Community-Based Tuberculosis Education For Filipino Americans in New York City: A Research Translation Project

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Community-Based Tuberculosis Education

For Filipino Americans in New York City: A Research Translation Project

Eileen F. Damante

University of Massachusetts Amherst

College of Nursing

DNP Project Chair: Donna Zucker
DNP Project Mentor: Mary Kiely
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# IMPLEMENTATION OF COMMUNITY-BASED EDUCATION

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Abstract

Background: Persons born outside the United States accounted for 85% of all the active Tuberculosis (TB) cases in New York City (NYC) in 2016. Individuals from countries with a high burden of TB, such as the Philippines, have a higher risk of developing TB than persons born in the United States. This is a significant health disparity. The reluctance of these individuals to seek TB screening due to lack of TB knowledge and fear of being stigmatized may contribute to this disparity. Research supports the need to provide community-based TB education.

Purpose: The goal of this research translation project was to improve knowledge of TB among Filipino Americans in NYC by providing community-based TB education.

Methods: A published TB Knowledge Instrument (TBKI) with a pre-test and post-test design was used to measure if knowledge about TB had improved after completing the education program.

Plan/Procedure: The TB education intervention was directed to adult members of the Filipino American community at a local neighborhood center in NYC; 25 volunteers participated.

Conclusions: All 25 participants showed an improvement in TB knowledge after the presentation; the desired project goal was achieved. The TBKI items measured basic TB facts and showed improvement in 12 out of 14 outcomes. Overcoming misperceptions about tuberculin skin testing and Bacille Calmette-Guérin vaccine was more challenging but provided opportunities for improvement with future TB programs. Collaborating with at-risk community groups to provide TB education can increase knowledge, reduce the fear of TB stigma and empower individuals to seek screening for TB.

Keywords: Tuberculosis, Knowledge, Immigrant, Migrant, Stigma.
Community-Based Tuberculosis Education

For Filipino Americans in New York City: A Research Translation Project

Introduction

Tuberculosis (TB) is the ninth leading cause of death in the world. Deaths from TB have exceeded deaths from HIV worldwide (World Health Organization [WHO], 2017). This infectious disease is caused by a bacterium known as *Mycobacterium tuberculosis* and spreads by airborne transmission. Once inspired, if the TB bacteria multiply, they usually attack the lungs, and this is known as pulmonary TB. The TB germs can also spread throughout the body, causing disease in any part of the body, and is known as extra-pulmonary TB. With active TB disease, the TB bacteria multiply; the person is sick and may spread the germs to others (Centers for Disease Control and Prevention [CDC], 2013a, p. 28). A different TB-related condition known as Latent TB Infection (LTBI) also exists. In this condition, the person is infected with the TB germs but they remain dormant, and the person is not sick, or contagious (CDC, 2013a p.28). If the dormant TB germs become active and multiply the person can develop active TB disease. Persons from countries with a high burden of TB, such as the Philippines, have an increased risk of developing active TB disease. The United States Preventive Services Task Force (USPSTF) guideline on Latent Tuberculosis Infection (LTBI) recommends screening persons who were born in or who are former residents of countries with a high prevalence of TB such as the Philippines. (USPSTF, 2016a). There is a reluctance for many at-risk individuals to seek out TB screening due to lack of knowledge of TB that may be intensified by the fear of being stigmatized (Abarca Tomás et al., 2013; Chang & Cataldo, 2014; Storla, Yimer, & Bjune, 2008; Yamada, Caballero, Matsunaga, Agustin, & Magana, 1999).

For this paper, anyone who was of Filipino heritage living in New York City (NYC),
regardless of immigration status, was defined as Filipino American. The Filipino population refers to persons born in the Philippines, living in NYC with TB. The educational presentation on TB was offered to any adult person who identified as a Filipino American. The intent of this project was to provide community-based education on TB to an at-risk group, so that individuals will have a better understanding of their health and how to maintain it.

**Background**

An individual with latent TB infection (LTBI) has been exposed to *Mycobacterium tuberculosis* but has not developed active TB disease and is not contagious. The bacteria remain dormant, there is no tissue damage, and the radiological chest films are normal. The person does not have any symptoms of TB such as a chronic cough, fever, hemoptysis, shortness of breath, weight loss or pain (CDC, 2013a). In some cases, the TB germs can remain dormant for an entire lifetime. In other persons, especially those with a weak immune system, the TB germs can become active, multiplying and causing active TB disease (CDC, 2013a). In 2014, it was estimated that about one-third of the world’s population had been infected with TB (LTBI), and about five to ten percent of these people will go on to develop active TB disease (Kahwati et al., 2016a; USPSTF, 2016b). In the United States (U.S.), up to 13 million people may have LTBI. This means that about 650,000 to 1,300,000 persons could develop active TB disease in the future without adequate treatment for LTBI (CDC, 2013b, p.5).

In the U.S., the prevalence of a person being infected with TB was estimated by using the National Health and Nutrition Examination Survey (NHNES) data. The prevalence in the U.S. population was estimated to be 4.7%, compared to 20.5% in the foreign-born population (Miramontes et al., 2015, p.13). The risk of progressing to active TB disease is greatest within two years of exposure to the TB germ. Foreign-born persons from countries with
a high burden of TB have a greater risk of developing active TB disease. In 2016, 85% of the cases of active TB in NYC occurred among foreign-born people (New York City Department of Health and Mental Hygiene - Bureau of Tuberculosis Control [BTBC], 2017, p.17).

Individuals arrive in the U.S. through various means: some by applying via the legal immigration process and were classified as immigrants, others as documented nonimmigrant visitors such as students, tourists, business people, and others who are unauthorized. From data that was collected between 2001 and 2008, Liu et al. (2012) projected that 58.4% of all TB cases were attributed to foreign-born persons who had a nonimmigrant visitor status as they did not undergo TB screening in their home country. This study did not look at unauthorized visitors due to unavailable data. (Liu et al., 2012, p.7). According to Pew Research, about 30% of the immigrants in the U.S. in 2008 were unauthorized (Passell & Cohn, 2009, p.3). This tenuous immigration status could become a barrier to seeking care for TB.

Screening the general U.S. population is not recommended by the USPSTF, as the risk of developing TB for this group is not significant. The highest risk populations, such as persons with HIV, close contacts of persons with active TB disease, and persons being treated with immunosuppressive medications, were excluded from the updated LTBI guideline of the USPSTF. This exclusion occurred because TB screening would be considered part of the standard of care in the management of each of these diseases or conditions (Kahwati et al., 2016b). The CDC, the American Thoracic Society (ATS), and the Infectious Disease Society of America (IDSA) reviewed the USPSTF guideline, the evidence based literature, and developed clinical practice guidelines (Lewinsohn et al., 2016).

Valanis (1999) stated that “Secondary prevention seeks to detect disease early, treat promptly, and cure disease at its earliest stage, or when cure is not possible, to slow its
progression, prevent complications, and limit disability” (p. 26). Once an individual is screened and diagnosed with LTBI, prophylactic antibiotic treatment may be beneficial to avoid developing active TB disease in the future. The USPSTF (2016b) estimated,

    if a hypothetical cohort of 100,000 asymptomatic adults at increased risk for tuberculosis (eg, persons born in, or former residents of, high prevalence countries) were screened 52 to 146 active tuberculosis cases would be prevented, 7 to 67 cases of hepatotoxicity would occur (depending on the type of treatment), and 111 persons would discontinue treatment because of adverse events. (Estimate of Magnitude of Net Benefit, p. 4)

The preventive treatment for LTBI is voluntary for the individual. Ultimately, the plan of care for LTBI treatment would be determined by a health care provider in collaboration with the individual after a personalized risk and benefit health evaluation was performed (CDC, 2013a). With the implementation of the updated LTBI guideline to eliminate TB, primary care providers must assume more responsibility in caring for individuals from an at-risk population (Kahwati et al., 2016a). The importance of preventing active TB disease cases from developing is also significant for the health of all New Yorkers.

According to Melinda Katz (2014), the Borough President of Queens County, more than 2.3 million people lived in Queens County. Queens is one of the five boroughs of NYC. The residents have come from 120 countries around the globe and converse in more than 135 languages in Queens. Foreign-born residents accounted for 48% of the county’s population. Woodside, and Elmhurst were among neighborhoods with the highest diversity (Katz, 2014).

In 2016, according to the BTBC, there were 565 active TB cases in NYC. Queens County had 43% of all the NYC active TB cases (241/565). Western Queens (part of Queens County) had 16% of all the NYC active TB cases (91/565) (BTBC, 2017, p.19). Western Queens includes
the neighborhoods of Woodside, Jackson Heights, Elmhurst, and Corona. The Filipino population, which described those persons born in the Philippines, accounted for 12% of all the active TB cases (11/91) in Western Queens (BTBC, 2017, p. 19). The foreign countries of birth for individuals with the highest incidence of active TB cases in Western Queens were China, the Philippines, Nepal, Ecuador, and Mexico (BTBC, 2017, p.19).

Case rate is a key indicator that measures the number of new and relapsed cases of TB that occur over one year per 100,000 people (WHO, 2015). Figure 1 illustrates the differences in TB case rates for US-born, and Filipino populations in NYC (BTBC, 2017, p.18).

\[\text{TB Case Rate in NYC (2016)}\]

\[\begin{array}{c}
\text{Per 100,000} \\
\hline
\text{US-born} & 1.6 \\
\hline
\text{Filipino} & 49.8
\end{array}\]

**Figure 1.** Comparison of the NYC TB case rate for two populations: US-born, and Filipino-born in the Philippines.

In 2016, the Filipino population in NYC had a TB case rate of 49.8/100,000 people, and the TB case rate for the US-born population was 1.6/100,000 (see above). When comparing the two populations, the Filipino population TB case rate was 31 times as high as the TB case rate for the US-born population (BTBC, 2017, p.18). This is a significant health disparity.

The percentage of foreign-born individuals residing in the U.S. for more than five years at the time of TB diagnosis increased to 64%, as compared to 56% in 2010 (BTBC, 2017, p.17). For the Filipino population, the median age for developing TB was 52.5, and the median years
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living in the U.S. was 11.5 years (BTBC, 2017, p.18). These statistics based on age and years in the U.S. may be attributed to reactivation of previous TB infection and may also be associated with increased medical risk from diseases like diabetes, silicosis, and cancer (CDC, 2013a).

