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Relationship Between Parent Demographics and Attitudes About Their Child's Diabetes in Nigerian Parents who Live in the United States

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Walden University
2025

Abstract

Relationship Between Parent Demographics and Attitudes About Their Child’s Diabetes

in Nigerian Parents who Live in the United States

by

Vivian Obioma Eluwa Nwankwo

MA, Walden University, 2018

BA, University of Nigeria, 1992

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Human and Social Services

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Abstract

Nigeria has the highest number of people with diabetes mellitus in sub-Saharan Africa, and 1 out of every 17 adults Nigerian live with diabetes mellitus, and this rate continues to increase. Approximately 348,000 immigrants from Nigeria reside in the United States and need to acclimate to a new healthcare system which may cause issues with helping their children have the best diabetes self-care. Researchers have examined the challenges related to parent attitudes in children with diabetes and negative outcomes of diabetes of children when parents provide incorrect or inconsistent care but not studied the relationship between parent demographics (age, gender, education level, gender of child, age of child, time since child's initial diagnosis), parent diabetes status, and attitudes about their child's diabetes as measured by the Parent - Diabetes Distress Scale (DDS) in Nigerian parents who live in the United States. Using a correlational, cross-sectional research design, a survey was administered to 57 Nigerian parents who live in the United States who have one or more children with diabetes. The health belief model and the theory of planned behavior were used as the lens to examine and interpret the results of the study. The results of the multiple linear regression analysis indicated the gender of child living with diabetes (*p* = .044) was the only independent variable related to parents' attitudes about their child's diabetes at a statistically significant level. The results of this study can contribute to positive social change in that they can inform culturally appropriate approaches, especially to address attitudes that Nigerian parents have about diabetes self-care depending on the gender of the child, to increase the awareness and care of diabetes, thereby improving quality of life.

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Dedication

I dedicate this academic achievement in memory of my beloved parents, my loving Dad, a moving encyclopedia, Professor Gabriel Ihie Chinenye (G.I.C.) Eluwa, and my beloved Mum, my rock, Rev. Mrs. Grace A. Eluwa. Dad and Mom, you are my strong pillars, very instrumental to my attaining this academic milestone of a Ph.D. degree. Also, to my husband Okechukwu Sylvester Nwankwo, and our amazing children Nneoma (Adanna), Chioma (Chichi) and Ogechi (Ezinne) without their support, it would have been more difficult to complete this academic journey.

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THANK YOU.

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First, I acknowledge my faith in God for giving me life, wisdom and knowledge, and for sustaining me as I navigated this process to a successful completion even in times of grief and great loss. TO GOD BE ALL THE GLORY!

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Chapter 1: Introduction to the Study

Introduction

Racial disparity exists in diabetes care and management among immigrant parents (Jasper et al., 2014; Uppal et al., 2017). Despite the lack of consensus on established guidelines for diabetes, Nigerian children are at a higher risk for acquiring and dying from diabetes. Previous researchers have found conflicting results regarding the associations between diabetes and racial/ ethnic background (Uppal et al., 2017). In this study I explored factors relating to participation in diabetes or adherence to recommended self-care or management methods (Brorsson et al., 2017; Deeb et al., 2018; Sohn & Rowe, 2015). The results from this study may help inform targeted attitudes/ behaviors and culturally appropriate approaches to increase the awareness and care of diabetes among children of Nigerian parents and decrease the disparity observed between diabetic cases and death. Chapter 1 includes a discussion related to the background of the study, problem statement and purpose of the study, the research question and hypotheses of the study, theoretical foundation, nature of the study, assumptions, scope and delimitations, limitations, and significance of the study.

Background

Diabetes is a metabolic disease that occurs globally (Campbell & Egede, 2020). It is the seventh leading cause of death in the United States. The negative outcomes of diabetes and its complications include decreased quality of life, morbidity, and mortality due to negative effects on body organs which obstruct normal body functions and activities (Agyemang et al., 2016; Cai et al., 2018; Centers for Disease Control and

Prevention [CDC], 2017; Saddique, 2019). The occurrence of diabetes globally is estimated at 422 million, especially among low- and middle-income countries (Lee et al., 2017; World Health Organization [WHO], 2022). Diabetes cases are expected to rise to 643 million and 783 million cases by 2030 and 2044 respectively (CDC, 2021; Cho et al., 2018).

