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The Association Between Provider Cultural Competence and Type 2 Diabetes Health Behaviors

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This is to certify that the doctoral study by

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2020

Abstract

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MS, California State University Long Beach, 2012

BS, San Diego State University, 2009

Doctoral Study Submitted in Partial Fulfillment

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Doctor of Public Health

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Abstract

Provider cultural competence is poorly understood in relation to the outcome of Type 2 diabetes patient health behaviors. The purpose of this study was to examine the association between provider cultural competence and diabetes patient health behaviors. The chronic care model provided the conceptual framework for this study. The research questions were designed to determine whether 5 measures of provider cultural competence play a role in diabetes patient health behavior change. The research design of the study was a quantitative cross-sectional survey using the 2017 National Health Interview Survey. The 2,342 participants included in the study represent a national sample of patients with Type 2 diabetes. The binary logistic regression analyses indicated an association between provider cultural competence and reducing fat or calorie intake (*p = .009)* with the odds of a diabetes patient reducing fat or calories 2.35 times more likely when treated with respect by the provider. Age and gender were independent predictors of fat and calorie intake, age of physical activity, fat or calorie intake, and weight loss program. There was insufficient evidence to determine associations between provider cultural competence and increasing physical activity and participating in a weight loss program. Future research should include further examination of provider cultural competence and diabetes patient health behavior changes. The implications for social change include evidence to support the implementation and training of provider cultural competence within the healthcare industry among diabetes patients.

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Dedication

I dedicate this study to my husband, Sonny, and my two sons, Sonny Dragon Hart and Liam Lionheart. Thank you, Sonny, for being my partner and helping me stand tall throughout this process. You always seem to know what to say in order to give me endurance and motivation. Thank you for all those times you handled our family so I could get work done. You are an amazing life partner and I hope we can continue to encourage and push each other to grow and surpass our boundaries. To my sons, I hope, from this, you will pursue to fulfill your passions in life, but realize the importance of putting in the time and hard work in order to succeed. I would also like to dedicate this study to my mom, Agnes, and brother, Earl. Mom, you always shared with me the importance of an education and how it would propel me forward in life. So far, you have been spot-on. Earl, thank you for being a sounding ear and for being the best "big" little brother. Lastly, I would like to dedicate this study to the memory of my father, Teodorico. I hope you are looking down on everything Earl and I have achieved thus far and are proud.

Acknowledgments

I would like to express my gratitude and appreciation to my academic advisors
Dr. Mary Lou Gutierrez and Dr. James Rohrer for their guidance and expertise
throughout this process. I appreciate the time and contributions on how to formulate and
articulate a research study. I am amazed by how much knowledge you two possess. You
two have been great mentors.

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Section 1: Foundation of the Study and Literature Review

Introduction

Diabetes is a chronic disease that may be managed through medications, exercise, nutrition, and weight loss (Centers for Disease Control and Prevention [CDC], 2017). Individuals with diabetes are at an increased risk of multiple comorbidity, including heart disease, kidney failure, amputation of limbs, vision loss, and premature death (CDC, 2017). In the first section of this study, I will discuss the background factors leading up to the problem statement, which deals with the need for quality of care for patients with diabetes to improve their health behaviors. This section also includes a review of the literature related to the association between provider cultural competence and diabetes patient health behaviors. The purpose of the study, research questions, and theoretical framework are also described.

Problem Statement

According to the 2017 National Diabetes Statistics Report, Type 2 diabetes was the seventh leading cause of death in the United States impacting nearly 30 million individuals (CDC, 2017). Data from the National Health and Nutrition Examination Survey from 2007 through 2010 indicated that half of adults with diabetes are not meeting recommended goals for diabetes care (Beverly et al., 2016; Casagrande, Fradkin, Saydah, Rust, & Cowie, 2013). Patient-provider communication is an essential component of higher quality of care for patients with diabetes and is associated with improved health behaviors (Vaccaro et al., 2012; Vacarro & Huffman, 2016; White et al., 2014; White et al., 2016; Wilkinson, Whitehead, & Ritchie, 2014).

Medical advice, higher health communication scores, and perception of quality of communication contribute to positive health outcomes and behaviors among patients with diabetes (Vaccaro et al., 2012; Vacarro & Huffman, 2016; White et al., 2014; White et al., 2016; Wilkinson et al., 2014). Diabetic patients who reported receiving medical advice were more likely to reduce body weight, caloric intake, sodium, and fat as well as increase physical activity or exercise (Vacarro et al., 2012; Vaccaro & Huffman, 2016). Diabetes patients who reported higher quality of communication, decision-making, and interpersonal style from their provider indicated greater diabetes treatment satisfaction, higher medication adherence, and reduced medical mistrust (White et al., 2014; White et al., 2016). Diabetes patients indicated that respectful communication from their provider in relation to consideration of their culture, tradition, or beliefs was more likely to positively influence their ability to self-care (Aseltine, Sabina, Barclay, & Grahan, 2016; Wilkinson et al., 2014).

Cultural competence is defined as the ability of providers and organizations to effectively deliver healthcare services that meet the social, cultural, and linguistic needs of patients (Betancourt, Green, & Carrillo, 2002). Although the association between medical advice, higher health communication with the perception of quality of communication, and health behaviors appears to be conclusive, the association between provider cultural competence was not examined (Vacarro et al., 2012; Vaccaro & Huffman, 2016; White et al., 2014; Wilkinson et al., 2014). Specifically, cultural competence was not measured or was assumed to be utilized by the provider when providing medical advice to the diabetic patient (Vaccaro & Huffman, 2016). Cultural

competence was also not a component included within measurement tools of health communication (White et al., 2014). Utilization of provider cultural competence is poorly understood as it relates to the outcome of diabetes patient behaviors. I conducted this study aiming to fill this research gap by examining the association between provider cultural competence skills and diabetes patient health behaviors.

Purpose of the Study

The purpose of this study was to examine the association between provider cultural competence and diabetes patient health behaviors. Using the 2017 National Health Information Survey (NHIS), I determined whether particular components of cultural competence utilized by the provider during a health visit improves diabetic patient health behaviors. Cultural competence may include that patients felt treated with respect, their beliefs and opinions about medical care were important, and they were provided easy to understand information. In this study, I sought to examine whether there is an association between these components of cultural competence and diabetes patient health.

Research Questions and Hypotheses

Research Question 1. Is there an association between provider cultural competence and diabetes patient physical activity?

$H_0 1$: There is no association between provider cultural competence and diabetes patient physical activity.

$H_A 1$: There is an association between provider cultural competence and diabetes patient physical activity.

Research Questions 2. Is there an association between provider cultural competence and diabetes patients reducing their fat and calories?

$H_0 2$: There is no association between provider cultural competence and diabetes patients reducing their fat and calories.

$H_A 2$: There is an association between provider cultural competence and diabetes patients reducing their fat and calories.

Research Question 3. Is there an association between provider cultural competence and diabetes patients participating in a weight loss program?

$H_0 3$: There is no association between provider cultural competence and diabetes patients participating in a weight loss program.

$H_A 3$: There is an association between provider cultural competence and diabetes patients participating in a weight loss program.

Research Question 4. Is there an association between provider cultural competence and diabetes patients participating in a yearlong lifestyle change program?

$H_0 4$: There is no association between provider cultural competence and diabetes patients participating in a yearlong lifestyle change program.

$H_A 4$: There is an association between provider cultural competence and diabetes patients participating in a yearlong lifestyle change program.

Research Question 5: Is there an association between provider cultural competence and diabetes patients doing routine diabetes lab test?

$H_0$5: There is no association between provider cultural competence and diabetes patients doing routine diabetes lab test.

H_A5: There is an association between provider cultural competence and diabetes patients doing routine diabetes lab test.

Theoretical Foundation for the Study

The theoretical framework for this study comprised the chronic care model, which originated from the MacColl Institute for Healthcare Innovation in the 1990s (Bodenheimer, Wagner, & Grumbach, 2002). The chronic care model provides a systematic approach in enhancing care delivery by identifying components of the healthcare system that can be modified to support chronic disease management (Bodenheimer et al., 2002). For instance, an interrelated element of the chronic care model includes taking into account cultural competence within the health system and how this may promote quality care (Bondenheimer et al., 2002). (). Further research and application of the chronic care model may provide insight on how modification or application of cultural competence within health centers may support diabetic patient health behaviors.

Nature of the Study

In this study, I employed a quantitative cross-sectional research design using secondary data from the 2017 NHIS. Inclusion criteria for the 2017 NHIS entailed U.S. adults ages 18 and older and those who are noninstitutionalized. In this study, I determined how patient reported provider utilization of cultural competence (i.e., the independent variable) affects diabetes patient health behaviors (i.e., the dependent

variable). The Statistical Package for the Social Sciences (SPSS) Version 24 was used for statistical analysis of the data. Descriptive statistics of each variable, including measures of central tendency and variation, were investigated. I conducted multivariable analysis to show whether there is an association between reported provider utilization of cultural competence on diabetic patient health behaviors. Demographic groups, such as age, working status, race/ethnicity background, gender, and household size, were controlled for in the study.