Asian Americans are the fastest-growing ethnic minority population in the U.S., and this includes Filipino Americans. Model minority is a term that was first used in the 1960s by a sociologist named William Petersen to describe Japanese Americans. It was based on the positive perception that the members of this minority population have attained higher socioeconomic, professional, and educational levels. Since then, the myth of the model minority has been commonly refuted due to the large number of health disparities that exist for Asian Americans (Barnes, Adames, & Powell-Griner, 2008). These health disparities include high rates of cardiovascular health problems, diabetes, cancer, and mental health concerns. There is limited research on Asian Americans in general and Filipino Americans in particular. Additional research is needed to address health disparities in this population (Soriano, 2014). A health disparity also exists with the communicable disease TB.

The Institute of Medicine (IOM) report on ending neglect to eliminate TB emphasized the need to improve TB control in foreign-born populations (IOM, 2000). This was considered critical to address the global threat of TB. The IOM also recommended collaboration with community groups and neighborhood health centers to improve TB awareness (IOM, 2000). In response to this, the CDC recognized the need to foster nontraditional public-private collaboration to provide culturally appropriate materials to improve knowledge about TB (CDC, 2002). The BTBC has also recommended educating the public and health professionals about TB to improve screening and treatment (BTBC, 2017). Education is a common intervention to encourage individuals from at-risk populations to interact with health care professionals or to
make a medical decision to seek care to address a health disparity (Agency for Healthcare Research and Quality [AHRQ], 2016).

The decision to seek care for TB is a personal one and is affected by an individual’s knowledge about TB. Screening for LTBI in foreign-born individuals from countries with a high burden of TB reflects one aspect of the Stop TB Partnership plan in NYC. It is also now known as the Global Plan to End TB: The Paradigm Shift 2016-2020 (BTBC, 2017; Stop TB Partnership, 2016). The barrier created by TB stigma may delay early diagnosis and treatment (Abarca Tomás et al., 2013; Chang & Cataldo, 2014; Craig et al., 2017; Macq, Torfoss & Getahun, 2007).

**Problem Statement**

The increased risk of developing active TB disease among the Filipino population in NYC is indicated by a lack of knowledge about TB and may have resulted from misperceptions and the fear of TB stigma, which may delay a person seeking care. This aim of this paper is to present the results of a Doctorate of Nursing Practice (DNP) project that implemented a community-based TB education program for Filipino Americans, a group at-risk for TB. The DNP student performed the translation of research into practice by demonstrating the successful implementation of a research-based intervention that is a component of the educational preparation of the DNP role (American Association of Colleges of Nursing [AACN], 2006).

**Organizational “Gap” Analysis**

Community-based TB education constructed from the evidence-based literature may improve TB knowledge, dispel misperceptions, and decrease the fear of TB stigma. A TB educational intervention was planned and implemented based on recommendations from the IOM, the CDC, USPSTF, and research studies. Education about TB may increase knowledge and
improve an individual’s ability to make a medical decision to seek care for a health disparity such as TB (AHRQ, 2016).

Western Queens, which includes the neighborhood of Woodside, had a number of cases of active TB disease in the Filipino population (11/91) (BTBC, 2017, p. 19). A neighborhood community center located in Woodside was chosen for the TB educational intervention. The majority of members of the community center are Filipino American, and health education is commonly provided there. To address this TB health disparity, a collaborative approach between the community stakeholders and the DNP student was used to plan and implement the culturally sensitive, evidence-based TB educational program.

**Review of the Literature**

A literature review was conducted to identify and critique the use of TB education to improve TB knowledge and address stigma for foreign-born persons. The present paper utilized the following databases: PubMed/Medline of the National Library of Medicine (NLM), Cumulative Index to Nursing and Allied Health Literature (CINAHL), and National Clearinghouse for the AHRQ from 2006-2017. Reference lists of the citations from PubMed and CINAHL were also manually searched. The Gray Literature that was examined for TB included the BTBC, the CDC, the Hawaii State Department of Health (Hawaii DOH) and the USPSTF. All sites were last searched on May 1, 2017. The *keywords* included Tuberculosis, Knowledge, Migrant, Immigrant, and Stigma.

Tuberculosis was defined in the Medical Subject Heading (MeSH) of NLM as “any form of the infectious diseases of man caused by the species of Mycobacterium” (NLM, MeSH, 2017). The term Latent Tuberculosis Infection (LTBI) was also defined under Tuberculosis as “the dormant form of tuberculosis where the person shows no obvious symptoms, and no sign of
the causative agent *Mycobacterium tuberculosis* in the sputum despite being positive for tuberculosis infection skin test” (NLM, MeSH, 2017). The broader search term Tuberculosis encompassed items about LTBI in the search results. Knowledge was identified as “knowledge, attitudes, and associated behaviors” which pertain to health-related topics such as pathological processes, or diseases, their prevention, and treatment” (NLM, MeSH, 2017). No MeSH term was found for the term foreign-born. Migrant was described as “people who frequently change their place of residence” (NLM, MeSH, 2017). Immigrant was defined as “people who leave their place of residence in one country and settle in another country” (NLM, MeSH, 2017). Stigma was named as “a perceived attribute that is deeply discrediting and is considered to be a violation of social norms” (NLM, MeSH, 2017).

The selection criteria included systematic reviews, meta-analysis, literature reviews, clinical guidelines, and full-text articles in English, limited to those published from 2006 to 2017 in English. Hand-searched items published before 2006 were also included since they proved to be essential to the project’s development. The exclusion criteria comprised articles that involved TB medical care in foreign countries since care in the U.S. is regulated by the CDC, not the WHO. Studies about children less than 18 years old or animal research, along with letters to the editors or op-ed pieces, were also excluded. During this search, 71 items were retrieved and reviewed for relevancy and content regarding the topic, of which 26 were included in the literature review.

The review of the literature included the highest rated levels of evidence-based research based on The Johns Hopkins Nursing Evidence-based Practice Rating Scale (Newhouse, Dearholt, Poe, Pugh, & White, 2005). Included in the literature review were ten systematic reviews, one meta-analysis, three national surveys, three comprehensive literature reviews, three
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clinical practice guidelines, research articles and the Gray Literature from the BTBC, the CDC, Hawaii DOH, and the USPSTF. A landmark study on Filipinos and hand-selected relevant items published from 1997 through 2005 were also included for a total of 38 items. The trends that were explored included the standard of care for LTBI, perspectives on TB knowledge, and TB stigma, measuring TB knowledge, perspective on the targeted population—Filipinos, and interventions to address health disparities.

**Standard of Care for Latent Tuberculosis Infection**

A landmark evidence-based report based on systematic review and meta-analysis by the USPSTF supported the recommendation to provide targeted screening and treatment for LTBI in primary care settings for populations at increased risk for TB, such as persons born in or former inhabitants of countries with increased tuberculosis prevalence (Kahwati et al., 2016a; Kahwati et al., 2016b; USPSTF, 2016a; USPSTF, 2016b). This report provided the evidence for the Grade B recommendation for the USPSTF Guideline on Latent TB Screening (USPSTF, 2016a).

Accurate screening tests for LTBI include the tuberculin skin test and Interferon-Gamma Release Assay (IGRA). Both tests are highly specific and moderately sensitive (USPSTF, 2016a). According to the CDC, IGRA is the preferred method to screen for LTBI; however, tuberculin skin testing can also be utilized regardless of Bacille Calmette-Guérin (BCG) vaccine history (CDC, 2016b). After the targeted screening, a plan for appropriate medical evaluation and treatment should be available. Preventive treatment for LTBI recommended by the CDC has been effective in reducing progression to active TB disease. Hepatotoxicity is a risk associated with the treatment of LTBI, and adverse events must be taken into consideration (USPSTF, 2016b). The USPSTF (2016b) “concludes with moderate certainty that the net benefit of screening for LTBI in persons who are at increased risk for tuberculosis is moderate” (p. 1).
Studies that were excluded involved public health surveillance or disease management. The highest risk populations, such as persons with HIV, close contacts of persons with active TB disease, and persons being treated with immunosuppressive medications, were excluded from the updated LTBI guideline of the USPSTF. This exclusion occurred because TB screening would be considered part of the standard of care in the management of each of these diseases or conditions (Kahwati et al., 2016b). There is support for TB educational programs, from the Gray Literature provided by the CDC, the BTBC, and the Hawaii DOH.

A task force from the ATS, CDC, and IDSA reviewed the evidence-based literature to develop clinical practice guidelines for the diagnosis of TB disease and LTBI in adults and children. The review by Lewinsohn et al. (2016) provided 23 recommendations. This task force advised that a clinician weigh the likelihood of infection, benefits of therapy, and risk of developing active TB disease when formulating a plan of care. Numerous scenarios about TB testing were identified, in general, the use of IGRA instead of tuberculin skin testing in adults who are likely to be infected was recommended. However, it was cautioned that tuberculin skin testing could be used if IGRA is not readily available, burdensome, or too costly. The screening tests cannot differentiate active TB disease from LTBI; therefore, further medical evaluation including documentation of signs and symptoms and chest radiography is necessary. Smear microscopy may be needed if pulmonary TB is suspected (Lewinsohn et al., 2016). Active TB disease guidelines are beyond the scope of this paper.

The CDC guideline (2000) on Targeted Tuberculin Testing and Treatment of LTBI continues to provide the foundation of evidence-based knowledge when teaching an individual about TB (CDC, 2000). This guideline was used in the development of PowerPoint slides by the Hawaii DOH, CDC handouts, and the TB Knowledge Instrument (Ailinger, Armstrong,
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Nguyen & Lasus, 2004).

**Perspectives on TB Knowledge and TB Stigma**

Researchers worldwide have identified gaps in the knowledge about TB based on misperceptions about TB, the fear of TB stigma, and the reluctance of individuals to refute long-held beliefs. The emphasis on TB education to improve knowledge has been shown to be important in addressing these barriers. Understanding the cultural and social aspects of stigma along with its consequences are essential in order to address the TB health disparity for at-risk populations.

Abarca Tomás et al. (2013) performed a definitive systematic review of the 30 qualitative studies published between 1997 and 2011. The studies were classified by country and identified that the methodology consisted of interviews or surveys of individuals, focus groups, or communities. Other than observational studies, there were no studies of higher research levels related to TB knowledge and education. There is a difference in how TB care is managed in the home country with limited resources versus how TB care is the managed in the host country with substantial resources like the United States. Individuals demonstrated some understanding about the idea that germs caused disease but also identified malnutrition, poor living conditions, and exposure to low temperatures, stress, witchcraft, imprudent lifestyles, and genetic predisposition as possible causes. Lack of knowledge, fear of testing, worry about missing work, being uninsured, the stigma associated with TB, and nonconforming resident status were all identified as barriers to accessing TB care. This inability to seek health care may also be affected by the fear of stigma, social exclusion, poverty, poor health literacy, and tenuous regulatory and work status. The review identified that there was a low level of TB knowledge and that knowledge is primarily based on their previous experiences and long-held unfounded beliefs. Education was
identified as a facilitator to address lack of knowledge (Abarca Tomás et al., 2013). The concept of LTBI is generally unknown in some home countries, and use of BCG vaccine is widely accepted as providing immunity for life. Many individuals are unaware that BCG does not provide protection for life (McEwen, 2005, p.348). The risk associated with TB exposure if immunity from BCG vaccination wanes may not be realized. These individuals also do not know that treatment for LTBI may prevent active TB disease in the future.

