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Walden University
2014

Abstract

Factors Influencing Diabetes Self-Management of Filipino Americans with Type 2 Diabetes Mellitus

by

Jocelyn B. Sonsona

MA, Adventist University of the Philippines, 1995

AB, Notre Dame of Midsayap College, 1985

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Health

Walden University

February 2014

Abstract

There is an increasing prevalence of Type 2 diabetes mellitus among Filipino Americans. However, how well Filipino Americans with diabetes self-manage their disease and what factors influence their diabetes self-management behaviors remain unknown. Based on a holistic approach, this quantitative study was designed to investigate the diabetes self-management behaviors of this population and the factors influencing their diabetes self-management behaviors. The combined roles of diabetes knowledge, diabetes self-efficacy, spirituality, and social support were examined in predicting diabetes self-care behaviors. A convenience sample of 113 Filipino Americans with Type 2 diabetes mellitus completed the Diabetes Knowledge Test, Self-Efficacy for Diabetes Test, Daily Spiritual Experience Scale, Diabetes Social Support Questionnaire-Family Version, Summary of Diabetes Self-Care Activities (Expanded), and a researcher-designed sociodemographic survey. A single sample *t*-test determined that the participants engaged well in diabetes self-management practices. Multiple regression analyses revealed self-efficacy, spirituality, and social support were predictive of diabetes self-management behaviors, even after controlling for the effect of the confounding variables (e.g., acculturation, socioeconomic status, immigration status, education). The implications for positive social change include the potential impact of educating clients with diabetes and their family members about the connections between self-efficacy, spirituality, and family social support in the self-management of diabetes. Furthermore, the use of a holistic approach by health professionals would improve diabetes self-management practices of Filipino American population with Type 2 diabetes mellitus.

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Dedication

This work is dedicated to the loving memory of my grandmother, Clemencia Canini Belarmino, whose belief in the pursuit of education inspired me to aim higher in my academic journey and to the loving memory of my father, Guillermo Meguiso Sonsona, an epitome of strength, courage, and endurance.

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Chapter 1: Introduction to the Study

Introduction

Diabetes mellitus (DM) poses a global public health concern. DM is a chronic disease affecting approximately 8.3% of the population or 25.8 million people in the United States (American Diabetes Association [ADA], 2011). The number of people in the United States with the disease is estimated to reach 48.3 million by 2050 (Narayan, Boyle, Geiss, Saaddine, & Thomson, 2006). According to Bassett (2005), one in twelve adults in the United States have the disease. The U.S. spent about $218 billion in 2007 for the diagnosis of both Types 1 and 2 diabetes, undiagnosed diabetes, prediabetes, and gestational diabetes (Dall et al., 2010). The figure excluded the cost for over-the counter drugs, services for diabetes program management, productivity loss, and nonpaid caregivers (Dall et al., 2009; Garber, 2009). DM is associated with several comorbidities with long-term complications, making the disease the seventh leading cause of deaths in the United States (Centers for Disease Control and Prevention [CDC], 2011a). These statistical figures permeate into the sub-groups of U.S. populations, including the Filipino Americans (FilAms).

There is an increasing prevalence of diabetes mellitus among FilAms. FilAms are at a high risk for the disease (Cuasay, Lee, Orlander, Steffen-Batey, & Hanis, 2001). Researchers have suggested a higher risk of FilAms for Type 2 diabetes mellitus (T2DM) than the non-Hispanic White group in the United States (Lee et al., 2000). Specifically, FilAms have the second highest odds ratio of T2DM prevalence among the Asian American (AsAm) population (Barnes, Adams, & Powell-Grinner, 2008; Lee, Brancati,

& Yeh, 2011). Furthermore, death rates of FilAms with diabetes are more than three times the rate of the Caucasians as shown in a study in Hawaii (U.S. Department of Health and Human Services Office of Minority Health [USDHHS-OMH], 2012). Adherence to a health-promoting lifestyle, which includes pharmacotherapy, diet regulation, physical activity, blood glucose monitoring, and foot care maintenance, is the foundation to prevent diabetes and decreases morbidity and mortality risks brought by the disease (Nwasuraba, Khan, & Egede, 2007; Xu, Pan, & Liu, 2010). This healthy lifestyle is known as diabetes self-management (Chatterjee, 2006; Poskiparta, Kasila, & Kiuru, 2006; Xu et al., 2010). While effective self-management is fundamental to achieve optimum control of blood sugar and reduce the risk of complications related to diabetes, only few individuals with diabetes engage in the recommended levels of diabetes self-management practices (Nwasuraba et al., 2007). Further, physical activity, dietary habits, and foot care practices have been shown to be different among racial/ethnic groups (Nwasuraba et al., 2007). Jordan and Jordan (2010) conducted a study among Filipinos with T2DM and found a suboptimum self-care behavior pertaining to dietary habits, medication taking, and blood sugar testing among younger patients. In a literature review to evaluate the dietary intake of FilAms with T2DM, Brooks, Leake, Parsons, and Pham (2012) found a lack of studies related to the subject. Research is needed to further understand diabetes self-care behaviors in this high-risk cultural group.

Several influential factors promote the adoption of a health-promoting lifestyle among individuals with diabetes such as diabetes knowledge (McEwen, Baird, Pasvogel, & Gallegos, 2007), self-efficacy (McEwen et al., 2007), spirituality (Polzer & Miles,

2007), and social support (Kokanovic & Manderson, 2006). While many scholars have shown individual variables to be related to self-care, few researchers have examined these factors to see which have the most influence on self-management practices or if there are any interactions among these factors. In a quantitative study examining multiple found a direct effect of self-efficacy and belief in treatment effectiveness on diabetes self-management and an indirect effect of knowledge, social support, and provider-patient communication on self-management through self-efficacy and treatment belief. There is a need for further investigation to examine what factors augment diabetes self-management and in what ways these factors influence diabetes self-care by using holistic approach.

Viewing health in the perspective of the traditional reductionist model of disease treatment and management, where social, psychological, and environmental frameworks are excluded, is insufficient. The holistic approach is a medical model where health and well-being are viewed in the composite interrelatedness of the patient's entire system that cannot be reduced to psychosocial, biological, sociological, and spiritual mechanisms and that an individual coexists in a give-and-take process with the environment (Rogers, 1992). In order to care for the individual's vital properties, assessment has to include the dynamism of the patient and the patient's social context. A holistic approach includes the interconnection of the spiritual, physical, and psychosocial dimensions in disease management (Patterson, 1998). Therefore, attention should be given to a holistic perspective in the study of diabetes self-management behaviors that includes the dynamism of the spiritual, physical, cognitive, and psychosocial dimensions of disease

management. The purpose of this study was to explain the relationship between diabetes knowledge, self-efficacy, spirituality, and social support, highlighting their combined roles in influencing diabetes self-management into a holistic approach.

In addition to understanding diabetes self-management from a holistic perspective, there is also a need to understand it in different cultural groups within the United States. However, there is a dearth of literature on the health behaviors of Asian Americans. Many researchers characterize Asian Americans as a single homogeneous group. This is a health study gap because Asian Americans comprise a heterogeneous cultural group that varies in the country of origin, language, dialects, cultures, health use, and health outcomes that may complicate their engagement in diabetes self-management practices. In this study, I investigated FilAms with T2DM and their diabetes self-management behaviors. Because there is no clear indication if diabetes self-management behaviors among FilAms are influenced by individual and environmental or sociocultural factors, I examined these variables using the integrative approach of the holistic model. It is pivotal to identify the factors influencing FilAMs' diabetes self-management behaviors in order to address intervention and self-management issues that may need culture-appropriate attention.

Researchers using the holistic framework have attempted to describe health lifestyle and illness management qualitatively (i.e., Cattich & Knudson-Martin, 2009; Samuel-Hodge et al., 2000). In this quantitative study, I was the first to draw on the holistic approach that used psychological, cognitive, spiritual, and sociocultural variables to understand diabetes self-management behaviors. Results will be useful for health

program developers, health educators, health psychologists, physicians, nurses, and other clinicians in creating health intervention to improve diabetes self-management practices of FilAms with T2DM. Further, researchers will likely benefit from the findings by replicating the concepts of holistic perspectives in studying health-promoting behaviors and life adaptation among FilAm patients who may have a chronic illness and life-threatening disease. I sought to add to the body of literature on the engagement of FilAms in diabetes self-management behaviors.

In this chapter, I summarize T2DM and diabetes self-management behaviors. I also summarize the problem, the intent of the study, the research questions, and hypotheses. The theoretical and conceptual framework of the study is explored using the holistic model of health management. I also identify the independent and dependent variables; summarize the methodology in collecting and analyzing the data; define the terms used; and present the assumptions, scope and delimitations, limitations, and significance of the study. The chapter ends with a brief summary, setting the stage for the literature review in Chapter 2 and methodology in Chapter 3.

Background of the Study

Researchers have focused on the prevention and complication control of diabetes. Pharmacotherapy, diet regulation, physical activity, blood glucose monitoring, and foot care maintenance are the cornerstone of health-promoting lifestyle among individuals with diabetes (Nwasuraba et al., 2007; Xu et al., 2010). Furthermore, previous scholars have examined diabetes knowledge, self-efficacy, spirituality, and social support as factors influencing diabetes self-management (Kokanovic & Manderson, 2006; McEwen,

Baird, Pasvogel, & Gallegos, 2007; Polzer & Miles, 2007). However, these factors have been investigated as separate variables, not with an integrated system of the holistic approach.

According to the holism approach, the individual's subsystems are interconnected to other aspects of that same individual in a systematic and dynamic manner (Strauch, 2003). According to Strauch (2003), the individual's entire system can only be fully understood by examining the parts, not in isolation from the whole system. In the Neuman's systems model (Neuman & Fawcett, 2002); the interrelated factors influencing a sick or healthy individual's functioning include developmental, psychological, spiritual, sociocultural, and physiological systems. According to Neuman (2002), these five variables are essential as they influence simultaneously and interact in a synergistic and holistic manner within all parts of the individual's system. A physiological variable would be the disease, which in this study was T2DM. A developmental variable refers to the cognitive process on what is the disease, its complications, and how to manage it (e.g., diabetes knowledge). Psychological variables include "mental processes and interactive environmental effects" (Neuman, 2002, p. 16). For example, self-efficacy, the individual's ability to exercise control over events that will likely affect his or her life (Bandura, 1989), could be considered a component of psychological variable. A spiritual variable may be exhibited in a belief system that involves the understanding of a power greater than the self in order to help maintain practices for healthy well-being (Gall & Grant, 2005). Sociocultural variables include social and cultural functions or influences

that are components of a client's source of help or support, such as those exhibited by family members in the management of diabetes.

In the social cognitive theory, Bandura (1989) emphasized the interaction of individual and environmental factors influencing behaviors. The individual factors that will likely influence diabetes self-management are diabetes knowledge (McEwen et al., 2007), self-efficacy (McEwen et al., 2007; Xu et al., 2008), and spirituality (Polzer & Miles, 2007). An environmental factor found to have effect on diabetes self-management includes social support (Kokanovic & Manderson, 2006). Diabetes knowledge is a developmental variable; self-efficacy is a psychological variable; spirituality is a spiritual variable; and social support is a sociocultural variable. Diabetes itself is a physiological variable.

Jordan and Jordan (2010) conducted a study on the self-care behaviors of FilaAm adults with T2DM. Younger FilAms with diabetes were less likely to perform optimum self-care behaviors pertaining to diet, medication, and blood glucose monitoring compared to their older counterparts (Jordan & Jordan, 2010). Jordan and Jordan (2010) also found that those who were below 65 years of age, more educated, younger when they immigrated to the United States, and younger when diagnosed with T2DM, reported more consumption of high fat, red meat, or dairy food products compared to older FilAms who were less educated, older when they immigrated, and older when diagnosed with the disease. However, it has not been investigated what influence the diabetes self-care practices of FilAms, specifically using the holistic approach. Understanding the implications of the holistic approach for diabetes self-management may shed light on

health-promoting lifestyle among persons with diabetes. In this study, I investigated if diabetes knowledge, self-efficacy, daily spiritual experiences, and social support from family members will influence the diabetes self-management practices of FilAms with T2DM. Using the holistic approach provided a foundation to find the different correlates between diabetes self-management behaviors and factors that may affect diabetes self-management behaviors among FilAms.

Problem Statement

There are limited studies on the health characteristics of Asian Americans, more specifically on the FilAms as a particular group. Asian Americans is a heterogeneous cultural group that varies in the country of origin, language, dialects, cultures, health use, and health outcomes (Barnes et al., 2008). Therefore, descriptive research focused on a specific cultural group, such as the FilAms, is relevant. The risk of T2DM is higher among FilAms than other Asian American groups (Fujimoto, 2006). The USDHHS-OMH (2012) found that FilAms are three times more at risk of diabetes-related deaths compared to their Caucasian counterparts. Researchers have shown that culture and gender influence self-management behaviors (i.e., Cherrington, Ayala, Scarinci, & Corbie-Smith, 2011; Gucciardi, Wang, DeMelo, Amaral, & Stewart, 2008). The vulnerability to changes brought about by acculturation condition has also been observed to contribute to the diabetes self-management behaviors of FilAms (Jordan & Jordan, 2010). However, no investigation has been conducted to verify if diabetes knowledge, self-efficacy, spirituality, social support, and diabetes self-management practices are related to diabetes self-management behaviors of FilAms. It is, therefore, significant to

examine the engagement of FilAms in diabetes self-management practices because it can contribute to the literature related to diabetes mellitus and diabetes self-management behaviors.

Purpose of the Study

The purpose of this quantitative inquiry was to examine, from a holistic perspective, the individual and environmental factors that influence diabetes self-management behaviors of FilAms. Specifically, I examined the diabetes self-management practices of FilAms with T2DM and the individual factors (diabetes knowledge, diabetes self-efficacy, and spirituality) and environmental factor (social support) in an integrative approach influencing diabetes self-management behaviors of FilAms. In a quantitative methodology approach, I explored the diabetes self-management practices of FilAms with T2DM using structured questionnaires.

There were confounding variables in this study such as acculturation conditions (length of residence in the United States, generation status, and primary language spoken at home), ethnicity, gender, age, social economic status, education, religious affiliation, and health-related data (insurance status, time since diabetes diagnosis, and type of medication regimen) of FilAms with T2DM. Confounding variables may have affected the actual relationship between the variables investigated. For example, those who were more acculturated through United States residency length and proficiency in English may have an increased frequency in the consumption of foods rich in fats and desserts and beverages (Lv & Cason, 2004). However, opposite directions between the association of acculturation and dietary intake were also observed (Lin, Bermudez, & Tucker, 2003;

Perez-Escamilla & Putnik, 2007; Sharma et al., 2004). In a study among FilAms, those who were below 65 years of age, more educated, younger when they immigrated to the United States, and younger when diagnosed with T2DM reported more consumption of high fat, red meat, or dairy food products compared to older FilAms who were less educated, older when they immigrated, and older when diagnosed with the disease (Jordan & Jordan, 2010).

Further, other investigations on the associations between acculturation and physical activity have conflicting results. For example, higher acculturation was related to lower engagement in physical activity (Gomez, Kesley, Glaser, Lee, Sidney, 2004; Unger et al., 2004) but was associated with more engagement in leisure time physical activity such as dancing and housework (Slattery et al., 2006). Additionally, being in the lower social class may predict the increased risk of not receiving preventive care such as not visiting the doctor during the past year, twice likely not having an eye examination, and one and half times more likely not having foot examination in the past year (Oladele & Barnett, 2006). Gender may predict self-care behavior. For example, Japanese men who retained their Japanese lifestyle in Hawaii reported higher levels of physical activity and consumed less fat and animal protein diet (Huang et al., 1996). In this study, however, the confounding variables were controlled instead of studying their effect on the strength or direction of the relationship between the factors that influence diabetes self-management and the outcome variable. As this investigation was correlational in nature, the statistical relationship between the factors influencing DM self-care and

diabetes self-management was not interpreted as evidence for the former causing the later.

Research Questions and Hypotheses

From the review of existing literature in the area of diabetes and diabetes self-management, research questions and hypotheses have been derived. A more detailed discussion of the nature of the study is discussed in Chapter 3. To conduct the investigation, I attempted to answer research questions. Based on these questions, there were hypotheses tested.

1. How well do FilAms with T2DM engage in diabetes self-management behaviors?

$H_0$1*:* FilAms with T2DM are not expected to have significantly higher self-management behaviors than the general population.

$H_1$1*:* FilAms with T2DM are expected to have significantly higher self-management behaviors than the general population.

2. Are diabetes knowledge, self-efficacy, spirituality, and social support related to diabetes self-management behaviors of FilAms with T2DM after controlling for acculturation, age, gender, socioeconomic status, health-related data, religious affiliation, immigration status, and education?

$H_0$2: Diabetes knowledge, self-efficacy, spirituality, and social support are not related to diabetes self-management behaviors of FilAms with T2DM after controlling for acculturation, age, gender, socioeconomic status, health-related data, religious affiliation, immigration status, and education.

$H_1$2: Diabetes knowledge, self-efficacy, spirituality, and social support are related to diabetes self-management behaviors of FilAms with T2DM after controlling for acculturation, age, gender, socioeconomic status, health-related data, religious affiliation, immigration status, and education.

To gather the data, the following instruments were used to measure the independent variables:

1. Diabetes Knowledge Test (diabetes knowledge)
2. Self-Efficacy for Diabetes Test (diabetes self-efficacy)
3. Daily Spiritual Experience Scale (spirituality)
4. Diabetes Social Support Questionnaire-Family Version (social support)

The Summary of Diabetes Self-Care Activities (Expanded) was used to measure diabetes self-management practices, the dependent variable. The Sociodemographic Survey was used to measure the confounding variables.

Theoretical and/or Conceptual Framework for the Study

The mind and body have complex interrelationships that can only be better understood by exploring the parts of a system into the totality of its structure (Strauch, 2003). The holistic perspective, which provided the conceptual framework for this study, has primary philosophical assumption about the advantage of considering the whole system than the sum of its parts (Colley & Diment, 2001). The individual's inseparability from its environment is the fundamental ontological assumption of holism (Rogers, 1992). In this study, I analyzed human self-care behavior from the holistic context of social cognitive theory (Bandura, 1986) and from the perspective of individual's dynamic

operation in the state of wellness or illness using Neuman's systems model (Neuman & Fawcett, 2002).

The Social Cognitive Theory

In the social cognitive theory (SCT), Bandura (1986) emphasized that there is an interaction between the behavioral, personal, and environmental factors in health and chronic disease management. According to Bandura (1986), there is a bidirectional influence that is present in the interaction of the behavior, cognitive and other personal factors, and environment that operate in the individual's system. However, these interactions differ in the intensity of influence and in the manner of occurrence (Bandura, 1989). Bandura (1989) asserted that cognitive process is the most external influence that affects behavior and considers social support an effective tool to get through the impediment and stresses encountered in the life paths people take. Bandura (1997) also posited that self-efficacy is a link between knowledge application and actual behavioral change and is one of the most effective predictors of health behavior. Clark and Dodge (1999) explored the SCT to predict disease management behavior and found self-efficacy as a construct in adherence to prescribed medication, recommended diet regulation, required adequate exercise, and stress management. SCT can further be explored by investigating the link between diabetes knowledge, self-efficacy, spirituality, and social support in predicting diabetes self-management behavior by using a holistic approach.

The Neuman's Systems Model

The theoretical framework of Neuman's systems model (NSM) is an open systems concept where the individual is perceived as biopsychosocial spiritual being in

constant interaction to the environment (Neuman & Fawcett, 2002). Neuman's holistic approach is viewed in the dynamic interrelationships of the physiological, psychological, sociocultural, developmental, and spiritual operations system within an individual's state of wellness or illness, thus influencing the person's functioning (Neuman & Fawcett, 2002). In allusion to the NSM structure, the physiological variable is diabetes disease; the developmental variable is diabetes knowledge; the psychological variable is self-efficacy; the spiritual variable is spirituality; the sociocultural variable is social support. Potter and Zauszniewski (2000) explored NSM and found that the holistic framework can be used to promote positive health perceptions and healthy lifestyle decisions. The explanation of these theoretical propositions and the conceptual framework are presented in Chapter 2.

Nature of the Study

The questions of the study were explored using a quantitative approach. The quantitative data were analyzed using the latest version of Statistical Package for the Social Sciences (SPSS) for Windows. Correlation and multiple regression were used to examine the relationships and patterns between factors influencing diabetes self-management and diabetes self-management behaviors. I used multiple regression analysis to analyze the factors that have most influence on diabetes self-management.

Quantitative data collection consisted of completing established instruments to measure diabetes self-management (dependent variable) and diabetes knowledge, diabetes self-efficacy, spirituality, and social support from family members (independent variables). The dependent variable, diabetes self-management, was measured by the Summary of Diabetes Self-Care Activities (SDSCA), which has 15 items. The

independent variables were measured by the following: diabetes knowledge by Diabetes Knowledge (DK) Test with 23 items, self- efficacy by Self-Efficacy for Diabetes (SED) Test with eight items, spirituality with Daily Spiritual Experience Scale (DSES) with 16 items, and social support with Diabetes Social Support Questionnaire (DSSQ-Family Version) with 52 items. All of the data were summarized using a frequency table to record how often the value of the variables occurred. Measurement scales for both dependent and independent variables were interval. In addition, a sociodemographic questionnaire, including questions regarding acculturation conditions and health-related data, was administered to describe the confounding variables. The sociodemographic survey has 10 nominal items and four ordinal items. The ordinal items were represented by numbers to make quantitative distinctions (Gravetter & Wallnau, 2009).

There were four predictor variables in this study. Target minimum sample size was 108 with an estimated R of .037, a minimum effect size based on Cohen's criteria (Field, 2009). The estimated R in the regression was dependent on the number of predictors (k) and the sample size (N) or $R = k/(N\text{-}1)$. According to Field (2009), the sample size in multiple regression if overall fit of the regression model is to be tested, is a minimum of $50 + (8)k$, where k is the number of predictors. For this study, it was $50+ (8)4 = 82$. In testing the contribution of individual predictors, a minimum sample size suggested is $104 + k$ or $104 + 4 = 108$. The interest of this study was both in the overall fit and in the contribution of individual predictors. It is suggested that in the calculation of both sample sizes described, the one that has the largest values will be used, which is 108.