Literature Search Strategy

I located the literature used in this study from peer-reviewed, professional journals found in the Sage, Medline, Project Muse, PubMed, Science Direct, and ProQuest databases accessed through the EBSCOhost search engine of the Walden University Library. Other articles were retrieved from Google Scholar and federal/state government websites that linked to U.S. federal government agencies, such as the American Diabetes Association (ADA)and CDC websites, which provided access to statistical information. The literature review includes sources published between 2003 and 2019. I also drew on some earlier, seminal works for the chronic care model theoretical framework and its history. In a few articles, researchers assessed the association between provider cultural competence and diabetes patient health behaviors; therefore, a comprehensive review on patient-provider communication and diabetes patient health behaviors was taken into consideration.

I performed the literature search using a combination of terms, of which *diabetes, cultural competence, health behaviors, patient-provider communication,* and *patient-*

provider relationship were the key words in most cases. Other search terms used included: *provider cultural competence and diabetes patient health behaviors, patient-provider relationship and diabetes patient health behaviors, patient-provider communication and diabetes health behaviors, patient-provider communication and health behaviors, provider cultural competence and diabetes, patient-provider communication and diabetes outcomes, provider cultural competence and patient satisfaction, patient-provider communication, cultural competence, chronic care model,* and *diabetes.* Unrelated topics were eliminated from all literature searches. The abstracts of the remaining articles were reviewed, and if related variables or concepts were noted, the body of the literature was further reviewed. For those articles that were reviewed, I searched reference lists for additional information on surveys or measuring tools. The most recent search of the literature was completed in May 2019.

Literature Review Related to Key Concepts

Patient-Provider Communication

Patient-provider communication plays an integral role in the health outcomes and behaviors of patients (Aikens, Bingham, & Piette, 2005; Piette et al., 2003). Specifically, effective patient-provider communication and shared decision-making is associated with greater patient satisfaction, adherence to treatment plans, and health outcomes in relation to diabetes (Aikens et al., 2005; Beverly et al., 2012; Beverly et al., 2016; Piette et al., 2003; Vaccaro et al., 2012; Vacarro & Huffman, 2016; White et al., 2014; White et al, 2016; Wilkinson et al., 2014). Diabetes patients receive advice from their provider to improve clinical and behavior outcomes, such as reducing their glycated hemoglobin

(A1C), adhering to medication usage, healthier eating habits, physical activity, and participating in self-management education programs (Berardis et al., 2004; Vacarro et al., 2012). However, diabetes patients are unable to reach each goal in relation to hemoglobin A1C, blood pressure, and low-density lipoprotein recommendations, and 81.2% do not achieve all three goals (Casagrande et al., 2013). Siminerio, Ruppet, Emerson, Solano, and Piatt (2008) reported that participation in diabetes self-management education or weight loss programs are underused resources by diabetes patients (Graziani, Rosenthal, & Diamond, 1999). Based on these findings, it was important for me to review research articles on patient-provider communication and diabetes health outcomes in this study to understand the discrepancy in patients enhancing diabetes outcomes.

Patient-Provider Communication Measurement Tools

Among patient-provider communication or medical advice given to patient, provider cultural competence was not a measure examined among communication measurement tools (Vacarro et al., 2012; Vaccaro & Huffman, 2016; White et al., 2014; Wilkinson et al., 2013). For instance, the Communication Assessment Tool (CAT) and Interpersonal Processes of Care (IPC-18) survey have been used to assess the overall quality of patient-provider communication and diabetes health outcomes (Nam & Song, 2014; White et al., 2014; White et al., 2016). The CAT is used to measure perceptions of physician performance in areas of communication and interpersonal skills (see Table 1; White et al., 2014; White et al., 2016).

Table 1

Communication Assessment Tool

The Doctor …	Poor	Fair	Good	Very Good	Excellent
Greeted me in a way that made me feel comfortable	1	2	3	4	5
Treated me with respect	1	2	3	4	5
Showed interest in my ideas about my health	1	2	3	4	5
Understood my main health concerns	1	2	3	4	5
Paid attention to me (looked at me, listened carefully)	1	2	3	4	5
Let me talk without interruptions	1	2	3	4	5
Gave me as much information as I wanted	1	2	3	4	5
Talked in terms I could understand	1	2	3	4	5
Checked to be sure I understood everything	1	2	3	4	5
Encouraged me to ask questions	1	2	3	4	5
Involved me in decisions as much as I wanted	1	2	3	4	5
Discussed next steps, including any follow up plans	1	2	3	4	5
Showed care and concern	1	2	3	4	5
Spent the right amount of time with me	1	2	3	4	5

Note. From "Measuring Patient Views of Physician Communication Skills: Development and Testing of the Communication Assessment Tool," by G. Makoul, E. Krupat, and C. H. Chang, 2007, *Patient Education Counseling, 67,* p. 341. Reprinted with permission (See Appendices A).

The IPC-18 consists of three broad domains in relation to communication, decision-making, and interpersonal style (see Table 2; Napoles et al., 2009; White et al., 2014; White et al., 2016). White et al. (2014) found that higher IPC-18 and CAT scores were associated with 2 times greater treatment satisfaction and medication adherence; however, there were no significant associations in other aspects of diabetes health behavior changes, such as modification of diet, reduction of portion size, self-efficacy for self-management, or glycemic control. Another study indicated higher IPC scores were significantly related to improved eating habits and exercise with a *p* value of .001, but not

hemoglobin A1C (Piette et al., 2003). Conclusive findings from the research studies

reviewed included the association of higher IPC-18 and CAT scores with greater

treatment satisfaction, medication adherence, healthier eating, and increased physical

activity. However, the concept in these studies is not clearly operationalized because the

IPC-18 and CAT survey were not used to assess provider cultural competence but rather

the patient's overall experience with the provider.

Table 2

Interpersonal Processes of Care Survey: Short Form (IPC-18)

	Never	Rarely	Sometimes	Usually	Always
How often did doctors speak too fast?	1	2	3	4	5
How often did doctors use words that were hard to understand?	1	2	3	4	5
How often did doctors really find out what your concerns were?	1	2	3	4	5
How often did doctors let you say what you thought was important?	1	2	3	4	5
How often did doctors take your health concerns very seriously?	1	2	3	4	5
How often did doctors explain your test results such as blood tests, x-rays, or cancer screening tests?	1	2	3	4	5
How often did doctors clearly explain the results of your physical exam?	1	2	3	4	5
How often did you and your doctors work out a treatment plan together?	1	2	3	4	5
If there were treatment choices, how often did doctors ask if you would like to help decide your treatment?	1	2	3	4	5
How often were doctors concerned about your feelings?	1	2	3	4	5
How often did doctors really respect you as a person?	1	2	3	4	5
How often did doctors treat you as an equal?	1	2	3	4	5
How often did doctors pay less attention to you because of your race or ethnicity?	1	2	3	4	5
How often did you feel discriminated against by your doctors because of your race or ethnicity?	1	2	3	4	5
How often was office staff rude to you?	1	2	3	4	5
How often did office staff talk down to you?	1	2	3	4	5
How often did office staff give you a hard time?	1	2	3	4	5
How often did office staff have a negative attitude toward you?	1	2	3	4	5

Note. From "Interpersonal Processes of Care and Patient Satisfaction: Do Associations Differ by Race, Ethnicity, and Language," by A. M. Napoles, S. E. Gregorich, J. Santoyo-Olsson, and A. L. Stewart, 2009, *Health Services Research, 44*, p. 1344. Reprinted with permission (see Appendices B).

Medical Advice and Diabetes Patient Health Behaviors

Researchers have evaluated diabetes health outcomes based on patient self-reporting that medical advice was given by the provider (Vacarro et al., 2012; Vaccaro & Huffman, 2016; Wilkinson et al., 2014). Diabetes patients were asked whether they received medical advice in relation to losing weight, increasing physical activity, reducing sodium, or reducing calories from the provider and whether they performed the behavior (Vacarro et al., 2012; Vacarro & Huffman, 2016). There was a significantly greater chance of performing the behavior if medical advice was given by the provider (Vacarro et al., 2012; Vacarro & Huffman, 2016). Specifically, a provider recommendation to reduce fat or caloric intake was significant in reported intake of reduced fat or calories 6.8 times greater than those whose provider did not make the recommendation and to engage in physical activity was significant in reported increase of physical activity 6.3 times greater than those whose provider did not make the recommendation (Vacarro et al., 2012). Lastly, individuals who were told to decrease or maintain their weight were 4.1 times more likely to than those who did not report being told so (Vacarro et al., 2012; Vacarro & Huffman, 2016). However, 33% of patients (i.e., 216 out of 654) stated they did not receive medical advice in regard to reducing fat or calories, maintaining or decreasing their weight, and increasing physical activity (Vacarro et al., 2012). The association between provider advice and diabetes health behavior was conclusive: Patients were more likely to improve diabetes health behaviors when their provider gave them medical advice. However, the study findings did not include information on the delivery of the medical advice and whether provider cultural

competence was a concept utilized in providing the medical advice (Vacarro et al., 2012; Vacarro & Huffman, 2016; Wilkinson et al., 2014).