A total of five systematic reviews explored the concept of TB stigma extensively. The findings identified that most studies were qualitative by design, and mainly included interviews or observation studies. The concept of stigma was examined from these five different perspectives. Chang and Cataldo (2014) published a systematic review of global cultural variations in knowledge, attitudes and health responses to tuberculosis stigma. Stigma was interpreted as a negative attitude or misperception about the causes of TB. The review included 83 articles and categorized them geographically into six world regions. There were so many studies about TB stigma in different cultures that they were summarized by country. The results were also categorized by topics such as TB knowledge, association with HIV, attitudes about TB and health responses to TB. Only one study from the Philippines was included and was reviewed under Filipino Perspective (Yamada et al., 1999). It was recommended that culture must be considered when developing interventions to reduce stigma and improve an individual’s ability to seek care and adhere to treatment.

Courtwright and Turner (2010) performed a systematic review that explored how social norms shape stigma. The authors recognized that stigma could create a barrier to accessing care. The review looked at three themes: 1) 52 studies measured stigma, 2) 38 studies explored how TB stigma affects diagnosis and treatment, and 3) nine interventions to reduce stigma. Asian
Pacific Islanders were represented in 33% of the articles. They concluded that lack of knowledge about transmission and contagiousness could lead to stigmatization and isolation. In areas where HIV is a problem, HIV stigma was transferred to TB infected individuals. TB was also associated with poverty, malnutrition, low social class, and being foreign-born. These negative perceptions associated with TB are conveyed to an infected person and result in the person becoming stigmatized. Some individuals believe that getting TB is punishment for some personal failing. Contracting TB can affect one’s ability to work, so a person or the family may try to hide the problem, fearing the economic consequences. A person fears that the family may shun them, and they will become outcasts. Measuring stigma is difficult. Many studies used interviews to gauge the degree of stigma felt by an individual and identified that fear of stigma may cause individuals to avoid seeking care for TB. Education about TB, along with support programs aimed at health care providers, individuals with TB and at-risk communities, are necessary strategies to address stigma, but there was very little data to measure the effectiveness of these strategies. The review had a biomedical focus that was recognized as a limitation of the review. Searches of psychological and sociological databases may identify articles that were missed in this review (Courtwright & Turner, 2010).

Macq, Solis, and Martinez (2006) performed a review of published research and the Gray Literature and found a lack of studies on methods to measure stigma; most studies were qualitative. The reviewer recommended that more emphasis should be placed on systems or intervention to address TB stigma (Macq, Solis, & Martinez, 2006).

Storla, Yimer, and Bjune (2008) published a systematic review that examined the delays in the diagnosis and treatment of TB. Only observational studies were included. The reviews included studies with noted delays in diagnosis from when symptoms were identified to the
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diagnosis and start of treatment. Studies were excluded that had variables such as visitors, mental health problems or how the patient defined symptoms onset. There were no studies from the Philippines. Some reasons for delayed care included poverty, age, perplexing beliefs, substance abuse, alcoholism, the existence of other lung diseases, chronic cough, limited access to health care, and seeking care from providers not specialized in TB care (Storla et al., 2008).

A systematic review by Craig, Daftary, Engel, O’Driscoll, and Ioannaki (2017) on TB stigma in low incidence countries examined 22 studies. It was concluded that TB stigma is an important social determinant of health, and may have significant influence on delays in seeking treatment and accessing health care. Many of the studies on knowledge, attitudes and beliefs about TB also included stigma. There is a lack of research on stigma in low incidence countries, and this is a limitation of the review. It was recommended that future research should critically examine how policies and research can address TB stigma in order to reduce health disparities. A greater focus on interventions to reduce stigma, especially in at-risk populations such as foreign-born individuals from countries with a high prevalence of TB is also important (Craig, Daftary, Engel, O’Driscoll, & Ioannaki, 2017).

A recommendation of the USPSTF focused on screening populations with increased risk for LTBI such as foreign-born persons from countries with a high burden of TB. It is essential to develop evidence-based interventions such as TB education to help these individuals to seek TB screening. Improved TB knowledge may address the fear of stigma since it affects an individual’s decision to seek care for TB. Fear of exclusion, rejection, or marginalization by family, friends, and society leads to feelings of inferiority. This perceived stigma results in social shunning. The barriers created by TB stigma may delay early diagnosis and treatment. Culture
also plays an important role when an individual seeks care (Abarca Tomás et al., 2013; Chang & Cataldo, 2014; Craig et al., 2017; Courtwright & Turner, 2010).

**Measuring TB Knowledge**

The TB Knowledge Instrument (*TBKI*) is a research tool that was published to measure TB knowledge in Latino immigrants (Ailinger et al., 2004). Subsequently, this instrument has been recognized by numerous researchers over several years. This review identified studies that measured TB knowledge in various populations.

Initially, Ailinger and Dear (1997) explored what a TB infection means to Latino immigrants based on interviews with a convenience sample of 65 individuals. Each interview lasted about 15 minutes and was taped and transcribed. Causes of TB included breathing the air of an infected person, drinking from the same bottle, imbalances of cold and hot, or not eating well. Misperceptions about TB infection and BCG vaccine, describing TB as a virus, fear about loss of work, or dying were also expressed. It is vital to understand an individual’s long-held health beliefs about TB. A recommendation included that educational materials should be culturally sensitive, and not just a translation from English (Ailinger & Dear, 1997).

Ailinger, Lasus, and Dear (2003) used data from the 1997 National Health Interview Survey (NHIS) Supplement to sample 14,727 adults from the general U.S. population about TB knowledge, along with perceived risk. While there was some knowledge of TB for people in the U.S., most had misperceptions about personal risk of developing TB. Older persons were more knowledgeable about TB than younger persons. There was a recommendation for more public health education regarding TB risk, especially for immigrant groups (Ailinger, Lasus, & Dear, 2003). The previous articles were included because of their historical perspective regarding the research in the development of the instrument to measure TB knowledge.
Ailinger, Armstrong, Nguyen, and Lasus (2004) studied the TB knowledge of Latino immigrants in the U.S. who were receiving LTBI treatment. Knowledge and attitudes about TB were measured using the reliable, validated tool, TBKI (See Appendix A). The TBKI consists of a questionnaire with a true/false/“don’t know” response format that was designed to avoid guessing. The tool was translated from English to Spanish and back to English by two different native Spanish speakers. The Spanish version of the TBKI had a sixth-grade reading level and a Cronbach’s alpha score of 0.60, which indicated moderate reliability for the Latino population. In this study, 82 participants had a low mean score of 66% for TB knowledge. Completing treatment was a major focus of education for patients of a TB clinic. The challenges faced when caring for these individuals included misperceptions about contagiousness and confusion over the difference between latent and active TB. The researchers found that the concepts of contagiousness, BCG, the etiology of TB, and folk beliefs had the most incorrect responses. The size of the convenience sample and the moderate reliability of the TBKI were recognized as limitations of the study. In addition to stressing the importance of assessing Latino clients undergoing LTBI treatment, the researchers recommended educating the Latino population about TB. Development of a separate scale about folk beliefs was also a recommendation of this study (Ailinger et al., 2004).

The U.S. National Health Interview Survey (NHIS, 2008) was used to identify TB knowledge, attitudes, and risk perceptions in the general population as well as those at higher risk for TB (Marks, Morris-McEwen, & Behler, 2008). There was limited knowledge about TB in the sample of the U.S. population. The survey recommended that greater effort was needed to provide targeted education to communities that were disproportionately affected by TB, such as foreign-born, Black, Hispanic, Asian, individuals who are homeless, impoverished, incarcerated,
alcoholics, smokers, and those diagnosed with diabetes or HIV. These groups are affected by a significant health disparity when compared to the general population (Marks, Morris-McEwen, & Behler, 2008).

Colson, Franks, Sondengam, Hirsch-Moverman, and El-Sadr (2010) surveyed 251 patients who enrolled in treatment for LTBI at an NYC Public Hospital; 84 were US-born, and 167 (66.5%) were foreign-born. Misconceptions were noted with both groups regarding contagiousness and transmission. Stigma was identified as a significant concern. Only 2.8% of the participants were identified as Asians, so it is impossible to draw any conclusions regarding this population. It was also noted that foreign-born individuals expressed a belief that they felt more protected about developing TB (Colson, Franks, Sondengam, Hirsch-Moverman, & El-Sadr, 2010).

Colson et al. (2013) performed a prospective cohort study in the U.S. and Canada to define the individuals who accept LTBI treatment versus those who do not. A total of 1692 participants were enrolled from 30 clinics from March 2007 to September 2008. Greater TB knowledge and convenient schedules were predictors of acceptance. Predictors of non-acceptance included believing that taking medicine would present a problem. The researchers concluded that TB education to increase knowledge is an essential key for successfully promoting adherence to treatment for LTBI (Colson et al., 2013).

Colson et al. (2014) utilized a cross-sectional survey to study TB knowledge of foreign-born individuals. A total of 1,475 participants from 22 sites in Canada and the U.S. were enrolled in the study. The respondents from East Asia Pacific Islanders made up 32% of the participants. The questionnaires and consents were translated into ten languages. The finding indicated that
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participants could not answer questions on TB knowledge satisfactorily, and there is a need for health education for the foreign-born (Colson, et al., 2014).

Chang, Hung, Chou, and Ling (2007) applied the Health Belief Model (HBM) to analyze a Taiwanese nursing student’s intention to participate in preventive TB examinations. They found that individuals with an understanding of the severity of active TB disease, with a higher perception of their susceptibility to TB, combined with the perception that there were fewer barriers to taking treatment, had a higher level of intent to participate in the preventive program. The authors recommended that health education programs targeted at dispelling misperceptions, while increasing TB knowledge and awareness, will enhance willingness to participate in TB screening (Chang, Hung, Chou, & Ling, 2007).

Li et al. (2015) performed a cross-sectional study of individuals in China to examine the relationships between the HBM, using behaviors to prevent the spread of TB, and the intention to seek care. The HBM was used to predict if the individual perceived the benefits of seeking preventive care based on TB knowledge. The authors recommended that TB health education and health promotion are important to TB prevention programs (Li et al., 2015).