Some complications of diabetes include heart disease, kidney disease, nerve damage, eye problems, teeth/ oral disease, lower limb amputations, and more (Agyemang et al., 2016; Bullard et al., 2018; CDC, 2021; Siddique, 2019). Other complications include cardiovascular disease, diabetic neuropathy, eye disease, mental health, emotional disturbance, and even death (American Diabetes Association [ADA], 2022; CDC, 2022; WebMD, 2022). The management of diabetes is dependent on maintaining blood sugar within normal limits. This can be achieved through healthy diet, oral medication, and/or insulin (CDC, 2021). Medical management of diabetes can reduce the risk of long-term complications (Christensen et al., 2020; Powers et al., 2016; Weaver et al., 2014).

The chronic nature of diabetes and associated complications make it difficult and costly to manage. An estimated amount of $966 billion USD (ADA, 2021) in global health costs for diabetes. A global projection of one trillion USD in 2045 (ADA, 2021; IDF, 2021). This continues to place a financial burden on individuals and families as they pay out of pocket medical expenses in diabetes care and management.

The high incidence rate and prevalence of diabetes continue to cause high health disparities among the different populations in the United States (Campbell & Egede, 2020). The prevalence of diabetes among African Americans is higher than among non-Hispanic White counterparts including the population coming from Nigeria (Osei & Gaillard, 2017; Spears et al., 2018). The health behavior of people from the sub-Saharan region is influenced by cultural beliefs and myths (Issaka et al., 2016). Nigerian culture beliefs related to food affects their diet and eating habits (Adegboye et al., 2016; Onyeaka et al., 2021).

Attitudes about diet can be cultural which can cause issues for children with diabetes. In many African cultures, the weight of children indicates how well a child is being taken care of or how heathy the child is, thereby indicating good parenting (Baughcum et al., 1998; Benton, 2004; Nabiwemba et al., 2014; Redsell et al., 2010; Sullivan et al., 2011). This belief causes parents to feed their children foods that may exacerbate diabetes, resulting in health issues that are contradictory or inappropriate to diet and diabetes management behaviors for the child with diabetes. Behaviors such as healthy eating, adherence to medication regimen, active exercises/physical activities, active monitoring of blood sugar, and being aware of changes in physical health contribute to the effective management of diabetes (Andriyanto et al., 2019; Christensen et al., 2020; Hailu et al., 2019; Hilliard et al., 2016; Pavithra et al., 2020; Vanstone et al., 2017). Attitudes and self-management of diabetes are determined by beliefs that a performed behavior will cause positive or negative outcomes (Bai et al., 2011; CDC, 2022; Hamilton et al., 2011; Heinig et al., 2006; Miller, 1995; Perry et al., 1988). Researchers have shown the importance of family involvement in the health care of children (Knafl et al., 2017; Young et al., 2014). The attitudes of parents play a vital role in the care and management of diabetes in their children. The family environment is related to health risks and outcomes for all members of that family (CDC, 2021). Corporative efforts are important in promoting the necessary diet, medication, and management of behaviors needed to control diabetes (Anderson et al., 1990).

Problem Statement

Researchers have indicated diabetes among children and adolescents is steadily on the rise and is the 7th leading cause of death in the United States (CDC, 2020; Gumbs, 2020). Diabetes affects the well-being of children, their family, and the community (ADA, 2021; Perm, 2013; Sahin et al., 2015; Ziegler & Neu, 2018). Some of the adverse outcomes related to diabetes include depression, low self-esteem, destructive behaviors, and other unhealthy choices/ lifestyles (Perm, 2013). Sahin et al. (2015) suggested that inappropriate attitudes of parents are related to adverse outcomes in their child’s diabetes management and overall health. These include increased mistakes in self-care, decreased metabolic control, and non-compliance with the disease treatment. This disease is highly prevalent among those who are Black/non-Hispanic when compared to other groups (CDC, 2020). Nigeria has the highest number of people with diabetes mellitus in sub-Saharan Africa, and 1 out of every 17 adults Nigerian live with diabetes mellitus, and this rate continues to increase (Dahiru et al., 2016; Uloko et al., 2018).