Convenience sampling and homogeneous sampling procedures were adapted to gather and identify the potential participants. My membership in a large Filipino church under an umbrella of organized Filipino-American churches in North America brought some sort of convenience to identify and get volunteer participants. According to Kim et al. (2009), one of the key factors in successful recruitment and retention of research participants is using a community-based participatory research strategy such as a partnership with community churches. Inserting announcement in church bulletins, posting flyers in Asian markets, and distributing flyers during Filipino community events were used to recruit volunteers. A random sampling procedure was also used to gather and identify the potential participants during Filipino community activities. Screening was conducted among those who agreed to participate. The selected participants received an introductory letter about the project and signed informed consent was secured.

Definition of Terms

Acculturation: Conditions that modify the attitude and behavior of FilAms from their original culture because of exposure to American culture overtime (Xu et al., 2010). Acculturation was measured by their length of residence in the United States, generation status, and primary language spoken at home (Hubert et al., 2005).

Asian Americans: Individuals born in Asian countries such as the Far East, Southeast Asia or the Indian subcontinent with a minimum residency of 1 year in the United States (Barnes & Bennet, 2002).

Diabetes knowledge: Awareness obtained through diabetes education that will provide an understanding in assisting individual with diabetes to properly manage the disease (Khunti, Camosso-Stefanovic, Carey, Davies, & Stone, 2008).

Diabetes mellitus: A chronic disease characterized by the body's failure to control high blood sugar levels (Adams, 2008; Rother, 2007).

Diabetes self-management: A set of health practices that are central to diabetes control and complication prevention which include medication adherence, diet, exercise or physical activity, blood sugar monitoring, and foot care (Chatterjee, 2006; Poskiparta et al., 2006; Xu et al., 2010).

Filipino Americans: Individuals born in the Philippines and resided in the United States at least 1 year. They may be "naturalized citizens, legal permanent residents, undocumented immigrants, and persons on long-term temporary visas, such as students or guest workers" (Oza-Frank & Narayan, 2009, p. 661).

Pharmacotherapy: Medication regimen using insulin supplement or oral medication to augment the body's inadequate endogenous insulin production (American Diabetes Association [ADA], 2007; Heinemann, 2004; Turner et al., 1999).

Self-efficacy: Individual's ability to exercise control over events affecting an individual's life (Bandura, 1989) specifically diabetes control and prevention of diabetes complications.

Self-monitoring of blood glucose: A daily practice of monitoring blood sugar using a tool to indicate the HbA1C level; below 7% means better blood glucose control (Berikai et al., 2007).

Social support: Support provided by family members whom an individual with diabetes can trust and rely on to make him/her feel being cared for and valued as a person (McDowell & Newell, 1996).

Socioeconomic status: Economic status based on yearly income.

Spirituality: Belief involving the understanding of a power greater than the self does in order to help maintain practices for healthy well-being (Gall & Grant, 2005; Gordon et al., 2002; Rowe & Allen, 2004).

Assumptions

It was assumed that the participants of the study were willing volunteers and this did not bias the study. I also assumed that the study participants answered truthfully and completed each item of the survey to the best of their ability. Additionally, I assumed that the instruments used appropriately measured the designated variables.

Scope and Delimitations

This study was confined to examining participants who were FilAms diagnosed with T2DM and were living in Los Angeles, Orange, Riverside, San Bernardino, and San Diego counties in Southern California. Inclusion criteria were as follows: time of diagnosis 1 year or longer, age between 25 and 75 years, and had identified as FilAm (born in the Philippines and had immigrated or resided for at least 1 year in the United States). Immigrants are non-U.S. citizens by birth, are residing in the United States (Schmidley, 2003), and include “naturalized citizens, legal permanent residents, undocumented immigrants, and persons on long-term temporary visas, such as students or guest workers” (Oza-Frank & Narayan, 2010, p. 661).

Delimitations that identify the boundaries of the study included participants who can read, understand, and speak English. Exclusion criteria for participants included major diabetes complications (such as proliferative retinopathy, neuropathy, nephropathy, amputations, cerebrovascular accident, or myocardial infarction within the last 12 months).The intent was to study patients who were in the early disease progression who would likely benefit from the intervention using holistic approach.

Limitations

This study was correlational in nature, focusing on the relationships between the independent variables (factors influencing diabetes self-management) and dependent variable (diabetes self-management practices). Because it was correlational and cross-sectional study, causation was not assessed. I hypothesized that diabetes knowledge, self-efficacy, spirituality, and social support influence diabetes self-management; therefore, I employed regression analysis to determine the direction of the relationship between variables. A correlational design was appropriate despite its limitations because the intention of this study was to determine the effect of the combination of four variables such as diabetes knowledge, self-efficacy, spirituality, and social support to diabetes self-management. The results of this study are limited to FilAms and may not be generalized beyond similar populations of FilAms with T2DM.

Significance of the Study

Diabetes has become a worldwide epidemic. When not properly managed, diabetes will bring symptoms and complications that will likely lead to higher health care cost, morbidity, and mortality, thereby creating greater financial burdens. Delaying the

progression of diabetes will lead to improvements in health and economic outcomes, benefitting the patients and their families, health-care payers, and the society as a whole. Additionally, an understanding of the potential impact of individual, environmental, and cultural factors in diabetes self-management will result in the creation and use of holistic and effective culture-sensitive intervention. The potential benefits of identifying factors that can augment in the self-management of diabetes are profound.

Through this study, I increased knowledge that will be useful for health intervention developers, educators, health psychologists, physicians, nurses, and other clinicians who are searching for direction in improving diabetes self-management for the FilAm population with T2DM. I contributed to research on the holistic theory, specifically in the area of diabetes self-management. I illustrated the ways holistic model on health behavioral change contribute to the self-management of diabetes. Furthermore, the theory used in this study will allow investigators to replicate the concepts of a holistic approach for further research on health-promoting behaviors and adaptation appropriate for this population group who may have life-threatening diseases such as cancer, HIV/AIDS, asthma, stroke, cardio-vascular disease, and obesity. I also found that holistic research can also be approached through quantitative methodology.

Summary

Diabetes has become a public health concern among FilAms in the United States. When not properly managed, diabetes will bring symptoms and complications that will likely lead to higher morbidity, mortality, and health care cost, creating great financial burdens. Diabetes self-management is the cornerstone in the control of diabetes and

prevention of the complications brought by the disease. Previous researchers have focused on the prevention and complication control of diabetes. However, the factors associated with diabetes self-management were investigated as separate variables. It is not clear if the increased risk of diabetes mellitus is due to diabetes self-management behaviors influenced by individual, environmental or cultural factors. Scholars have not explored holistic perspective to examine the diabetes self-management behavior and in the prediction of diabetes self-management behaviors among persons with T2DM. Additionally, the holistic framework emphasizing the interaction between physical, cognitive, psychosocial, and spiritual factors in diabetes self-management is not yet determined. Using the holistic perspective, I attempted to explore the interaction of diabetes knowledge, self-efficacy, spirituality, and social support in analyzing the self-care behaviors of FilAms with T2DM.

In this quantitative methodology, the independent variables (diabetes knowledge, self-efficacy, spirituality, and social support) and dependent variable (diabetes self-management behaviors) were measured by structured questionnaires while the confounding variables were measured using a sociodemographic survey that included items on immigration status, acculturation conditions, and health-related data. I attempted to answer the following questions: (a) How well do FilAms with T2DM engage in diabetes self-management behaviors? and (b) are diabetes knowledge, self-efficacy, spirituality, and social support related to diabetes self-management behaviors of FilAms with T2DM? The role of the confounding variables was controlled instead of studying their effect. SPSS was used to analyze the data using correlation and multiple regression

to find the relationships and patterns of the variables. A frequency table recorded how often the value of the variables occurred.

The subjects were FilAms with T2DM recruited from Filipino churches and communities and identified through convenience and random sampling procedures. Participants were selected after receiving introductory flyer and signing informed consent. Participation was voluntary in nature, and it was assumed that subjects completed and truthfully answered each item in the questionnaires. I also assumed that the tools administered appropriately appraised the variables identified to be measured. Limitations of subjects included residency in Los Angeles, Riverside, San Diego, and San Bernardino counties in Southern California; diagnosed with T2DM for more than 1 year; age between 25- and 75-years-old; had identified as being born in the Philippines; had immigrated or resided in the United States for a minimum of 1year; and can read, understand, and speak English. Participants had no major diabetes complications such as proliferative retinopathy, neuropathy, nephropathy, amputations, cerebrovascular accident, or myocardial infarction within the last 12 months. Because the study was correlational in nature, I determined the directional relationships of the dependent and independent variables. It was also used to predict the dependent variables. The results cannot be used for generalized findings to populations beyond FilAms with T2DM. This study contributed to the investigation of the holistic model approach, specifically in the area of diabetes self-management.

In Chapter 2, I will review the existing literature in the area of diabetes and diabetes self-management. Chapter 3 will follow after with a description of the study

design, methodology (participants, recruitment procedures, and assessments used), and how the data gathered were assessed.

Chapter 2: Literature Review

Introduction

DM is a growing health concern for FilAms. In the United States, the risk of T2DM is rising among FilAms compared to the non-Hispanic group (Lee et al., 2011). Further, researchers found that FilAms have the second highest prevalence of the disease among AsAms (Barnes et al., 2008; Lee et al., 2011). Moreover, the death rate due to diabetes was more than three times among FilAms than the Caucasians (USDHHS-OMH, 2012).

Diabetes self-management such as diet, physical activity, medication, blood sugar monitoring, and foot care is central to diabetes control and complication prevention (Chatterjee, 2006; Poskiparta et al., 2006; Xu et al., 2010). However, patients with DM consistently fail to engage in diabetes self-management behaviors. For example, there is a nonadherence to optimum self-management practices among many minority population groups with diabetes (Nelson et al., 2005; Xu et al., 2010). In particular, in the examination of the self-care behaviors of FilAms with T2DM, Jordan and Jordan (2010) found that younger FilAms do not conform to optimal diabetes self-management. It is, therefore, important to investigate the factors influencing diabetes self-management behaviors, specifically among the FilAms.

Researchers have shown significant results on self-care behaviors of patients with T2DM. Patients tend to have poor adherence to pharmacotherapy (Hertz, Unger, & Lustik, 2005), have difficulty in maintaining or following dietary guidelines (Chowdhury, Helman, & Greenhalgh, 2000; Nelson, Reiber, & Boyko, 2002), do not have regular

physical activities desirable for the disease or perform less than the recommended physical activity level (Nelson et al., 2002), are less likely to test their blood glucose as recommended by their health care providers (Karter, Ferrara, Darbinian, Ackerson, & Selby, 2000), and neglect foot care (Safford, Russell, Suh, Roman, & Pogach, 2005). While these scholars yielded important findings, most of these diabetes self-management practices were taken as individual variables and not as multiple self-care behaviors. Disease self-management practices will likely complement with each other; therefore, it is necessary to address diabetes self-management as multiple behaviors. To investigate these practices, a holistic perspective in considering factors that affect diabetes self-management behavior is needed. According to the holistic approach, spiritual, physical, and psychosocial dimensions of disease management are interrelated and should not be isolated from each other (Patterson, 1998).

Several factors are associated with health behaviors. Researchers have shown that diabetes knowledge (McEwen et al., 2007), self-efficacy (McEwen et al., 2007), spirituality (Polzer & Miles, 2007), and social support (Kokanovic & Manderson, 2006) are factors associated with diabetes self-management. Some scholars have attempted to use holistic framework in describing health lifestyle and disease management. For example, spirituality, multiple responsibilities of caregivers, general life stress, and the psychological impact of diabetes implies influence on diabetes self-management behaviors (Samuel-Hodge et al., 2000). Also, couples who have an engaging connection with each other and those with a spiritual coping style would likely be better equipped in exploring alternative options to approach diabetes that brings optimism, creativeness, and

skill in diabetes management (Cattich & Knudson-Martin, 2009). However, the holistic framework emphasizing the interaction between individual and environmental factors in diabetes management is not yet determined. In this study, I attempted to address these factors integrated into a holistic understanding in the diabetes self-management behaviors of FilAms. Specifically, I explained the relationship between diabetes knowledge, self-efficacy, spirituality, and social support, highlighting their combined roles in influencing diabetes self-management into a holistic approach.

In this chapter, I will describe the following: (a) the literature search strategy, including library databases and search engines used, key search terms, as well as, the dates and types of publications searched; (b) the theoretical foundation and the rationale for choosing SCT and NSM, and the integration of factors in the systemic approach of the holistic model influencing diabetes self-management; (c) the conceptual framework, which presents the holistic perspective in diabetes self-management; (d) the literature review which provides information about DM, its comorbidities and complications, and statistics on FilAms with DM; (e) the different activities comprising diabetes self-management such as pharmacotherapy, diet regulation, exercise or physical activity, blood glucose monitoring, and foot care maintenance; (f) the factors that influence health behaviors such diabetes knowledge, self-efficacy, spirituality, and social support; (g) the role of acculturation in disease and health behaviors; and (h) the research gap on multiple self-care behaviors, holistic perspective in the study of multiple self-care behaviors, diabetes self-management among FilAms, and other moderator factors such as age, gender, social economic status, cultural issues, and acculturation.

Literature Search Strategy

The literature used in this study was from peer-reviewed professional journals. The PsycINFO, PsycARTICLES, CINAHL, and MEDLINE databases were searched by using the EBSCOhost search engine of Walden University library. Databases from OVID and Web of Sciences made some literature available through the PUBMED search engine of a local university library in the area. Other articles were retrieved from Google Scholar and the World Health Organization website. FedStats.gov website that links to several United States Federal government agencies such as the ADA and CDC websites provided access for statistical information.

Keywords used to find the literature in this study included *diabetes mellitus*, *diabetes self-management*, *Asian Americans*, *Filipino Americans*, *diabetes knowledge*, *self-efficacy*, *social support*, and *spirituality*. A majority of the articles had publication dates between 2002 and 2012. However, older articles were obtained for appropriate references. Results of keywords narrowed to the full text provided 45 journals from PsycINFO database, 51 articles from CINAHL database, and 305 references from MEDLINE database. Google scholar provided 1,330 articles.

Theoretical Foundation

The holistic approach is a medical model where health and well-being are viewed in the complex interrelationships of the entire system of the patient, assumed in a unitary and inseparability of the individual from the environment (Patterson, 1998). Viewing health in the interrelationship of individual and environmental complexities has shifted the perspective of the traditional reductionist model of disease treatment and

management. According to the reductionist biomedical model, the disease is a deviation from biological or somatic variable, without considering its social, psychological, and behavioral framework (Engel, 2012). However, in order to care for the individual's vital properties, assessment has to include the dynamism of the individual and his or her environment. According to Engel (2012), a biopsychosocial model of disease treatment and management will provide a basis for disease understanding to arrive at rational treatments and health care patterns by taking into account the patient and his or her social context. In this study, I analyzed self-care behaviors from the holistic context of individual's dynamic operation in the state of wellness or illness by using two health behavioral frameworks: the perspective of SCT (Bandura, 1986) and NSM (Neuman & Fawcett, 2002).

Bandura's Social Cognitive Theory

In SCT, Bandura (1986) emphasized the interrelationship between behavioral, personal, and environmental factors in health and chronic diseases. According to Bandura (1986), SCT includes a model where the complementary operation of behavior, cognitive and other personal factors, and the environment reciprocate to each other in both directions. Self-management of diabetes incorporates behavioral, personal, and environmental variables into the conduct of the recommended daily self-activities.

The concept of SCT is relevant for examining diabetes self-management. Bandura (1989) asserted that these main interacting associations between the distinctive subsystems that had an effect on each other are not necessarily of the same intensity nor occur in a simultaneous manner. It is expected that the association of individual factors,

such as diabetes knowledge, diabetes self-efficacy, spirituality, and environmental factors such as social support have varied effects on diabetes self-management behavior. In this study, I investigated the combined effect of these variables taken together in studying diabetes self-management behavior.

Neuman's Systems Model - An Open-Systems Concept

To help identify and understand the self-care behaviors of FilAms with T2DM, the NSM was another theoretical framework chosen for this research study. NSM is an open-systems concept that views the holistic context of individual as a biopsychosocial spiritual being interacting constantly with the environment (Neuman & Fawcett, 2002). Neuman proposed that there are five different interrelated variables: physiological, psychological, sociocultural, developmental, and spiritual, operating dynamically within the person's state of wellness or illness, which influence the individual's functioning (Neuman & Fawcett, 2002). Neuman and Fawcett (2002) further proposed that, as a system, the person is "in a dynamic, constant energy exchange with the environment" (p. 14). NSM helped describe the bio-psycho-socio-spiritual framework in the self-management practices of FilAms with T2DM.

The health mandate of the World Health Organization (WHO) implies the concept and approach of holism. WHO (2003) defined health as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (p. 1), so health refers to "wholeness." The holistic concept, which is the directive of the WHO in 2000, means unity in the wellness states of the "spirit, mind, body, and environment" (Neuman, 1995, p. 10). This view of holism provided a foundation to find the different

correlates between behavior and factors that influence diabetes self-management practices among FilAm subjects who have T2DM.

Integrating Factors in the Holistic Approach Influencing Diabetes Self-Management

The factors that may influence diabetes self-management are diabetes knowledge (Kuo, Chang, Chang, Wang, & Yeh, 2008), self-efficacy (Aljasem, Peyrot, Wissow, & Rubin, 2001; Johnston-Brooks, Lewis, & Garg, 2002; Sarkar, Fisher, & Schillinger, 2006), and spirituality (Newlin, Melkus, Tappne, Chyun, & Koenig, 2008; Polzer & Miles, 2007). An environmental factor found to have effect on diabetes self-management includes social support (Kokanovic & Manderson, 2006; Toljamo & Hentimen, 2001). In reference to the NSM framework, diabetes knowledge is a developmental variable, self-efficacy is a psychological variable, spirituality is a spiritual variable, and social support is a sociocultural variable. The diabetes disease itself is a physiological variable.

Researchers have focused on the prevention and complication control of diabetes. Pharmacotherapy, diet regulation, physical activity, blood glucose monitoring, and foot care maintenance are the cornerstone of health-promoting lifestyle among persons with diabetes (Chatterjee, 2006; Xu et al., 2010). Previous scholars have examined the relationship of diabetes self-management and diabetes knowledge (Kuo et al., 2008), self-efficacy (Aljasem et al., 2001; Johnston-Brooks et al., 2002; Sarkar et al., 2006), spirituality (Newlin et al., 2008; Polzer & Miles, 2007), and social support (Kokanovic & Manderson, 2006; Toljamo & Hentimen, 2001). However, these factors were investigated as segregated variables and not from an integrative systemic approach of the holistic

perspective, viewing the person's health behavior as a dynamic interaction of the individual and the environmental factors.

Holism is an assumption that an individual's aspect connects to the other aspects of that same individual in a systematic and dynamic manner (Strauch, 2003). According to Strauch (2003), the patient's entire system cannot be fully understood by examining the parts in isolation from the whole system. In seeking to understand the patient's lifestyle, the biological, psychological, social, and spiritual facets of the person have to be considered. This view of holism provided a foundation to find the different correlates between behavior and factors that influence the diabetes self-management practices among FilAm subjects who have T2DM.

Conceptual Framework

Patients with diabetes are encouraged to adopt a healthy behavior and lifestyle. Relevant factors as the foundation for designing interventions (Kaewthummanukul & Brown, 2006) include behaviors to self-manage chronic diseases. To have an effect on health behavior, the dynamism involves the interaction of the individual and the environmental factors (Bandura, 1986). These factors are interrelated variables; viewed in a holistic system of the dynamic operation of the physiological, psychological, sociocultural, developmental, and spiritual aspects within the individual's wellness or illness situation influencing his or her functioning (Neuman & Fawcett, 2002). Patterson (1998) suggested that a holistic approach advocates the interrelationship of spiritual, physical, and relational dimension of health care without necessarily isolating them from each other. In a holistic approach, the interrelationships of the bio-psycho-socio-spiritual

aspects of the individual's entire system are considered in order to encourage healthy disease management or adopt healthy practices and lifestyle.

The Holistic Perspective in Diabetes Self-Management

The concept of holistic perspective has been previously applied in SCT to examine health-promoting behavior (Bandura, 1998) and in the prediction of disease management behavior such as the use of prescribed medicine, engagement in adequate exercise, stress management, and adherence to recommended diet (Clark & Dodge, 1999). In a cross-correlational study, Potter and Zauszniewski (2000) concluded that a holistic framework using NSM promotes positive health perceptions and supports healthy lifestyle decisions. The notion of holism was used in this study to illustrate how the holistic approach on behavioral change augments disease self-management behavior of FilAms with T2DM that will affect symptoms control and complications prevention of diabetes. Figure 1 shows the holistic perspective of this study, identifying the factors influencing diabetes self-management behaviors and the multiple diabetes self-management practices.