Researchers worldwide have identified gaps in the knowledge about TB based on misperceptions about TB, the fear of TB stigma and reluctance to refute long-held folk beliefs. The emphasis on education has been shown to be an important recommendation in these studies.

Perspectives on the Targeted Population - Filipinos

A landmark study by Yamada et al. (1999) identified many beliefs and misperceptions about TB among Filipinos. Four focus groups of Filipinos living in California and Hawaii had discussions about TB conducted in English, Ilocano, and Tagalog. The discussions were recorded and transcribed. Individuals, with LTBI or active TB disease, were actively recruited.
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The results were organized into several different themes, including theories of causation, mechanism of disease, social implications, psychological implication, and treatment. There were many ideas about what caused TB. *Causation theories* included bacteria and viruses, unsanitary or dirty conditions, cigarettes and alcohol, poor nutrition, overwork, contact with a person with TB, and sharing eating utensils. The *mechanism of disease* identified common symptoms but also characterized TB as a dry disease, in which the body shrinks. The *social implications* identified isolation even from a spouse or family. Many participants cited the fear of not being allowed to immigrate to the United States. Families were afraid that if the government knew that someone in their family had TB, they would not be allowed to immigrate. The researchers noted a general attitude of stigmatization toward the TB victim. The *psychological implications* depicted the TB victim as having a life of suffering from a fear of death and losing interest in life. The feelings described were attributed to social stigma and were associated with depression. *Treatment* for all focus groups identified that modern medical treatment is the most effective. Living in more rural areas was a barrier to accessing care. Using traditional healers known as albularyo was recognized by many.

Study limitations included possible bias of interpreters when translating the responses, the groups were not randomly selected, and attitudes toward TB may have changed with acculturation. While major themes were explored, not all the opinions transcribed in the discussions were entered into the report. The study did not discuss the perceptions of the BCG vaccine and the misperceptions about the lifelong protective nature of this vaccine, and this is also a limitation (Yamada et al., 1999).

Soriano (2014) reviewed the literature to examine concerns and health conditions that affect Filipino Americans. The health disparities that were identified included cardiovascular
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disease, diabetes, mental health problems, and cancer. Communicable diseases such as TB were not recognized as a health disparity, and this was a limitation of the review. (Soriano, 2014).

According to Managan et al. (2009), a report sponsored by the CDC utilized descriptive analysis and logistical regression to examine disparities TB in the non-Hispanic White population and Asian Pacific Islanders from 1993-2006. This review recommended directing efforts and resources to all groups of foreign-born patients, especially Asian Pacific Islanders, to reduce health disparities (Manangan et al., 2009).

Choi (2009) contrasted immigrant health for the Filipino, Korean and Marshallese populations in Hawaii. Asians account for 70% of all the immigrants who come to Hawaii. Focusing on a sociological point of view, the researchers used household surveys for 378 recent immigrants between October 2005 and January 2006. The survey found that Filipino immigrants were not usually entitled to state insurance but got help through networking and kinship within their ethnic community. Filipinos reported readily interacting with co-ethnic and non-co-ethnic social networks. Filipinos had significantly better access to health care than Koreans, who had a higher income and educational level of attainment. The survey also noted that 82% of Filipino respondents were proficient in English and did not have communication problems. English is the official language of the Philippines. This study recommended mobilizing ethnic networks in Marshallese, Korean, and Filipino communities to improve health care for these groups (Choi, 2009).

Explaining TB disease includes a blend of social, cultural and biomedical factors. The cause of TB was unknown before microbiology and medical science identified Mycobacterium tuberculosis, along with contagiousness and germ theory. Before this, unfounded health beliefs evolved to explain how someone could be more vulnerable to getting sick with TB. Some
examples of this included exposure to hot and cold, eating poorly, or overworking. These long-held beliefs about health and sickness are not easily dismissed, as they have been passed down from generation to generation. They have been shaped by culture and history. Becoming more aware of common TB misperceptions and long-held beliefs may improve a health care provider’s understanding, focus TB education efforts, and improve the delivery of care.

**Interventions to Address the TB Health Disparity**

Macq, Torfoss and Getahun (2007) performed a literature review of 314 published and non-published works on patient empowerment and TB. Empowering individuals to become involved in advocacy and activism gives more voice to TB patients and increases involvement with key stakeholders in the community. Patient empowerment includes working to change societal and community norms through TB education, and support programs for individuals with TB and at-risk populations (Macq et al., 2007). Patient empowerment is a cornerstone of the Stop TB partnership programs such as Directly Observed Therapy. Some TB clinics in the United States also provide support with incentives to attract patients to the clinic.

A review of the literature compared HIV/AIDS, leprosy, TB, mental illness and epilepsy to recognize strategies to reduce stigma. Strategies that focus on the empowering the individual or community were deemed to be most effective (Hejinders & Van Der Meji, 2006).

Tankimovich (2013) performed a literature review of 22 articles that focused on barriers and interventions surrounding TB detection, treatment, and immigrant populations. Barriers for immigrants included fear of deportation, loss of job, and also the cultural barriers and stigma associated with TB. Native health knowledge and literacy may also create a barrier to seeking care. Raising TB awareness and assessing knowledge to understand the effects of TB stigma were recommended to improve case management and TB education of immigrant populations.
Successful interventions for at-risk populations also included providing cash incentives and making health care appointments more convenient and accessible (Tamkimovich, 2013).

Campbell, Sasitharan, and Marra (2015), in a systematic review, evaluated the cost of screening adult immigrants for LTBI. Although the studies were of limited quality, screening adults who are likely to be infected with *Mycobacterium tuberculosis* using IGRA was moderately cost-effective (Campbell, Sasitharan, & Marra, 2015).

Houston, Harada, and Makinodan (2002) described the development of a culturally sensitive educational intervention to reduce the incidence of TB in foreign-born Vietnamese. Vietnam and the Philippines are both Asian countries in the Western Pacific geographic area. This study demonstrated the importance of providing ethnocentric care that is culturally appropriate. Community organizations were engaged in developing a program to address the health disparity of TB (Houston, Harada, & Makinodan, 2002).

McEwen (2005) along with Michaels, Morris-McEwen, and Behler (2008) evaluated client values, beliefs, and the recommendations of evidence-based medicine regarding LTBI. Despite best-practice medical evidence that supports secondary prevention with prophylaxis for LTBI, many participants in the study were unconvinced. They still preferred their own long-held beliefs. Respondents expressed the belief that they were not susceptible to TB because they had the vaccine which gave them lifetime immunity. They were more likely to take LTBI treatment if they believed it was required. Expert coaching and providing pertinent information about TB may increase the likelihood that the individual will seek care for TB (McEwen, 2005; Michaels Morris-McEwen, & Behler, 2008). A limitation is that this study focused on the Mexican population.
Community-Based Participatory Research (CBPR) is a collaborative approach between community members and health professionals to address community health concerns. A series of three articles published between 2011 and 2013 chronicled how a CBPR was forged as a partnership between health care providers from the Mayo Clinic and members of a local community education center in Rochester, MN. The CBPR explored the perceptions of TB among immigrants and refugees who were attending community-based adult education classes. Barriers to TB testing that were identified included cost, problems with transportation, fear of job loss, and work schedule conflicts. The recommendations included providing education about TB, utilizing monetary incentives, and developing flexible schedules for delivering services (Weiland et al., 2011; Weiland et al., 2012; Weiland et al., 2013).

**Summary of Studies with Verification of Evidence-Based Practice**

The development of this research translation project to provide community-based TB education to Filipino Americans, an at-risk group, was supported by the literature review. Providing culturally sensitive, evidence-based TB education was documented to be an effective strategy to address this health disparity. Utilizing a collaborative, participatory approach with the Filipino American community was essential for success when planning and implementing the educational program on TB. Making the educational program accessible and convenient, without affecting work responsibilities, were important considerations.

The majority of higher level research identified as systematic reviews and meta-analysis supported the need for educational interventions to promote knowledge of TB. Many studies recognized the need to provide education to improve TB knowledge and to address TB stigma (Abarca Tomás et al., 2013; Chang & Cataldo, 2014; Courtwright & Turner, 2010). Stigma is caused by negative sociocultural viewpoints and is a social determinant of health. Poverty, fear
and lack of knowledge are barriers and result in delays when seeking care (Craig et al., 2017; Storla et al., 2008). Programs to empower individuals to withstand TB stigma are essential and include patient education (Chalco et al., 2006; Hejinders & Van Der Meij, 2006; Macq et al., 2007). Using a published instrument such as the TBKI is an effective way to measure TB knowledge (Ailinger et al., 2004). Community-based participatory interventions that recognize the uniqueness of each person, address barriers, and are culturally sensitive are most successful (Weiland et al., 2011; Weiland et al., 2012; Weiland et al., 2013). Making the service convenient and accessible is important (Tamkimovich, 2013). Providing community-based TB education to improve TB knowledge and decrease the fear of TB stigma may encourage individuals from at-risk populations to make a medical decision to seek TB screening.

Theoretical Framework

The Health Belief Model (HBM) was the conceptual framework selected to guide the DNP project to improve an individual’s knowledge of TB. This psychological model based on behavioral science was initially developed to explain why individuals did not partake in free TB screening (Hochbaum, 1956; Rosenstock & Stretcher, 1997). The HBM continues to be utilized in current research to explain and predict health behaviors related to TB (Chang et al., 2007; Li et al., 2015).

The model originally identified four perception-dependent health behaviors that determine whether or not screening will be sought. These behaviors or components of the model included: 1) perceived susceptibility to disease, 2) perceived severity of disease, 3) perceived benefits of treatment, and 4) perceived barriers to treatment. More recently two additional components were added: 5) Cues to Action or motivation and 6) self-efficacy (Glanz, Rimmer, & Lewis, 2002). The components of the model can be examined individually or in combination to
explain the health behavior (See Appendix B).

According to the HBM, an individual is more likely to seek care for TB if the person believes that there is a susceptibility to developing TB (perceived susceptibility), and that will lead to getting sick or dying from TB (perceived severity). If the individual believes that the action to seek care will provide the benefit of reducing susceptibility to getting TB (perceived benefits), and the anticipated barriers to seeking care do not overwhelm the benefits (perceived barriers), then action will be taken. Self-efficacy explains how confident an individual is in the ability to take action. Cues to action are motivational strategies that can activate one’s readiness, such as the proposed educational intervention (Glanz et al., 2002).