Ancillary Staff Cultural Competence and Diabetes Patient Health Behaviors

The association between cultural competence and ancillary staff has also been researched. In these studies, ancillary staff included medical assistants, nurse practitioners, case managers and health educators but not the patient's medical provider (Tucker et al., 2014; Williams et al., 2014). Diabetes patients who participated in a culturally tailored diabetes self-management education program, provided by nurse practitioners and case managers, were able to decrease the mean value of their hemoglobin A1C from 8% to 7.6%, although not significant ($p = 0.22$) and also exhibited significant outcome measures for exercise ($p = .007$), foot care ($p = .013$), and diabetes knowledge, ($p = .001$; Williams et al., 2014). Diabetes knowledge was measured using the spoken knowledge in low literacy in the Diabetes Knowledge Assessment Scale (Williams et al., 2014). Tucker et al. (2014) found that patients who received a culturally sensitive diabetes self-management education program from health educators were 38% more likely to reduce their Body Mass Index, diastolic blood pressure ($p = .05$), and physical stress ($p = .05$); however, there were no significant changes in relation to systolic blood pressure, blood glucose levels, overall stress, cognitive stress, behavioral stress, and treatment adherence.

Ruggiero et al. (2014) examined the association between culturally competent medical assistants with diabetes self-care behaviors and hemoglobin A1C. Medical assistants received a 40-hour training on diabetes self-care coaching intervention and

cultural sensitivity in their study (Ruggiero et al., 2014). The culturally competent

medical assistants who provided coaching did not have an effect on diabetes self-care

behaviors or hemoglobin A1C (Ruggiero et al., 2014). The association between culturally

competent ancillary staff (i.e., nurses, case managers, and health educators) and diabetes

health behaviors and outcomes are conclusive; however, the studies reviewed do not

present evidence to support whether there is an association between a culturally

competent medical provider and diabetes health behaviors or outcomes.

Predictors of Diabetes Patient Health Behaviors

The World Health Organization has investigated predictors of health behaviors

and found that experiences of individuals in terms of material, psychosocial factors,

biological factors, and the health system influence health (Clark & Utz, 2014; Walker et

al, 2014). Socioeconomic (i.e., education, employment, and income), psychological (i.e.,

social support, perceived stress, depression), race, gender, age, and health literacy are

noted to be significant predictors of diabetes patient health behaviors (Abubakari et al.,

2015; Clark & Utz, 2014; Walker et al., 2014). In more detail, researchers indicated that

education and employment play a significant role in personal control of diabetes

(Abubakari et al., 2015; Clark & Utz, 2014; Walker et al., 2014). A high level of

education is associated with the perception of greater personal control and less concern

for their illness, while individuals who work reported having less control of their diabetes

(Abubakari et al., 2015; Clark & Utz, 2014; Walker et al., 2014). In relation to ethnic

groups, researchers have found that varying ethnicities place priority in differing diabetes

self-care behaviors (Peyrot et al., 2018; Walker et al., 2014). For instance, non-Hispanic

Whites are more likely to adhere to insulin therapy while Asians are likely to adhere to

diet, African Americans are likely to have regular foot exams, and Hispanics are less

likely to engage in physical activity (Hernandez et al; 2014; Peyrot et al., 2018). As a

result, I controlled for the predictors of diabetes patient health behaviors that were

available in the NHIS 2017 in testing associations between provider cultural competence

and diabetes patient health behaviors.

Summary of Provider Cultural Competence and Diabetes Patient Health Behaviors

Cultural competence is a component of patient-provider communication, which

requires a better understanding on the role it plays on diabetes patient health behaviors.

Provider cultural competence has been defined as the ability to recognize and integrate

the importance of the patient's culture and its interaction with health beliefs and

behaviors (Betancourt et al., 2014; Huey et al., 2014; Shen, 2014). Patients have multiple

health beliefs, values, behaviors, and preferences as it relates to their culture that may

influence their ability to communicate with a provider, their ability to manage their

diagnoses, when to seek care, and their expectations of care (Betancourt et al., 2014;

Huey et al., 2014; Shen, 2014).

Based on the evidence of the review of literature, provider cultural competence is

not the key component within measurement tools to assess the association between

patient-provider communication or medical advice and diabetes health behaviors. The

association between cultural competence and diabetes patient behavior is reviewed for

ancillary staff but not the medical provider. The gap in the literature is due to the

different tools used to operationalize whether there is an association between provider

cultural competence and diabetes health behaviors. Therefore, the research study utilized the 2017 NHIS supplementary questions on participants with diabetes about their health behaviors and experiences with health care providers related to cultural competence while controlling for predictors of diabetes health behavior. The research study utilized the chronic care model in determining whether provider cultural competence is associated with supporting diabetes management within health centers.

Definitions of Terms

The following are key terms used in this study and their definition:

Chronic care model: A systematic approach in enhancing care delivery by identifying components of the health care system that can be modified to support chronic disease management (Bodenheimer et al., 2002).

Cultural competence: The recognition and integration of the importance of the patient's culture and its interaction with health beliefs and behaviors (Betancourt et al., 2014; Huey et al., 2014; Shen, 2014).

Diabetes mellitus: A group of metabolic disease characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both (American Diabetes Association, 2010).

Diabetes patient health behaviors: Includes improvements in diet, physical activity, weight loss, medication adherence, blood glucose levels, participation in diabetes-related programs or weight loss programs, self-efficacy for self-management, frequent visits to the doctor, and/or frequent blood glucose checks (Tucker et al., 2014; Vaccaro et al., 2012).

Patient-provider communication: Entails clinicians providing patients with information for priority setting and problem solving, assisting them in identifying realistic goals for behavior changes, and providing ongoing support and encouragement (Piette et al., 2003).

Assumptions

This study was limited to the use of secondary data sets. In terms of my source of data from an established national database, I assumed the data has been cleaned and entered accurately without errors. I assumed there would be no selection bias and the participants were randomly selected. There was the presumption that participants of the study understood the questions and answered to the best of their knowledge and truthfully because they are components to the study's authenticity, reliability, and validity.

Scope and Delimitations

This study was limited to participants living in the United States who participated in the NHIS and who reported having diabetes. Generalizability of the results of this study cannot be extended to people from other countries. I delimited my study to the association between provider cultural competence and diabetes patient health behaviors. All participants were assumed to be 17 years of age and over and, therefore, excludes children. This exclusion of the population may reduce the result to a generalization to all population of diabetes. Based on the availability in the NHIS data, diabetes patient health behaviors included physical activity, dietary changes, participation in weight loss or yearlong programs, routine blood tests, and medication adherence. Provider cultural competence include patients seeing a medical provider with the same culture or ethnicity,

receiving respect, being asked of cultural opinions and beliefs, and easy to understand information.

Significance, Summary, and Conclusions

This study may contribute to the current literature on the roles played by provider cultural competence in diabetes patient health behavior outcomes. The findings from the study may also help to identify which aspect of provider cultural competence is more useful in improving diabetes patient health behaviors. The knowledge from this finding may help to understand which component of provider cultural competence in the health care field results in improved diabetes patient health behavior outcomes necessary for social change. In Section 2, I will describe the research design and methodology of the study.

Section 2: Research Design and Data Collection

Introduction

The purpose of this quantitative study was to examine the association between provider cultural competence and diabetes patient health behaviors. This section includes the methodology used to investigate and analyze research findings. Within this section, I provide a description of the research design and approach to the study, the target population and selection of study sample, the setting and sampling techniques, research instrumentation and materials, data collection and analysis, threats to validity, and the measures taken to protect participants' rights.

Research Design and Rationale

In this study, I used a quantitative, cross-sectional research design with secondary data analysis as the approach. A cross-sectional study was beneficial to use for this study because it measures the set of variables at a single point in time and is descriptive in interpretation (Frankfort-Nachimas & Nachimas, 2008). Advantages of a cross-sectional design include the use of a population-based sample, inexpensive, can be carried out in a short time frame, and allows for the investigation of several outcomes simultaneously (Creswell, 2003). A quantitative method was selected instead of a qualitative method for this study in order to quantify data sets and measure the association between the variables.