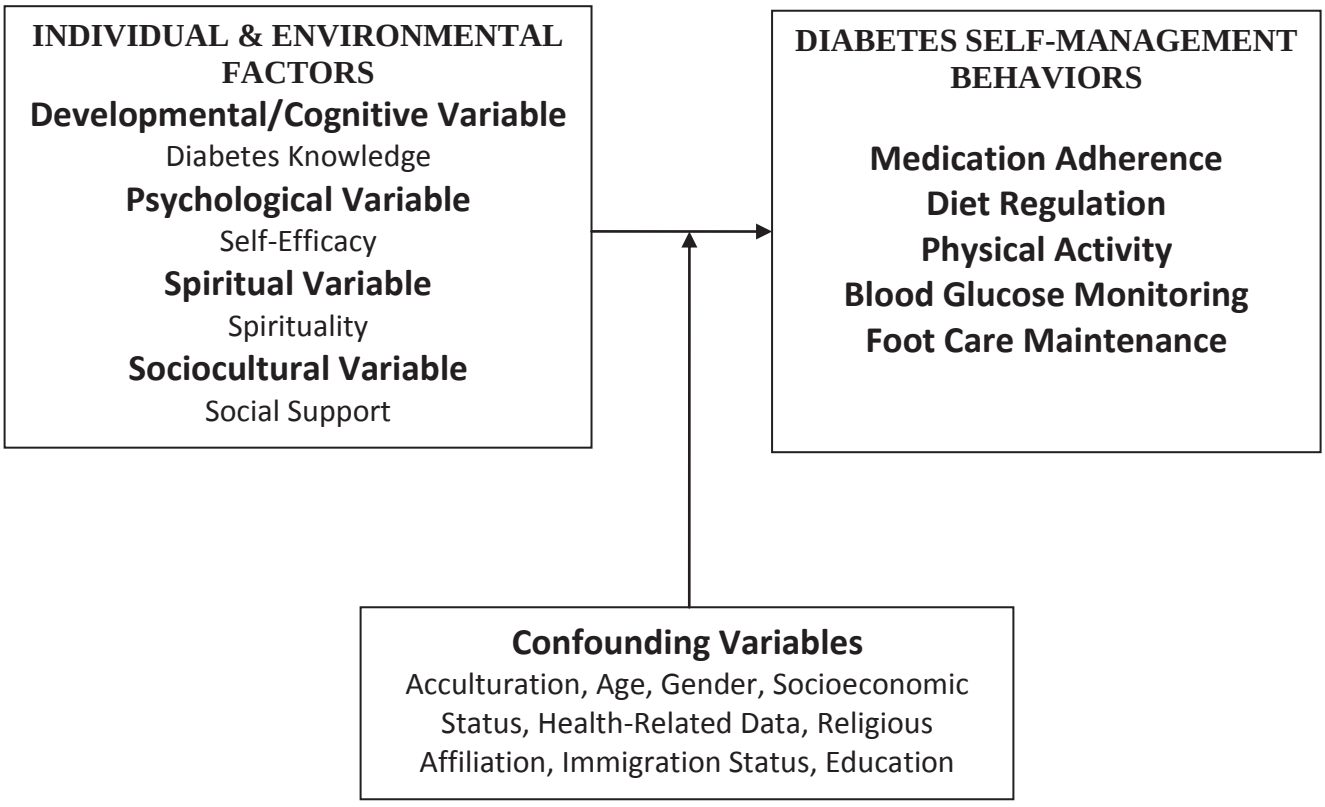

Figure 1. Factors influencing diabetes self-management behaviors: A holistic approach

Literature Review Related to Key Variables and/or Concepts

In the succeeding sections, I will define DM and the comorbidities and complications brought by the disease. I will also present what the statistics say about T2DM. The components of diabetes self-management, what studies have been done to self-manage the disease, and how the researchers have approached diabetes self-management will be reviewed. The knowledge gap from what had already been investigated will also be presented.

The Meaning of Diabetes Mellitus

DM is a metabolic disease where the body fails to keep the blood sugar under control. The two reasons for spiraling glucose level are (a) when the pancreas does not produce insulin because there is autoimmune destruction of the pancreatic islet beta cells (Adams, 2008) and (b) when the body cells resist responding to the insulin that is produced (Rother, 2007). The body's nonproduction of insulin causes type 1 diabetes. Insulin resistance is a Type 2 diabetes abnormality. Type 1 diabetes mellitus (T1DM) has higher complication prevalence than T2DM because of its onset at a younger age among patients (Dall et al., 2009). While T2DM is preventable; however, it may bring economic burden to the nation because 90%-95% of cases were estimated to have T2DM, compared to 5%-10% that comprise T1DM (CDC, 2011a; CDC, 2012; Dall et al., 2009). The recommendation to diagnose T2DM is by the use of glycated hemoglobin values or A1C values which is 6.5% or above, where A1C values between 5.7 and 6.49 is considered prediabetic (NIDDK, 2012). Fasting glucose is another test frequently used in the clinical setting (CDC, 2011a).

There is a global public health concern on the rising trend of DM. In 2011, it was estimated that nearly 8.3% or 25.8 million Americans have diabetes while 79 million were prediabetic (ADA, 2011; CDC, 2011b). It is forecasted that people diagnosed with T2DM in the United States (U.S.) would reach 48.3 million by 2050 (Narayan et al., 2006). The WHO (2011) reported that, in 2004, about 3.4 million people around the world died from the consequences of the disease and projected that deaths due to diabetes will double between 2005 and 2030.

Comorbidities and Complications of Diabetes Mellitus

DM is associated with several comorbidities, which cause long-term complications. These include: (a) retinopathy, potential loss of vision or nontraumatic blindness (ADA, 2013; CDC, 2011a); (b) nephropathy, major end-stage renal failure (ADA, 2013; Bloomgarden, 2008; CDC, 2011a; Guinti, Barit, & Cooper, 2006;); (c) peripheral neuropathy, nerve damage with the risk of foot ulceration and eventually amputation (Boulton et al., 2005; CDC, 2011a); (d) autonomic neuropathy causing gastrointestinal, genitourinary, as well as, sexual dysfunction (CDC, 2011a; Vinik, Maser, Mitchell, & Freeman, 2003); (e) hypertension (CDC, 2011a; Guinti et al., 2006; McNeely & Boyko, 2005); (f) cardiomyopathy (heart failure) and cardiovascular ailments such as stroke and heart attack, the principal morbidity and mortality causes among individuals with diabetes (CDC, 2011a; Fonarow & Srikanthan, 2006; Idris, Thomson, & Sharma, 2005; Sobel & Schneider, 2005); (g) cuts or bruises that are slow to heal (Argenta & Morykwas, 2004); (h) periodontitis or gum disease (CDC, 2011a); (i)

recurring skin, or bladder infections (Argenta & Morykwas, 2004); and (j) depression that can complicate the management of the disease (CDC, 2011a).

Health care costs, disability, mortality, and morbidity brought by diabetes and its complications have enormous implications. In 2007, the United States spent about $218 billion associated with diabetes cost (Dall et al., 2010). The amount includes 174.4 billion for diagnosed diabetes (both T1DM and T2DM), $18 billion for undiagnosed diabetes, $25 billion for prediabetes, and $636 million for gestational diabetes (Chen et al., 2009). The figure also includes loss in national productivity associated in health-related problems due to diabetes through increased rates of absenteeism, “presenteeism” or diminished productivity while at work, disability, early retirement, and premature mortality (CDC, 2011a; Dall et al., 2009). The actual amount may exceed this figure because it excluded the price tag for drugs bought over the counter, optical and dental expenditures, disease management programs and services, productivity loss when a family member had the disease, and caregivers who were not paid (Dall et al., 2009; Garber, 2009). Individuals with diabetes had more than twice-higher expenses on medical cost than those without diabetes (CDC, 2011a).

DM is one of the primary causes of death in the U.S. In 2006, it was the seventh leading cause of deaths recorded on death certificates (CDC, 2011b; National Institute of Diabetes and Digestive and Kidney Diseases [NIDDK], 2011). There were 71,383 deaths in 2007 because of diabetes alone (CDC, 2011a; NIDDK, 2011). An additional 160,022 deaths listed diabetes as the contributing cause of death (CDC, 2011a).

The Statistics on FilAms with Diabetes Mellitus

There were considerable evidences on the rising incidence of diabetes among FilAms. For example, the five-year trend of age-adjusted percentage among Filipinos who have diabetes in Hawaii recorded 5.9 in 2002 to 12.0 in 2006 (Nguyen & Salvail, 2007). Concurrently, there is also a coincidental population increase in this ethnic group. In 1960, foreign-born Filipinos ranked 20th and shared 1.1% (or 104,843) of all other foreign-born immigrants (9,738,091) residing in the United States (Terrazas, 2008). However, in 2006, the Filipino immigrants ranked second, sharing 4.4% (or 1,638,413) of the total 37,547,315 immigrants (Terrazas, 2008). Of the total 281.4 million U.S. populations in 2000, 4.2% or 11.9 million reported Asians (Barnes & Bennet, 2002) with Philippines as the third top immigrant country (4.4%) having a citizenship rate of 64.9% (Camarota, 2002). Based on the U.S. Census Bureau report comparing the health characteristics of the 11.9 million Asian adult populations in the United States from 2004-2006, Filipino 18-year-old adults and above accounted for 21.2% while Chinese adults of the same age bracket accounted for 20.7% (Barnes et al., 2008). In 2006, the largest FilAms (750,056) were in California where almost half (45.8%) of the Filipino immigrants resided (Terrazas, 2008; Terrazas & Batalova, 2012).

It is equally important to address the problem on diabetes mellitus among FilAms. There is a limited research examining FilAms with T2DM in spite of a higher death rate among FilAms compared to other ethnic groups, such as more than three times probability of dying among FilAm residents in Hawaii compared to their Caucasian counterparts due to T2DM (USDHHS-OMH, 2012). In a review of 643 patient charts, no

association was indicated between gender, age, and duration of diabetes with control of T2DM after a year of follow-up, implying that diabetes control improvement depends on self-care practices of the patient (Hartz et al., 2006).

Diabetes Self-Management

T2DM is a chronic disease necessitating self-management, which is central to control and complication prevention (ADA, 2007; Watkins & Connell, 2004). Non-adherence to self-care behavior results in the development of complications. Diabetes self-management is a number of self-care behaviors that include medication, diet, physical activity, blood sugar monitoring, and foot care (Chatterjee, 2006; Poskiparta, et al., 2006; Xu et al., 2010). In many countries, adopting health-promoting lifestyle is encouraged (Kosaka, Noda, & Kuzuya, 2005; Lindström et al., 2006; Oldroyd, Unwin, White, Mathers, & Alberti, 2006). According to Lindström et al. (2006), the relative risk of diabetes is reduced up to 43% by adopting dietary, exercise, and weight control lifestyle.

While diabetes self-management is critical for the control of the disease, many patients with diabetes do not consistently perform diabetes self-management practices. For example, only 39.6% of patients with diabetes self-monitor their blood glucose daily (CDC, 2000). In an analysis of the 2000 BRFSS among 11,647 individuals who reported diabetes mellitus diagnosis, only 50% reported glucose level monitoring every day (Nelson et al., 2005). In Finland, 19% of patients with diabetes disregard self-care (Toljamo & Hentimen, 2001). There is also a significant nonadherence to optimum self-management practices among many minority population groups with diabetes. For

example, in a study conducted among 192 FilAm adults with diabetes in Southern California, 42.5% took their recommended insulin, 31.3% monitored their recommended blood glucose levels daily, 19.8% performed specific exercise daily, 33.9% ate high fat content food 1 to 3 days a week, and 20.8% frequently ate fruits and vegetables 7 days a week (Jordan & Jordan, 2010).

Pharmacotherapy

Insulin is the long known glycemic control treatment for DM to augment the body's inadequate endogenous insulin production (ADA, 2007; Heinemann, 2004). Insulin supplement or oral medication, especially during stressful times or in illness, becomes necessary for those with T2DM to counter insulin resistance and control adequate blood glucose (ADA, 2007; Sone, Kawai, Takagi, Yamada, & Kobayashi, 2006). However, patients have poor adherence to pharmacotherapy that will likely bring inadequate control of the disease. In a retrospective cohort study of 6,090 patients newly diagnosed with T2DM, 10.5% failed to fill their second prescription after the initial prescription, 37.0% discontinued pharmacotherapy after12 months of initial prescription, and 46.2% did not adhere to their medication during the time interval when prescriptions were being filled (Hertz et al., 2005). Additionally, several researchers suggested that pharmacological therapies of diabetes do not have long-term cost benefit. For example, medical regimens brought adverse effects, diabetes-related complications, and hospitalization (de Weerdt et al., 1991; Rettig, Shrauger, Recker, Gallagher, & Wiltse, 1986). Investigators also showed that the administration of insulin to individuals with diabetes is not always successful (i.e., Diabetes Control and Complications Trial

Research Group and United Kingdom Prospective Diabetes Study (UKPDS) Group as cited in Kokanovic & Manderson, 2006).

Diet Regulation

Dietary modification is often promoted to assist patients with health problems. In the treatment and control of T2DM, a special diet is the foundation (Mann & Lewis - Barned, 2004) and is generally recommended for controlling blood sugar or glucose level (Mayo Clinic, 2010). Adherence to recommended proper balanced diet has been related with improved T2DM control (Hartz et al., 2006; Koenigsberg, Bartlett, & Cramer, 2004) and reduced risk for lipoprotein-mediated coronary heart disease (Mann & Lewis-Barned, 2004). Proper diet alone will likely suffice in the management of major abnormal metabolism related with T2DM, resulting in the aversion of either oral medication or insulin (Mann & Lewis-Barned, 2004). The recommended foods for those with diabetes include healthy carbohydrates, rich in fiber, and good fats. Foods to be avoided are saturated fats, transfats, cholesterol, high glycemic, and high sodium.

For persons with diabetes, proper food choices imply survival, but this diet change is difficult to maintain (Chowdhury et al., 2000). In the analysis of data from the NHANES III study, Nelson et al. (2002) found that 42% of the respondents took 30%-40% of their calories from fat while 26% reported their daily intake of calories was taken from more than 40% fat. Sixty-two percent of individuals with diabetes reported consuming less than five servings of vegetables and fruits daily while 61% consumed more than 10% of total calories from saturated fat (Nelson et al., 2002). FilAms' diet is relatively high in fat and cholesterol such as organ meats like tripe, pork blood, pork and

chicken intestines, and poultry (Periyakoil & Dela Cruz, 2010). Filipino menus generally contain high-sodium flavoring such as fish sauce (*patis*), shrimp paste (*bagoong*), soy sauce (*toyo*), anchovies, and anchovy paste. Sugar-concentrated pastries and rice cakes are also often taken for sweet treats.

Exercise or Physical Activity

Researchers have shown that the long-term effect of physical activity benefits persons with diabetes. Physical activity and exercise is associated with increased quality of life and decreases between 50%-60% long term mortality for individuals with T2DM (Sigal, Kenny, & Koivisto, 2003; Trichopoulou, Psaltopoulou, Orfanos, & Trichopoulos, 2006). Physical activity also reduced blood glucose levels (Feo et al., 2006). In another study, investigators found that individuals with impaired glucose tolerance had a 60% decreased incidence of T2DM even with a small weight loss due to exercise (Liberopoulos, Tsouli, Mikhailidis, & Elisaf, 2006; Sigal et al., 2003). According to Hu, Lakka, Kilpeläinen, and Tuomilehto (2007), the population with T2DM is safe with a thirty-minute of moderate or high level of physical activity every day. Glycemic control improved even among older adults by using both resistance (e.g., weights) and nonresistance (e.g., walking, swimming) exercises (Sigal et al., 2003). It may appear that FilAms, specifically older women, were active in nonresistance exercise. In a study among older FilAm women living in Los Angeles county, physical activities most frequently reported by FilAm women included walking, stretching, dancing, and gardening or yard work (Maxwell, Bastani, Vida, & Warda, 2002).

While physical activity is desirable for individuals with diabetes, many persons with diabetes refuse or resist engaging in the activity. In their analysis of a nationally representative sample (*N*= 1,480) of U.S. adults with T2DM, Nelson et al. (2002) found that 31% did not have regular physical activity and 38% reported less than the recommended physical activity level. Further, Safford et al. (2005) reported that 37.7% of patients with diabetes did not exercise. Persons with diabetes reported some barriers in doing exercise which included the risk of hypoglycemia (Dubé, Valois, Prud'homme, Weisnagel, & Lavoie, 2006), possible severe blood pressure increase, specifically from resistance exercise, (Sigal et al., 2003), illness, bad eyesight, concerns on falling/stumbling, and concerns for safety and crime (Belza et al., 2004).

Blood Glucose Monitoring

Self-monitoring of blood glucose (SMBG) is critical in diabetes care (Karter et al., 2000) as it is a key component of effective glycemic control (He & Wharrad, 2007). In a random sample of 689 patients with T2DM, patients who engaged in monitoring of their blood glucose had lower HbA1C level (8.1 +/- 1.6) than the control group (8.4+/- 1.45, *P*=0.012), indicating better quality of metabolic control (Guerci et al., 2003). SMBG, a vital element of self-care, is widely considered an essential tool to comprehend the effect of nutrition, medication, and exercise on glucose levels (Lau, Qureshi, & Scott, 2004; National Institute for Clinical Excellence [NICE], 2003; Nicolucci et al., 2004). The optimal impact of SMBG can only be achieved when individuals with diabetes properly use their monitoring data in consonance with the other components of their comprehensive diabetes self-care plan (Gurková, Čáp, & Žiaková, 2009). By self-

monitoring blood glucose, persons with diabetes can control their daily blood sugar levels (Siebolds, Gaedeke, & Schwedes, 2006).

There is a significant association between blood glucose monitoring frequency (a mean difference of 3.866, *P*=0.016 between irregular and daily self-monitoring) with treatment satisfaction (Gurková et al., 2009). However, self-monitoring frequency was not associated with glycemic control as indicated by the A1C level (Harris, 2001a). Therefore, education for individuals with T2DM must include setting personal self-care goal of attaining <7% A1C level for better blood glucose control (Berikai et al., 2007). For persons with T2DM who receive insulin and/or oral regimen, daily SMBG is particularly essential to avoid asymptomatic hypoglycemia (ADA, 2007).

In spite of the value of glucose monitoring, individuals with diabetes were less likely to test their blood glucose as recommended by their health care providers. Karter et al. (2000) found that 67% of the 44,181 patients with T2DM reported nonadherence to the ADA recommended once-a-day SMBG monitoring practice. In a study conducted among 192 FilAms with T2DM, Jordan and Jordan (2010) found one-third of participants did not perform their once-a-week SMBG monitoring. Failure to monitor blood glucose or infrequent performance of SMBG can amplify the inability to adjust to medication dosage (such as insulin injections), diet modification, and exercise that help manage levels of blood sugar (Jordan & Jordan, 2010).

Foot Care Maintenance

The most common complication of diabetes that led to hospitalization is foot problems (Pinzur, Slovenkai, Trepman, & Shields 2005; Reiber, 1992). In the United

States, foot care maintenance was the most common problem among persons with diabetes that resulted in extensive hospitalization, amputation, lifetime disability, and diminished quality of life (Reiber, 1992). About 2 million Americans with T2DM were affected by diabetic foot disease every year (Reiber, Boyko & Smith, as cited in Giurini & Lyons, 2005). Peripheral neuropathy resulting from irregular blood glucose control may lead into serious foot problems like foot ulcers that heal slowly (Wieman, 2005), foot infections that include gangrene and osteomyelitis (Bethel, Sloan, Belsky, & Feinglos, 2007; Boulton & Armstrong, 2006; Giurato & Uccioli, 2006; Lavery et al., 2006), and disfigurations due to lower extremity amputations (Bethel et al., 2007; Boulton et al., 2005; Giurato & Uccioli, 2006). One in six individuals with T2DM will develop foot ulcer in his or her lifetime; 7% has foot ulcers at any given time, and 15% of foot ulcers end in amputation (Boulton, Kirsner, & Vileikyte, 2004; Young, Maynard, Reiber, & Boyko, 2003).

Daily basic foot care maintenance for persons with diabetes includes (a) not walking barefoot, (b) avoiding the use of corn or callus removers, (c) bathing the foot with mild soap, (d) cleaning the nails with a soft brush, (e) drying the feet with special attention such as using lamb's wool between the toes when web spaces are moist, (f) using oil, lotion, or lanolin cream to avoid dryness, (g) wearing appropriate footwear, and (h) using socks to absorb perspiration (Johnston, Newton, & Goyder, 2006; Pinzur et al., 2005). Nevertheless, several patients with diabetes disregard foot care. In a cross-sectional study of 1,482 patients with diabetes with health insurance, 37.9% reported neglecting foot care and 25% of those with symptoms of severe foot neuropathy reported

not spending time on foot care (Safford et al., 2005). According to Beckles et al. (1998), only 61% of persons with diabetes had their feet inspected at least once. Additionally, the numbness from neuropathy likely let them ignore foot injuries that may be even serious (Young, Maynard, Reiber, & Boyko, 2003).

The succeeding sections will explore individual factors associated with diabetes self-management such as diabetes knowledge, self-efficacy, spirituality, and environmental factors such as social support.

Factors Influencing Health Behavior

People's behavior is affected by what they think, believe, and feel. While the cognitive process is considered as the most external influence affecting behavior (Bandura, 1989), self-efficacy is a critical link between knowledge application and actual behavioral change and is one of the most effective predictors of health behavior (Bandura, 1997). Bandura (1989) also posited that social support is an effective tool to get through the impediment and stresses encountered in the life paths people take. Positive connection had also been highlighted between spiritual factors and well-being (Gall & Grant, 2005; Gordon et al., 2002; Rowe & Allen, 2004).

Cognitive Variable: Diabetes Knowledge

Researchers reported that diabetes knowledge is a factor affecting diabetes self-management and encouraging healthy behaviors (Kuo et al., 2008). The importance of diabetes education was recognized as playing an important role in diabetes management to build skills and empower patients to assume daily responsibilities to manage their disease (Khunti et al., 2008). McPherson, Smith, Powers, and Zuckerman (2008)

measured the relationship between medication knowledge and blood glucose control by giving the 44 patients in an ambulatory care practice consumer guide questionnaires and by drawing blood samples to measure their A1C. McPherson et al., (2008) found that knowledge score predicted 40% of A1C levels variation, where those who scored at or above the median knowledge score of 5 had 2.3 A1C level points lower than those scoring below the median. In another study, 77 participants with diabetes were tested on their knowledge using the Michigan Diabetes Knowledge Test along with measuring HbA1C (Colleran, Starr, & Burge, 2003). Colleran et al. (2003) found that better scores were inversely correlated to HbA1C (r = -0.337, P <0.003), indicating a positive influence on glycemic levels.

However, diabetes knowledge does not guarantee the achievement of good glycemic control. In a cross-sectional study among 40 inpatients and 60 outpatients with T2DM in Shanghai, China, He and Wharrad (2007) found no difference in the overall diabetes knowledge among Chinese people who have good glycemic control or suboptimal glycemic control. Nevertheless, there was a negative correlation (r = -0.208, P=0.038) between diabetes knowledge with age (He & Wharrad, 2007). Further, occupation has significant correlation with diabetes knowledge where the white-collar workers having highest (24.84) mean score while the housewives having the lowest (20.67) mean score (He & Wharrad; 2007).