Methods

Goals and Objectives

The goal of the DNP research translation project was that participants would demonstrate an improvement in TB knowledge. The TBKI, a valid, published tool, was used to measure TB knowledge. Permission was obtained from the author to use the English version of the TBKI (see Appendix A) with the Filipino American participants since English is the official language of the Philippines. The 20-item English version of the tool, with a sixth-grade reading level and content validity of 0.81, was also provided by the author. The TBKI and how it was adapted for this project is more fully described under the heading Measurement Instrument (see Appendix I). Based on the scored pre-test and post-test responses, the DNP student was able to:

1. Determine what the baseline knowledge of TB was for participants before the educational session, as evidenced by the mean pre-test score.

2. Measure if there was an improvement in knowledge of TB for participants after the educational presentation, as evidenced by an increase in the mean post-test score as compared to
the mean pre-test score.

3. Analyze the mean pre-test score and the mean post-test score for each of the 14 items of the adapted TBKI to measure if there was an improvement in the mean post-test score of each item.

Ethical Considerations/Protection of Human Subjects

The Human Determination Form was submitted to the Institutional Review Board (IRB) of the University of Massachusetts Amherst (UMass). The DNP project was exempted from IRB review (see Appendix L). Ethical considerations and protection of human subjects were adhered to by the DNP student with the planning and implementation of the DNP project. This research translation project provided a TB educational presentation to members of the Filipino American community who are at risk for developing TB, which is a health disparity. This community-based educational intervention used evidence-based TB information approved by the CDC. There was no difference in the identified or anticipated risk from participating in this educational presentation. Participation was voluntary. No protected health information or individual demographics were collected. All participants signed an Informed Consent form (See Appendix D), and each participant was given a duplicate copy of this form. Signed informed consents and completed forms were secured in a locked cabinet by the DNP student. The anonymous pre-and post-test forms were assigned unique numbers to evaluate if TB knowledge had improved. Only the completed forms from those adult individuals who self-identified as Filipino Americans were used for data analysis. Completed forms from other individuals not of Filipino descent were collected but not used. The community center did not require IRB approval.

Project Design

This research translation project utilized a community-based participatory approach to
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Develop and implement a TB education program for Filipino Americans, who are an at-risk group for developing active TB disease. PowerPoint slides about TB from the Hawaii DOH and CDC TB handouts (See Appendices E and G) provided the culturally sensitive TB educational materials used for the TB program. Using a pre-test/post-test design, the adapted TBKI tool consisted of 14 items with a true/false/“don’t know” format (See Appendix I) to evaluate if there was an improvement in the TB knowledge of participants.

Project Site

The educational presentation was implemented in a local community center in Woodside, New York, located in Queens County. The community center serves a local Asian Christian community primarily Filipino American. There is a church for religious services and an adjoining fellowship hall where the community partakes in a dinner following services, as well as attending community meetings and activities such as nutrition classes and hypertension screening. This project was developed by utilizing a community-based collaborative approach. In the weeks before presentation, several preliminary discussions with the health committee covered topics such as where and when the project would take place, how to advertise, and what audiovisual equipment would be needed. The PowerPoint slides (See Appendix E) used with permission from the Hawaii DOH (See Appendix F), and CDC handouts (See Appendix G) were reviewed.

The community center has a health committee that is headed by the pastor and three volunteers with health care backgrounds. They are the internal stakeholders who represented the community. It was agreed that the presentation would be open to all adults who were older than 18 years. Participation would be voluntary and members of the local community would also be included if they wanted to attend the presentation. No demographic information or health
information would be collected; the Pre-Assessment and Post-Assessment forms would be anonymous. Informed consent for each participant would be obtained before the presentation (See Appendix D).

The Medical Director of the local public hospital TB clinic agreed to accept any person who requested a referral for screening, consultation and possible treatment (See Appendix C). The DNP student also met with the nurses of the TB clinic to establish how best to have participants contact the clinic for an appointment. These health care providers were considered to be external stakeholders. Information about local New York City Department of Health and Mental Hygiene TB Clinics was also available and posted. Care is provided at all these sites without regard to immigration status, and this information was made known to all.

**Community Assessment**

There is a large representation of Filipino Americans living in the Woodside; it is a neighborhood in Western Queens County with a significant number of active TB cases (BTBC, 2017). According to the Asian American Federation (AAF), the census statistics reported that there were about 82,000 Filipino Americans living in NYC. In fact, 56% of all Filipino Americans live in Queens. They represent seven percent of the total Asian American population and are the fourth largest subgroup after people of Chinese, Koreans and Japanese heritage. The Filipino American community is comprised of 68% immigrants. Of these immigrants, 32% have come to the U.S. since 2000. Overall, 56% of Filipino Americans are naturalized citizens. English is the national language of the Philippines; Filipino Americans’ English language proficiency is superior to that of other foreign-born ethnic minorities. Filipino Americans have large households, with 39% owning their own homes (AAF, 2013). Participation in an ethnic community is customary (Choi, 2009). The local faith-based congregation is an example of this.
Setting, facilitators, and barriers. The pastor and health committee members of the community center were motivated to provide health education to their members and the community at large. Their support facilitated the implementation of the TB education program. They donated the use of the space in the Fellowship Hall since it was available for use at that time. A podium, microphone, and laptop computer with a projector were also provided by the health committee members.

Several possible barriers which could have affected attendance at the presentation were identified and addressed to facilitate success. Federal immigration policy may have presented a concern for some individuals who might not want to bring undue attention to themselves. To reduce this barrier, the DNP student met with the community several times at fellowship events in the weeks before the presentation. This was done to promote familiarity between the community members and the DNP student. The participants were also assured that no demographic information would be collected and that the forms were anonymous.

There may have been a reluctance to attend a class on TB since this could imply that one needed to know about TB, and that may be associated with fear of stigma. A flyer on display in the fellowship hall advertised the event in advance. The poster highlighted why the topic on TB might be relevant to someone living in Queens. The poster also advertised the time and date of the program. A person who was not willing to participate may have chosen not to come to the center at that time. The community members were informed that participation was voluntary, and that there would not be a penalty for refusing to participate.

Time to participate in the program was limited to approximately 30 minutes, which included completing pre-test, viewing the presentation, allowing time for questions, completing post-test, and doing the raffle. The health committee identified that waiting to have the program
after the meal would decrease the number of people who would attend it. Based upon this recommendation, the material was presented after a church service during the fellowship meal on Sunday evening. The raffle of six gift cards to a local popular discount retail chain was a well-received incentive to promote participation.

An adult volunteer assisted with general administrative duties. The volunteer was also directed to assist any participant with reading or completing the forms if requested to do so. The volunteer was cautioned not to coach or explain any item (See Appendix H). No one requested help with interpretation from the volunteer. To allay test-taking anxiety, the anonymous forms were labeled Pre-Assessment and Post-Assessment, not pre-test and post-test. It should be noted that the terms pre-test and post-test were used for data analysis.

Implementation

The project planning with the key stakeholders began in October 2017, and the presentation occurred on November 5, 2017. It was well attended so there was no need to repeat the program. The project timeline continued after the presentation was completed and included analysis of the results, and dissemination of the information continued until April (See Appendix K). Event planning, preparation of handouts and incentives for participants, orientation of the volunteer, space and equipment procurement, along with associated costs, have been described in the project implementation procedure (See Appendix H).

Audiovisual

Audiovisual aids that were endorsed by the CDC for the program were found on the Internet. The Hawaii DOH had developed a PowerPoint slide deck and titled it “What You Should Know about TB.” It was made readily available online in English, Tagalog, and Ilocano, and the slides were culturally tailored to the large Filipino community living in Hawaii (See
Appendix E). The Hawaii DOH gave written permission to use the slides and confirmed that the slides are still being used (see Appendix F). These English versions of the slides were compatible with the online CDC patient education resources used in the presentation.

**Handouts**

The official CDC TB patient education handouts were obtained online (See Appendix G). The booklets were shipped free of charge from the CDC to the DNP student (CDC, 2016c). The official CDC handouts were designed to be culturally sensitive while providing easily understood TB information without causing undue psychological discomfort. The handout, *TB: What You Need to Know about Tuberculosis Infection*, provided basic information about latent and active TB disease. The handout, *Get the Facts about TB Disease*, provided patient information on active TB disease; it was printed in English and Tagalog in the same booklet. Both handouts covered the information found in the PowerPoint TB presentation. Contact information about referral to the local TB clinic was affixed to the brochures. Fifty complimentary gift bags of nominal value were assembled and included the two CDC handouts with clinic referral information, a pen, and a copy of the Informed Consent form and several pieces of miniature candy. Extra copies of all the CDC handouts were given to the TB Clinic.

**Measurement Instrument**

The *TBKI* is a published tool used to measure TB knowledge of participants. The DNP student obtained a copy of the *TBKI*, along with permission to use and adapt it, from the author. Written communications with the author of the tool were chronicled in e-mails (See Appendix J). The original *TBKI* measured basic TB facts, health beliefs, treatment and medication (See Appendix A), and was based on the CDC guideline of 2000 (Ailinger et al., 2004). This guideline is still valid (CDC, 2000). The *TBKI* was adapted by the DNP student. Instead of 20
items, the adapted \textit{TBKI} was reduced to 14 items and included items 1, 2, 5, 6, 7, 11, 12, 14, 15, 16, 17, 18, 19, and 20 from the original \textit{TBKI}. These items focused on TB facts and health beliefs. The items were then renumbered from 1 to 14 (See Appendix I). The six items 3, 4, 8, 9, 10, and 13 about TB medications were removed with the author’s permission (See Appendix J), as this was not a focus of the TB presentation. The original \textit{TBKI} had a true/false/“don’t know” response format, and this was maintained in the adapted tool. The original \textit{TBKI} tool rubric had assigned a value of 5 points for each of the 20 items. Each of the 14 items of the adapted tool was worth 7.1 points. Each correct response had an adjusted value of +7.1, while an incorrect response or “don’t know” response had a -7.1 value.

The pre- and post-forms of the adapted \textit{TBKI} had an identical unique number assigned to each pair. This unique identification of the pre- and post-forms enabled tabulation and analysis of an individual’s scores, as well as the overall mean pre-test and mean-post test scores. The mean pre-test score and mean post-test score were compared to determine if TB knowledge had improved, which was the main goal of the DNP project. Each one of the 14 items had the mean pre- and post-test scores measured. This item analysis was done to establish if there was an improvement in TB knowledge for each concept tested. Analysis of the mean pre- and post-test scores for each item was used to identify any deficits or misperceptions for future presentations.