As of 2017, approximately 348,000 immigrants from Nigeria reside in the United States (Pew Research Center, 2020). According to the Pew Research Center (2020), in 2018, 45% of Nigerian adults surveyed indicated they were considering moving to another country within five years. In addition to having to assimilate to the culture of the

United States, Nigerian immigrants also need to acclimate to a new healthcare system, and this may cause issues with helping their children have the best self-care possible with their diabetes (Alloh et al., 2019; Omenka et al., 2020). Therefore, the problem is the negative outcomes related to diabetes care experienced by children who have diabetes of Nigerian parents in the United States such as decreased diabetic self-care, poor diabetes management, poor coping skills, depression, and health problems associated with diabetes in children and adolescents that can be exacerbated by incorrect or inconsistent diabetes management by their parents.

Although researchers have examined the challenges related to parent attitudes in children with diabetes (Deeb et al., 2018; Gumbs et al., 2020; Sahin et al., 2015; Zhang et al., 2016) and negative outcomes of diabetes of children when parents provide incorrect or inconsistent care (Pereira et al., 2019; Uloko et al., 2018; Zhang et al., 2016), I found no researchers who studied the relationship between parent demographics (age, gender, education level, gender of child, age of child, time since child's initial diagnosis), parent diabetes status, and attitudes about their child's diabetes in Nigerian parents who live in the United States. Researchers have examined parental attitudes about diabetes in their children with other groups among immigrant Sikhs in Canada (Uppal et al., 2016), patients in Erode district of South India (Malathy et al., 2011), urban community of Southwest Ethiopia (Aynalem & Zeleke, 2018), among others (Adejoh, 2014; Firat et al., 2020; Gumbs et al., 2020; Malathy et al., 2011; Uppal et al., 2016; Yunka et al., 2020), but I found no literature in which the researchers studied Nigerian parents who live in the

United and their attitudes about diabetes in their children. Therefore, I focused on Nigerian parents' attitudes who live in the United States in their children with diabetes.

Parental support has an impact on the performance of some self-care behaviors of children with diabetes (Sahin et al., 2015), some of which may include blood sugar checks, adherence to medication, healthy eating, healthy coping skills, and making healthy living choices. Thus, with established increase in the number of diabetes cases, and health disparities of Nigerians who live in the United States, it is intended that this study may help formulate strategies that promote appropriate attitudes in Nigerian parents in the care and management of children with diabetes thereby reducing complications of diabetes related diseases and mortality rates.

Purpose of Study

The purpose of this quantitative study is to examine the relationship between parent demographics (age, gender, education level, gender of child, age of child, time since child's initial diagnosis), parent diabetes status, and attitudes about their child's diabetes as measured by the Parent Diabetes Distress Scale (PDDS) in Nigerian parents who live in the United States. This is important because racial disparity exists in diabetes care and management among immigrant parents (Jasper et al., 2014; Uppal et al., 2017). Despite the lack of consensus on established guidelines for diabetes, Nigerian children are at a higher risk for acquiring and dying from diabetes. Previous researchers have found conflicting results regarding the associations between diabetes and racial/ ethnic background (Uppal et al., 2017). In this study I explored factors relating to participation in diabetes or adherence to recommended self-care or management methods (Brorsson et al., 2017; Deeb et al., 2018; Sohn & Rowe, 2015). The results from this study may help inform targeted attitudes/ behaviors and culturally appropriate approaches to increase the awareness and care of diabetes among children of Nigerian parents and decrease the disparity observed between diabetic cases and death.

Research Question and Hypothesis

The research question for this study was: What is the relationship between parent demographics (age, gender, education level, gender of child, age of child, time since child's initial diagnosis), parent diabetes status, and attitudes about their child's diabetes as measured by the PDDS in Nigerian parents who live in the United States?

Null hypothesis: There is no statistically significant relationship between parent demographics (age, gender, education level, gender of child, age of child, time since child's initial diagnosis), parent diabetes status, and attitudes about their child's diabetes as measured by the PDDS in Nigerian parents who live in the United States.

Alternative hypothesis: There is a statistically significant relationship between parent demographics (age, gender, education level, gender of child, age of child), parent diabetes status, and attitudes about their child's diabetes as measured by the PDDS in Nigerian parents who live in the United States.

Theoretical Foundation

The health belief model (HBM) and the theory of planned behavior (TPB) were used as the theoretical foundations for this study. Researchers have used these theories to predict and explain health related behaviors (Glanz et al., 2015). The HMB suggests that health behavior is determined by individual perceptions about the diseases and ways to reduce their occurrences (Glanz et al., 2015; Hochbaum, 1958). The TPB focuses on behavior intention or perceived behavior control (Ajzen, 1991).