Psychological Variable: Self-Efficacy

Self-efficacy is the individual's ability to exercise control over events that will likely affect one's life (Bandura, 1989). The application of self-efficacy as a health

behavior framework was well documented. For example, self-efficacy, as a health promotion model, influenced perceived action barrier (Sakraida, 2006). In a study of 570 older women with heart disease, self-efficacy predicted the use of prescribed medicine, engagement in adequate exercise, stress management, and adherence to recommended diet (Clark & Dodge, 1999). Bandura (1997) asserted that self-efficacy is a critical link between knowledge application and actual behavioral change and is one of the most effective predictors of health behavior.

Researchers showed considerable evidence that diabetes self-efficacy is a consistent predictor of diabetes self-management behaviors. For example, Johnston-Brooks and colleagues (2002) found that the variance accounted for self-efficacy is 35% in the overall self-care, 42% in diet self-care, 14% in exercise self-care, and 7% in blood testing self-care of young adults with diabetes. In another cross-sectional study that investigated the relationship between self-efficacy and self-care behaviors of 309 individuals with diabetes, the variance accounted for by self-efficacy in diabetes self-care behavior was from 4% to10%, explaining beyond what characteristics and health beliefs of the patients about barriers had been accounted (Aljasem et al., 2001). Similarly, Sarkar et al. (2006) administered a survey to 408 ethnically diverse participants and found that increased diabetes self-efficacy was related to increased optimal diet (.14 day more weekly), exercise (0.09 day more weekly), blood glucose monitoring (16% increased daily), and foot care (22% increased daily) but not to medication adherence. In a previous study, Senécal, Nouwen, and White (2000) found that self-efficacy had a significant association with adherence to dietary self-care. Johnston-Brooks et al. (2002)

also reported that self-efficacy would likely increase the relationship between diabetes knowledge and diabetes self-management.

A healthy lifestyle is important to prevent the progression and complications of diabetes. However, modification of long-term health habits may not be very easy. Patient with prediabetes required a substantial increase in self-efficacy before they prevailed over the difficulties in implementing healthy lifestyles (Janz, Champion, & Strecher, 2002).

Spiritual Variable: Spirituality

Illness may result in stress leading to the imbalance of mind, body, and spirit. Yet, spirituality can help individuals make some meaning out of pain and suffering (Kaye & Raghavan, 2002), turning illness and its related stress into a spiritual growth opportunity. A growing number of researchers and clinicians recognized the relevant role of spirituality in dealing with people confronted with stressful conditions (e.g. Hodge, 2005; Miller, Korinek, & Ivey, 2006; Polzer & Miles, 2007). Several studies also highlighted the positive connection between spiritual factors, health, and well-being (Gall & Grant, 2005; Gordon et al., 2002; Rowe & Allen, 2004). Spirituality is regarded as the unfolding of life's course linking up with a dimension outside of the self (Tornstam, 1994). Spiritual beliefs involve an understanding of a power greater than the self does and a sense of relationship with this power (Gall & Grant, 2005). However, "spiritual beliefs can also exist without a belief in a higher power as an individual can draw upon his or her own meaningful life experiences" (Gall & Grant, 2005, p. 522).

Several studies were conducted on the relationship between diabetes management and spirituality. In a qualitative study of 20 heterosexual couples, Cattich & Knudson-

Martin (2009) suggested the inter link and integral pattern of spirituality with couple communication and problem solving in the diabetes management of at least one partner. Similarly, spirituality was found to be an important factor in the general health, adjustment, and coping with diabetes among African-American women with T2DM (Samuel-Hodge et al., 2000). In a ground theory analysis, spirituality played a significant role that influenced diabetes self-management among African Americans with diabetes (Polzer & Miles, 2007). Particularly, religion and spirituality demonstrated a significant relationship with glucose control among Black women with T2DM (Newlin et al., 2008). Rapaport (1998) stressed that there is a lifetime benefit in coping with diabetes by finding positive and meaningful spirituality.

Sociocultural Variable: Social Support

Social support has been defined as "the availability of people whom the individual trusts, on whom he can rely, and who makes him feel cared for and valued as a person" (McDowell & Newell, 1996, p. 125). In a literature review of 29 studies, Gallant (2003) found evidence that social support has modest positive relationship to self-management of chronic diseases. In another study among 164 participants with diabetes, Rosland et al. (2008) found a 1.77% adjusted odds ratio of completing the recommended glucose monitoring for every unit increase in family members and friends' (FF) support. However, FF did not show a relationship with medication taking, dietary plan adherence, physical activity, and feet monitoring. Nevertheless, there were also studies showing significant results. For example, Anderson et al. (1995) found the likelihood of individuals with diabetes to perform better dietary routine (46% vs. 24%) and exercise

(79% vs. 63%) behaviors when they were satisfied with the social support they received. Similarly, Toljamo and Hentimen (2001) found that patients who received more social support from family and friends would likely adhere to self-care than those who neglected self-care (*F*=7.4, P.001). Gallant (2003) also found a strong relationship between social support and diet and exercise but a relatively weak relationship between support and pharmacotherapy adherence and glucose level monitoring.

The Role of Acculturation in Disease and Health Behavior

Acculturation is the modification of attitude and behavior of individuals from their indigenous culture because of exposure to Western culture over time (Xu et al., 2010). Hubert et al. (2005) measured acculturation condition by three indicators: length of residence in the United States, generation status, and primary language spoken at home. Researchers had also found the role of acculturation in DM risk. Higher acculturation had a significant relationship with the prevalence of DM among non-Mexican-origin Hispanics in the United States (Kandula et al., 2008) and among the Japanese Americans (Huang et al., 1996). Chinese Americans who adopted Western lifestyle were likely at a greater risk of developing diabetes (Gomez et al., 2004). There was also an inverse association in being born in Japan and the total number of years having lived in Japan to diabetes prevalence, after age, body mass index, and physical activity were controlled (Huang et al., 1996).

Acculturation and Diabetes Self-Management Practices

Researchers found significant association of acculturation and health behaviors such as eating and lifestyle behaviors. For example, in a cross-sectional survey

administered to 399 Chinese Americans who were more acculturated through United States residency length and proficiency in English, Lv and Cason (2004) found an increased frequency in the consumption of foods rich in fats and desserts (r = 0.128 to 0.142) and beverages (r = 0.128 to 0.198). In a cross-sectional survey among 348 Korean Americans, Lee, Sobal, and Frongillo (1999) discovered that high acculturation indicators have a positive correlation with more consumption of American foods and less consumption of Korean foods. Further, more acculturated participants consumed more of fruits, sweets, and fats. In a study among FilAms, those who were below 65 years of age, more educated, younger when they immigrated to the United States, and younger when diagnosed with T2DM reported more consumption of high fat, red meat, or dairy food products compared to older FilAms, less educated, older when they immigrated, and older when diagnosed with the disease (Jordan & Jordan, 2010). Relationships between acculturation and dietary habits were also found. For example, higher acculturation was related to lower consumption of fruits and vegetables (Neuhouser, Thomson, Coronado, & Solomon, 2004) and higher fat intake from fast food (Unger et al., 2004). Investigators also showed opposite directions between the association of acculturation and dietary intake (Lin, Bermudez, & Tucker, 2003; Perez-Escamilla & Putnik, 2007; Sharma et al., 2004).

Scholars also explored the association between acculturation and physical activity. For example, Unger et al. (2004) observed that higher acculturation has a significant relationship to lower frequency of participation in physical activity. Slattery et al. (2006) found that more engagement in leisure time physical activity such as dancing

and housework was associated with higher acculturation. In a cross-sectional study of Asian subgroups, Gomez et al. (2004) found that those who were highly acculturated engaged in low (45 %) physical activity. Nevertheless, there were also inconsistent results. For example, older Chinese adults who have lived longer in the United States had the higher odds (OR = 1.02) of doing physical activity than their counterparts who have lived shorter in the country (Parikh, Fahs, Shelley, & Yerneni, 2009). Some researchers also examined the relationship between acculturation and diabetes self-care behaviors. For example, Huang, et al. (1996) found that the Japanese men who retained their Japanese lifestyle in Hawaii reported higher levels of physical activity (33.4 ± 0.16 vs. 32.7 ± 0.05, $p<0.01$) and consumed less fat and animal protein diet (70.8 ± 0.45 vs. 73.2 ± 0.15 $p<0.05$) than those who adopted to Western lifestyle. In addition, younger FilAms were less likely to perform optimum self-care behaviors pertaining to diet, medication, and blood glucose monitoring compared to their older counterparts (Jordan & Jordan, 2010).

Research Gap on Diabetes Self-Management Behaviors

There were somewhat inconsistent findings in the literature in exploring factors related to self-care practices across racial/ethnic groups. For example, CDC (2011c) conducted the Behavioral Risk Factor Surveillance Survey (BRFSS) from 1995 and 2001 in all 50 states, the District of Columbia, and three U.S. territories (Guam, Puerto Rico, and Virgin Islands) to investigate the racial/ethnic preventive care practices among persons with diabetes. In 1995, among the Hispanics, 46% did eye examination, 62.9% did foot examination, and 28.1% did blood glucose self-monitoring. In the same year,

among Black non-Hispanics, 69% did eye examination, 54.1% did foot examination, and 45.4% did blood glucose self-monitoring. For White Non-Hispanics, 62.4% did eye examination, 52.7% did foot examination, and 43.3% did blood glucose self-monitoring. CDC (2011c) noted an increase in all preventive-care practices after age adjustment from 1995 to 2001. In contrast, other investigators found no racial/ethnic differences in preventive care. For example, Martin, Selby, and Zhang (1995) analyzed 378 medical records of noninsulin dependent diabetes mellitus (NIDDM) patients in a health maintenance organization (HMO) in Northern California and found that the HMO's eight-point prevention score, which reflects the ADA guidelines for care and rates of diabetes complications, did not differ by race. In another cross-sectional study, using the random-digit-dialing telephone survey conducted among noninstitutionalized 23,434 participants who have diabetes, Oladele and Barnett (2006) did not find race or ethnicity as a strong predictor for any of the diabetes care practices examined. These findings confirmed the Third National Health and Nutrition Examination Survey (NHANES III) analysis, showing some racial and ethnic differences in health status and outcomes, as well as health care access and utilization among patients with T2DM (Harris, 2001b). Nevertheless, the differences when compared to the suboptimal health status of all racial/ethnic groups in relation to the established treatment goals did not have significant magnitude (Harris, 2001b).

While studies have conflicting analysis on the diverse racial/ethnic preventive care practices, there was also inadequate research focused on the health gaps among Asian Americans despite their significant increasing figures (Liburd, Jack, Williams, &

Tucker, 2005). For example, there were only 0.01% or 1,499 articles that directly involved the health of Asian Americans/Pacific Islanders in about 10 million published articles found from the MEDLINE database research between 1966 to 2000 (Ghosh, 2003). Further, Asian Americans comprise a heterogeneous ethnic group with varied language, dialects, cultures, health utilization, and health outcomes (Barnes et al., 2008). However, health studies on Asian Americans characterized them as one group population (Liu et al., 2009). Moreover, studies specific to racial/ethnic subgroups were even less accessible (Chesla et al., 2009). It is, therefore, relevant to focus a descriptive research on a specific cultural group, such as the FilAms.

Study Gap in Multiple Diabetes Self-Care Behaviors

The cornerstone in control and prevention of diabetes is self-management; however, adherence to self-management practices is poor. Nelson et al. (2002), after analyzing the data of the NHANES III conducted by the National Center for Health Statistics among 1,480 adults taken from 89 U.S. survey locations between 1988 and 1994, concluded that there was low, optimum self-management practices among people with T2DM, Of the respondents with T2DM, 31% had no regular physical activity and 38% did not engage in recommended levels of physical activity. A significant rate did not follow the daily dietary guidelines for fat, fruit, and vegetable consumptions, such as 62% consumed fewer than five fruits and vegetables servings and about 66% got more than 30% of their calories from fatty foods and more than 10% of their total calories were from saturated fat.

There also seems to be a limited study on disease self-care practices among ethnic and racial groups. While existing literature may have taken into account the importance of optimal self-care behaviors among various population groups, Gallant, Spitze, and Grove (2010) noted the absence of prevalent studies about chronic illness self-care behaviors in population-based samples among Asian Americans. After analyzing the literature review, Gallant et al. (2010) concluded that the result was non-exhaustive due to relatively small number of studies focused on different racial-ethnic group self-care among older adults with chronic illnesses.

Former investigations found significant results on specific diabetes self-care behaviors. For example, insulin supplement or oral medications were necessary for those with T2DM (ADA, 2007). Nevertheless, patients with T2DM had poor adherence to pharmacotherapy, bringing inadequate control of the disease that also carries financial burden (Berger, 2007). Modification of diet is the foundation in the treatment and control of T2DM (Mann & Lewis-Barned, 2004). While proper food choices imply survival for persons with diabetes, diet behavior is difficult to maintain (Chowdhury et al., 2000). Forty-two percent of adults more than 17 years old diagnosed with T2DM reported that 30%-40% of their calories were taken from fat while 26% reported their daily intake of calories was taken from more than 40% fat (Nelson et al., 2002). Physical activity is desirable for individuals with diabetes; however, 31% of people with diabetes did not have regular physical activity and 38% reported less than the recommended physical activity level (Nelson et al., 2002). Self-monitoring of blood glucose is critical in diabetes care, but 67% among 44,181 persons with T2DM receiving pharmacological treatment

were less likely to test their blood glucose as recommended by their health care providers (Karter et al., 2000). Daily foot care maintenance is important to minimize peripheral neuropathy that results to improper blood glucose control leading to serious foot problems such as foot ulcers, foot infections, and disfigurations (Bethel, Sloan, Belsky, & Feinglos, 2007; Boulton & Armstrong, 2006; Wieman, 2005). Nevertheless, many patients with diabetes neglect foot care. For example, of the 1,482 patients with diabetes, 37.9% did not practice foot care and 25% did not spend time on foot care even in the presence of severe foot neuropathy symptoms (Safford et al., 2005). The results imply that there are factors influencing suboptimal diabetes self-management practices.

Holistic Perspective in the Study of Multiple Self-Care Behaviors

Disease self-management practices will likely complement with each other. The holistic approach suggests the interrelatedness of spiritual, physical, and psychosocial dimensions of disease management (Patterson, 1998). For example, Potter and Zauszniewski (2000) conducted a correlational cross-sectional study using a survey format to examine 47 community-based adults with rheumatoid arthritis. When examined individually, social, emotional, and physical stressors did not predict general health perception, but when taken together, a significant effect on health perception was observed that will likely support health lifestyle decision. The significant correlation between learning resources and spirituality suggests the possible interactive consequence of the individual's mental and spiritual facets, indicating that holistic framework promotes positive health perception and disease management (Potter & Zauszniewski, 2000).

Scholars attempted to explore health lifestyle and illness management using the holistic framework with qualitative approach. For example, Samuel-Hodge et al. (2000) interviewed 70 African-American women with T2DM and found that spirituality, general life stress, multicare giving responsibilities, and psychological impact of diabetes influenced diabetes self-management behaviors. In another qualitative study, Cattich and Knudson-Martin (2009) found a link between the meaning that couples with at least one partner having T2DM diagnoses during adulthood ascribed to their diabetes and the ways connection with each other and with God, called "spiritual coping style couples" (p. 118) in dealing together with diabetes. Couples who had engaging connection with each other and those with spiritual coping style would likely be better equipped in exploring alternative options to approach diabetes that brings optimism, creativeness, and skill in diabetes management (Cattich & Knudson-Martin, 2009).

Significance of Diabetes Mellitus and Diabetes Self-Management for FilAms

The susceptibility of AsAms to DM has recently gained attention. AsAs have risk of T2DM 20%-40% greater than the Caucasian population, in spite of having a body mass index substantially lower compared to their Caucasian counterparts (Lee, Brancati, & Yeh, 2011). This result was consistent with previous studies that used NHIS data comparing Asian subgroups to Caucasians in the risk of T2DM. Oza-Frank et al. (2009) reported that the Asians' likelihood of risk for T2DM compared to Caucasians was an odds ratio of 2.0-3.5. After multiple adjustments, Ye, Rust, Baltrus, & Daniles (2009) also found that the odd range of Filipinos and Asian Indians at risk for T2DM as compared to Caucasians was 1.2-2.2. The increasing trend of diabetes was also found

among the youth aged <20 years, raising a health concern (Liu et al., 2009). Liu et al. (2009) found that in every 1,000 youths of Asian, Pacific Islander, and Asian-Pacific Islander descent aged 10-19 years, there is a 52% prevalence of T2DM (Liu et al., 2009). In particular, the risk is rising among the FilAms (Araneta & Barret-Connor, 2005; Araneta, Wingard, & Barret-Connor, 2002; Kim, Park, Grandinetti, Holck, & Waslein, 2008; Lee et al., 20011; Nguyen & Salvail, 2007; Oza-Frank et al., 2009; Ye et al., 2009). The national estimates for diabetes status after age adjustment reported Filipinos at 8.9%, a rate higher than Caucasians at 6.4%, Chinese at 6.2%, Vietnamese at 6.1%, Japanese at 4.9%, and Koreans at 4.0% (Barnes et al., 2008). In a case-control study conducted from 1996-2001 at an HMO, Filipinos had 21.2% risk of developing diabetes, compared to Caucasians at 8.1%, Chinese at 6.4%, and Japanese at 5.5% (Gomez et al., 2004). Additionally, recent analysis of the U.S. National Health Interview Survey conducted from 1997-2008 revealed that the odds ratio for developing T2DM for Filipinos was 1.09, second to Asian Indians (*OR* 2.27) across all Asian subgroups compared to Caucasians (Lee et al., 2011). Observation depicted the stability of this trend from 2006-2008 (Lee et al., 2011). The Filipinos in Hawaii, the island's largest ethnic group, had 21.8% prevalence and 15.5% incidence of diabetes (Fujimoto, 2006), with the rate going upward since 2001 (Nguyen & Salvail, 2007). In comparing the prevalence of diabetes within the age-specific stratum of above 50-years-old among 208 participants categorized as having T2DM, Kim et al. (2008) found that Filipinos were at the second order of greater prevalence (30.9%), following the Hawaiians (36.8%) when compared to Caucasians (11.3%). The score remains to be high for Filipinos (*OR* 1.75) compared with Japanese

(*OR* 1.38) after smoking and dietary factors adjustment. When energy intake was further adjusted, Filipinos had the highest odd ratio (1.92) compared to Hawaiians (1.83) and Japanese (1.589).

Diabetes affects mortality. Diabetes had been listed in the death certificates as the cause of 9.6% deaths and is listed 38.2% in any cause in 1986 (Geiss, Herman & Smith, 2006). According to Geiss et al. (2006), deaths related to DM are higher among racial and ethnic minority groups (12.6% for African-Americans and 11.6% among Hispanics) than the Caucasian (9.2%) population; and the death rates attributable to diabetes are higher in this group than the rates among the general population. In particular, USDHHS-OMH (2012) reported that the death rate of Filipino residents in Hawaii is more than 3 times as the Caucasian residents do due to diabetes.

Further, FilAms are the second largest Asian groups in the United States with more than 3.4 million populations (Hoeffel, Rastogi, Kim, & Shahid, 2010). They account about 4.4 per cent or 1,684,802 of the 38.0 million foreign-born immigrants residing in the United States in 2008, the second rank relative to other immigrant groups regarding population size that reside in the country (Terrazas, 2008). Despite significant statistical growth in numbers of FilAms, data on their health practices, specifically diabetes self-management practices, are less available.

The Age Factor

Age seems to be a factor that plays a role in the disease development. Based on a study conducted in 1993 to 2001, McBean, Li, Gilbertson, and Collins (2004) found that elderly Asian Americans had the greatest increase of susceptibility to DM (68%)

compared to other ethnic groups such as Caucasians (35.8%), African-Americans (32.9%), and Hispanics (38.55%). This trend is similar among FilAms living in Houston, Texas. In a cross-sectional study conducted between September 1998 and March 2000 using a convenience sample of 831, Cuasay et al. (2001) found that the prevalence of T2DM among FilAms ages 35-44 years old was at 5.6% compared to 34.2% among ages 65-74 years old.

The Gender Factor

FilAm women appeared to be at high risk of increased diabetes prevalence. Araneta et al. (2002) recruited FilAm women (*n*=294) and Caucasian women (*n*=379) in San Diego, California between 1992 and 1999 and found that the prevalence of T2DM among Filipino women was higher (36%) than Caucasian women (9%) based on an oral glucose tolerance test criteria. In the same study using metabolic syndrome, Filipinas had 34.3% prevalence of DM compared to 12.9% prevalence among Caucasian women. In another study, Araneta and Barret-Connor (2005) found a higher risk for T2DM among Filipino women (32.1%) than the Caucasian women (5.8%) or African-American women (12.1%) after age adjustment. The same trend was noted even after adjusting for age, visceral adipose tissue (VAT) fat, exercise, education, and alcohol intake with two-fold adjusted odds ratio higher risk for Filipino women in comparison to African American women and seven-fold higher risk compared to Caucasian women. Araneta & Barret-Connor (2005) also found that the visceral adipose tissue (VAT) fat among normal weight FilAm women was higher (69.1 cm^3) than the Caucasian women (62.3 cm^3) and African American women (57.5 cm^3). Nevertheless, in comparison with Caucasian or

African American women, the excess VAT fat among FilAm women did not explain the excess risk for T2DM (Araneta & Barret-Connor, 2005). Researchers also found that the mean waist-to-hip ratio (WHR) was highest among FilAm women (.914) compared to Hawaiians (.901), Japanese (.906), and Caucasians (.879) women (Kim et al., 2008). In comparing the gender difference in the impact of T2DM on the risk for coronary heart disease, Juutilainen, Kortelainen, and Lehto (2004) found the rate was higher for women (14.4) than men (2.9%).

Gucciardi, Wang, DeMelo, Amaral, and Stewart (2008) reported that women tend to have higher expectations of the benefits of diabetes self-management. While women perceived higher levels of social support from their diabetes health care team than men did, researchers found that women's primary barrier to self-management of the disease was social (Gucciardi et al., 2008; Cherrington, Ayala, Scarinci, and Corbie-Smith, 2011).