The English version of the \textit{TBKI} has a sixth-grade reading level and had a final content validity of 0.81. The Cronbach’s alpha score was established in Spanish-speaking Latino immigrants (Ailinger et al., 2004). The Cronbach’s alpha score for the English version of the \textit{TBKI} was not available. Cronbach’s alpha is the most widely used measure of reliability; a strong measure of reliability is in the range 0.70 to 0.95 (Tavakol & Dennick, 2011). In a research study, it would have been necessary to test reliability in Filipino Americans. This may
be a limitation of the data analysis for this research translation project since reliability was not specifically determined for Filipino Americans.

**Results**

Twenty-nine adult individuals volunteered to participate in the educational session given on November 5, 2017. Two packets were excluded from the data analysis, as the participants were not of Filipino descent, and two packets were excluded, as they were incomplete, resulting in a group of 25 participants. No one declined to participate. No demographic information was collected, and the forms were anonymous. Before the presentation, all the individuals signed an informed consent and completed the anonymous Pre-Assessment (pre-test) form. An anonymous Post-Assessment (post-test) form with the identical number was completed and collected after the presentation. Everyone was entered in the raffle. The program took 30 minutes, and the information was delivered by the DNP student. The volunteer handled the administrative details such as handing out and collecting papers, running the raffle and assisting participants according to the established procedure (See Appendix H). None of the Filipino American participants requested assistance when completing the Pre- or Post-Assessment forms.

**Data Analysis and Findings**

The data were analyzed using descriptive statistics, which were compiled and analyzed on an Excel spreadsheet. The *TBKI* instrument consisted of 14 items with a true/false/“don’t know” response. The individual mean pre-test and mean post-test scores for each participant were analyzed quantitatively using frequency, which was expressed as percentages (Polit, 2010). The individual participant pre- and post-test scores were determined, and the mean pre-test and mean post-test scores were then tabulated and compared. *Figure 2* illustrated the mean pre-test and mean post-test scores. The descriptive analysis for the first goal indicated that the baseline
knowledge of the participants had a mean group pre-test score of 69% for TB knowledge. The second goal demonstrated that there was an improvement from the mean pre-test score of 69% to a mean post-test score of 81%, with an overall improvement of 12%. This documented that there was an improvement in TB knowledge and the goal of improving TB knowledge was met.

**Figure 2. Mean Percent Correct**

The mean pre-test and post-test data for each of the 14 items were also analyzed using frequency as a percentage to measure the results of correct and incorrect responses (See Table 1). This table illustrated the mean pre-test to post-test scores for each item and included the overall grade differences for each item. The change in the mean pre-test and post-test scores for each item gave some insight into how the participants understood the concepts being evaluated. The Cronbach’s alpha score was not available for the English version of the TBKI, and reliability studies were not established for Filipino Americans. The analysis of the outcomes in this research translation study did not discuss reliability, and any inferences about results and reliability should be interpreted with caution.
The analysis of each test item showed an improvement of correct responses in 12 out of 14 questions (See Figure 3). This reflected an increase in knowledge related to latent and active TB knowledge.
Figure 3. Percent Correct Pre vs Post Test

Results for items 1, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, and 14 illustrated that there was an improvement in current understanding of the key evidence-based TB concepts. Items 2 and 7 did not demonstrate any change in the mean pre-test and post-test scores. There were no items that showed a decline in TB knowledge. Item 1 had the greatest improvement in the mean pre-test and post-test scores, with a difference of 48%. This confirmed that 96% of the participants knew that TB medicine can kill the germs in the body. Item 8, which focused on understanding how TB germs can be spread, also showed improvement, with a difference of 20% from the mean pre-test to mean post-test scores. The final analysis showed that 92% of the participants understood the concept of contagiousness.

Item 7 examined the misperception that not eating well during childhood is a cause for TB and did not show any improvement in understanding that a germ caused TB. The mean pre and post-test scores of 68% were unchanged. The presentation identified that bacteria is the cause of TB, and the participants demonstrated that they had some understanding of TB germ theory, as evidenced by the mean post-test score of 96% for item 1. The presentation also
identified eating well as essential for healthy living. Yamada et al. (1999) documented that eating poorly is a long-held theory of causation held by some Filipinos (Yamada et al., 1999). This unchanged result may be a reflection of a long-held belief and may be difficult to change a participant’s thinking. There is an opportunity in future TB presentations, to stress that bacteria causes TB, and while not eating well can contribute to getting sick, it does not cause TB.

For item 2, 76% of the participants understood that a positive tuberculin skin testing means that you were exposed to the TB bacteria. There was no change from the mean pre-test score to the mean post-test score for one-quarter of the group of participants who were not convinced of this. Item 5 measured the concept that someone with a positive tuberculin skin test who does not feel sick may have a LTBI, and should consider taking prophylaxis to prevent developing active TB disease in the future. The results demonstrated that only 56% of the participants understood this after the presentation. In the literature review, the findings for other groups demonstrated that it is challenging to convince an individual with a positive tuberculin skin test reaction that it may be due to exposure to *Mycobacterium tuberculosis*, since many individuals believe that BCG caused the reaction.

Item 11 explored what it means that the tuberculin skin test remains positive for life. While there was an improvement of 16% after the presentation, about one-quarter of the participants did not understand this concept. During the presentation, there was some confusion about this voiced by a participant who asked why his tuberculin skin test reading was negative, even though he had BCG vaccine. In many home countries, the tuberculin skin test is not routinely done because prophylaxis is not offered forLTBI. It may be an assumption in the home country that the tuberculin skin test could always be positive due to BCG (a false positive result). In the U.S., without proper written documentation of a positive tuberculin skin test reading,
a verbal history of cannot be assumed to be true. The guideline directs that once the tuberculin skin test has been properly documented as a positive reaction by a health care provider, and followed with a chest X-ray, it is no longer necessary to repeat a tuberculin skin test (CDC 2013a). This was a difficult question to answer during the presentation and may have confused some participants (CDC, 2013a, p.48-61). For future presentations, it would be better to instruct the participants beforehand that it is not possible to discuss an individual’s case, and it is also better to hold general questions until the end of the presentation. Individuals with concerns like this should be offered a referral to a TB clinic to have a follow up with a TB provider.

Analysis of items 6 and 10 also suggests that there were misperceptions that BCG does not protect a person from getting TB for life. Since immunity from the BCG may wane over time, an exposure to Mycobacterium tuberculosis could result in developing LTBI or active TB disease. With item 6 about one-quarter of the participants did not understand this concept after the presentation. For item 10, only 24% of participants correctly recognized this concept before the presentation, and after the presentation, only 52% had improved knowledge that BCG does not protect for life. Changing a person’s fervent beliefs about this issue is difficult. These are similar to findings of BCG misperceptions in other foreign-born populations (Abarca Tomás et al., 2013). This misperception also provides an opportunity for future presentations to provide more information about BCG vaccine (CDC, 2016b).

The outcomes found in this research translation project are consistent with the outcomes identified in the literature that measured TB knowledge in foreign-born persons (Abarca Tomás et al., 2013). There were no specific research studies that looked at tuberculin skin testing or BCG understanding for Filipino Americans; however, these misconceptions have been documented by researchers with other foreign-born populations (Ailinger & Dear, 1997; Ailinger
et al., 2004). Many other studies documented that it was difficult to change long-held beliefs about TB (Ailinger et al., 2004; Chang et al., 2007; Colson et al., 2010; Colson et al., 2013; Colson et al., 2014). The DNP student did not test the TBKI for reliability in Filipino Americans and any inferences made about the reliability of these results for the Filipino Americans should be interpreted with caution. This was a limitation of this research translation project.

Demographic data were not collected about participants, so it was not possible to correlate the item responses with age, marital status, years of education or number of years living in the United States. This was beyond the scope of the DNP project.

Discussion

According to the HBM (See Appendix B), an individual is more likely to seek care for TB if the person believes that there is a susceptibility to developing TB, and it will lead to potentially serious consequences such as death. Individuals diagnosed with LTBI may not understand the benefit of secondary prevention. Since the individual does not feel sick, and the lungs do not show damage, the individual does not perceive susceptibility to contracting TB. Furthermore, because taking medications may have side effects, and treatment is prolonged over several months, an individual may doubt the perceived benefits of taking preventive treatment. Another barrier is the inconvenience of medical visits, which could affect employment (Chang et al., 2007).

The concept that the BCG vaccine may lead to false positive tuberculin skin tests is confusing. Individuals may not understand that the effectiveness of the BCG vaccine may wane over time. Those who have been exposed to Mycobacterium tuberculosis may have misperceptions about the BCG vaccine’s lifelong effectiveness, and may decline to be screened or treated for LTBI. The TB case rate for the Filipino population in NYC (BTBC, 2017) supports
the idea that there could be a false sense of security regarding BCG. This may have altered many individuals’ perception of susceptibility to TB. Confidence in the LTBI plan of care is essential, or it will not be successful.

Fear of deportation is another barrier. The stigma associated with TB, even if it is a latent infection, could cause fear. The person may experience anxiety that bringing attention to oneself about TB may also affect the person’s family. The cultural explanations about how a person gets TB and fear of how one is treated are ingrained in how a person reacts to a TB diagnosis (Chang & Cataldo, 2014; Craig et al., 2017; Li et al., 2015; Storla et al., 2008; Yamada et al.,1999).

An alternative solution to screen for TB by using blood analysis using an IGRA instead of tuberculin skin test in adults who are likely to be infected with *Mycobacterium tuberculosis* has been shown to be moderately cost-effective and should remove the confusion associated with BCG vaccination (Campbell et al., 2015). The review by Lewinsohn et al. (2016) also recommended using an IGRA instead of tuberculin skin testing in adults from at-risk groups who are likely to be infected. This statement also cautioned that tuberculin skin testing can be used if IGRA is not readily available, burdensome, or too costly (Lewinsohn et al., 2016). This recommendation sought to address the confusion in diagnosing TB due to potentially false positive tuberculin skin testing readings, which may be confounded by BCG vaccine (CDC, 2016b). Conversely, if the tuberculin skin test is not administered properly, it could result in a false negative test result (Abarca Tomás et al., 2013). In 2013, the CDC compiled a list of False Positive and False Negative reactions to the tuberculin skin test reaction (CDC, 2013a, p.57). These discrepancies are confusing for the individual, and may affect a person’s ability to understand the risk of a latent TB infection.

There is very little research on the HBM and Filipino health beliefs about TB, BCG,
tuberculin skin testing, and the need for screening for LTBI. More research is needed to understand how to address unfounded beliefs more effectively. It is necessary to continue to provide TB education to members of the Filipino American community to dispel misperceptions and reduce the fear of TB stigma among those who are at increased risk of developing TB.