Methodology

Population

Individuals with Type 2 diabetes were included in this study. According to the CDC (2017) diabetes report card, it is estimated that approximately 9.4% of the U.S. population or 30.3 million people had diabetes in 2015. The 2017 NHIS included a nationally representative sample of the United States with participants aged 18 years old and up who reported being diagnosed with Type 2 diabetes.

Sampling and Sampling Procedures

The sampling design used for the 2017 NHIS was cluster sampling, in which the researchers identify clusters, obtain names of individuals within the cluster, and samples within them (CDC, 2018a; Creswell, 2014). The researchers started sampling and interviewing in one geographic location and continued to do so in different areas each 2-week period (CDC, 2018b). Since this research study was on the association of provider cultural competence and diabetes patient health behaviors, participants who indicated they were told by a healthcare professional that they have diabetes and had completed the supplement questions on provider cultural competence were analyzed. I reviewed patients ages 18 years old and up since my interest was in the adult population who have Type 2 diabetes. Data on race, ethnicity, socioeconomic status, and gender were not excluded from the study.

I used effect size, significance level, and power to determine the sample size for this study. The level of significance is the probability of committing a Type 1 error (Field, 2013). Level of significance was set as $\alpha = 0.5$ because it is a common level of

significance in psychological research to establish statistical significance or not (see

Bradley & Brand, 2013). Effect size refers to the strength of the relationship among the

variables (Creswell, 2015). Within this study, the effect size measured the strength of the

relationship between the independent variables and diabetes patient health behaviors.

Cohen's *d* is a common measure of effect size with $d = .2, .5$, and $.8$ representing small,

medium, and large effect sizes, respectively (Chen, Cohen, & Chen, 2010). Cohen (1988)

expanded recommendations of small, medium, and effect size to odds ratio in which

equivalents levels are 1.49, 3.45, and 9. I used the medium detectable odds ratio of 3.45

for this study. Statistical power refers to the probability that an analysis will detect a real

treatment effect (Anderson, Kelley, & Maxwell, 2017). A typically accepted value for

statistical power is .80, which indicates that 80% of the time the null hypothesis is

rejected when there is a true effect (Field, 2013).

I used G*Power 3.1, a power analysis program for statistical tests used within

psychological research, to calculate the sample size (see Faul & Erdfelder, 2007).

Through conducting an a priori analysis, the researcher can determine the required

sample size, given alpha level, power, and effect size (Faul & Erdfelder, 2007). A

binomial logistic regression was conducted with the ordinal independent and dependent

variables and, therefore, the test family was *z* tests. Using the G*Power 3.1 manual, I

employed the Hsieh et al. procedure with the statistical test of logistic regression, an odds

ratio of 3.45, alpha of 0.5, and power of .8 (G*power, 2017). The total sample size

required was 287 with actual power of .800.

Instrumentation and Operationalization of Constructs

The National Center for Health Statistics, which is part of the CDC, developed the 2017 NHIS and published the information in 2018 (CDC, 2019). The 2017 NHIS contains information on diabetes patients who completed supplement questionnaires on diabetes-related health behaviors and provider cultural competence, which was conducted through face-to-face interviews (CDC, 2018a). I submitted an application to the Walden University institutional review board for permission to obtain the data. In order to ensure reliability and validity of values, the National Center for Health Statistics performs cognitive testing on the varying questions before they are included on the survey in the field (Dunston et al., 2016). Quality assurance testing of the variables are performed to ensure variables are within expected parameters on a yearly basis (Dunston et al., 2016).

In order to examine the association between provider cultural competence and diabetes patient health behaviors, I used secondary data from the 2017 NHIS in this study. The independent variables that were reviewed in relation to provider cultural competence were provider same culture, respect from provider, opinions and beliefs, and easy to understand information. These independent variables were originally coded as ordinal variables where "always was coded as = 1," "most of the time was coded as = 2," "some of the time was coded as = 3," and "none of time was coded as = 4" and were turned into dummy variables where "none of the time and some of the time was coded as = 0" and "always and most of the time was coded as = 1." The dependent variables that were reviewed in relation to diabetes patient health behaviors included behavior change in relation to physical activity, reduction in fat or calories, participation in a weight loss

program, participation in a yearlong program, and high blood sugar test. These dependent variables were coded as binomial, ordinal variables where "yes was coded as = 1" and "no was coded as = 0." High blood sugar test was coded as an ordinal variable where "never was coded as = 0," "1 year ago or less was coded as = 1," "more than 1 year ago, but not more than 2 years ago was coded as = 2," "more than 2 years ago, but not more than 3 was coded as = 3," and "more than 3 years ago was coded as = 4." Confounding variables available in the 2017 NHIS, such as age, working status, gender, marital status and race, were controlled for in testing associations (Caspersen et al., 2012; Kushner, 2013; May et al., 2010; Walker et al., 2014). Researchers have indicated the association between diabetes and these confounding variables (Caspersen et al., 2012; Kushner, 2013; Maty et al., 2010; Walker et al., 2014). Confounders can modify the effect of the independent variables on the diabetes patient health behavior outcomes by either amplifying or covering the association between the independent and dependent variables (see Creswell, 2009; Walker et al., 2014). Table 3 lists the operation description of variables.

Table 3

Operational Description of Measures and Variables

Variables	Description	Response Category	Type of Variable
Provider of same culture	How often do you see a health care provider who share similar race, ethnicity, beliefs, native language, gender, or ethnicity?	0 = None of the time, some of the Time 1 = Always, most of the time	Ordinal, independent variable
Respect	How often were you treated with respect by your health care providers?	0 = None of the time, some of the time 1 = Always, most of the time	Ordinal, independent variable
Opinions and beliefs	How often did your health care providers ask for your opinions or beliefs about your medical care or treatment?	0 = None of the time, some of the time 1 = Always, most of the time	Ordinal, independent variable
Easy to understand information	How often did your health care providers offered easy to understand information about your medical care or treatment?	0 = None of the time, some of the time 1 = Always, most of the time	Ordinal, independent variable
Behavioral change: Physical activity	Are you now increasing your physical activity?	Physical activity 1 = Yes, 0 = No	Binomial, dependent variable
Behavioral change: Fat or calories	Are you now reducing the amount of fat or calories in your diet?	Fat or calorie intake 1 = Yes, 0 = No	Binomial, dependent variable
Behavioral change: Weight loss program	Are you now participating in a weight loss program?	Weight loss program 1 = Yes, 0 = No	Binomial, dependent variable

(*table continues*)

Variables	Description	Response Category	Type of Variable
Behavioral change: Yearlong program	Have you ever participated in a yearlong program?	Yearlong program 1 = Yes, 0 = No	Binomial, dependent variable
High blood sugar test	About how long has it been since you last had a blood test for high blood sugar or diabetes?	0 = Never 1 = 1 year ago or less 2 = More than 1 year, but not more than 2 years ago 3 = More than 2 years, but not more than 3 4 = More than 3 years ago	Ordinal, dependent variable
Age	Age in years	1 = 18 to 34 years of age 2 = 35 to 64 years of age 3 = 65 and up years of age	Ordinal
Working status	What is your current working status?	1 = Employed 2 = Unemployed	Ordinal
Gender	Participant self-identified gender	1 = Male 0 = Female	Binomial
Marital status	What is your marital status?	1 = Married 2 = Single	Binomial
Race	Participants self-identification of race	1 = White 2 = Black/African American 3 = Hispanic 4 = Others	Nominal

Data Analysis Plan

I used SPSS Version 25 to provide descriptive and inferential statistics and analyze data. The sample characteristics present weighted descriptive statistics through the complex sample function in SPSS and unweighted descriptive statistics, including frequencies, measure of central tendency (i.e., mean, median, and mode), and measure of dispersion (standard deviation). Associations were considered significant if $p < .05$.

Research Questions and Hypotheses

Research Question 1. Is there an association between provider cultural competence and diabetes patient physical activity?

$H_0 1$: There is no association between provider cultural competence and diabetes patient physical activity.

$H_A 1$: There is an association between provider cultural competence and diabetes patient physical activity.

Statistical plan. The first research question had five key variables: four provider cultural competence independent variables (i.e., predictor variable, ordinal) and physical activity (i.e., dependent variable, binomial). Using binomial logistic regression, the predictor was adjusted for sociodemographic confounders and the null hypothesis would be rejected if $p < .05$.

Research Question 2. Is there an association between provider cultural competence and diabetes patients reducing their fat and calories?

$H_0 2$: There is no association between provider cultural competence and diabetes patients reducing their fat and calories.

$H_A 2$: There is an association between provider cultural competence and diabetes patients reducing their fat and calories.

Statistical plan. The second research question had five key variables: the four provider cultural competence independent variables (i.e., predictor variable, ordinal) and reducing fat and calories (i.e., dependent variable, binomial). Using binomial logistic

regression, the predictor was adjusted for sociodemographic confounders and the null hypothesis would be rejected if $p < .05$.

Research Question 3. Is there an association between provider cultural competence and diabetes patient participating in a weight loss program?