The Socioeconomic Factor

Socioeconomic factor might also play an important role in the development of diabetes among FilAm women. In an investigation of 389 FilAm women ages between 40-86 years old, Langenberg, Marmot, Araneta, Barret-Connor, & Bergstrom (2007) found that those who were socioeconomically disadvantaged from childhood to adulthood have high odds ratio for diabetes (0.55, 0.19, and 0.11) respectively, compared to 0.07 among the most advantaged women. In tracking the health progress of residents in Hawaii from 2001 to 2006, a significant higher rate of diabetes among the low-income households (between 8.9%-12.8%) than those who have better income (5.5%-6.8%) was

observed (Nguyen & Salvail, 2007). The association between lower income and T2DM was consistent with the Houston, Texas observation of Filipinas with T2DM (Cuasay et al., 2001).

Additionally, being in the lower social class will likely predict the increased risk of not receiving preventive care. For example, in the analysis of BRFSS data from 1998-2001, Oladele and Barnett (2006) found that those who have no health care coverage twice likely did not visit the doctor during the past year, twice likely did not have an eye examination, and one and half times more likely did not have foot examination in the past year. Kandula, Kersey, and Lurie (2004) investigated the health and status needs of immigrants in the United States and found that the immigrant populations as a whole had limited access to medical care and health services. On the other hand, access to health care did not seem to influence health status (Oladele & Barnett, 2006). In the analysis of data from NHANES III, Harris (2001a) found that the health status across three racial/ethnic groups did not show significant association with access to health care such as having primary source of ambulatory medical care, frequency of yearly physician visits, having health insurance of any type, or having private insurance.

The Cultural Issues

Asian Americans will likely face challenges in self-managing diabetes because of distinct cultural issues, family and social relationships, language barriers, and limited health care access. For example, in a comparative analysis from six semi-structured interviews conducted among 20 foreign-born Chinese American couples (n=40) with one member diagnosed with T2DM, Chesla et al. (2009) found that the prescribed diet for

patients with diabetes challenged their cultural beliefs and practices. Additionally, increased irritability, a symptom brought by the disease, challenged family harmony. Further, living with a person with diabetes challenged family roles and responsibilities adaptation (Chesla et al., 2009). In a focus group interview of 15 members with T2DM from an HMO, Finucane and McMullen (2008) found that discussions centered on concerns for family obligations and maintaining social relationships emerged as important factor that can complicate diabetes self-management of Filipinos. Hsu et al. (2006) also identified that language is a barrier in the diabetes knowledge and glycemic control among 55 Chinese Americans with T2DM.

Additionally, dietary habits, physical activity patterns, medication adherence, and SMBG practices differ among racial/ethnic groups (Nwasuruba et al., 2007), which will likely complicate their engagement in self-management practices that influence their behavior. For example, Kim et al. (2008) found that the dietary patterns of FilAms with T2DM in Hawaii were food consumption high in animal foods and ethnic dishes such as rice, processed meats, prepared with fats (OR 1.34; 95% CI 0.93-1.83) over a diet high in fruits, vegetables, and complex carbohydrates (OR 0.99; 95% CI 0.74-1.34). In the same study, Kim et al. (2008) also found that FilAms with diabetes consume at higher rate (Student's *t* test $P < 0.001$) of such diet pattern than those without diabetes.

Acculturation Factors and Westernization Lifestyle

Researchers also found that acculturation and Westernization led to an increased risk of diabetes and diseases associated to diabetes. Acculturation, a condition related to Westernization due to the modification of attitude and behavior of individuals from their

original culture because of exposure to Western culture over time (Xu et al., 2011), can be measured by three indicators: length of residence in the United States, generation status, and primary language spoken at home (Hubert, Snider & Winkleby, 2005). In an analysis of national population-based standardized telephone interviews using 11,099 participants with diabetes, McNeely and Boyko (2005) found that the odds of diabetes-associated conditions such as hypercholesterolemia and retinopathy had no significant differences by ethnicity. Further, no statistical significance between AsAms and non-Hispanic Whites in the below 50% adjusted prevalence of foot ulceration (McNeely & Boyko, 2005). McNeely and Boyko (2005) also found the prevalence of hypertension (OR.9) was similar among AsAms and the Hispanics. These findings imply that the prevalence of diabetes-associated conditions among AsAms parallels to that of the non-Hispanic Whites due to acculturation.

Acculturation and subsequent increased risk of T2DM had also been documented in recent population based surveys. For example, in the comparative study analysis between Japanese-Americans living in Hawaii and Los Angeles and native Japanese, Nakanishi et al. (2004) found that the impact of exposure to Western lifestyle resulted in higher serum fasting insulin level, higher insulin level after a glucose load, and higher prevalence of T2DM. Nakanishi et al. (2004) also found higher deaths from ischemic heart disease in Japanese Americans compared to the native Japanese.

Acculturation may also affect diabetes self-management. Nakanishi et al. (2004) observed more high fat and simple carbohydrate consumption and lower physical activity among Japanese Americans living in Hawaii and Los Angeles than among the Native

Japanese. In a study of 209 Chinese Americans, whose average duration of residency in the United States was 20.97 years and with average duration of diabetes of 9.19 years, only 36.8% followed the recommended diet, 42% followed the daily foot care, 40% exercised more than 5 days a week, and 26.8% monitored their blood glucose levels daily (Xu et al., 2010). Nevertheless, more than 80% adhere to the daily-prescribed medication (Xu et al., 2010). Further, more acculturated Chinese Americans through longer U.S. residency had increased consumption of fatty and sweet foods and beverages than their counterparts (Lv & Carson, 2004). Korean Americans who were also highly acculturated consumed more of American foods rich in fats and consumed less of Korean foods (Lee, Sobal, & Frongillo, 1999).

The susceptibility to changes accompanied by acculturation contributing to the diabetes self-management behaviors of FilAms was recently examined. Jordan and Jordan (2010) conducted a cross-sectional study using convenient sampling to investigate the multiple self-care behaviors of 194 FilAms diagnosed with T2DM by administering Summary of Diabetes Self-Care Activities-Revised (SDSCA-R). Jordan and Jordan (2010) noted that age, gender, age of immigration, length of stay in the United States, education, and age of diagnosis were likely linked to performance of different self-care behaviors. Specifically, FilAms who had lived longer period in the United States followed healthy eating habits. Those who have lived for a shorter time and were older upon immigration to the United States evenly spaced their intake of carbohydrates throughout the day. Females tended to eat five or more servings of fruits and/or vegetables daily than men. Those who were less than 65 years of age, have higher

education, younger when immigrated to the United States, and younger when diagnosed with the disease consumed more of nonrecommended diet such as eating of fatty foods, red meat, and dairy products compared to those older than 65 years old, have less education, older when immigrated to the United States, and older when diagnosed with the disease. FilAm males with higher education tended to participate in at least half-hour of physical activity most of the week. Those who were older in age, were older upon immigration to the United States, and had been diagnosed for a longer time adhered to medication regimen. Likewise, FilAm women tended to comply with the T2DM medications, specifically the oral diabetes pills, and the recommended number of medications. Conversely, those who have lower education tended to have fewer adherences to medication regimen. Participants who were older and had longer diagnosis of the disease tended to monitor their blood glucose levels most of the days. Additionally, those who were diagnosed for a longer period tended to comply with the recommended blood glucose levels testing. These results imply that other factors will likely contribute to the increasing T2DM risk among FilAms brought about by nonadherence to diabetes self-management practices. The factors that influence the diabetes self-management behaviors of FilAms need to be clarified. This study will, therefore, complement or advance prior studies by exploring the combined outcomes of factors influencing diabetes self-management behaviors and by examining the multiple self-care behaviors of FilAms.

Summary and Conclusions

DM is a chronic disease that is increasingly prevalent among the AsAms, particularly among the FilAms. The death rate attributable to diabetes among FilAms is

more than three times as their Caucasian counterparts. Despite this growing trend, there is a dearth of data on the health status, especially diabetes self-care behaviors among FilAms. Additionally, AsAms is a diverse heterogeneous ethnic group. However, the limited health studies have taken the health characteristics of the AsAms as one group of the population. Further, diabetes mellitus brings a high price tag. There is an enormous economic implication due to high health care costs, disability, mortality, morbidity, and productivity loss because of diabetes and the complications the disease brings.

Diabetes self-management is the corner stone to diabetes control and complication prevention. Diabetes self-management practices include medication, diet, physical activity, blood sugar monitoring, and foot care. Many individuals with diabetes do not adhere to self-management practices, particularly among the minority population groups.

To have an effect on health behavior, the dynamism of disease management involves the interaction of the individual and environmental factors. A holistic approach looks at the interrelationship of spiritual, physical, psychosocial, and dimensions of health care. Viewing health management in the perspective of a holistic approach where the dynamism of the patient's physical (diabetes mellitus), developmental (diabetes knowledge), psychological (self-efficacy), spiritual (spirituality), and sociocultural (social support) dimensions are assessed integrally will likely improve diabetes self-management practices as these factors simultaneously influence and interact within the individual's entire system. In order to help maintain practices for healthy well-being, the significant roles of the following variables are to be considered: (a) diabetes knowledge, the cognitive process about what is diabetes, its complications, and its management; (b) self-

efficacy, the individual's ability to exercise control over events that will likely affect one's diabetes self-care management practices; (c) spirituality, a belief system that involves the understanding of a power greater than the self to help maintain practices for healthy well-being; and (d) social support, a source of help exhibited by significant others in order to manage diabetes. Acculturation, a sociocultural dimension, had also influenced diabetes self-management practices. Researchers that considered these factors singly found significant results. When taken as interrelated factors operating within the entire system affecting self-management practices, their total contribution may augment disease management behavior.

Current diabetes studies focused on the risk to FilAms for diabetes, but it is unclear whether the increasing risk is due to diabetes self-management behaviors influenced by individual and environmental or cultural factors. Earlier investigations had not also explored the holistic model to examine the health-promoting behavior and in the prediction of diabetes self-management behavior among persons with diabetes, much more so among FilAms with T2DM. To develop effectual interventions that will encourage short-and long-term health practices of patients with T2DM, it is critical to identify the factors that influence diabetes self-management using holistic perspective, specifically among the FilAms.

Several studies investigated the association between diabetes self-management and its determinants, such as diabetes knowledge, self-efficacy, spirituality, and social support. Diabetes knowledge had a positive influence on glycemic control. However, knowledge alone did not guarantee good glycemic control. Diabetes self-efficacy was a

consistent predictor of better self-care such as optimal diet, exercise, blood glucose monitoring, and foot care, but not on adherence to medication. Nevertheless, a substantial increase in self-efficacy was required so that patients with diabetes can overcome the difficulties in healthy lifestyle implementation. Spirituality had a strong relationship with glucose control. Social support predicted blood glucose monitoring but researchers found conflicting results on its relationship with adherence to diet, medication, and exercise. There were unsubstantial studies that investigated the roles of diabetes knowledge, self-efficacy, spirituality, and social support integrated together in order to understand diabetes self-management behaviors. This dissertation, therefore, complemented prior studies by examining the combined effects of factors influencing diabetes self-management behaviors and the multiple self-care behaviors among FilAms with T2DM by using a quantitative method.

The findings also helped to broaden the understanding of behaviors that positively influence health through the diabetes self-management among FilAms with T2DM. Specifically, this research study was the first to examine if a holistic approach influences the self-management practices of FilAms with T2DM. Further, results may add to the knowledge base about the diabetes self-management practices of FilAms.

The result may also increase the knowledge that would be useful for health intervention developers, educators, health psychologists, physicians, nurses, and other clinicians who are searching for direction in improving diabetes self-management among FilAms with T2DM. Furthermore, researchers may benefit from the findings by replicating the concepts of the holistic perspectives in studying health-promoting

behaviors of FilAm patients who may have life-threatening diseases such as cancer, HIV/AIDS, asthma, stroke, cardiovascular disease, and obesity. Finally, the results may have potential impact on culture-sensitive intervention models to help delay the progression of diabetes, thereby resulting in effective and substantial improvements in health and economic outcomes, which would provide benefits for the FilAm patients and their families, health-care payers, and the society as a whole.

The next chapter will present the research design and the rationale why quantitative research methodology was used in the study. The target population will be defined, and procedures for recruitment of subjects will be stated. The determination of sampling size will also be explained.

Chapter 3: Research Method

Introduction

It is not known if a holistic approach can be used to explain the influence of diabetes knowledge, self-efficacy, spirituality, and social support on the diabetes self-management behavior of individuals with T2DM. There is also no investigation about the diabetes self-management behaviors of FilAms with T2DM. In this study, I explored if diabetes knowledge, self-efficacy, spirituality, and social support are related to diabetes self-management behaviors among FilAms with T2DM, using the holistic approach.

In Chapter 3, I present the methodology of the research. The chapter is organized into a description of the research design and rationale, population and sampling procedures, instrumentation and constructs organization, threats to validity, and ethical considerations. The study's design includes a rationale on why the quantitative research design was selected. The characteristics and size of the sample, as well as the recruitment process, is presented. The instrumentation used is described. The data collection process and analysis are explained. At the end of the chapter, threats of validity are discussed.

Research Design and Rationale

The problem in this study was explored using a quantitative approach. The quantitative approach was used to examine the relationships and patterns between factors influencing diabetes self-management and diabetes self-management behavior. The quantitative approach was appropriate for this study because data collection was done by completion of established instruments that measured the dependent variable (diabetes self-management) and the independent variables (diabetes knowledge, diabetes self-

efficacy, spirituality, and social support). The scores reflected the participants' report of their knowledge about diabetes, confidence in doing certain activities related to diabetes management tasks, daily spiritual experiences, and perception of family support. In addition, a sociodemographic questionnaire that included items on acculturation conditions and health-related data were also administered to describe the confounding variables.

Methodology

In the succeeding paragraphs, I describe the research methodology in details, such as the definition of the target population, procedures to get the samples, recruit participation, data collection, instruments used, and analysis of data.

Population

The participants in this study were FilAms diagnosed with T2DM who were living in Los Angeles, Orange, San Bernardino, San Diego, and Riverside counties, Southern California. Inclusion criteria were as follows: time of diagnosis 1 year or longer, age between 25 and 75 years, no evidence of major diabetes complications, and had identified as FilAms (born in the Philippines and has resided in the United States for a minimum of 1 year). Schmidley (2003) defined immigrants as people living in the United States who are not U.S. citizens at birth. Immigrants include "naturalized citizens, legal permanent residents, undocumented immigrants, and persons on long-term temporary visas, such as students or guest workers" (Oza-Frank & Narayan, 2010, p. 661). In this study, my participants included Filipinos who were born outside the U.S.

and have migrated in the country with documents as U.S. citizens or holders of green card, tourist, student, and other visas.

Exclusion criteria for participants included major diabetes complications (such as proliferative retinopathy, nephropathy, amputations, cerebrovascular accident, or myocardial infarction within the last 12 months). The intent was to study patients who were in the early disease progression in order to benefit from the holistic intervention approach.

Sampling and Sampling Procedures

Convenience sampling was the strategy used in this study. The participants were volunteers recruited from churches, stores, community centers, and through local Filipino organizations. A minimum of 115 participants signed the consent forms, which were scrutinized for the inclusion and exclusion criteria. However, 113 (98%) successfully completed and returned the study packet.

Experts in the field of statistics provided guidelines in deciding the sample size using the multiple regression. According to Field (2009), the estimate of R in the regression depends on the number of predictors (k) and the sample size (N) or $R = k/(N-1)$. The sample size in multiple regression was based on whether the interest is to test the overall fit of the regression model or the contribution of individual predictors (Field, 2009). If overall fit of the regression model is to be tested, the minimum sample size is $50 + 8k$, or $50 + 8(4) = 82$. In testing the contribution of individual predictors, a minimum sample size suggested is $104 + k$ or $104 + 4 = 108$. In this study, there were four predictor variables and the interests were on both the overall fit and contribution of individual

predictors. In the calculation of both sample sizes described, the one that has the largest values was used, which was 108. The assumed medium-size relationships between the individual variables and the dependent variables were α= .05 and ß= .20 (Tabachnik & Fidell, 2001). According to Field (2009), the expected *R* for random data is *k*/(*N*-1). With four predictors, the estimated *R* was .037, which was a minimum effect size representing a practical significant effect for data in social science based on Cohen's criteria (Field, 2009).

Procedures for Recruitment, Participation, and Data Collection

I got permission for the use of the venues for recruitment and test administration. In the recruitment materials, which were posted in Filipino churches, community centers, and Asian markets, I emphasized the inclusion and exclusion criteria. Those who qualified to participate and indicated their agreement to the conditions for participation of the study were provided an informed consent form. A copy of the informed consent is found in Appendix A. Once informed consent was obtained, participants were informed of the designated schedule and venue for the test. Those who preferred to take the test at their home were handed or mailed the test packet. Each participant was assigned a unique ID number.

I gave out the questionnaires to the participants who could read, understand, and speak English and who used pen and paper. I answered any questions posed by the participants about the study. Completed surveys were mailed back or handed in personally to me in the self-addressed and stamped envelope included in the packet. I did

a quick check if any data were missing immediately upon submission of answered questionnaires.

Those who completed all of the surveys, which was filled out in 1 hour and 30 minutes to 2 hours, were given a $5.00 gift card for their participation. Any participant who signified their interest to receive the results of the study checked a box in the consent form and will be given the results when available. Dissemination of the results will be conducted in a similar manner the survey was administered.

Instrumentation

To gather the quantitative data, I used the following instruments to measure the identified variables:

Sociodemographic Survey. The sociodemographic survey was used to assess the following items: gender, age, marital status, employment status, household income, religious affiliation, and education. Other items included immigration status, acculturation conditions, and health-related data. Five age groups: 25-34, 35-44, 45-54, 55-64, and >65 years were created. Marital status was defined as never married (or single), married, separated, divorced, and widowed. Employment status was specified as employed (full time), employed (part-time), not working and not looking for work, unemployed and looking for work, disabled or retired and not looking for work, and currently in school. Five-income statuses were created based on yearly income: below $10,000, between $10-000 and $24,999, between $25,000 and $49,999, between $50,000 and $100,000, and above $100,000. Religious affiliations were classified as Roman Catholic, Protestant, Seventh-day Adventist, Islam, and others. Education levels were

classified according to highest education completed: below high school, high school graduate or general equivalency degree (GED), some college or vocational training, graduated college, and more than college (Masters, PhD., MD). Immigration status were identified as naturalized U.S. Citizen, legal permanent resident (green card holder), and nonimmigrant (student/tourist or guest worker) while acculturation condition was categorized into three types: length of residence in the United States, generation status (first, second, and third generation), and primary language spoken at home (English and native language). Health-related data had three types: insurance status (government funding, private insurance, self-pay or out of pocket), time since diabetes diagnosis, and type of medication regimen (no medication, diabetes pills only, long-acting insulin only, long acting insulin and short-acting insulin, pills and long-acting insulin and short-acting insulin, and others).

Diabetes Knowledge Test. The Diabetes Knowledge (DK) Test is a scale developed in the mid-1980s by the Michigan Diabetes Research and Training Center (MTRC). It has evolved into a 23-item single test: 14-item general test and 9-item insulin-use scale that can be completed in 15 minutes. Flesch-Kincaid measurement assessed its readability at a sixth grade reading level (Fitzgerald et al., 1998). The DK Test was used to examine two different populations, with one group receiving diabetes care in a community of varied local health providers and one group receiving diabetes care from a local health department. Fitzgerald et al. (1998) found the reliable Chronbach's alpha for both the general test and insulin-use subscale of DK Test was at $\alpha \geq 0.70$. Chronbach's coefficient alpha was also determined that the two samples had

similar reliability estimates as well. Alpha reliability refers to how a single construct measures the items well on a scale (Cohen & Swerdlick, 1999). The DK Test and its answer key are available free and can be downloadable online from http://www.med.umich.edu/mdrtc/profs/survey.html#dkt. A written permission to use the test instrument in the study was received from Fitzgerald, the test author (see Appendix B).

Self-Efficacy for Diabetes. The Self-Efficacy for Diabetes (SED) Test is an 8-item scale developed by the Stanford Patient Education Research Center (2013). It is an open source test available online (http://patienteducation.stanford.edu/research/sediabetes.html) and is free to use without permission. Nevertheless, a written permission through e-mail was sought and granted to me (see Appendix C). Each question has a 10-point scale ranging from *not at all confident* to *totally confident* where participant can choose the number to whatever corresponds to the tasks done regularly at the present time. SED was tested on 186 subjects with diabetes and has a .828 internal consistency reliability (M = 6.87, SD = 1.76). The Spanish version was tested on 189 Spanish-speaking subjects with T2DM, and its internal consistency reliability was .854 (M = 6.46, SD = 2.07).

Daily Spiritual Experience Scale. The Daily Spiritual Experience Scale (DSES) is a 16-item self-report scale intended to measure the day-to-day, ordinary life experiences of an individual's perception and connection with the transcendent (Underwood, 2011). With its intent to transcend particular religion boundaries, the items are designed to measure daily spiritual experience of ordinary individuals rather than

specific behaviors or beliefs or extraordinary experiences (Underwood & Teresi, 2002). Underwood developed the scale, which has been translated into several languages, used in several countries, and published in more than 70 studies. The reliability of the coefficient alpha values of the English scale and its translation has high consistency (.89 and above) across several studies (Underwood, 2011; Underwood & Teresi, 2002). Further, the test-retest Pearson correlation over 2 days is at 0.85 with good reliability and internal consistency for the test-retest reliability of the scale in translation (Underwood, 2011). The use of the scale is free. However, I requested permission and registration for use to be able to track its usage and network investigators with recent information, data translation, and current researches in fields of interest. Underwood granted written permission to me for the use of the instrument. A copy of the consent and all e-mail correspondence between Underwood and me is available in Appendix D.