Education is identified in the HBM as Cue to Action since it may affect someone’s motivation to seek care for TB. The DNP student focused on the concept of Cues to Action by developing an educational program on TB. Testing the participants who were given this information did verify an improvement in TB knowledge. This improvement in TB knowledge may encourage individuals to interact with health care providers or to make a medical decision to seek care for TB sooner (Abarca Tomás et al., 2013).

The DNP project to provide community-based TB education for Filipino Americans was compatible with the goals and recommendations of the IOM, the AHRQ, the current USPSTF guideline on LTBI, the CDC and BTBC government initiatives, along with the current literature review. This gap in knowledge may affect whether a person seeks health care for TB; therefore, TB education is needed to address this health disparity for Filipino Americans. Providing evidence-based TB education has been widely supported since improved TB knowledge may empower an individual from an at-risk group to seek TB screening.

Educating the Filipino American community about TB has proven to be an effective intervention to address the health disparity. This outreach project also provided more opportunities for the DNP student to foster a stronger bond with members of the Filipino American community to assist them in dealing with this health disparity, as well as others. The challenge is to continue to address the misperceptions and fear of TB stigma by reaching out to at-risk communities to provide more culturally sensitive TB education.
IMPLEMENTATION OF COMMUNITY-BASED EDUCATION

Conclusion

In 2016, members of the Filipino population in NYC had a TB case rate that was 31 times as high as the TB case rate for the general U.S. born population. This significant health disparity was documented in the NYC public health statistics (BTBC, 2017). This evidence-based education project used a CDC approved PowerPoint presentation in English on TB and CDC handouts. The goal to improve the participants’ knowledge of TB was achieved. There was an improvement in the mean post-test score of 81% when compared to the mean pre-test score of 69%. There was also an improvement in TB knowledge demonstrated in 12 out of 14 of the items in the adapted TBKI. While the participants did demonstrate improved TB knowledge, it was shown to be more difficult to dissuade a person to refute long-held beliefs about BCG vaccine and tuberculin skin testing. This challenge also provides opportunities to clarify these misperceptions in future presentations. Providing community-based educational programs on TB has been proven to be an effective intervention. With TB education, a person at-risk for TB may be empowered to engage the health care system. Having improved TB knowledge may also enable a person to make an informed medical decision to get screened for TB. Many cases of active TB disease could be prevented, and thus the health disparity would be addressed. Education is essential to address the TB health disparity in at-risk populations to protect the health of the individual, the community, and ultimately the public health of all New Yorkers.
IMPLEMENTATION OF COMMUNITY-BASED EDUCATION

References


http://dx.doi.org/10.1080/1355785022000060718


http://dx.doi.org/10.1001/jama2016.10357


IMPLEMENTATION OF COMMUNITY-BASED EDUCATION


http://doi.10.1371/journal.pone.0032158


## Appendix A

### Original TB Knowledge Instrument

Reprinted with permission of Dr. Rita Ailinger


<table>
<thead>
<tr>
<th>Knowledge of Tuberculosis (TB) Questionnaire</th>
<th>True</th>
<th>False</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The medicine for tuberculosis (TB) acts by killing the TB germs that are in your body.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>2. If you have a positive reaction to the TB skin test that means that you have been exposed to someone with TB.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>3. Once you have begun treatment with INH, you must continue it every day for 3 months.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>4. It is important that you keep clinic appointments while on TB medicine because you must be observed for side effects.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>5. One can contract TB if you are hot and go out in the cold air.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>6. If you do not kill the germs of TB infection you could get contagious TB with symptoms such as cough and fever.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>7. A person with a positive TB skin test needs to take pills, although he/she does not feel sick.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>8. If you believe that the INH pill makes you sick, simply stop taking it.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>9. If you feel your hands get numb while you are taking INH, do not pay attention to it.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>10. You cannot drink alcohol (beer, wine, liquor) during the time you are taking INH.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>11. If you were vaccinated against TB when you were a baby, you cannot develop TB.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>12. Not eating well during childhood can cause TB.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>13. While on TB medicine, brown urine is normal.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>14. A person with active TB cannot give the germs to someone when coughing or talking.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>15. TB is a disease that can be fatal.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>16. The BCG protects you for life from getting TB.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>17. If your skin test for TB is positive it will always be positive.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>18. TB affects only poor people.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>19. You should eat a well balanced diet while you are on TB medicine.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>20. A negative chest X-Ray means that you do not have active TB.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

*TBKnow 4-8-04  5th grade  © Ailinger & Lasus, 2001, 2002*
Appendix B

Theoretical Model

Health Belief Model

(Rosenstock, & Stretcher, 1997; Glanz, Lewis & Rimer, 2002)
Appendix C

Referral to TB Clinic

Elmhurst Hospital Center

May 1, 2017

To Whom It May Concern:

Participants in the Community Outreach by Eileen Damante ANP who request to be screened for Tuberculosis can be referred to the TSTU, which is the TB Clinic at Elmhurst Hospital.

Thank you.

George Alonso, MD
Director,
Infection Prevention and Tuberculosis Services
Elmhurst Hospital Center
7901 Broadway
Elmhurst, New York 11373
(718) 334-3077

New York City
Health and Hospital Corporation
Affiliated with
Mt Sinai School of Medicine
Appendix D

Informed Consent for the Educational Project

**Informed Consent Form**

1. The class on Tuberculosis is based upon information from the Centers for Disease Control (CDC). Handouts are from the CDC.

2. The class is provided by Eileen Damante, a Nurse Practitioner who is doing this class as part of her capstone project for her Doctoral Degree from the University of Massachusetts in Amherst.

3. Participating is voluntary, and if I do not decide to do so, nothing will happen to me.

4. If I change my mind during the class, and decide not to participate, I can do so.

5. No personal information will be collected on me. Participation in this class is anonymous.

6. There will be two anonymous forms to be completed. One form will be completed before the PowerPoint Slide Presentation and the other after the presentation. No personal information is collected on these forms.

7. The class is free.

8. If someone requests it, there will be a way to get a referral to the TB clinic at Elmhurst Hospital.

9. The slide presentation will take about 15 minutes. Allowing time for the forms to be completed, allow about 30 minutes.

10. There will be opportunities to ask questions.

________________________________________________________________________

I agree to participate in the class.

Signature                        Date
Appendix E

PowerPoint Slides - What you should know about TB

What you should know about TB. Power Point slides presenting basic TB information for the general public. Presentation stresses difference between latent TB infection and active TB disease, and how TB is spread.

Developed by the Hawaii State DOH/ Tuberculosis Control Program  June 2002

Title

What you should know about TB

Hawaii TB Control Program
Telephone (808) 832-5731
Revised June 2002
Appendix F

Written Communication from Susan Schorr Granting Permission to use PowerPoint Slides from the Hawaii State DOH, TB Control Program

-----Original Message-----
From: efdamante
To: Susan. Schorr
Sent: Mon, Feb 13, 2017 9:20 pm
Subject: Re: DNP Student Request to use DOH TB Slides

Dear Susan,
Thank you so much!

Best regards,

Eileen

-----Original Message-----
From: Schorr, Susan F
To: efdamante
Sent: Mon, Feb 13, 2017 9:07 pm
Subject: RE: DNP Student Request to use DOH TB Slides

I enjoyed speaking with you also.
You may use the power point slides as you wish. I actually use an English version of them when I hold a TST Workshop. They have been around for quite a while. Some things just do not change. Especially the basics.

Best of luck to you.

Susan

Susan Schorr, RN
TB Nurse Consultant
1700 Lanakila Ave.
Ground Floor
Honolulu, HI  96817
Appendix F

Communications with Hawaii DOH

Written Communication from Susan Schorr Granting Permission to use PowerPoint Slides from the Hawaii DOH, TB Control Program

Sent: Monday, February 13, 2017 3:51 PM  
To: Schorr, Susan F.  
Subject: DNP Student Request to use DOH TB Slides

Dear Ms. Susan Schorr:

Greetings. It was a pleasure to speak with you today. I understand that you are the Registered Nurse Consultant of the Hawaii DOH TB Control Program. I am very grateful that you stated that I can use the PowerPoint Slides: “What You Should Know about TB.” These slides are readily available at the Hawaii DOH TB Control website address: [http://health.hawaii.gov/tb/patient-education/](http://health.hawaii.gov/tb/patient-education/) in English, Ilocano and Tagalog. Since they are in the Public Domain, I do not need written permission to download or use them.

As we discussed, I am planning to use them in Educational Presentations on Tuberculosis for the Filipino Community in Queens, NYC. These presentations will take place in the fall of 2017, and are to be used for my capstone project, which is in partial fulfillment of the DNP Degree at the University of Massachusetts Amherst. I promise to properly credit the Hawaii Department of Health in my DNP paper, and also if there is any future publication of my paper.

I truly appreciate all your help. Please reply to me regarding this e-mail as I would like to update my UMass Capstone advisor, Dr. Zucker about my approved use of these slides on TB. Again, thank you for your assistance in this matter.

Sincerely,

Eileen Damante RN, MSN, ANP-BC
Appendix G

CDC Handouts

CDC Handouts obtained from https://www.cdc.gov/tb/publications/culturalmaterials.htm (Centers for Disease Control and Prevention [CDC Handout], 2016) Patient Education Series

Get the Facts About TB Disease

- English
- Spanish/English
- Tagalog/English
- Vietnamese/English
### Appendix H

**Project Implementation Procedure and Cost Analysis**

**Development Procedure for TB Education Program**

Prerequisite: Ethical Considerations/Protection of Human Rights observed:
No demographic information collected. Forms are anonymous. Participation is voluntary.