H_03—There is no association between provider cultural competence and diabetes patient participating in a weight loss program.

H_A3— There is an association between provider cultural competence and diabetes patient participating in a weight loss program.

Statistical plan. The third research question had five key variables, the four provider cultural competence independent variables (predictor variable, ordinal) and participation in a weight loss program (dependent variable, binomial). Using binomial logistic regression, the predictor was adjusted for sociodemographic confounders and the null hypothesis was rejected if $p < .05$.

Research Question 4. Is there an association between provider cultural competence and diabetes patient participating in a yearlong lifestyle change program?

H_04—There is no association between provider cultural competence and diabetes patient participating in a yearlong lifestyle change program.

H_A4—There is an association between provider cultural competence and diabetes patient participating in a yearlong lifestyle change program.

Statistical plan. The fourth research question had five key variables, the four provider cultural competence independent variables (predictor variable, ordinal) and

participation in yearlong lifestyle change program (dependent variable, binomial). Using binomial logistic regression, the predictor was adjusted for sociodemographic confounders and the null hypothesis was rejected if $p < .05$.

Research Question 5. Is there an association between provider cultural competence and diabetes patient doing routine diabetes lab test?

H_05—There is no association between provider cultural competence and diabetes patient doing routine diabetes lab test.

H_A5—There is an association between provider cultural competence and diabetes patient doing routine diabetes lab test.

Statistical plan. The fifth research question had five key variables, the four provider cultural competence independent variables (predictor variable, ordinal) and routine diabetes lab test (dependent variable, ordinal). Using logistic regression, the predictor was adjusted for sociodemographic confounders and the null hypothesis was rejected if $p < .05$.

Threats to Validity

Validity entails the extent to which the survey and its response or response alternatives measure the phenomenon that is supposed to be measured (Creswell, 2014). Possible external threats to validity may include situational factors, such as the specific conditions which the research was conducted (Creswell, 2014). Data were collected throughout the year, in which the researchers completed the questionnaire in one area before moving on to the next (CDC, 2018b). It is possible that seasonal bias may play a role in external threats to validity (Creswell, 2014). Possible internal threats to validity

may entail selection bias, mortality, and instrumentation (Creswell, 2014). Selection bias

could occur in the selection of the participants of the study, however, NHIS selects

households to interview at random in order to minimize selection bias (CDC, 2018b). It is

possible that participants of the questionnaire may fail to complete the questionnaire due

to illness or death or decide to withdraw from the study at the time of the interview

(Creswell, 204). This potential issue is addressed through the multistage sampling, as it

allows researchers to gather representative data within the same area or zip code

(Creswell, 2014). Lastly, instrumentation or the quality of how the questionnaire was

administered, the attitude of the interviewer, and interview method may affect internal

validity (Creswell, 2014). This is minimized through the review and utilization of a field

representative manual and survey flowchart, which guides the interviewer appropriately,

and a computer assisted personal interviewing mode (CDC, 2018b). Instruments were

also made in English and Spanish with appropriate staff who speak English or Spanish to

facilitate the interview (CDC, 2018b).

Construct validity ensures that the variables of interest are measured. The key

variables of interest are provider cultural competence and diabetes patient health

behaviors. These variables of interest underwent cognitive testing before being included

within the questionnaire (Dunston et al., 2016).

Ethical Procedures

Survey participants were made aware of the parameters of the interview, its

voluntary nature, and how the results would be used (CDC, 2018b). At the time of the

interview, consent was obtained for survey participation and data collectors utilized a

computer, which had password protection and encryption (CDC, 2018b). Interpreters were available to help those participants who did not speak or read English or Spanish (CDC, 2018b). Participants' identities are protected with no names or identifying information within the public use data files. For the analysis of the secondary data, I obtained a Walden University Institutional Review Board Approval number of 09-23-19-0508270.

<div align="center">**Summary**</div>

The purpose of this study was to examine the association between provider cultural competence and diabetes patient health behaviors. Section 2 of this doctoral study included the research design, rationale for the approach, and methodology. This is a cross-sectional quantitative study using secondary data from the 2017 NHIS. Statistical analysis for five research questions and corresponding hypotheses-testing included logistic regression analysis, where each predictor was examined individually and then adjusted for the effect of cofounders.

The key independent variables were provider cultural competence such as provider same culture, respect of patient, opinions and beliefs, and easy to understand information. The dependent variables were diabetes behavioral change and high blood sugar test. The confounding variables included age, working status, gender, household size, and race. A review of the threats to validity and strategies utilized to reduce them were discussed. Lastly, ethical procedures were discussed to ensure the rights and confidentiality of the participants.

In Section 3, the results and findings of the data analysis are presented.

Section 3: Presentation of the Results and Findings

Introduction

The purpose of this quantitative study was to examine the association between

provider cultural competence and diabetes patient health behaviors. I designed the

research questions to determine the association between aspects of provider cultural

competence, such as sharing the same culture, respect in relation to the patient's culture,

asking the patient's opinions and beliefs about medical treatment, and providing easy to

understand information, and diabetes patient health behaviors. Diabetes patient health

behaviors included performing physical activity, decreasing fat or calories, participating

in a weight loss program, participating in a yearlong lifestyle change program, and a

routine blood sugar test. I intended to test the five sets of hypotheses using binary logistic

regression and ordinal logistic regression.

In this section, I present the results of the data analysis to address the research

questions and the associated hypotheses. The section is divided into three subsections. In

the first subsection, I describe the data collection of the secondary data set, response rates

of the participants, and time frame. In the second subsection, the descriptive statistics are

used to describe the demographic characteristics of the sample being studied. In the third

section, I review the statistical analyses used to address each of the research questions

and the results.

Data Management and Descriptive Analyses

The data for this cross-sectional study were originally collected by the 2017 NHIS

among the civilian, noninstitutionalized population living in the United States (CDC,

2018a). In total, there were 26,742 individuals who participated in the 2017 NHIS (CDC, 2018a). The study sample was limited to respondents who indicated they were diagnosed by their primary care provider with Type 2 diabetes and included 2,342 individuals.

Data Subset and Variable Manipulation

Cultural competence was the key independent variable and consisted of measures of whether the provider seen was of the same culture as the patient, whether the patient felt they received respect from the provider in relation to their beliefs and culture, whether the provider asked for the patient's opinions and beliefs in regards to treatment, and whether the provider gave easy to understand information to the patient. Originally, the independent variables were nominal variables with responses of always, most of the time, some of the time, and none of the time. I converted these independent variables into binomial, dummy variables for logistic regression analyses. The dependent variables that were reviewed in relation to diabetes patient health behaviors included behavior change in relation to physical activity, reduction in fat or calories, participation in a weight loss program, participation in a yearlong program, and high blood sugar test. The dependent variables remained as binomial, dummy variables with the response of *yes* or *no* from the respondent. Confounding variables available in the 2017 NHIS, such as age, working status, gender, marital status and race, were controlled for in testing associations (Caspersen et al., 2012; Kushner, 2013; May et al., 2010; Walker et al., 2014). Originally, the confounding variable, age, was a continuous variable ranging from 18 years old and up; however, I transformed age into an ordinal variable, grouping participants from ages 18 to 34 years of age, 35 to 64 years of age, or 65 plus years of age. For the study, gender

remained as a binomial variable with a response of male or female. Originally, marital

status was a nominal variable with a variety of responses, such as married, married, but

spouse not in household, widowed, divorced, or separated; however, I converted marital

status into a binomial variable and grouped it into either married or single. Lastly, the

data from the Hispanic race variable had to be added onto the race variable. The original

race variable did not include data from the Hispanic race and had to be merged, creating a

new race variable that grouped individuals as either White, Black/African American,

Hispanic, or others.

Missing Data Imputation

   I ran a cross-tabulation analysis to determine available cases for each of the

research questions. Based on the results of the cross-tabulation, there were no available

cases to examine whether there was an association between provider cultural competence

and the diabetes patient health behavior of participation in a yearlong lifestyle change

program. In addition, there were no available cases to examine whether there was an

association between provider cultural competence and the diabetes patient health

behavior of doing routine high blood sugar tests (see Table 4). Upon full review of the

data, participants with Type 2 diabetes who completed the provider cultural competence

questions did not answer the two questions in relation to participating in a yearlong

lifestyle change program and the high blood sugar test. Unfortunately, the cross-

tabulation of the independent and dependent variables could only be performed after

approval of the proposal from IRB. As a result, I performed the binary logistic regression

data analyses to examine whether there was an association between provider cultural

competence and diabetes patient health behavior change of increasing physical activity,

reducing fat or calories, and participating in a weight loss program.

