 5 years? If so, which country?_____ What date or year you arrived in U.S.?_____	**YES**	**NO**
2. Have you lived, worked, gone to school or visited for more than 1-month in any of the following regions: Africa, Asia, Central America, Eastern Europe or South America (see full list of TB high-risk countries below) If so, which country/ies?_____	**YES**	**NO**
3. Have you ever traveled to or in one or more of the countries listed below? *(please check all the countries)*	**YES**	**NO**
4. Have you ever been diagnosed with AIDS, chronic immune disorders, diabetes, HIV, leukemia, lymphoma, silicosis, lung disease/cancer, intestinal surgery, alcoholism, and or use illicit drugs?	**YES**	**NO**
5. Have you ever experienced persistent coughing lasting more than 3 weeks, fever, night sweats, fatigue, and loss of appetite or weight loss?	**YES**	**NO**
6. Have you ever lived with or been in close contact with a person known or suspected of being sick with TB?	**YES**	**NO**
7. Have you ever lived, worked, or volunteered in any drug rehabilitation center, homeless shelter, hospital, nursing home, prison/jail, or residential healthcare facility?	**YES**	**NO**

Patient Signature:_____ Date:_____

If the response to any of the questions above was YES, BPS requires a health care provider to complete a TB risk assessment prior to start of classes or employment.

If the response to all the questions above is NO, no further testing is required.

Section C: Must be completed by Qualified Healthcare Provider

ATTENTION HEALTH CARE PROVIDER: *if patient answered YES to any of the above questions, proof of a PPD, QuantiFERON –TB Gold or T-SPOT is REQUIRED. If PPD results are 10mm or more, or QuantiFERON-TB Gold or T-SPOT are positive a chest x-ray is REQUIRED. Testing and/or chest x-ray must be done within one calendar year prior to admittance (unless history of positive PPD). If student has history of positive PPD, chest x-ray is required. History of BCG vaccination does not prevent testing of a member of a high-risk group.*

PPD: Date Placed_____ Date read_____ # Of mm induration _____

QuantiFERON-TB Gold or T-SPOT Result Date_____ Result (attach lab report)____

Date of Chest X-ray_____ Result_____

If negative CXR and positive PPD, did student complete a course of INH? YES NO

If yes, when _____ (months & year) & for how many months did patient take INH? _____
(# of months)

HEALTHCARE PROVIDER'S CONTACT INFORMATION REQUIRED

_____ _____ _____

Signature/Stamp of healthcare provider | Phone number of practice | Date

Source: Centers for Disease Control and Prevention

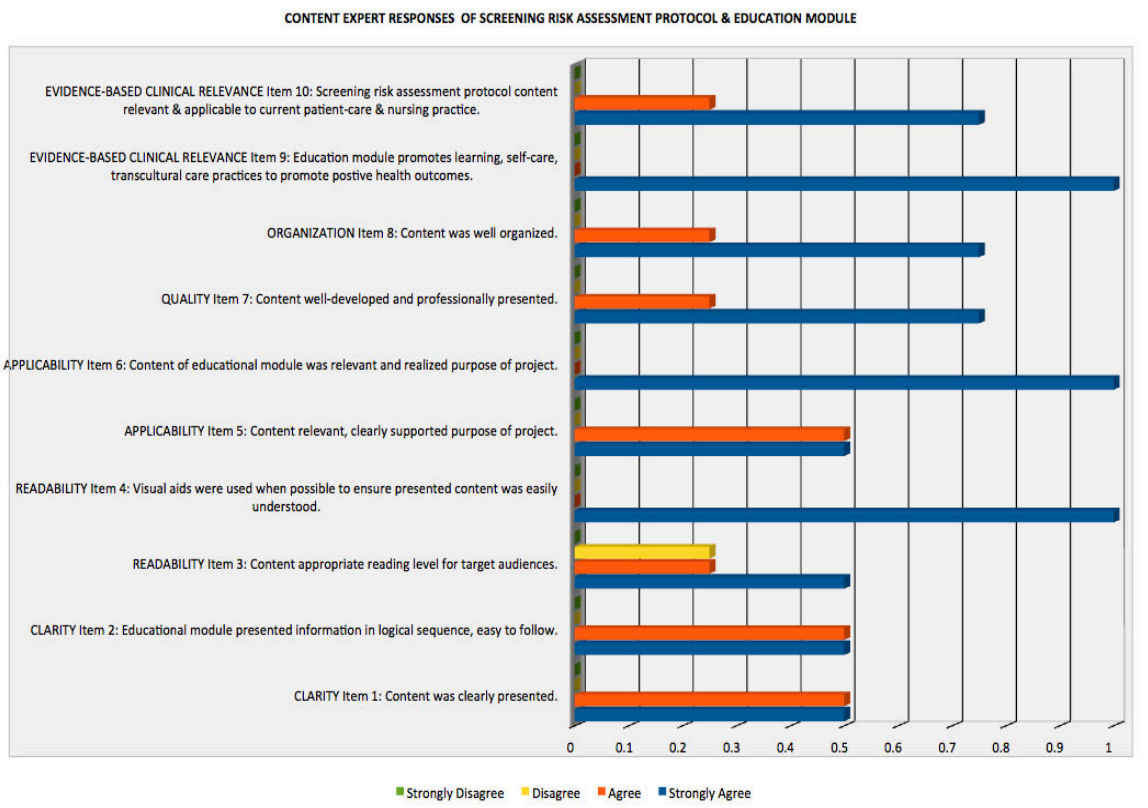
List of Countries High Risk for Tuberculosis			
Afghanistan*	Democratic Republic of the Congo	Madagascar	Saint Vincent and the Grenadines
Algeria	Djibouti	Malawi	Sao Tome and Principe
Angola	Dominican Republic	Malaysia	Senegal
Anguilla	Ecuador	Maldives	Serbia
Argentina	El Salvador	Mali	Seychelles
Armenia	Equatorial Guinea	Marshall Islands	Sierra Leone
Azerbaijan	Eritrea	Mauritania	Singapore
Bahrain	Estonia	Mauritius	Solomon Islands
Bangladesh*	**Ethiopia***	Micronesia (Federated Sate of	Somalia
Belarus	French Polynesia	Mongolia	**South Africa***