Health Belief Model

The HBM was developed to explain and predict health related behaviors. This was to address the reluctance of people participating in preventive health care screening for early detection of asymptomatic diseases and to encourage health behaviors that promote good health (Glanz et al., 2015; Rosenstock, 1974). Changes in health behavior are primarily due to their beliefs or perception of threats to wellness or potential risks of health problems, and the outcome of their behavior (Glanz et al., 2008; Hayden, 2014).

The HBM identifies six constructs that determine health behaviors including perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy. These constructs explain the individual's likelihood to engage in health behaviors that positively impact health and avoid or reduce illness (Bandura, 1997; Glanz et al., 2015; Mikhail, 1981; Rosenstock, 1974). *Perceived susceptibility* refers to the perceived risk that they will contract the disease (Hayden, 2014; Sheeran et al., 2014). *Perceived severity* refers to the individual's perception of the seriousness of the disease if they were to contract the disease and its associated problems/ consequences (Glanz et al., 2008; Hayden, 2014). *Perceived benefits* include the values and usefulness of a specific health behavior held by the individual. The perceived benefits must outweigh perceived threats for the individual to engage in positive health behaviors (Glanz et al., 2008; Hayden, 2014). *Perceived barriers* are those things that must be overcome by the individual to engage in a desired health behavior (Glanz et al., 2008).

Self-efficacy is the individual's belief that they have the ability to engage in positive health behaviors and that those efforts will result in positive health outcomes (Bandura, 1997). *Cues to action* are strategies identified by the individual to activate their readiness and willingness to engage in health behavior change (Glanz, 2008).

Theory of Planned Behavior

The TPB was used to predict health related behavioral intentions and link a person's beliefs and attitudes held to their behaviors (Ajzen, 1991; Ajzen & Fishbein, 1980; Albarracin et al., 2001; Glanz et al., 2015). There are three main factors that influence an individual's desire and/or intention to participate in a behavior. These core constructs are attitudes, subjective norms, and perceived behavioral control (Ajzen, 1991; Ajzen & Fishbein, 1980).

Attitudes are the overall positive or negative assessment of the health behavior outcome by the individual. Their ability to overcome the behavior depends primarily on the perceived good or bad of the outcome of their behavior(s) related to their health (Ajzen, 1991; Glanz et al., 2008). *Subjective norms* are the individual's perception of how other people will approve or disapprove of the behaviors of the individual related to their health (Ajzen, 1991; Topa & Moriano, 2012). *Perceived behavioral control* is the perception of their ability to perform a given behavior that would result in the desired health outcome (Ajzen, 1991; Asare, 2015; Glanz, 2008). Attitudes, subjective norms, and perceived behavioral control work together to determine the likelihood of the individual to perform the desired health behavior (Ajzen, 1991; Glanz et al., 2008). The

TPB is widely used for its ability to explain as well as predict health behaviors (Gerend & Shephard, 2012).

Use of the HBM and TPB

For this study, the two identified theories were applied to explore and explain the statistical relationship between parent demographics, parent diabetes status, and attitudes about their child's diabetes in Nigerian parents who live in the United States. The HBM and the TPB are both relevant because both theories explain and predict the motivation and behaviors that individuals have that can promote positive health outcomes (Abraham et al., 2005; Conner et al., 2005). This is because health behaviors and behavior changes have been found to be related to beliefs and reasoning (Glanz et al., 2008). Because parents are responsible for their child's health care (Aarthun et al., 2018; Power & Franck, 2008), it makes sense that their beliefs and reasoning would filter to, and be learned by, their children (Grusec, 2006; Vaughn et al., 2016). These attitudes of the parents may be intentional or unintentional, but they influence the beliefs, attitudes, and behaviors of the child (Vaughn et al., 2018). The theories are discussed in depth in Chapter 2.