Table 4

*Cross-Tabulations of Provider Cultural Competence by the Diabetes Patient Behavior Change
Variables*

Provider Cultural Competence by Diabetes Patient Behavior Change	Valid %	Cases Missing %	Total %
Provider same culture*physical activity	46.6	53.4	100
Provider same culture*fat or calories	46.6	53.4	100
Provider same culture*weight loss program	46.7	53.3	100
Provider same culture*lifestyle change program	0	0	0
Provider same culture*routine diabetes lab test	0	0	0
Provider respect*physical activity	95.6	4.4	100
Provider respect*fat or calories	95.6	4.4	100
Provider respect*weight loss program	95.6	4.4	100
Provider respect*lifestyle change Program	0	0	0
Provider respect*routine diabetes lab test	0	0	0
Provider opinions and beliefs*physical activity	95.2	4.8	100
Provider opinions and beliefs* fat or calories	95.2	4.8	100
Provider opinions and beliefs* weight loss program	95.2	4.8	100
Provider opinions and beliefs* lifestyle change program	0	0	0
Provider opinions and beliefs* routine diabetes lab test	0	0	0
Provider easy information* physical activity	95.5	4.5	100
Provider easy information* fat or calories	95.5	4.5	100
Provider easy information* weight loss program	95.5	4.5	100
Provider easy information* lifestyle change program	0	0	0
Provider easy information* routine diabetes lab test	0	0	0

Descriptive Analyses

Sample Characteristics

National surveys are designed to represent the population of the United States. To

compare the sample of randomly selected participants in this study ($N = 2,342$) with the

representative U.S. population, I calculated weighted and unweighted frequencies and

presented them in Table 5. The characteristics include the five measures of provider

cultural competence, diabetes patient behavior change, and sociodemographic factors.

There were no pronounced differences in percent distribution between weighted and

unweighted frequencies, except for sociodemographic factors. These characteristics are

not of the full population but only those that were diagnosed with Type 2 diabetes. The

table presents both sets of distributions for general comparison; however, the remainder

analyses were carried out adjusting for design weights.

     The weighted percentages show that more than half of the sample were males

(53.6%), 35 to 64 years of age (54.5%), unemployed (63.5%), married (56.7%), and

White (61.7%). I applied weights in order to adjust the results of the study to better

reflect what is known about the Type 2 diabetes sample (see CDC, 2018a). According to

the National Institute of Diabetes and Digestive and Kidney Diseases (2017), individuals

45 years old and older and self-identified as African American, Hispanic, American

Indian, Asian American, or Pacific Islander were more likely to have Type 2 diabetes.

Table 5

Unweighted and Weighted Characteristics of the Study Sample with Type 2 Diabetes

Characteristic	Unweighted Frequencies	Unweighted Percentages	Weighted Frequencies	Weighted Percentages
Provider same culture				
None, some of the time	304	13.0	2,939,987	15.4
Always, most of the time	789	33.7	6,678,431	34.9
No response	1,249	53.3	9,511,620	49.7
Respect				
None, some of the time	85	3.6	714,028	3.7
Always, most of the time	2,154	92.0	17,615,698	92.1
No response	103	4.4	800,312	4.2
Opinions and beliefs				
None, some of the time	895	38.2	7,283,421	38.1
Always, most of the time	1,335	57.0	10,945,362	57.2
No response	112	4.8	901,255	4.7
Easy to understand				
information	203	8.7	1,939,612	10.1
None, some of the time	2,034	86.8	16,363,562	85.5
Always, most of the time	105	4.5	826,864	4.3
No response				
Physical activity				
No	1,013	43.3	8,130,695	42.5
Yes	1,328	56.7	10,982,776	57.4
No response	1	0.0	16,567	0.1
Fat or calories				
No	860	36.7	6,855,845	35.8
Yes	1,481	63.2	12,258,951	64.1
No response	1	0.0	15,242	0.1
Weight loss program				
No	2,108	90.0	17,096,428	89.4
Yes	234	10.0	2,033,610	10.6
Gender				
Male	1,165	49.7	10,250,500	53.6
Female	1,177	50.3	8,879,538	46.4

(table continues)

Characteristic	Unweighted Frequencies	Unweighted Percentages	Weighted Frequencies	Weighted Percentages
Age				
18 to 34	46	2.0	551,998	2.9
35 to 64	1,111	47.4	10,434,350	54.5
65 and up	1,185	50.6	8,143,690	42.6
Marital status				
Married	1,045	44.6	10,853,353	56.7
Single	1,293	55.2	8,250,494	43.1
Working status				
Employed	757	32.3	6,986,008	36.5
Unemployed	1,585	67.7	12,144,030	63.5
Race				
White	1,559	66.6	11,812,174	61.7
Black or African American	350	14.9	2,789,206	14.6
Hispanic	285	12.2	3,125,819	16.3
Others	141	6.0	1,350,741	7.1
No response	7	0.3	52,098	0.3

Note. N = 2,342.

Provider Cultural Competence and Diabetes Behavior Change

I carried out three descriptive cross-tabulations to illustrate the frequency

distribution of the five measures of provider cultural competence (i.e., where provider is

of same culture as patient, treats patients with respects, cares about opinions and beliefs

of patient, and offers easy to understand information) by frequency of time that diabetes

patients changed their behavior (for physical activity, see Table 6; for reduction in fat and

calorie intake, see Table 7; and for participation in weight loss programs, see Table 8).

The measures of provider cultural competence are on the first column to reflect

the independent variables. If the behavior changed, the "Yes" and "No" columns reflect

how often the behavior was changed due to provider cultural competence (either none,

some of the time or always, most of the time). Those with Type 2 diabetes were more

likely to increase their physical activity behavior whether the provider engaged patients

with cultural competence (see Table 6). Only cultural competence due to provider asking

about opinions and beliefs of patients was significantly associated with change in

physical activity behavior ($p = .009$).

Table 6

Provider Cultural Competence and Diabetes Behavior Change in Physical Activity

	Diabetes Behavior Change: Physical Activity			
	Yes		No	
Provider Cultural Competence	None, Some of the Time	Always, Most of the Time	None, Some of the Time	Always, Most of the Time
	%	**%**	**%**	**%**
Provider is of the same culture as patient	56.3	56.1	43.8	43.9
Provider treats patient with respect	49.4	57.1	50.6	42.9
Provider asks about opinions and beliefs of patient	53.5	59.1	46.5	40.9
Provider offers easy to understand information	51.2	57.5	48.8	42.5

Note. $N = 1,092$; Pearson χ^2, Same culture, $p=.962$; Respect $p=.159$; Opinions $p=.009$; Information $p=.088$.

A majority of patients with Type 2 diabetes responded they decreased their fat or

calorie intake whether they felt their provider engaged patients with cultural competence

(see Table 7). However, associations were not statistically significant.

Table 7

Provider Cultural Competence and Diabetes Behavior Change in Fat and Calorie Intake

	Diabetes Behavior Change: Fat and Calorie Intake			
	Yes		No	
Provider Cultural Competence	None, Some of the Time	Always, Most of the Time	None, Some of the Time	Always, Most of the Time
	%	%	%	%
Provider is of the same culture as patient	68	64.4	32	35.6
Provider treats patient with respect	55.3	63.8	44.7	36.2
Provider cares about opinions and beliefs of patient	63.4	63.7	36.6	36.3
Provider offers easy to understand information	60.6	63.8	39.4	36.2

Note. N=1,092; Pearson χ^2, Same culture, *p=*.263; Respect *p=*.109; Opinions *p=*.905; Information *p=*.366

A majority of patients with Type 2 diabetes responded they do not participate in a weight loss program whether they felt provider engaged patients with cultural competence (see Table 8). However, associations were not statistically significant, except for providers that ask about patient's beliefs and opinions (*p* = .014) or offers easy to understand information to their patients (*p* = .043).

Table 8

Provider Cultural Competence and Diabetes Behavior Change in Weight Loss Program

Provider Cultural Competence	Diabetes Behavior Change: Weight Loss Program			
	Yes		No	
	None, Some of the Time %	Always, Most of the Time %	None, Some of the Time %	Always, Most of the Time %
Provider is of the same culture as patient	9.5	10.4	90.5	89.6
Provider treats patient with respect	4.7	10.2	95.3	89.8
Provider cares about opinions and beliefs of patient	8.0	11.2	92	88.8
Provider offers easy to understand information	5.9	10.4	94.1	89.6

Note. $N = 1,092$; Pearson χ^2, Same culture, $p=.676$; Respect $p=.099$; Opinions $p=.014$; Information $p=.043$.

Binary Logistic Regression Analyses

To answer the three research questions, the independent variables (cultural competence) were transformed into dummy variables and the dependent variable (health behavior change) distributions were converted to binomial in order to perform the binary logistic regression analysis. I applied weights of a complex sample design plan for variance estimation, in which the variable for the stratum for variance estimation was labeled as PSTRAT, the variable for variance estimation variable was labeled as PPSU, and the weight variable was labeled as WTFA (Delwiche & Slaughter, 1998). I conducted binary logistic regression analyses to determine whether there was a significant association between predictor (independent variables) and dependent variable (behavior change) while controlling for demographic variables (i.e. age, working status, gender, marital status, and race). Logistic regression allows researchers to predict values

of a dependent variable from information about other independent variables (Wagner,

2017).