Diabetes Social Support Questionnaire-Family Version. The Diabetes Social Support Questionnaire (DSSQ-Family Version) was originally a 52-item instrument developed for adolescents with Type 1 diabetes to measure their perceptions of diabetes-specific family support (La Greca & Bearman, 2002). With the written permission from La Greca, six items on foot care were added. Each statement of the instrument has a 5-point scale ranging from *none of the time* to *all of the time* where participants can choose the number to how they perceive the support they receive from their family about managing their diabetes. The DSSQ-Family Version was conducted to 74 adolescents (age range from 11 to 18 years) with Type 1 diabetes and the Chronbach's alpha for internal consistency on frequency ratings for Total was at .95, insulin at .75, blood testing

at .85, meals at .93, and exercise at .89 (La Greca & Bearman, 2002). The individualized ratings for internal consistencies had slightly higher figures: Total at .98, insulin at .82, blood testing at .91, meals at .96, and exercise at .89. The intercorrelations within the five areas (insulin, blood testing, meals, exercise, and emotions) of diabetes care among the frequency ratings had a moderate range (.51 to .76; median = .57; all *ps* <.001) while the individualized ratings had a bit higher range (.62 to .85; median =.72, all *ps* <.001).). A high correlation of frequency rating emerged, ranging from .75 to .91 (median = .84; all *ps* <.001) of the individualized rating, which was computed by combining the frequency and supportiveness. There was a significant interrelationship (r =.88, p <.001) for the Total DSSQ-Family scores. A copy of the e-mail correspondence from La Greca granting me permission to use the instrument and adding items on foot care is available in Appendix E.

Summary of Diabetes Self-Care Activities (Expanded). The Summary of Diabetes Self-Care Activities (SDSCA-Expanded), developed by Toobert, Hampson, and Glasgow (2000), is a self-report measurement with 15 items that is used to assess the diet, exercise, blood sugar testing, and foot care regimen of diabetes self-management. Toobert et al. (2000) found from seven different studies that SDSCA measure has high interitem correlations within the scale (mean = 0.47), except for specific diet, which has a moderate test-retest correlations (mean = .40). Further, SDSCA subscales revealed correlations (mean = 0.23) with other measures of diet and exercise, supporting its validity (Toobert et al., 2000). The SDSCA is a reliable, valid, and usable instrument to measure diabetes self-care as it has been used in over 2,000 patients with diabetes across

the United States (Toobert et al., 2000). It was also used among FilAms with diabetes (Jordan & Jordan, 2010). For participants who were on pharmacotherapy (insulin or noninsulin), I added one item on medication activity in the scale. The measurement is a public domain and available online, including its scoring instructions (http://familymedicine.medschool.ucsf.edu/pdf/bdrg/scales/SDSCA.pdf). Nevertheless, I had permission from Toobert and a copy of the e-mail with her consent is in Appendix F.

Operationalization

The dependent variable, diabetes self-management, was measured by the SDSCA-Expanded, which has 15 items. An example question on dietary self-care states "How many days of the last 7 days have you followed your eating plan?" The scoring scale is between zero to seven, and the mean number of days was used to calculate for each five-regimen areas assessed. The independent variables were measured as follows: diabetes knowledge by DK Test with 23 items; self- efficacy by SED Test with eight items; spirituality with DSES with 16 items, and social support with DSSQ-Family Version with 58 items. An item on self-efficacy, for example, states on "How confident do you feel that you can exercise 15 to 30 minutes, 4 to 5 times a week?" Participants encircled the number that corresponded to his or her confidence of doing the task from *not at all confident* (1) to *totally confident* (10) and higher values indicated higher self-efficacy. An item on DSES states, "I ask for God's help in the midst of daily activities." Answer choice was from 1 or *never* to 6 or *many times a day* with higher value indicating higher spirituality. Social support item includes "You can count on your family to avoid tempting you with food or drinks that you shouldn't have." The numbers that described

the subject's experience range from 1 (*none of the time*) to 5 (*all of the time*). All of the data were summarized using a frequency table to record how often the value of the variables occurred. Measurement scales for both dependent and independent variables were interval. In addition, a sociodemographic questionnaire that included items on immigration status, acculturation conditions, and health-related data was administered to describe the confounding variables. The sociodemographic survey has 10 nominal items and four ordinal items. The nominal scale items were represented by numbers to make quantitative distinctions (Gravetter & Wallnau, 2009).

Data Analysis Plan

The instruments were hand scored. The data gathered were analyzed using the latest version of SPSS. The first hypothesis was tested using a single sample *t*-test against a hypothetical population mean ($m = 0$) and the dependent variable being the DSM scores. The second hypothesis was analyzed using multiple regression analysis to find the effects of several independent variables on diabetes self-management scores. The *z*-scores of independent variables (diabetes knowledge, self-efficacy, spirituality, and social support) and the dependent variable (diabetes self-management) were entered in the regression. The converted *z*-scores of the dependent and predictor variables were used in the regression because *z*-scores gave eigenvalues closer to 1, showing a more even variance of the distribution of the matrix (Field, 2009). In the first step of the regression, the independent variables were entered as predictors of the dependent or outcome variable, which in this study, was diabetes self-management score. The role of the confounding variables was controlled in the regression.

Results were produced in tables showing the descriptive statistics, correlations, and model summary. Frequencies and descriptive were used to assure the accuracy of the data. To check the correlation matrix for collinearity, the descriptive statistics was used, such as independent variables that have a high correlation with each other (Field, 2009). The model summary table showed what the dependent variable was and what independent variables were in the model. The value of *R* was the multiple correlation coefficients between the dependent and independent variables while the value of the squared *R* showed how much of the variability in the dependent variable was accounted for by the independent variable (Field, 2009).

For review, the research questions and hypotheses are listed below.

1. How well do FilAms with T2DM engage in diabetes self-management behaviors?

$H_0$1*:* FilAms with T2DM are not expected to have significantly higher self-management behaviors than the general population.

$H_1$1*:* FilAms with T2DM are expected to have significantly higher self-management behaviors than the general population.

2. Are diabetes knowledge, self-efficacy, spirituality, and social support related to diabetes self-management behaviors of FilAms with T2DM after controlling for acculturation, age, gender, socioeconomic status, health-related data, religious affiliation, immigration status, and education?

$H_0$2: Diabetes knowledge, self-efficacy, spirituality, and social support are not related to diabetes self-management behaviors of FilAms with T2DM after controlling

for acculturation, age, gender, socioeconomic status, health-related data, religious affiliation, immigration status, and education.

$H_1$2: Diabetes knowledge, self-efficacy, spirituality, and social support are related to diabetes self-management behaviors of FilAms with T2DM after controlling for acculturation, age, gender, socioeconomic status, health-related data, religious affiliation, immigration status, and education.

Threats to Validity

There may be a sample selection bias in this study because convenience sampling was used. This threat to internal validity was addressed by recruiting diversified subjects from different Filipino community groups and community centers in four counties. Historical events such as immigration status and acculturation condition may likely had affected the participants' behavior. These were considered as confounding variables. However, instead of studying the effects of the confounding variables, they were controlled in the study. There may also have a likelihood of threat to the external validity of generalization from participants to the general population. The exclusion criteria addressed this issue because the results were not generalized beyond similar populations of FilAms with T2DM.

Ethical Procedures

The participants of the study were given careful consideration. The informed consent indicated that the participants understood the voluntary nature of the study, that information will be kept in strict confidentiality, and that they can withdraw at any time without consequence. If they had questions about the study, my contact information and

that of the Walden University representative were provided. It was clearly indicated that records would remain confidential, would be kept in a locked file, and that only I would have an access to them. All data would be destroyed after five years of the study. Participants got a copy of the informed consent to keep.

Information on potential risk and benefits was also indicated in the informed consent. The potential risk of being in the study included minor discomforts that could be encountered in daily life such as fatigue, stress, or emotional upset while completing the questionnaires. However, it would not pose risk for safety or wellbeing of the participant. The potential benefit was the opportunity to participate in a research study on factors that influence diabetes self-management.

The packets were coded as it was necessary for in hand scoring the data, but all coding information remained completely confidential. In any sort of report that might be published, the identity of the participants would remain confidential at all times. Foremost, permission from and institutional approval of the IRB were first sought before data gathering was conducted by the researcher.

Summary

Quantitative method was used to explore if holistic approach can explain the influence of diabetes knowledge, self-efficacy, spirituality, and social support on the diabetes self-management behavior of FilAms with T2DM. The instruments that measured the independent variables included DK Test, SED Test, DSES, and DSSQ-Family Version. The SDSCA-Expanded measured the dependent variable. The

sociodemographic survey included items on immigration status, acculturation conditions, and health-related data that assessed the confounding variables.

FilAms diagnosed with T2DM were recruited from Los Angeles, Orange, Riverside, San Bernardino, and San Diego counties, Southern California. Selected participants were provided with an informed consent form, indicating the voluntary nature of the study, all information would be held in strict confidentiality, and that there would be no consequence when they needed to withdraw from the study anytime. Prior to the conduct of the survey, I got the consent and approval from the IRB.

The data were entered into the computer using the latest SPSS version. To answer the research questions and hypothesis, analysis from multiple regression evaluated the effects of scores of the independent variables on diabetes self-management scores. Tables showed the results of descriptive statistics, correlations, and model summary. Accuracy of the data were shown by the frequencies and the descriptive.

Chapter 4, the data collection and report of data, will follow this chapter.

Chapter 4: Results

Introduction

The purpose of this quantitative inquiry was to examine, from a holistic perspective, the individual and environmental factors that influence diabetes self-management behaviors of FilAms with T2DM. Two hypotheses were tested using two different statistical techniques. In this chapter, I provide a description of the participants sampled in this study and present the results of the analyses aimed at answering the following questions: (a) How well do FilAms with T2DM engage in diabetes self-management behaviors? and (b) are diabetes knowledge, self-efficacy, spirituality, and social support related to diabetes self-management behaviors of FilAms with T2DM after controlling for acculturation, age, gender, socioeconomic status, health-related data, religious affiliation, immigration status, and education? The first null hypothesis states that FilAms with T2DM are not expected to have significantly higher self-management behaviors than the general population. The alternate hypothesis states that FilAms with T2DM are expected to have significantly higher self-management behaviors than the general population. The second null hypothesis states that diabetes knowledge, self-efficacy, spirituality, and social support are not related to diabetes self-management behaviors of FilAms with T2DM after controlling for acculturation, age, gender, socioeconomic status, health-related data, religious affiliation, immigration status, and education. The alternate hypothesis states that diabetes knowledge, self-efficacy, spirituality, and social support are related to diabetes self-management behaviors of

FilAms with T2DM after controlling for acculturation, age, gender, socioeconomic status, health-related data, religious affiliation, immigration status, and education.

In this chapter, I present the results of the data collected of the research. The chapter is organized into data collection and results. The data collection includes the timeframe, actual recruitment, and response rates of the participants. The results include reports on descriptive statistics, statistical assumptions, and statistical analysis findings organized by research questions and hypothesis. Tables and figures are also included in this chapter.

Data Collection

The collection of data started after receiving the approval from Walden University Institutional Review Board (IRB) with the approval number 07-22-13-0168077. Over a 3-month period in the summer of 2013, more than 5,000 flyers and posters were placed in designated places as preapproved by the research partners who had agreed to distribute the flyers and posters regarding the study in their respective establishments. One hundred forty-three respondents signified their interest to participate in the study by calling back the contact number stated in the flyers. Of these, 115 participants signed and returned the informed consent forms. However, 113 (98%) successfully completed and returned the study packet. This is more than the 108 predetermined minimum number of participants required for a multiple regression study with four variables.

I administered no test because volunteer participants preferred to fill out the questionnaires at their home and send back the packet in person or by mail through the self-addressed and stamped envelope provided. Of those who responded, 61 (54%) were

in the age bracket above 65-years-old; 47 (41.6%) were males and 66 (58.4 %) were females. Of the 113 participants, only 16 (14.2%) were not on diabetes medication. Table 1 summarizes the demographic characteristics of the study sample.

Table 1

Demographic Characteristics of Study Sample (N=113)

Characteristic	*N*=113	%
Age Bracket		
25-34	1	.9
35-44	11	9.7
45-54	13	11.5
55-64	27	23.9
65 and above	61	54
Marital Status		
Never Married or Single	8	7.1
Married	84	74.3
Separated	2	1.8
Divorced	5	4.4
Widowed	14	12.4
Employment Status		
Employed Full Time	28	25.2
Employed Part Time	13	11.7
Not Working and not Looking for Work	21	18.9
Unemployed and not Looking for Work	6	5.4
Disabled or Retired and not Looking for Work	43	38.7
Income		
Below 10,000	27	24.8
Between 10,000 and 24,999	18	16.5
Between 25,000 and 49,999	28	25.7
Between 50,000 and 100,000	22	20.1
Above 100,000	14	12.8

(table continues)

Characteristic	*N*=113	%
Religious Affiliation		
Roman Catholic	22	19.5
Protestant	4	3.5
Seventh-day Adventists	85	75.2
Others	2	1.8
Education		
Below High School	11	9.7
High School Graduate or GED	12	10.6
Some College or Vocational Training	17	15.0
College Graduate	56	49.6
More than College	17	15.0
Immigration Status		
Naturalized Citizen	88	77.9
Legal Permanent/Green Card Holder	20	17.7
Nonimmigrant/Guest Worker	5	4.4
Residence in the USA (Years)		
Below 5	7	6.5
Between 6-10	16	15.0
Between 11-20	25	23.4
Between 21-30	20	18.7
Between 31-40	17	15.8
41 and Above	22	20.6
Generation Status		
First Generation	63	65.6
Second Generation	28	29.2
Third Generation	5	5.2
Primary Language		
English	36	32.1
Tagalog	37	33.0
Ilocano	11	9.8
Cebuan	22	19.6
Ilongo	6	5.4

(table continues)

Characteristic	*N*=113	%
Health Insurance		
Government/Medicaid/Medicare	47	42.7
Private	54	49.1
Self-Pay	9	8.2
Diagnosis Time (Years)		
1 Year	11	10.3
Between 2-5	21	19.6
Between 6-10	31	31.8
Between 11-15	21	19.6
Between 16-20	8	7.5
Between 21-25	5	4.7
Between 26-30	6	5.6
Between 31-35	1	.9
Medication		
No Medication	16	14.2
Diabetes Pills Only	76	67.3
Long-Acting Insulin Only	1	.9
Long-Acting Insulin and Short-Acting Insulin	5	4.4
Pills + Long-Acting Insulin and Short-Acting Insulin	11	9.7
Pills and Long-Acting Insulin	3	2.7
Others	1	.9
Submission Type		
By Person/Hand In	74	65.5
By Mail	39	34.5

Data Analysis

The data were entered into the SPSS program for statistical analysis. Descriptive statistics were run to check for possible double entry and outliers, but none was found. A single sample *t*-test was performed to identify how well the subjects engaged in diabetes self-management behavior. Before running the multiple regression, the raw scores of the dependent variable and the four independent variables were converted into *z*-scores.

According to Gravetter and Wallnau (2009), X values transformed into *z*-scores would indicate whether "the *X* value is above (+) or below (-) the sample mean" (p. 153). Additionally, the distance between the score and the sample mean in terms of the sample standard deviation was identified by the numerical value of the *z*-score (Gravetter & Wallnau, 2009). Multiple regression backward method was done because in testing the theory of holistic approach, all independent variables are to be used. In backward regression, the multiple regression started by using all the independent variables and then performed multiple regression with each independent variable that caused smallest decrease in *R*-squared eliminated. The elimination continued until any of the variable would cause a significant decrease in *R*-squared. Additionally, only backward regression method produced highest adjusted *R*-squared. Prior to the analyses, the data were reviewed to ensure that assumption for multiple regressions had been met.

Hypothesis 1

The first goal of the present study was to assess the hypothesis predicting that FilAms with T2DM are not expected to have higher self-management behaviors than the general population. A single sample *t*-test, with alpha set at .05 level, was performed to determine if the sample differed from the hypothetical population mean with the dependent variable being the DSM scores. The mean was the best measure of central tendency because there were no extreme scores or outliers. The results of the single sample *t*-test indicated that the sample mean ($M = 69.39$; $SD = 16$, N = 96) exceeded the established population estimate ($M = 0$), $t(95) = 42.49$, $p < .001$. The 95% of confidence interval for the sample mean (66.14 - 72.63) indicated the hypothesis predicting that

FilAms with T2DM are not expected to have higher diabetes self-management behavior than the general population was rejected at the .05 alpha level. Tables 2 and 3 summarize the statistics. The results signify that FilAms with T2DM engaged well in diabetes self-management behaviors.

Table 2

Summary Statistics for the Study on FilAms with Type 2 Diabetes Mellitus Using the Summary of Diabetes Self-Care Activities (Expanded) measure

	N	96
	M	69.385
	Md	1.632
	SD	15.998
95% C.I. for M - upper estimate		72.627
95% C.I. for M – lower estimate		66.143
	μ	0
	df	95
	t	42.493
	p	.000

Note. *p* significant at .000 level, 2-tailed

Table 3

Frequency Table on Self-Care Activities Using the Summary of Diabetes Self-Care Activities (Expanded) Measure

	M	*SD*	Min	Max
Diet	23.482	6.916	7.0	35.0
Exercise/Physical Activity	7.090	4.077	0.0	14.0
Blood Testing	8.099	5.500	0.0	14.0
Foot Care	24.682	5.873	7.0	35.0
Medication	6.627	1.363	0.0	8.0

Hypothesis 2

The second goal of this study was to assess the hypothesis indicating that diabetes knowledge, self-efficacy, spirituality, and social support are not related to diabetes self-management behaviors of FilAms with T2DM after controlling for acculturation, age, gender, socioeconomic status, health-related data, religious affiliation, immigration status, and education. The samples consisted of FilAms diagnosed with T2DM at least within 1 year and were on diabetes medication. SPSS program automatically excluded the subjects who were not on medication, thus reducing the sample ($N = 77$).

The converted *z*-scores of the dependent and predictor variables were used in the regression because *z*-scores gave eigenvalues closer to 1, showing a more even variance of the distribution of the matrix (Field, 2009). The dependent variable in the study was diabetes self-management behavior ($M = .048$, $SD = .979$). The predictor variables were

the following: diabetes knowledge (*M* = .061, *SD* = .968), self- efficacy (*M* = -.084, *SD* = .939), spirituality (*M* = .011, *SD* =1.122), and social support (*M* = -.002, *SD* = .998).

Collinearity among all variables was assessed (Tolerance = .949) and "ruled out" based on the Tolerance statistic where values more than .2 is accepted (Menard, 1995), and the Variance Inflation Factors (VIF = 1.053) were within the acceptable level, which is above 1.00 (Myers, 1990; Field, 2009). The test for correlation using the Durbin-Watson coefficient (*d* = 2.285) indicated no cause of concern for serial autocorrelation (Field, 2009). Figure 2 shows the normality of probability plot, indicating homoscedasticity. Figure 3 shows the normal distribution of all variables.

Based on the correlations appearing in Table 3, only three variables contributed positively to diabetes self-management behaviors: self-efficacy (r=.506, p < .000, r^2=.256), spirituality (r =.302, p <.004, r^2= .091), and social support (r = .275, p <.008, r^2= .076). In this sample, diabetes knowledge was particularly low (*M* = 14.7345, *SD* = 3.689) and was negatively correlated (-.028) to self-care. Additionally, there was a negative correlation between diabetes knowledge and spirituality (-.219).

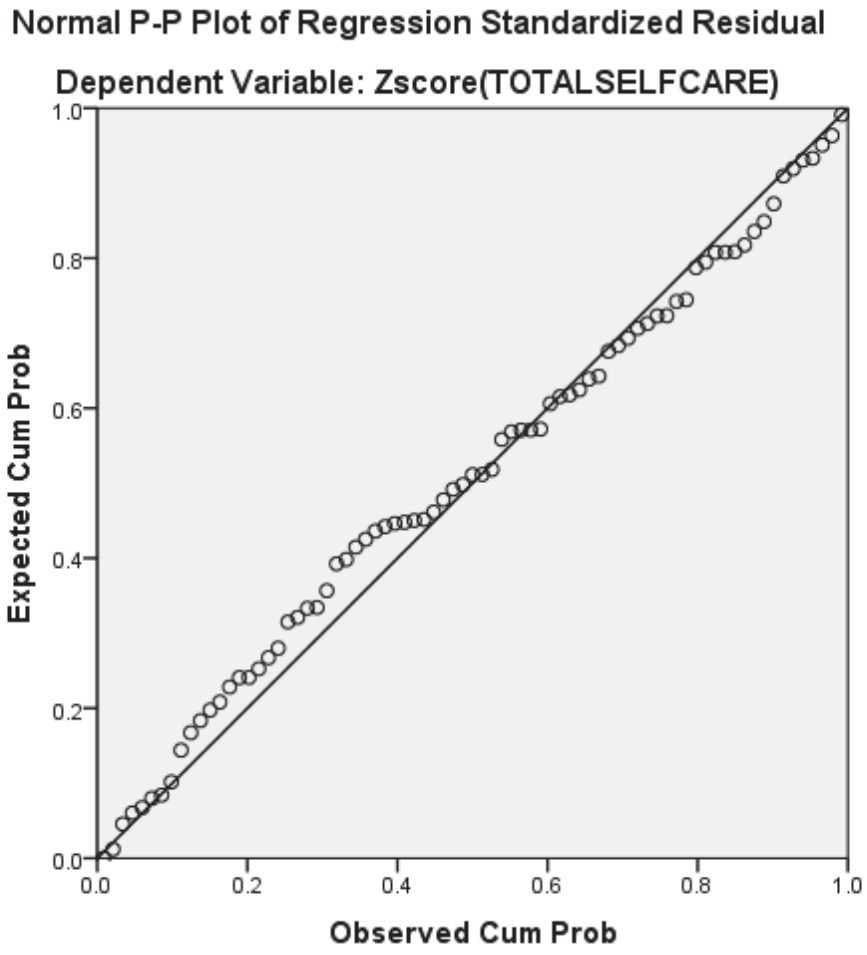

Figure 2. Normal P-P Plot of Regression Standardized Residual.