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDC Audiovisual Aides were obtained by the DNP Student</td>
<td>Free</td>
</tr>
<tr>
<td>PowerPoint Slides What</td>
<td>Free</td>
</tr>
<tr>
<td>50 copies of 2 CDC booklets on TB</td>
<td>Free</td>
</tr>
<tr>
<td>Preparation of Supplies for Program Performed by DNP Student</td>
<td>Cost</td>
</tr>
<tr>
<td>50 copies of each form labeled Pre-Assessment and Post Assessment were made. Each pair of anonymous Pre and Post forms were given identical numbers, collated and place in an individual folder.</td>
<td>100 X .10 $10.00</td>
</tr>
<tr>
<td>100 copies of the Informed Consent forms were made. 50 forms were allocated to be used with the participants. 50 forms were reserved to be given to the individual once the original form by the participant.</td>
<td>100 X .10 $10.00</td>
</tr>
<tr>
<td>Six gift cards to a local retail chain in the amount of $25.00 were obtained for the raffle.</td>
<td>25X6 $150.00</td>
</tr>
<tr>
<td>Miniature candy was obtained (7 pieces per gift bag).</td>
<td>350 $25.00</td>
</tr>
<tr>
<td>50 complimentary gift bags were assembled and included: the 2 CDC handouts with TB clinic referral information, a pen, and candy</td>
<td>50 gift bags $25.00</td>
</tr>
<tr>
<td>Supplies: Pens</td>
<td>$10.00</td>
</tr>
<tr>
<td>50 pens</td>
<td></td>
</tr>
<tr>
<td>50 folders</td>
<td>$20.00</td>
</tr>
<tr>
<td>Thumb drive and computer owned by DNP student</td>
<td>$0.00</td>
</tr>
<tr>
<td>Hardware</td>
<td></td>
</tr>
<tr>
<td>Subtotal</td>
<td>$250.00</td>
</tr>
<tr>
<td>Preparation with the Stakeholders for the Program</td>
<td>Cost</td>
</tr>
<tr>
<td>Use of space for Program</td>
<td>Free</td>
</tr>
<tr>
<td>Podium, Microphone, Computer for Presentation, Screen</td>
<td>Free</td>
</tr>
<tr>
<td>Adult Volunteer (&gt;18yo) Oriented By DNP</td>
<td>Free</td>
</tr>
<tr>
<td>Volunteer Time Donated</td>
<td>Free</td>
</tr>
<tr>
<td>Orientation to Project Implementation Procedure</td>
<td></td>
</tr>
<tr>
<td>1. Assist with set up for the presentation as needed. Handout gift bags and folders with collated forms.</td>
<td></td>
</tr>
<tr>
<td>2. Obtain a signed informed consent form for each participant, then place them in a secure envelope and when all are collected, seal the envelope. An identical Informed Consent form should be given to each participant. (If asked, the completed Informed Consent Forms will be placed in a locked file cabinet by the DNP student).</td>
<td></td>
</tr>
<tr>
<td>3. Assist any participant as needed. Only read the item. Do not give additional explanation. If the person does not know, to avoid guessing have the person choose “don’t know” response.</td>
<td></td>
</tr>
<tr>
<td>4. Instruct participant to hand in the completed Pre-Assessment Form Collect each completed form. If anyone is not self-identified to be of Filipino descent, put that form aside, and mark it Not Filipino.</td>
<td></td>
</tr>
<tr>
<td>5. Assist with the breakdown and clean up.</td>
<td></td>
</tr>
<tr>
<td>Project on Completion</td>
<td>Total Cost $250.00</td>
</tr>
</tbody>
</table>
## Appendix I

**Adapted TB Knowledge Instrument (TBKI) for DNP Project**

[ ] Pre-Assessment  
[ ] Post-Assessment

Instructions: Answer the question “True” “False” or “Don’t Know”

<table>
<thead>
<tr>
<th>#</th>
<th>Statement</th>
<th>True</th>
<th>False</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The medicine for TB acts by killing the TB germs in the body.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>If you have a positive reaction to the TB skin test, that means you have been exposed to someone with TB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>One can contact TB if you are hot and go out into the cold air</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>If you do not kill the germs of TB infection, you could get contagious TB with symptoms such as cough and fever</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>A person with a positive TB skin test needs to take pills, although he/she does not feel sick</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>If you were vaccinated against TB, when you were a baby, you cannot develop TB.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Not eating well during childhood can cause TB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>A person with active TB cannot give the germs to someone when coughing or talking.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>TB is a disease that can be fatal.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>The BCG protects you for life from getting TB.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>If your skin test for TB is positive, it will always be positive.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>TB only affects poor people.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>You should eat a well-balanced diet when taking medications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>A negative chest X-ray means that you do not have active TB.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix J

Emails from Professor Rita Ailinger regarding TB Knowledge Instrument

Sent: Fri, Feb 17, 2017 10:45 pm
Subject: Re: UMass DNP follow up about TB Knowledge Instrument request

From: Rita Ailinger

Don't know counts as incorrect.

On Feb 17, 2017

Dear Rita,
Your grading rubric of 5% per question is very clear. The only question that I have is how to count 'don't know' responses. If the person answers "don't know", do I count it as if they answered incorrectly? I understand why you put that option into the instrument to avoid guessing. I appreciate all your help. Sorry to have so many questions.
Best,
Eileen

----Original Message------
From: Rita Ailinger
To: efdamante
Sent: Fri, Feb 17, 2017 1:02 pm
Subject: Re: UMass DNP follow up about TB Knowledge Instrument request

Eileen,

The TB Knowledge Instrument had 20 questions and each one counted 5%. You are welcome to revise the instrument in accordance with your research goals.

Rita
Appendix J
E-mails from Professor Rita Ailinger regarding TB Knowledge Instrument

To: Rita Ailinger  
Subject: Re: UMass DNP follow up about TB Knowledge Instrument request

Dear Dr. Ailinger,

Greetings. I had a meeting with my capstone advisor, Dr. Donna Zucker. She asked me to contact you regarding the TB Knowledge Instrument.

- Could you please provide me with the grading rubric for the TB Knowledge Instrument?
- The focus of my capstone is to provide an educational presentation on TB in the community. The participants will not be on any LTBI medications yet. In the instrument, there are six questions which pertain to LTBI treatment. May I remove these questions from the test, or would this be a problem with using the tool? All the other questions would be included as written

Thank you for your consideration of this matter. I really appreciate all your help.

Sincerely,
Eileen

-----Original Message-----
From: Rita Ailinger  
Sent: Wed, Feb 1, 2017 2:06 pm  
Subject: Re: UMass DNP follow up about LTBI Knowledge Instrument request

Please see attached instrument.
Good luck on your research.

-----Original Message-----

Sent: Monday, January 30, 2017 10:21 AM  
To: Rita Ailinger  
Subject: UMass DNP follow up about LTBI Knowledge Instrument request

Dear Dr. Ailinger,

Greetings. I was able to contact my adviser, Dr. Zucker (see below). May I have a copy of the LTBI Knowledge Instrument, or please advise me how to obtain a copy.
Your help is greatly appreciated.
Sincerely,
Eileen Damante

-----Original Message-----
Appendix J
E-mails from Professor Rita Allinger regarding TB Knowledge Instrument

From: Donna Zucker

Sent: Sat, Jan 28, 2017 6:33 am
Subject: Re: Need meeting re Capstone 2 project updated idea for project

Hi Eileen. Good to hear from you. Let’s set up a zoom or phone call (whatever works for you) on February 14, 9 am.
If you have permission to use the tool then just ask for a copy unless it is published and publicly available.

Donna
Donna M. Zucker, RN, PhD, FAAN
Professor
Associate Dean for Academic Affairs
College of Nursing
Principal Investigator
SBIRT: The Power of Nursing to Change Health
20 Skinner Hall
651 No. Pleasant St.
Amherst, MA 01003

-----Original Message-----
From: Rita
to: efdamante
Sent: Fri, Jan 20, 2017 3:11 pm
Subject: Re: UMass Amherst DNP student interested in LTBI research

I'd suggest that the answer to both questions is "yes".
Appendix J
E-mails from Professor Rita Ailinger regarding TB Knowledge Instrument

Dear Professor Ailinger,


Thank you so much for permitting me to use the LTBI Knowledge Instrument (Ailinger, Armstrong, Nguyen, & Lasus, 2004). I am planning to consult with my advisor, Dr. Donna Zucker. I will obtain the required documents needed for you and your colleague, Dr. Lasus. I will send them to you as soon as possible.

I have 2 questions about the Instrument.

1. In the article, you indicated that the Spanish Version of the instrument had moderate reliability. It was used predominantly in immigrants from Central America and Bolivia. Would it be reliable to use this instrument in other Latino groups such as Mexicans, Ecuadorians, people from the Dominican Republic and other Hispanic countries?

2. The reliability of the TB Knowledge Instrument - English Version is 0.81. Would it be reliable to use the instrument with Filipino Immigrants? English is designated as the official language of the Philippines along with Filipino.

Again, thank you for your consideration in this matter. I look forward to hearing from you.

Sincerely,
Eileen Damante

-----Original Message-----
From: Rita
To: efdamante
Sent: Tue, Jan 17, 2017 7:43 pm
Subject: Re: UMass Amherst DNP student interested in LTBI research

Dear Ms. Damante,

You are most welcome to use the instrument. Please include the citation on the tool and send me any publications that result from publication.

Best of luck with your research on this important topic.

Rita Ailinger, PhD, RN
Lecturer
UMASS-Boston
### Appendix K

**Timeline of the Project**

*Simplified Project Timeline for Educational Intervention on TB*

<table>
<thead>
<tr>
<th>Task</th>
<th>October 2017</th>
<th>November 2017</th>
<th>December 2017</th>
<th>January 2018</th>
<th>February 2018</th>
<th>March 2018</th>
<th>April 2018</th>
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<tbody>
<tr>
<td>Meet with community stakeholder to finalize project details and communicate about ongoing plans.</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Recruitment of eligible participants</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Prepare the site for the presentation</td>
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<tr>
<td>Prepare the packets for educational presentations</td>
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<tr>
<td>Obtain the gift cards</td>
<td>X</td>
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<tr>
<td>Complete Informed Consent, and maintain forms securely in locked cabinet.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Pre-Assessment administered</td>
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<tr>
<td>Complete Educational Intervention provided</td>
<td>X</td>
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<tr>
<td>Post-Assessment administered</td>
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<tr>
<td>Pretest/ Posttest and Analysis of outcomes</td>
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<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Complete final project results with interpretation</td>
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<tr>
<td>Present results to local stakeholders and at Scholarship Day</td>
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Appendix L

IRB Exemption

MEMORANDUM – Not Human Subject Research Determination

Date: September 26, 2017
To: Eileen Fortune Damanite, Nursing

Project Title: Implementation of Community-Based Education to Promote Knowledge of Tuberculosis for Filipino Americans in New York City

IRB Number: 17-147 (REVISED)

The Human Research Protection Office (HRPO) has evaluated the above named project and has made the following determination based on the information provided to our office:

☐ The proposed project does not involve research that obtains information about living individuals.

☐ The proposed project does not involve intervention or interaction with individuals OR does not use identifiable private information.

☒ The proposed project does not meet the definition of human subject research under federal regulations (45 CFR 46).

Note: This determination applies only to the activities described in the submission. If there are changes to the activities described in this submission, please submit a new determination form to the HRPO.

Please do not hesitate to call us at 413-545-3428 or email humansubjects@ora.umass.edu if you have any questions.

Iris L. Jenkins, Assistant Director
Human Research Protection Office