Research Questions and Hypotheses

Research Question 1. Is there an association between provider cultural

competence and diabetes patient changing physical activity behavior?

$H_0$1—There is no association between provider cultural competence and diabetes

patient changing physical activity behavior.

H_A1—There is an association between provider cultural competence and diabetes

patient changing physical activity behavior.

The binary logistic regression model indicated that provider cultural competence

did not predict diabetes patient physical activity behavior change (Table 9). Therefore,

since $p > .05$, the null hypothesis was not rejected; there is no association between

provider cultural competence and diabetes patient change in physical activity behavior.

Table 9

Binary Logistic Regression Analysis of Provider Cultural Competence and Physical Activity

Provider …	β	S.E.	Wald	*df*	Sig.	Exp (β)	95% C.I. for EXP β Lower	Upper
Same culture as patient	-.080	.144	.311	1	.557	.923	.696	1.224
Treats patient with respect	.303	.323	.879	1	.349	1.354	.719	2.552
Cares about opinions and beliefs of patient	.205	.138	2.202	1	.138	1.228	.936	1.610
Offers easy to understand information	.005	.219	.001	1	.980	1.005	.654	1.546
Gender	-.058	.127	.207	1	.649	.944	.735	1.211
Age	-.405	.128	10.046	1	.002	.667	.519	0.857
Working status	-.042	.148	.081	1	.777	.959	.717	1.282
Marital status	-.144	.129	1.244	1	.265	.866	.672	1.115
Race	-.022	.063	.122	1	.727	.978	.865	1.107
Constant	1.238	.520	5.673	1	.017	3.449		

Note. Variables entered on Step 1: Gender, Marital Status, Race, Working Status, and Age

Research Question 2. Is there an association between provider cultural competence and diabetes patient reducing their fat and calorie intake?

$H_0 2$—There is no association between provider cultural competence and diabetes patient reducing their fat and calorie intake.

$H_A 2$—There is an association between provider cultural competence and diabetes patient reducing their fat and calorie intake.

The binary logistic regression model indicated that provider cultural competence partially predicted diabetes patient behavior changes in the reduction of fat or calorie intake. Seeing a provider who treats patients with respect was a significant predictor of diabetes patient behavior change in reduction of fat and calorie intake (β = .855, *p* = .009), as well as gender (β = -.338, *p* = .012) and age (β = -.429, *p* = .002). The odds of

a diabetes patient reducing their fat or calorie intake is 2.35 times more likely when the provider treats the patient with respect, controlling for gender and age.

Therefore, since $p < .05$, for provider cultural competence who treat patients with respect, the null hypothesis is rejected since there was a significant association between provider cultural competence in treating patients with respect and diabetes patient behavior change of reducing fat or calorie intake. There was no statistically significant association between provider cultural competence when provider was of the same culture as patient, cares about opinions and beliefs of patient, or offers easy to understand information and diabetes patient behavior to reduce intake of fat and calories.

Table 10

Binary Logistic Regression Analysis of Provider Cultural Competence and Fat/Calorie Intake

Provider …	β	S.E.	Wald	*df*	Sig.	Exp (β)	95% C.I. for EXP β	
							Lower	Upper
Same culture as patient	-.260	.154	2.861	1	.091	.771	.570	1.042
Treats patient with respect	.855	.330	6.727	1	.009	2.352	1.232	4.488
Cares about opinions and beliefs of patient	-.158	.147	1.145	1	.285	.854	.640	1.140
Offers easy to understand information	.077	.232	.110	1	.741	1.080	.685	1.702
Gender	-.338	.134	6.374	1	.012	.713	.548	.927
Age	-.429	.135	9.830	1	.002	.655	.503	.853
Working status	-.115	.158	.533	1	.466	.891	.654	1.214
Marital status	-.227	.136	2.761	1	.097	.797	.610	1.042
Race	-.050	.066	.577	1	.448	.951	.836	1.082
Constant	1.887	.545	12.005	1	.001	6.598		

Note. Variable(s) entered on Step 1: Gender, Marital Status, Race, Working Status, and Age

Research Question 3. Is there an association between provider cultural competence and diabetes patient participating in a weight loss program?

$H_0$3—There is no association between provider cultural competence and diabetes patient participating in a weight loss program.

H_A3— There is an association between provider cultural competence and diabetes patient participating in a weight loss program.

The binary logistic regression model indicated that provider cultural competence did not predict diabetes patients participating in a weight loss program (Table 11). Only age was a predictor of participation in weight loss programs ($p = .002$). Therefore, since $p > .05$, the null hypothesis was not rejected; there were no significant associations between provider cultural competence and diabetes patient participation in a weight loss program.

Table 11

Binary Logistic Regression Analysis of Provider Cultural Competence and Weight Loss Program

Provider …	β	S.E.	Wald	df	Sig.	Exp (B)	95% C.I. for EXP β Lower	Upper
Same culture as patient	-.060	.236	.064	1	.800	.942	.593	1.496
Treats patient with respect	1.532	1.036	2.188	1	.139	4.628	.608	35.234
Cares about opinions and beliefs of patient	.160	.232	.477	1	.490	1.174	.745	1.851
Offers easy to understand information	.389	.428	.824	1	.364	1.475	.637	3.416
Gender	.059	.207	.082	1	.775	1.061	.707	1.593
Age	-.649	.205	10.023	1	.002	.523	.350	.781
Working status	-.105	.229	.209	1	.648	.901	.575	1.411
Marital status	.075	.211	.126	1	.723	1.078	.713	1.629
Race	-.074	.106	.493	1	.482	.928	.755	1.142
Constant	-2.400	1.226	3.834	1	.020	.091		

Note. Variable(s) entered on Step 1: Gender, Marital Status, Race, Working Status, and Age

Research Question 4. Is there an association between provider cultural competence and diabetes patient participating in a yearlong lifestyle change program?

$H_0$4—There is no association between provider cultural competence and diabetes patient participating in a yearlong lifestyle change program.

H_A4—There is an association between provider cultural competence and diabetes patient participating in a yearlong lifestyle change program.

A cross tabulation of the variables was performed and SPSS indicated there were no available cases. As a result, I am unable to determine whether there is or is not a significant association between provider cultural competence and the diabetes patient health behavior of participating in a yearlong lifestyle change program.

Research Question 5. Is there an association between provider cultural competence and diabetes patient doing routine diabetes lab test?

$H_0$5—There is no association between provider cultural competence and diabetes patient doing routine diabetes lab test.

H_A5—There is an association between provider cultural competence and diabetes patient doing routine diabetes lab test.

A cross tabulation of the variables was performed and SPSS indicated there were no available cases. As a result, I am unable to determine whether there is or is not a significant association between provider cultural competence and the diabetes patient health behavior of doing routine diabetes lab tests.

Summary of Results

From the results of the data analysis, with a 95% confidence interval and $p < 0.05$, it is noted that there is no association between provider cultural competence (provider respect, provider with the same culture, provider opinions and beliefs, and provider easy

information) and the diabetes patient health behaviors of increasing physical activity and participating in a weight loss program. In this case, the null hypotheses were not rejected. A significant association between provider cultural competence and the diabetes patient health behavior of decreasing fat and/or calories was observed. In particular, there was a significant association between the provider treating the patient with respect in relation to their culture and beliefs and the likelihood of the Type 2 diabetes patient decreasing fat and/or calories. In this case, the null hypothesis was rejected. Lastly, I was unable to determine whether there was an association between provider cultural competence and the diabetes patient health behavior of participating in a yearlong lifestyle change program and doing routing diabetes blood sugar lab tests since there were no available cases. As a result, there was insufficient evidence to indicate whether there was a statistical significance or not between these variables. Section 4 describes the summary of the findings, interpretation of the findings, theoretical application, limitations, recommendations as it relates to future research, and implications for professional practice and social change.

Section 4: Application to Professional Practice and Implications for Social Change

Introduction

The purpose of this quantitative study was to examine the association between provider cultural competence and diabetes patient health behaviors. I designed the research questions to determine to what extent aspects of provider cultural competence, such as sharing the same culture, respect in relation to the patients' culture and beliefs, asking the patient's opinions and beliefs about medical treatment, and providing easy to understand information, predicted diabetes patient health behaviors. Diabetes patient health behaviors included increasing physical activity, decreasing fat or calorie intake, participating in a weight loss program, participating in a yearlong lifestyle change program, and routine blood sugar testing. In this section, I interpret the results of the data analyses, indicate limitations of the study, provide recommendations for future studies, and discuss implications for professional practice and social change.