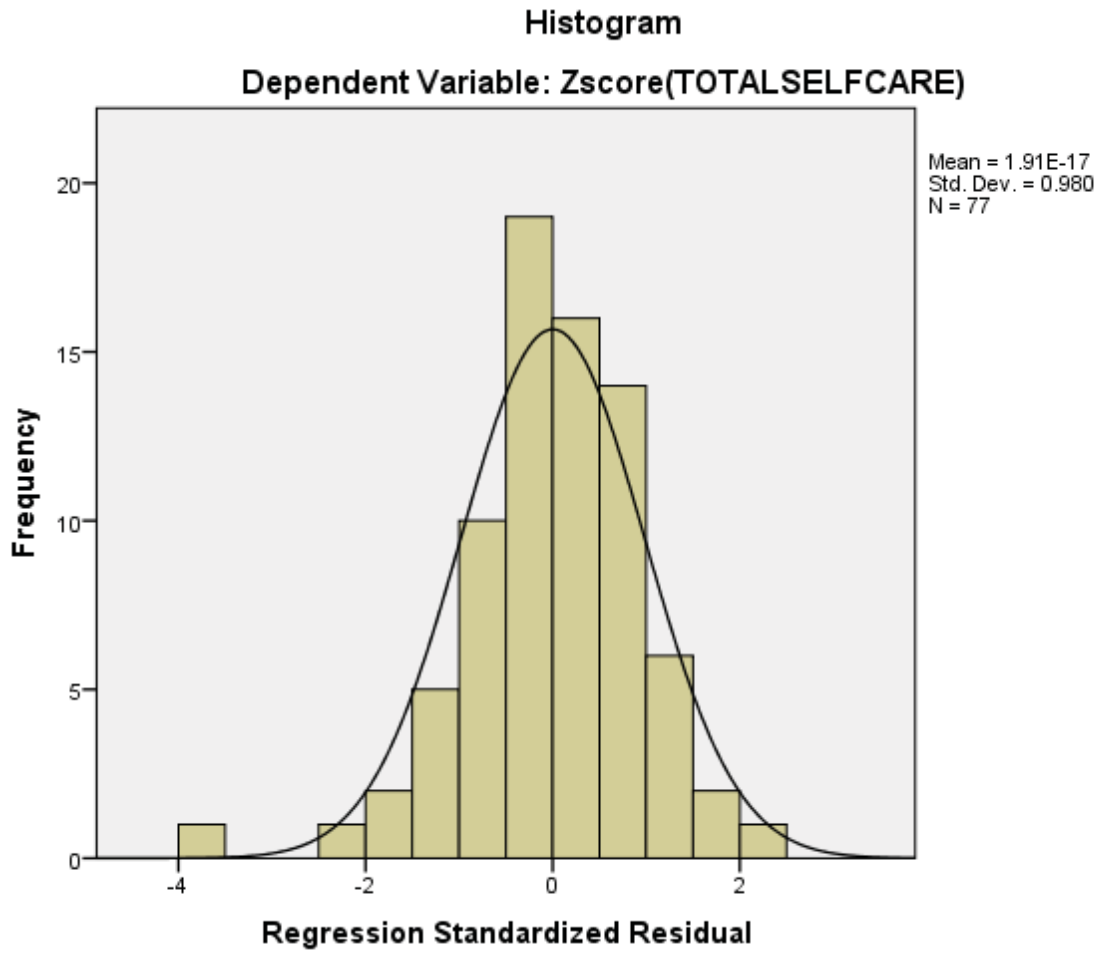

Figure 3. Histogram

Multiple regression had also examined the direct impact of self-efficacy, spirituality, and social support on diabetes self-management behaviors. Tables 4 and 5 display the results of the analysis. In the final model, the multiple correlation (R =.579) was large and differed significantly (F (3, 73) = 12.302, p. < .000). The R^2 (adjusted R^2 = .309) indicated that self-efficacy, spirituality, and social support are good predictors of diabetes self-management behaviors, with a squared semi-partial correlation (sr^2) of .813, accounting approximately 81.3% variability of diabetes self-management behavior (see Table 5). After controlling for the effect of the confounding variables (acculturation, age, gender, socioeconomic status, health-related data, religious affiliation, immigration status, and education), the predictor variables (self-efficacy, spirituality, and social support) still improved the prediction of the criterion variable (diabetes self-management behaviors). Even after considering the participants' response, (either through mail or through personal handing in of the survey packet), the regression result did not show any difference at all.

Table 4

Correlations Matrix for Collinearity (N=77)

	Self-Care	Diabetes Knowledge	Self-Efficacy	Spirituality	Social Support
Pearson Correlations					
Self-Care	1.000	-.028	.506	.302	.275
Diabetes Knowledge	-.028	1.000	.012	-.219	.003
Self-Efficacy	.506	.012	1.000	.182	.172
Spirituality	.302	-.219	.182	1.000	.062
Social Support	.275	.003	.172	.062	1.000
Sig. (1-tailed)					
Self-Care	.403	.000	.004	.008	
Diabetes Knowledge	.403		.458	.028	.489
Self-Efficacy	.000	.458		.057	.068
Spirituality	.004	.028	.057		.297
Social Support	.008	.489	.068	.297	

Table 5

ANOVA Table for the Regression Model

	SS	*df*	*MS*	*F*	*R*	R^2	Adjusted R^2	*SE* of Estimate	*P*
Model 1					.580	.336	.299	.819	<.001
Regression	24.457	4	6.114	9.106					
Residual		48.343	72	.671					
Total	72.799	76							
Model 2					.579	.336	.309	.813	.001
Regression	24.446	3	8.149	12.302					
Residual		48.353	73	.662					
Total	72.799	76							

Table 6

Summary of Regression Analysis of Variables Predicting Diabetes Self-Management Behaviors

Measure	*b*	*SE B*	ß	*t*	*p*
Model 1					
Constant	.084	.094		.892	.375
Diabetes Knowledge	.013	.100	.013	.127	.899
Self-efficacy	.453	.103	.435	4.388	.000
Spirituality	.187	.087	.214	2.137	.036
Social Support	.183	.096	.187	1.918	.059
Model 2					
Constant	.085	.093		.910	.366
Self-efficacy	.454	.103	.436	4.430	.000
Spirituality	.184	.085	.211	2.178	.033
Social Support	.184	.095	.187	1.932	.057

An examination of the regression appearing in Table 6 indicates that the three predictor variables have positive and significant impact on diabetes self-management. The standardized regression coefficient for self-efficacy equaled (ß) .436, which is the average increase amount of diabetes self-management behavior when self-efficacy increases 1standard deviation, is statistically significant ($p < .000$) and represents a large effect size (Cohen, as cited in Gravetter & Wallnau, 2009). Spirituality had positive, significant, and medium effect ($\beta = .211$, $p = .033$) on diabetes self-management behavior. Consequently, social support also had positive and significant but small effect size ($\beta = .187$, $p = .057$) on diabetes self-management behavior. Diabetes knowledge, $\beta = .013$, $t\ (72) = .127$, $p = .899$, was not a significant coefficient in the regression model.

Based on these results, I supported the conclusion that self-efficacy, spirituality, and social support influence the diabetes self-management behaviors of FilAms with T2DM, after controlling for acculturation, age, gender, socioeconomic status, health-related data, religious affiliation, immigration status, and education.

Summary

Based on the above results, the findings indicate that FilAms with T2DM engage well in diabetes self-management behaviors and are expected to have significantly higher diabetes self-management behavior than the general population. Secondly, the results also indicate that self-efficacy, spirituality, and social support are related to diabetes self-management behaviors of FilAms with T2DM after controlling for acculturation, age, gender, socioeconomic status, health-related data, religious affiliation, immigration

status, education, and participants' response style. However, diabetes knowledge did not show any relationship at all.

The next chapter will interpret the findings and present conclusion about the study. Chapter 5 will also describe the limitations of the study, provide recommendations for future research, and present implications of the study for social change within the boundaries of the study.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this quantitative study was to examine, from a holistic perspective, the individual and environmental factors that are related to diabetes self-management behaviors of FilAms with T2DM. Specifically, I sought to evaluate how well FilAms with T2DM self-manage their disease. The study was carried out to examine if diabetes knowledge, self-efficacy, spirituality, and social support are related to diabetes self-management behaviors of FilAms with T2DM after controlling for acculturation, age, gender, socioeconomic status, health-related data, religious affiliation, immigration status, and education. According to the study results, FilAms with T2DM engaged well in diabetes self-management behaviors. I also found that self-efficacy, spirituality, and social support influence diabetes self-management behaviors. Diabetes knowledge did not show influence.

In this chapter, I address the key findings and summarize the results of the study in comparison to related published studies. Implications for health practitioners, researchers, individual, family, and societal levels are also examined, describing the potential for positive social change. Finally, study limitations, recommendations, and conclusions are also presented.

Summary and Interpretation of Findings

In the current study, FilAms diagnosed with T2DM evaluated their diabetes self-management behaviors and assessed their levels of diabetes knowledge, self-efficacy, daily spiritual experience, and social support. It was expected that participants who

reported high levels of diabetes knowledge, self-efficacy, daily spiritual experience, and social support from family would also report higher level of diabetes self-management behaviors. It is relevant to assess the diabetes self-management behaviors of FilAms with T2DM because researchers have revealed that FilAms are at a high risk for the disease (Barnes et al., 2008; Cuasay et al., 2001; Lee et al., 2011; Lee et al., 2000). Additionally, there is limited literature on diabetes self-management behaviors of FilAms as well as studies on what factors influence their diabetes self-care behaviors. This study added to the knowledge on diabetes self-management and identified the factors that influence diabetes self-management among FilAms with T2DM.

Self-Rated Diabetes Self-Management Behaviors

The cornerstone in health management lifestyle among individuals with diabetes is diabetes self-management behaviors, which include pharmacotherapy, diet regulation, physical activity, blood glucose monitoring, and foot care maintenance (Nwasuraba et al., 2007; Xu et al., 2008). Overall, I found that a good number of FilAms with T2DM engage in diabetes self-management behaviors. In particular, these self-rated self-care activities for the last 7 days include the following: (a) diet such as following eating plan, eating five or more servings of fruits and vegetables, eating high fat foods, and spacing carbohydrates evenly through the day; (b) exercise such as participating in at least 30 minutes of physical activity or participating in an exercise session other than housework or job-related work; (c) testing of blood sugar at the number of times recommended by health care provider; (d) foot care such as checking the feet, inspecting the inside of shoes, washing of feet, drying the between of toes after washing, and soaking of feet; and

(e) medication taking as recommended by health care professionals. In general, FilAms with T2DM engage well in the self-management of the disease. This contrasts with findings from previous reports where many of the minority populations did not engage in diabetes self-care practices (Heisler et al., 2007; Oster et al., 2006). In particular, Asian Americans were found to have suboptimal diabetes self-management practices (Xu et al., 2010). However, for FilAms, there was a discrepancy from these findings, after taking into consideration factors such as self-efficacy, spirituality, and social support.

Factors Influencing Diabetes Self-Management Behaviors

I found that participants who reported high self-efficacy, spirituality, and social support reported high diabetes self-management behaviors. However, diabetes knowledge score was not predictive of high self-management behaviors. This aligns with findings reported by Xu et al. (2008) among 201 adults with diabetes in China where diabetes knowledge did not directly affect diabetes self-management practices. Conversely, Kuo et al. (2008) found that diabetes knowledge may affect diabetes self-management and encourage healthy behaviors. However, researchers who have studied diabetes and diabetes knowledge indicated positive influence only on blood glucose control (Colleran et al., 2003; McPherson et al., 2008). In particular, He and Warrad (2007) did not find a difference in the overall diabetes knowledge among those who have good and suboptimal glycemic control. In this sample, diabetes knowledge was particularly low and was negatively correlated to self-care. This finding confirms an assessment done among multiethnic patients with diabetes (N=161) who were treated with insulin, where Asians and Afro-Caribbeans found to have lesser diabetes knowledge compared to Caucasians

(Ford, Mai, Manson, Rukin, & Dunne, 2000). There is an implication that FilAms with T2DM may likely have low diabetes knowledge. Nevertheless, diabetes knowledge score of FilAms with T2DM had no direct effect on their diabetes self-management behavior.

Self-Efficacy and Diabetes Self-Management

I confirmed previous evidence of the significant role self-efficacy plays in the self-management behavior of individuals with diabetes. Self-efficacy is a consistent predictor of diabetes self-management behaviors (Aljasem et al., 2001; Johnston-Brooks et al., 2002). Xu et al. (2008) reported that diabetes self-efficacy had a direct effect on diabetes self-management. Specifically, increased self-efficacy was related to increased weekly optimal diet, weekly exercise, daily blood glucose monitoring, and daily foot care (Sarkar et al., 20006; Senécal, Nouwen, & White, 2000). Bandura (1997) asserted that self-efficacy is a critical link between knowledge application and actual behavioral change and is one of the most effective predictors of health behavior. In this investigation, I found that higher self-efficacy score has a significant relationship in the diabetes self-management of FilAms with T2DM.

Spirituality and Diabetes Self-Management

In this study, I highlighted the positive connection between spirituality and diabetes self-management behaviors. The relevant role of spirituality in the management of chronic illness and stressful conditions has been reported (e.g. Hodge, 2005; Miller, Korinek, & Ivey, 2006; Polzer & Miles, 2007). In particular, Samuel-Hodge et al. (2000) reported the significant role spirituality played in influencing diabetes self-management among individuals with diabetes. Further, Rapaport (1998) stressed that there is a lifetime

benefit in coping with diabetes by finding positive and meaningful spirituality. I also showed the negative correlation between spirituality and diabetes knowledge. However, it is not known how faith and fact factors relate to each other.

Social Support and Diabetes Self-Management

In this study, I showed the positive relationship between social support and diabetes self-management behaviors. Gallant (2003) highlighted the significant relationship of social support to self-management of chronic disease. Specifically, individuals with diabetes who received more social support would likely adhere to self-care than those who neglect self-care (Toljano & Hentimen, 2001). Conversely, Xu et al. (2008) found that social support from family members did not directly affect diabetes self-management behaviors. However, family support affects self-efficacy and beliefs, which, sequentially, influences self-care practices (Xu et al., 2008). In this investigation, patients who perceive social support from family members showed positive diabetes self-management practices.

Holistic Approach

I confirmed that the holistic perspective of disease management is a dynamism that includes the psychosocial, spiritual, and physical dimensions of diabetes management for FilAms with T2DM (Patterson, 1998). In the SCT, Bandura (1986) emphasized the interaction between the behavioral, personal, and environmental factors in health and chronic diseases management. Bandura (1986) stressed the presence of bidirectional influence in the interaction of the behavior, cognitive and other personal factors, and environment that operate in the individual's system. However, these

interactions differ in the intensity of influence and in the manner of occurrence (Bandura, 1989). Furthermore, proponents of the NSM holistic framework view the interrelatedness of the person's physiological, psychological, sociocultural, developmental, and spiritual systems in the person's state of wellness or illness, thereby influencing the individual's functioning (Neuman & Fawcett, 2002). In exploring NSM, Potter and Zauszniewski (2000) found that holistic framework promotes positive health perception and supports healthy lifestyle decision. According to Patterson (1998), a holistic approach includes the interconnection of the spiritual, physical, and psychosocial dimensions in disease management and must not be isolated from each other. I found that the use of holistic model in this study has proven the interconnection of the psychological, spiritual, and social variables in the self-management of diabetes. Specifically, I found that combining self-efficacy, spirituality, and social support factors are related to better diabetes self-management than any of these variables at their own. It is pivotal to use an integrative approach of the holistic model in order to address intervention and disease self-management issues among FilAms with T2DM. Additionally, I also validated that the quantitative method is an approach that can be used in research using holistic model.

Limitations of the Study

This study was limited to only participants who were FilAms diagnosed with T2DM living in Los Angeles, Orange, Riverside, San Diego, and San Bernardino counties in Southern California. Inclusion criteria were the following: time of diagnosis or longer; age between 25 and 75 years; had identified as FilAms (born in the Philippines and has immigrated or resided for at least 1 year in the United States); and can read,

understand, and speak English. I did not include those individuals with major diabetes complications such as proliferative retinopathy, neuropathy, nephropathy, amputations, cerebrovascular accident, or myocardial infarction within the last 12 months because I wished to study participants who were in the early disease progression who will likely benefit from the intervention using holistic approach. Most of the research partners in the study were Filipino churches and 85% of the respondents have Seventh-day Adventist religious affiliation. While religion was controlled in the study, future researchers should explore heterogeneous Filipino populations so that there would be more generalizability of the results.

Another limitation of the study was the absence of the attempt to exclude the participants who were not on medication. Total diabetes self-care activities include medication taking. However, those who were not on medication of any kind were automatically excluded in the analysis, which reduced the size of my study participants. Future scholars may consider this criterion in the recruitment and increase the number of volunteer participants in order to get results that are more representative.

The nature of the study was correlational and I focused on the relationship between factors that influence diabetes self-management practices (independent variables) and diabetes self-management behaviors (dependent variable). Being corrrelational in nature, I did not assess causation. Nevertheless, correlational design was appropriate for the study because I determined the influence of the combination of four variables, namely diabetes knowledge, self-efficacy, spirituality, and social support to diabetes self-management behaviors. Moreover, the results of this study were limited to

FilAms and would not be generalized beyond similar populations of FilAms with T2DM. Future researchers may consider using another population group to shed further clarity on the factors that influence diabetes self-management practices. Finally, participants' diabetes self-care behaviors were based on self-rated reports and were not examined nor observed; therefore, their actual self-management practices maybe overestimated and had some biases that could not be substantiated.

Recommendations

Based on the findings of this study, it is imperative to highlight the concept of holistic approach in the self-management of diabetes. The importance of diabetes knowledge through education is recognized as having a role in diabetes management to build skills and to empower patients to assume daily responsibilities to manage their disease (Khunti et al., 2008). However, in this study, diabetes knowledge did not influence diabetes self-management behaviors. How this cognitive variable affects self-management practices needs to be explored further in order to strengthen the validation of holistic approach in the disease management. Further, future researchers may also consider how spirituality and diabetes knowledge (faith and fact factors) relate to each other. Additionally, replication of this study with other FilAm populations from other cities, counties, or states, may yield additional information about the general validity of the holistic model. A larger sample size is also recommended when replication will be done.

Implications

The results of this study have positive social change implications for health and clinical practice. Health intervention developers, educators, health psychologists, physicians, nurses, and other clinicians will find it useful in the creation and utilization of holistic intervention in order to improve diabetes self-management practices of FilAm population with T2DM. This study also offers support for educating clients with diabetes and their family members about the connections between self-efficacy, spirituality, and family social support in the self-management of diabetes. When properly managed, progression of diabetes will be delayed and complications will likely be prevented, thereby benefitting the patients and their families through reduced financial burdens, decreased morbidity, and lessened mortality. On the broader spectrum, it will likely impact health care cost benefitting the health-care payers and the society as a whole. Furthermore, the findings will benefit researchers by replicating the concepts of a holistic approach in studying health-promoting behaviors and adaptation appropriate for similar population group who may have life-threatening diseases such as cancer, HIV/AIDS, asthma, stroke, cardio-vascular diseases, and obesity. Finally, the findings of this study will add to the body of literature suggesting that holistic research can also be approached through quantitative methodology.

Conclusion

In conclusion, I offered in this study the potential expansion and understanding of holistic model in the area of diabetes self-management. Additionally, while there is a good number of FilAms with T2DM who are engaged in diabetes self-management

behaviors, the creation and utilization of effective intervention by using holistic approach in the management of diabetes may have an impending impact in the behavioral change that will augment diabetes self-management practices. I also helped clarified the individual and environmental factors influencing diabetes self-management behaviors. I underscored the need to develop comprehensive behavior change programs that would include self-efficacy, spirituality, and social support. Moreover, there is a need to know more how diabetes knowledge contributes to diabetes self-management behaviors. Further exploration of the relationship between diabetes knowledge and self-care behaviors is needed to strongly validate the cognitive aspect of holistic model in the disease management. On the broader scale, intervention using holistic approach in the management of diabetes may be beneficial for more controlled and complication prevented diabetes, thereby promoting more quality life benefitting the individual with diabetes mellitus, the family, the health-care payers, and the society.

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Appendix A: Informed Consent

CONSENT FORM

You are invited to participate in a research study of what factors influence diabetes self-management. The researcher is inviting Filipino Americans with type 2 diabetes mellitus. This form is part of a process called “informed consent” to allow you to understand this study before deciding whether to take part.

This study is being conducted by Jocelyn B. Sonsona, who is a doctoral student at Walden University.

Background Information:
The purpose of this study is to explore what factors influence diabetes self-management practices of Filipino Americans with type 2 diabetes mellitus. Number of participants needed is 108.

Procedures:
If you agree to participate in this study, you will

- Be asked to sign this informed consent form and return it using the self-addressed stamped envelope.
- Receive a packet within five days of receipt of your informed consent.
- Asked to complete the demographic sheet as well as the following five questionnaires:
    - Diabetes Knowledge Test (23 items)
    - Self-Efficacy for Diabetes (8 questions)
    - Daily Spiritual Experience Scale (16 questions)
    - Diabetes Social Support Questionnaire (58 items)
    - Summary of Diabetes Self-Care Activities Questionnaire (15 questions)

Together, you should be able to complete all surveys in 1.5 to 2 hours. You can complete all the surveys and mail them back to the researcher in the self-addressed stamped envelope included in your packet.

Here are some sample questions:

1. “Which of the following is usually not associated with diabetes: a) vision problems, b) kidney problems, c) nerve problems, d) lung problems?“
2. “How confident do you feel that you can exercise15-30 minutes, 4-5 times a week?”
3. “I ask for God’s help in the midst of daily activities.”

4. “You can count on your family to avoid tempting you with food or drinks that you shouldn’t have.”
5. “How many days of the last seven days have you followed your eating plan?”

Voluntary Nature of the Study:
This study is voluntary. Everyone will respect your decision of whether or not you choose to be in the study. No one will treat you differently if you decide not to be in the study. If you decide to join the study now, you can still change your mind later. You may stop at any time without any penalty.

Risk and Benefits of Being in the Study:
Being in this type of study involves some risk of the minor discomforts that can be encountered in daily life, such as fatigue, stress, or emotional upset while completing the questionnaires. However, being in this study would not pose risk to your safety or wellbeing.

The potential benefit is your opportunity to participate in a research study on factors that influence diabetes self-management.

Payment:
After you hand in the surveys, you will receive a $5.00 gift card for your participation, even if you decide to withdraw from the study.