Belize	Gabon	Montenegro	Sri Lanka
Benin	Gambia	Morocco	Sudan
Bhutan	Georgia	**Mozambique***	Suriname
Bolivia	Ghana	**Myanmar***	Swaziland
Bosnia and Herzegovina	Guam	Namibia	Syrian Arab Republic
Botswana	Guatemala	Nepal	Tajikistan
Brazil*	Guinea	New Caledonia	**Thailand***
Brunei Darussalam	Guinea-Bissau	Nicaragua	The former Yugoslav Republic of Macedonia
Bulgaria	Guyana	Niger	Timor- Leste
Burkina Faso	Haiti	**Nigeria***	Togo
Burundi	Honduras	Northern Mariana Islands	Tonga
Cambodia*	**India***	**Pakistan***	Trinidad and Tobago
Cameroon	**Indonesia***	Palau	Tunisia
Cape Verde	Iraq	Panama	Turkey
Central African Republic	Japan	Papua New Guinea	Turkmenistan
Chad	Kazakhstan	Paraguay	Tuvalu
China*	**Kenya***	Peru	**Uganda***
China, Hong King Special Administrative Region	Kiribati	**Philippines***	Ukraine
China, Macao Special Administrative Region	Kuwait	Poland	**United Republic of Tanzania***
Colombia	Kyrgyzstan	Portugal	Uruguay
Comoros	Lao People's Democratic Republic	Qatar	Uzbekistan
Congo, Dem Republic of *	Latvia	Republic of Korea	Vanuatu
Cook Islands	Lesotho	Republic of Moldova	Venezuela
			Vietnam*
Côte d'Ivoire	Liberia	Romania	Yemen
Croatia	Libyan Arab Jamahiriya	**Russian Federation ***	Zambia
Democratic People's Republic of Korea	Lithuania	Rwanda	**Zimbabwe***

Bold Countries (*) are 22 countries with the Highest-Burden of TB new cases in 2013
Source: World Health Organization (WHO). Global tuberculosis reports 2014. Retrieved from http://apps.who.int/iris/bitstream/10665/137094/1/9789241564809_eng.pdf?ua=1

Appendix E

Results of Content Expert Evaluation Tool



Interpretation of the Results

Criteria Clarity

Item 1: Asked the content experts if the information content was clearly presented. Two out of four content expert (50%) Strongly agreed that the information was clearly presented, and 2 content experts (50%) agreed.

Item 2: Asked the content experts if the educational module content was presented in a logical sequence and easy to follow. Two out of four content expert (50%) Strongly agreed that the educational module content was presented in a logical sequence and easy to follow, and 2 content experts (50%) agreed.

Criteria Readability

Item 3: Asked the content experts if the content reading level was appropriate for the target audiences. Two out of four content expert (50%) Strongly agreed that the content reading level was appropriate for the target audiences, and 1content experts (25%) Agreed, and 1 content expert (25%) Disagreed

Item 4: Asked the content experts if the visual aids were used whenever possible, to ensure presented content was easily understood. All four content experts (100%) Strongly Agreed that the visual aids were used whenever possible, to ensure presented content were easily understood.

Criteria Applicability

Item 5: Asked the content experts if the content was relevant and clearly supported the purpose of the project. Two out of four content expert (50%) Strongly agreed that the content was relevant and clearly supported the purpose of the project, and 2 content experts (50%) agreed.

Item 6: Asked the content experts if the content of educational module was relevant and realized the purpose of the project. All four content experts (100%) Strongly Agreed that the educational module content was relevant and realized the purpose of the project.

Criteria Quality

Item 7: Asked the content experts if the content well-developed and professionally presented Three out of four of the content experts (75%) Strongly Agreed that the content was well-developed and professionally presented, one content expert (25%) Agreed.

Criteria Organization

Item 8: Asked the content experts if the content was well organized. Three out of the four content experts (75%) Strongly Agreed that the content was well-organized, one content expert (25%) Agreed.

Criteria Evidence-Based Clinical Relevance

Item 9: Asked the content experts if the content of education module facilitates learning, encourages self-care, transcultural care practices to promote health and positive patient outcomes. All the content experts (100%) Strongly Agreed that the content of education module facilitates learning, encourages self-care, transcultural care practices to promote health and positive patient outcomes.

Item 10: Asked the content experts if the information content of the screening risk assessment protocol is relevant and applicable to issues faced in current patient-care and the nursing practice. Three out of the four content experts (75%) Strongly Agreed that the information content of the screening risk assessment protocol was relevant and applicable to issues faced in current patient-care and the nursing practice, one content expert (25%) Agreed.