Summary and Interpretation of the Findings

Summary of Findings

In this study, I sought to answer five research questions. The results of binary logistic regression analyses were presented for the associations between provider cultural competence and diabetes patient behavior change in physical activity (to address Research Question 1), reduction of fat or calorie intake (to address Research Question 2), and participation in a weight loss program (to address Research Question 3). However, there were no available data to determine whether there was an association between

provider cultural competence and participation in a yearlong lifestyle change program and routine blood sugar testing.

Provider cultural competence and diabetes patient behavior change in physical activity. I failed to reject the null hypothesis for the first research question because none of the four measures of provider cultural competence were statistically significant. Age was an independent predictor of physical activity behavior change ($p = .002$).

Provider cultural competence and diabetes patient behavior change in reduction of fat or calorie intake. The null hypothesis for the second research question was partially rejected because only one of the four measures of provider cultural competence (i.e., treating patients with respect) was a predictor of diabetes patients who would change their health behavior by reducing fat or calorie intake. The odds of a diabetes patient reducing their fat or calorie intake were 2.35 times more likely when the provider treated the patient with respect. Age ($p = .002$) and gender ($p = .002$) were independent predictors of reducing fat or calorie intake behavior change.

Provider cultural competence and diabetes patient behavior change in participation in a weight loss program. I failed to reject the null hypothesis for the third research question; there were no significant associations between provider cultural competence and diabetes patient participation in a weight loss program. Age was an independent predictor of participation in weight loss programs ($p = .002$).

Interpretation of Findings

While the findings of the association between provider cultural competence was limited to one measure of provider cultural competence (i.e., provider respect), they represent the first evidence of cultural competence in relation to diabetes patient behavior change. Several studies conducted prior to the present study represent a conclusive association between medical advice, higher health communication with perception of quality of communication, and health behaviors (see Vacarro et al., 2012; Vaccaro & Huffman, 2016; White et al., 2014; Wilkinson et al., 2014). However, provider cultural competence was not measured or was assumed to be utilized by the provider when providing medical advice to the diabetic patient (Vaccaro & Huffman, 2016).

The results from the present study suggest that utilization of provider cultural competence increases the likelihood that Type 2 diabetes patients will improve their eating habits (i.e., change in fat and calorie intake) and, therefore, improve blood glucose control reducing diabetes complications. Evidence in the literature on eating habits and diabetes patients also supports the findings from the present study, indicating that healthier eating habits among diabetes patients are associated with improvements in blood glucose levels and diabetes management as well as a reduction in complications associated with diabetes (Fanning et al., 2018; Monlenzun et al., 2015; Pan et al., 2018; Watson et al., 2016.

Indirect evidence supporting the findings from the present study are broader areas of medical advice, communication, and patient perceptions associated with health outcomes and diabetes patient behaviors. Recent scientific reviews have indicated that

medical advice, higher health communication scores, and perception of quality of communication contribute to positive health outcomes and behaviors among patients with diabetes (Vaccaro et al., 2012; Vacarro & Huffman, 2016; White et al., 2014; White et al., 2016; Wilkinson et al., 2014). Diabetes patients who reported receiving medical advice were more likely to reduce body weight, caloric intake, sodium, and fat as well as increase physical activity or exercise (Vacarro et al., 2012; Vaccaro & Huffman, 2016). Diabetes patients who reported higher quality of communication, decision-making, and interpersonal style from their provider indicated greater diabetes treatment satisfaction, higher medication adherence, and reduced medical mistrust (White et al., 2014; White et al., 2016).

In the literature, cultural competence was not a component included within measurement tools of health communication (White et al., 2014). Overall, research and evidence on the association between provider cultural competence and diabetes patient health behavior were scarce. As a result, the findings of this study are able to extend knowledge in the discipline by showing whether there was an association between provider cultural competence and diabetes patient health behaviors.

Theoretical Applications

In this study, I used the chronic care model as the theoretical framework. This model represents a systematic approach to enhance care delivery by identifying components of the healthcare system that can be modified to support chronic disease management (Bodenheimer et al., 2002). Based on the results of the study, an interrelated element of the chronic care model includes considering the utilization of provider cultural

competence within the health system in order to promote diabetes patient health behaviors. Healthcare facilities may also consider providing a provider training on aspects of provider cultural competence and how to implement cultural competence during patient interactions or embed it within the health center's mission or goals.

<h3 style="text-align:center">Limitations of the Study</h3>

Limitations identified for this study included the concept that the key variables, provider cultural competence and diabetes patient health behavior, were new, supplemental questions that were added to the 2017 NHIS data set (see CDC, 2017). This may be one of the key factors that led to the lack of available data to examine whether there was an association between provider cultural competence and participation in a yearlong weight loss program or routine blood sugar testing. Therefore, I was unable to identify whether there was a significant association between those variables.

Upon reviewing the data set, I found that Type 2 diabetes patients who completed the provider cultural competence survey did not provide a response to whether they participated in a yearlong weight loss program and perform routine blood sugar tests. It is not clear whether this was an error in part of the interviewer or the interviewee or if sufficient training was provided to the interviewer in regard to the newly added supplemental surveys.

Another limitation was that each of the dependent variables were *yes* or *no* responses given by the patients. A summary index score of the varying diabetes patient behavior change responses would have been a more valid and reliable measure. I expect, over time, that these questions will be improved and that the survey may be enhanced to

provide a summation score or health behavior index in relation to diabetes patient health behaviors.

Lastly, according to the National Institute of Health (NIH) (NIH; 2017), individuals 45 years old and older and self-identified as African American, Hispanic, American Indian, Asian American, or Pacific Islander were more likely to have Type 2 diabetes. However, within this study, the weighted percentages indicated that 61% of the Type 2 diabetes respondents identified themselves as White. A higher weighted percentage of the African American, Latino, Asian, American Indian, and Alaskan Native population could have provided substantial information on provider cultural competence and diabetes patient health behaviors.

Recommendations

My recommendations for future research include further examination of provider cultural competence and Type 2 diabetes patient health behavior changes. This study is one of the first to examine the association between provider cultural competence and Type 2 diabetes patient health behavior changes and, therefore, requires a call for other researchers to extend knowledge on these findings. Prior studies are conclusive in regard to the association between medical advice, higher health communication with perception of quality of communication, and health behaviors; however, the association between provider cultural competence was not examined (Vacarro et al., 2012; Vaccaro & Huffman, 2016; White et al., 2014; Wilkinson et al., 2014). It would also be beneficial to review the 2018 NHIS data that has been released in 2019 to examine provider cultural competence and other Type 2 diabetes patient health behavior changes in relation to

seeing the podiatrist, retinopathy screenings, routine blood sugar tests or glycosylated hemoglobin, and participation in a lifestyle change program.

Implications for Professional Practice and Social Change

It is important for healthcare facilities, such as hospitals or federally qualified health centers, to embed cultural respect, one of the measures of provider cultural competence, within the workplace. Based on the results of this study, Type 2 diabetes patients are more likely to decrease their fat or calories in comparison to those patients whose providers did not treat the patient with respect in relation to their beliefs and culture. According to the NIH (2017), methods of applying provider respect for patient engagement and healthcare delivery include education on the varying cultures, ideas, and beliefs of patients and utilizing that information to engage and educate patients. Healthcare facilities should instill the use of provider cultural respect within their mission statement and consider it as a goal within the strategic planning of their organization. Strategic planning methods of incorporating provider cultural respect may include cultural competence trainings, embedding a diversity coordinator, or conducting cultural assessments on the patient population (NIH, 2017). Lastly, healthcare facilities may implement provider cultural respect within their policies and procedures during patient-provider interactions. The use of cultural competence within health facilities has been linked with improved patient satisfaction, health outcomes, and aspects of patient-centered care (Clifford et al., 2015). Now, based on the results of this study, the use of cultural respect, one of the measures of provider cultural competence, can be linked with

adherence to treatment or behavior change in relation to patients with Type 2 diabetes and healthier eating habits.

Conclusion

Type 2 diabetes is a chronic disease that is the seventh leading cause of death in the United States (CDC, 2017). Type 2 diabetes is known to be managed through medications, exercise, nutrition, and weight loss (CDC, 2017). Based on the results of this study, the utilization of cultural respect, one of the measures for provider cultural competence, is associated with an increased likelihood of a Type 2 diabetes patient reducing their fat or calories. There are many studies available that indicate healthier eating habits among diabetes patients are associated with improvements in blood glucose levels and diabetes management as well as a reduction in complications associated with diabetes (Fanning et al., 2018; Monlenzun et al., 2015; Pan et al., 2018; Watson et al., 2016). It is important for healthcare facilities, such as hospitals or federally qualified health centers, to advance the use of provider cultural respect within the workplace through mission statements, policies and procedures, company strategic planning, or provider trainings in order to improve the behavior outcome of reducing fat and calories among Type 2 diabetes patients.

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