Privacy:
Any information you provide will be kept confidential. The researcher will not use your personal information for any purposes outside of this research project. Also, the researcher will not include your name or anything else that could identify you in the study reports. Data will be kept secure in a locked file; only the researcher will have access to the records. Data will be kept for a period of at least 5 years, as required by the university.

Contacts and Questions:
You may ask any questions you have now. Or if you have questions later, you may contact the researcher via phone (909-558-4563) and/or email (jobson04@hotmail.com). If you want to talk privately about your rights as a participant, you can call Dr. Leilani Endicott. She is the Walden University representative who can discuss this with you. Her phone number is 612-312-1210. Walden University’s approval number for this study is **07-22-13-0168077** and it expires on **July 21, 2014.**

I am providing you a copy of California’s Participant’s Bill of Rights for Non-Medical Research.

You may keep the duplicate copy of this consent form.

This study is not sponsored and there is no potential conflict of interest.

If you would be interested in receiving a copy of the results of this study, please indicate by checking here _____.

Statement of Consent:
I have read the above information and I feel I understand the study well enough to make a decision about my involvement. By signing below, I understand that I am agreeing to the terms described above.

Printed Name of Participant _____

Address of Participant _____
(This will be used to send the incentive)
_____

Date of Consent _____

Participant's Signature _____

Researcher's Signature _____

Appendix B: Written Permission to Use the Diabetes Knowledge Test

From: Fitzgerald, Tom [mailto:tfitz@med.umich.edu]
Sent: Wednesday, June 12, 2013 5:37 AM
To: Sonsona, Jocelyn (LLU)
Subject: Re: Diabetes Knowledge Test

Hello,

You have our permission to use our test instrument in your study. You can find the survey at http://www.med.umich.edu/mdrtc/ just select "For Health Professionals" and then "Survey Instruments" from the site's menus. You might also consider a revised version, see attached. Please call (734-763-5054) or email if you have any questions. Good luck with your project.

James T. Fitzgerald, PhD
Professor
Department of Medical Education
University of Michigan
(734) 936-1644
(734) 936-1641 (fax)
Associate Director of Education & Evaluation
Geriatric Research, Education, and Clinical Center
Ann Arbor VA
(734) 845-3047
(734) 845-3298 (fax)\

*****

On Jun 11, 2013, at 5:14 PM, Sonsona, Jocelyn (LLU) wrote:

James T. Fitzgerald, Ph.D.
Department of Medical Education
University of Michigan Medical School

Dear Dr. Fitzgerald,

Greetings! I hope this email does not come as a surprise. I am Jocelyn Sonsona, a Ph.D. Candidate of Walden University.

I am currently in dissertation writing. My study is about “Factors Influencing Diabetes Self-Management among Filipino Americans with Type 2 Diabetes mellitus” using a holistic model. Diabetes knowledge is one of my variables. I am interested in the use of Diabetes Knowledge Test which I retrieved from http://www.med.umich.edu/mdrtc/profs/survey.html#dkt. This is then to request permission to use and reproduce the instrument for my research.

Please advise me what to do in order to use the DKT. Any helpful updates or usage tips of the test will also be appreciated.

Hope to hear from you soon. Have a great day!

Thank you very much.

Sincerely yours,

Jocelyn Sonsona

Jocelyn B Sonsona, Administrative Assistant
General Conference Representative Office - Loma Linda University Campus
11245 Anderson Street, Suite 220 | Loma Linda, CA 92354
Tel: 909.558.4563 |Fax: 909.558.4845 |Email: jsonsona@llu.edu

Appendix C: Written Permission to Use the Self-Efficacy for Diabetes Test

Mon, Jun 10, 2013 at 8:43 AM
8:43 AM
FROM jocelyn sonsona TO 1 recipient

From: jocelyn sonsona
To: Kate Lorig

Dear Kate,

Thank you for this prompt and kind reply. Though an instrument is available for free use, I think sending a courtesy permission to use from the author is proper. I am pleased Walden University requires that.

Have a great day!

Best regards,

Jocelyn Sonsona

*****

From: Kate Lorig <lorig@stanford.edu>
To: 'jocelyn sonsona' <jojo_september@yahoo.ca>
Sent: Sunday, June 9, 2013 2:08:47 PM
Subject: RE: Self-Efficacy for Diabetes

FROM Kate Lorig TO You

From: Kate Lorig
To: 'jocelyn sonsona'

You have my permission although this scale is in the public domain and free for anyone to use.
Kate

*****

From: jocelyn sonsona [mailto:jojo_september@yahoo.ca]
Sent: Sunday, June 09, 2013 1:47 PM
To: self-management@stanford.edu
Subject: Self-Efficacy for Diabetes

Dear Sirs/Madams,

Dear Sir/Madam,

Greetings! I hope this email does not come as a surprise. I am Jocelyn Sonsona, a Ph.D. Candidate of Walden University.

I am pleased to inform that I successfully passed my proposal defense last Friday, June 7, 2013. My study is about “Factors Influencing Diabetes Self-Management among Filipino Americans with Type 2 Diabetes mellitus” using a holistic model.

One of the instruments I will be using in my study is the Self-Efficacy for Diabetes which I retrieved from http://patienteducation.stanford.edu/research/sediabetes.html. I understand that the use of the instrument is free but I would like to ask a professional courtesy of my plan to use the tool in my research. This is also to comply requirements from the IRB to ask permission to reproduce and administer the Diabetes Self-Efficacy test.

Any helpful updates or usage tips of the test will also be appreciated.

Hope to hear from you soon. Have a great day!

Thank you very much.

Sincerely yours,

Jocelyn Sonsona
Ph.D. Candidate
Walden University

Appendix D: Written Permission to Use the Daily Spiritual Experience Scale

Sun, Jun 9, 2013 at 1:58 PM
Sun, 1:58 PM
FROM jocelyn sonsona TO 1 recipient

From: jocelyn sonsona
To: Lynn Underwood
BCC: jocelyn sonsona

Thank you, Dr. Underwood, for your usual prompt reply.

God bless,

Jocelyn Sonsona

*****

From: Lynn Underwood <lynnunderwood@researchintegration.org>
To: jocelyn sonsona <jojo_september@yahoo.ca>
Sent: Sunday, June 9, 2013 1:30:21 PM
Subject: Re: Daily Spiritual Experience Scale (DSES)

Congratulations!
As long as you include: © Lynn G. Underwood and http://www.dsescale.org/ on any copies of the scale you print, and cite Underwood 2006 or Underwood 2011 when reproducing or referencing the scale, you have my permission to include it.

All the best,
Lynn

Lynn Underwood PhD
Graduate Faculty, Cleveland State University
Honorary Fellow, University of Liverpool, UK
http://www.lynnunderwood.com/
http://www.spiritualconnectionindailylife.com/

*****

On Jun 9, 2013, at 4:12 PM, jocelyn sonsona wrote:

Dear Dr. Underwood,

I am pleased to inform that I successfully passed my proposal defense last Friday, June 7, 2013. I need to comply with an additional requirement from the IRB – that is to ask permission to reproduce the DSES.

Hope to hear from you soon. Thank you very much. Have a great day!

Sincerely yours,

Jocelyn Sonsona
Ph.D. Candidate

*****

On Jan 15, 2013, at 5:58 PM, Sonsona, Jocelyn (LLU) wrote:

Dear Dr. Underwood,

I am impressed by your prompt response. Foremost, I appreciate you so much for allowing me to use the DSES in my study.

Attached please find the registration form and the layout of the Filipino/Tagalog version, similar to the English version. I did just some very minor corrections (i.e. capitalization, lay-out, and prepositions). I agree to all the provisions you stated for the use of your tool.

Thank you so much for your time, expertise, and generosity to share what you have.

Hope your day is going well. God bless.

Gratefully yours,

Jocelyn B Sonsona, Administrative Assistant
General Conference Representative Office - Loma Linda University Campus
11245 Anderson Street, Suite 220 | Loma Linda, CA 92354
Tel: 909.558.4563 |Fax: 909.558.4845 |Email: jsonsona@llu.edu

*****

From: Lynn Underwood [mailto:lynnunderwood@researchintegration.org]
Sent: Tuesday, January 15, 2013 1:53 PM
To: Sonsona, Jocelyn (LLU)
Subject: Re: Daily Spiritual Experience Scale (DSES)

Dear Jocelyn,

You have my permission to use the Daily Spiritual Experience Scale for non-profit use if:

1) You return the attached registration form to me.
2) You include: © Lynn G. Underwood and http://www.dsescale.org/ on any copies of the scale you print.
3) You keep me informed of results from your work and publications and presentations that come from your work using the scale. You cite Underwood 2006 or Underwood 2011 in your published or presented results.

The best source for information on the scale, which I try to keep updated, is:
www.dsescale.org

Find attached the Filipino version. I have been involved in refining it together with investigators, however there is no publication yet regarding psychometrics.

If you lay it out in a format similar to the English one, would you send me a copy?

Best wishes to you in your life and in your work,

Lynn G. Underwood PhD
Graduate Faculty, Cleveland State University
Honorary Fellow, University of Liverpool, UK
President, Research Integration
http://www.researchintegration.org/

*****

On Jan 15, 2013, at 4:27 PM, Sonsona, Jocelyn (LLU) wrote:

Dear Dr. Underwood,

Greetings! I hope this email does not come as a surprise. Dr. James Lee, a professor of Loma Linda University, referred me to a pamphlet that directed me to your website.
I am currently in dissertation writing. My study is about "Factors Influencing Diabetes Self-Management among Filipino Americans with Type 2 Diabetes mellitus" using a holistic model. Spirituality is one of my variables. I am interested in the Daily Spiritual Experience Scale (DSES). Please advise me what to do in order to use the DSES. I understand the scale has several translations. Do you have Tagalog or Filipino translated version and its psychometric validity?

I hope to hear from you. Please let me know if you have any question. Thank you so much.

Sincerely yours,

Jocelyn B Sonsona, Administrative Assistant
General Conference Representative Office - Loma Linda University Campus
11245 Anderson Street, Suite 220 | Loma Linda, CA 92354
Tel: 909.558.4563 |Fax: 909.558.4845 |Email: jsonsona@llu.edu

Appendix E: Written Permission to Use the Diabetes Social Support Questionnaire – Family Version

Mon, Jun 10, 2013 at 8:38 AM
8:38 AM
FROM jocelyn sonsona TO 1 recipient

From: jocelyn sonsona
To: Annette La Greca

Dear Dr. La Greca,

Thank you for this prompt reply.

Have a great day!

Best regards,

Jocelyn Sonsona

*****

Mon, Jun 10, 2013 at 2:20 AM
2:20 AM
FROM Annette La Greca TO You

From: Annette La Greca
To: jocelyn sonsona

Ok to reproduce for use with subjects.

Sent from Annette's Iphone

*****

On Jun 9, 2013, at 10:16 PM, jocelyn sonsona <jojo_september@yahoo.ca> wrote:

Dear Dr. La Greca,

I am pleased to inform that I successfully passed my proposal defense last Friday, June 7, 2013. I need to comply with additional requirement from the IRB – that is to ask permission to reproduce the DSSQ-Family Version. Attached please find the updated copy (items on foot care added).

Hope to hear from you soon. Have a great day!

Thank you very much.

Sincerely yours,

Jocelyn Sonsona
Ph.D. Candidate

*****

From: Sonsona, Jocelyn (LLU)
Sent: Wednesday, April 03, 2013 11:42 AM
To: 'Annette M. La Greca'
Subject: RE: DQSS-Family Scale

Dear Dr. La Greca,

Thank you very much for your prompt reply. I really appreciate your permission to use the DQSS-Family Scale, and my liberty to add items related to foot care.

Blessings,

Jocelyn B Sonsona, Administrative Assistant
General Conference Representative Office - Loma Linda University Campus
11245 Anderson Street, Suite 220 | Loma Linda, CA 92354
Tel: 909.558.4563 |Fax: 909.558.4845 |Email: jsonsona@llu.edu

*****

From: Annette M. La Greca [mailto:alagreca@miami.edu]
Sent: Wednesday, April 03, 2013 6:21 AM
To: Sonsona, Jocelyn (LLU)
Subject: Re: DQSS-Family Scale

I don't have an adult version, or items for foot care…but you could use the scale as it is and just add a few more items related to foot care.

Best wishes
Annette M. La Greca, Ph.D., ABPP
Cooper Fellow
Professor of Psychology and Pediatrics
Director of Clinical Training
PO Box 249229
University of Miami
Coral Gables, FL 33123
(305) 284-5222 (ext. 1)
(305) 284-4795 (fax)
email: alagreca@miami.edu

*****

From: "Sonsona, Jocelyn (LLU)" <jsonsona@llu.edu>
Date: Wed, 3 Apr 2013 00:32:32 +0000
To: "Annette M. La Greca" <alagreca@miami.edu>
Subject: DQSS-Family Scale

Dear Dr. LaGreca,

Greetings! I hope this email does not come as a surprise. I got your article "The Diabetes Social Support Questionnaire-Family Version: Evaluating Adolescents' Diabetes-Specific Support from Family Members" published in the Society of Pediatric Psychology, Vol. 27, No. 8 in 2002. Your email address (alagreca@umiami.edu) in the article did not work so I googled it and found this one. Hope this works.

I am currently in dissertation writing. My study is about "Factors Influencing Diabetes Self-Management among Filipino Americans with Type 2 Diabetes mellitus" using a holistic model. Social support is one of my variables. I am interested in the DQSS-Family Scale that you and others developed. However, it is intended for adolescents. Do you have a version for adults

(25 years and above) which also includes foot care maintenance items? Or do you have other suggestion like revision of the DQSS or another scale?

I hope to hear from you. Thank you so much.

Sincerely yours,

Jocelyn B Sonsona, Administrative Assistant
General Conference Representative Office - Loma Linda University Campus
11245 Anderson Street, Suite 220 | Loma Linda, CA 92354
Tel: 909.558.4563 |Fax: 909.558.4845 |Email: jsonsona@llu.edu

Appendix F: Written Permission to Use the Summary of Diabetes Self-Care Activities - Expanded

Tue, Jun 11, 2013 at 10:16 AM
10:16 AM
FROM jocelyn sonsona TO 1 recipient

From: jocelyn sonsona
To: Deborah Toobert
BCC: jocelyn sonsona

Dear Dr. Toobert,

Thank you for your positive, and as usual, prompt response.

Blessings,

Jocelyn Sonsona

*****

Mon, Jun 10, 2013 at 7:29 PM
Mon, 7:29 PM
FROM Deborah Toobert TO You

From: Deborah Toobert
To: 'jocelyn sonsona'

Dear Dr. Sonsona,

Congratulations on successfully defending your proposal!! You have our permission to reproduce the SDSCA-Expanded Questionnaire.

Best of luck,

Deborah

Deborah J. Toobert, PhD
Senior Research Scientist
Oregon Research Institute

1776 Millrace Drive
Eugene, Oregon 97403

http://www.ori.org/

Phone:(541) 484-4421 ext. 2407
Home office (541) 338-8037
Fax: (541) 434-1505
email: deborah@ori.org

*****

From: jocelyn sonsona [mailto:jojo_september@yahoo.ca]
Sent: Sunday, June 09, 2013 1:09 PM
To: Deborah Toobert
Subject: Re: Summary of Diabetes Self-Care Activities (SDSCA)

Dear Dr. Toobert,

I am pleased to inform that I successfully passed my proposal defense last Friday, June 7, 2013.

I need to comply with an additional requirement from the IRB – that is to ask permission to reproduce the SDSCA-Expanded Questionnaire. Attached please find the updated copy (smoking item deleted and one item on medication activity added) for your easy reference.

Hope to hear from you soon. Have a great day!

Thank you so much.

Sincerely yours,

Jocelyn Sonsona
Ph.D. Candidate

*****

From: jocelyn sonsona <jojo_september@yahoo.ca>
To: Deborah Toobert <Deborah@ori.org>
Sent: Tuesday, February 12, 2013 11:22:48 AM
Subject: Re: Summary of Diabetes Self-Care Activities (SDSCA)

Great! Thank you, Dr. Toobert.

Hope you have a great day.

Jocelyn

*****

Tue, Feb 12, 2013 at 11:20 AM
Feb 12
FROM Deborah Toobert TO You

From: Deborah Toobert
To: 'jocelyn sonsona'

Dear Jocelyn,

Yes, you can delete any items that are not relevant to your study. That goes for both the smoking question, and the expanded version.

Deborah

*****

From: jocelyn sonsona [mailto:jojo_september@yahoo.ca]
Sent: Tuesday, February 12, 2013 11:17 AM
To: Deborah Toobert
Subject: Re: Summary of Diabetes Self-Care Activities (SDSCA)

Dear Dr. Toobert,

I am pleased by your prompt response to my request. Thank you very much.

I have two quick questions:

1. My study does not include smoking. Can I delete item no. 11 in the SDSCA instrument?

2. For the expanded version, can I choose what to include in the questionnaire?

Once again, my sincere thanks for your assistance.

Blessings,

Jocelyn Sonsona

*****

From: Deborah Toobert <Deborah@ori.org>
To: 'jocelyn sonsona' <jojo_september@yahoo.ca>
Sent: Tuesday, February 12, 2013 10:50:52 AM
Subject: RE: Summary of Diabetes Self-Care Activities (SDSCA)

Dear Jocelyn,

You have our permission to use the Summary of Diabetes Self-Care Activities Questionnaire in your research project. The instrument is in the public domain, and permission is not required. (But you have it anyway). Attached is the 2000 Diabetes Care article with the SDSCA psychometric information. At the end of the article, there is an appendix with the questionnaire, and the scoring information. I have also attached a user-friendly copy of the SDSCA instrument.

Best of luck with your research,

Deborah

*****

From: jocelyn sonsona [mailto:jojo_september@yahoo.ca]
Sent: Monday, February 11, 2013 10:28 PM
To: Deborah Toobert
Subject: Summary of Diabetes Self-Care Activities (SDSCA)

Hi Dr. Toobert,

Greetings! I hope this email finds you well.

I am a PhD candidate at Walden University and now in the dissertation stage of my studies. My research of interest is "Factors influencing diabetes self-management among Filipino Americans with type 2 diabetes mellitus". I will be using the Summary of Diabetes Self-Care Activities (SDSCA) tool that you and your colleagues have developed. In this relation, I would like to ask permission from you to use the instrument. Further, I am interested in any published reliability and validity of SDSCA, including the populations it was previously used and how the instrument was developed.

Thank you very much for the information you may be able to share about SDSCA. I am looking forward for your response.

Sincerely yours,

Jocelyn Sonsona, Ph.D. Candidate

Curriculum Vitae

JOCELYN B. SONSONA

Present Address:
11281 Anderson St.
Loma Linda, CA 92354

Tel. Number: 909-358-7253
E-mail Address: jobson04@hotmail.com

EDUCATION

Walden University, Minnesota, Minneapolis
PhD in Health Psychology, expected May 2014
GPA: 3.96/4.0

Adventist University of the Philippines, Putingkahoy, Silang, Cavite, Philippines
Master of Arts in Education, Major in Guidance and Psychology
March 1995
GPA: 3.90/4.0

Notre Dame of Midsayap College, Midsayap, Cotabato, Philippines
Bachelor of Arts, Major in English and General Science
March 1985
GPA: 90.98/100

RESEARCH AND ACADEMIC EXPERIENCE

Dissertation Research - 2014
"Factors Influencing Diabetes Self-Management among Filipino Americans with Type 2 Diabetes Mellitus: A Holistic Approach"

Thesis Research - 1985
"Communication Style and Its Relationship to Self-Esteem, Physical and Emotional Morbidity of Seventh-day Adventist Professionals in Iligan City"

Asst. Professor – 1995-2003

- *Taught psychology and biological science subjects: General Psychology, Human Growth and Development, Sociology, and Biological Science to college nursing physical therapy, and radiologic technology students*

Guidance Counselor – 1995-2003

- *Conducted guidance counseling to college students and career counseling to high school students*

- *Founded Peer Counselors Club and trained selected college students to become peer counselors*
- *Spearheaded outreach guidance program for street kids in the community*

HONORS AND ACHIEVEMENTS

- *Psi Chi Honor Society Lifetime Member, Walden University (2010)*
- *Japan International Cooperating Agency-Philippine Representative (1999) – one of the five selected from nationwide 500+ applicants to represent the Philippines (Education Category) to the Japan Friendship Program with other Asian countries*
- *Magna cum Laude Award, Adventist University of the Philippines (1995)*
- *Journalism Award, Notre Dame of Midsayap College (1985)*
- *Magna cum Laude Award, Notre Dame of Midsayap College (1985)*

PRESENTATIONS/LECTURES

Presenter/Lecturer to various leader groups on Cross-Cultural/Bridge-Building Relations Initiative

- *USA – April 2003- present*
- *Palawan, Philippines – Jan. 2010, Mar. 2011*
- *Beirut, Lebanon - Jun. - Sept. 2008*
- *Calcutta, India - Jul. 23-28, 2007*
- *Larnaca, Cyprus – Jan. 24 – Feb. 4, 2007*
- *Vancouver, Canada - Oct. 6-10, 2006, Feb. 2001- Jan. 2002*
- *Serbia & Montenegro – Jun. 3-21, 2004*
- *Mindanao, Philippines – 1998-2000*

Presenter/Lecturer to Filipino Domestic Helpers on How to Develop Self-Esteem

- *Hongkong – Oct. 22-26, 2004*

Presenter/Lecturer to Different Church Leaders (2008 – present)

- *Facilitating Sabbath School Classes*
- *Women's Ministry Programs*
- *Community Service Programs*
    - *Mindanao, Philippines*
    - *Southeastern California*
    - *Vancouver, Canada*

IN AND OFF CAMPUS LEADERSHIP

Complete Health Improvement Program (CHIP) Director (2007-2008)

- *Directed in the church-sponsored, scientifically sound, and community health education program that envisioned to bring healing to the whole person- body, mind, and soul*

Cross-Cultural Program Developer/Trainer/Coordinator (2003-present)

- *Spearheaded in the development and in the training of leaders of a cross-cultural bridge-building relationship program, the model adapted now in some places outside USA. (1998-present)*
- *Organized and coordinated health outreach programs in the Philippines geared towards holistic living, including free medical and health services for adults and children (1998-present)*