Nature of Study

I used a quantitative correlational research design of a cross-sectional nature to examine the relationship parent demographics (age, gender, education level, gender of child, age of child, time since child's initial diagnosis), parent diabetes status, and attitudes about their child's diabetes as measured by the PDDS in Nigerian parents who live in the United States. A correlational study was used to determine relationships between variables (Creswell & Creswell, 2018). A cross-sectional study was used when using data collected at one point in time (Hessler et al., 2018). A purposeful convenience sample of Nigerians who live in the United States who have one or more children with diabetes was recruited. I also used snowball sampling to let individuals who see my recruitment materials know that they can forward the information to others who may qualify for my study. Recruitment was through postings of flyers in public and through social media sites like Facebook, LinkedIn, and other sites that may be frequented by the desired population. Details about the methodology used to collect, analyze, and interpret the data for this study are described in Chapter 3.

Definitions

Child with diabetes: A child who is between 3 and 17 years old who has been diagnosed with diabetes by a medical professional (Type 1 or Type 2).

Nigerian who has immigrated to United States: An individual who was born in Nigeria, moved to the United States at the age of 15 or later, and has lived in the United States for at least one year.

Type 1 diabetes: Also known as juvenile or childhood diabetes, this form of diabetes is characterized by insulin deficiency and therefore requiring insulin administration (Bullard et al., 2018).

Type 2 diabetes: This type of diabetes is usually found in adults but can also be seen in children. This type of diabetes develops over time and is often related to the diet of the individual (CDC, 2018; WHO, 2022).

Assumptions

In this study, I made several assumptions. I assumed that the participants would provide honest answers to the questions asked (Roberts, 2020; Simon & Goes, 2013). I assumed that the theoretical framework and methodology are appropriate and accurate reflection of the topic under study. I explained each theoretical framework in detail in Chapter 2 and explained how they were appropriate to the study. It is assumed that the variables used in this study are quantitatively measurable and that the instrument used is valid and reliable. To demonstrate this, I explained the variables and how they were measured in detail in Chapter 3. I also discussed the reliability and validity of the instrument used in Chapter 3. Finally, I assumed that the results of the study were generalizable to the broader population of Nigerian parents with children with diabetes who live in the United States. In order to determine this, I collected demographic information from participants and provided a description of the sample demographics to determine the generalizability of the results in Chapter 4.

Scope and Delimitations

The scope of study was limited to the sample of Nigerian parents residing in the United States who have children with diabetes within a specified age range. The scope of the study, and the generalizability of the results, only included those who met the inclusion criteria of the study: at least 18 years of age, born in Nigeria, moved to the United States at the age of 15 or later, lived in the United States for at least 1 year, have at least one child who is between 3 years old or and 17 years old who has been diagnosed with diabetes, and can read and understand English. Also, the interpretation of results related to the theoretical framework for the study was limited to the HBM and the TPB. These theories helped predict health related behaviors (Glanz et al., 2015). The use of the health belief theory and the TPB excluded the consideration of other theoretical frameworks.

Limitations

Potential limitations for this study included access to participants, potential participant access to research survey/questionnaire, and incomplete responses from participants, and/or participants not truthfully answering all survey questions. Recruiting participants from various social media platforms and physical locations via my recruitment flyer assisted in accessing the number of participants necessary to meet statistical power calculated for the study (Faul et al., 2009). Response bias may be a limitation of the study if participants did not honestly answer the questions in the online survey (Tyson, 2020). I discussed the reliability statistics of the instrument used for the study in Chapter 3 and calculated the reliability statistic for that instrument for my sample in Chapter 4. Where reliability does not meet the statistical standard, I addressed such as a limitation in Chapter 5.

Inability to participate in the study due to lack of a computer and/or Internet access or computer ability was another potential limitation of this study. This is a limitation that is applicable to this study especially since I asked Nigerian immigrants to participate in the study. They may be from a lower socioeconomic status that could affect their access to the survey site. I addressed this in a discussion of the limitations in Chapter 5.

Significance

Making and supporting positive behavioral changes in management of a chronic illness like diabetes can be challenging. Many individuals struggle to achieve self-management goals, including eating a healthy diet, engaging in regular physical activity, taking medications as directed, and maintaining frequent self-monitoring behaviors (e.g., blood sugar, blood pressure; Clark & Utz, 2011; Jasper et al., 2014; Tang et al., 2008). Children with diabetes depend on their parents to help them with managing their diabetes (Deeb et al., 2018; Pereira et al., 2019). The results of the study have the potential to help promote parent participation in diabetes care and management by better understanding the relationship between parent demographics (age, gender, education level, gender of child, age of child, time since child's initial diagnosis), parent diabetes status, and attitudes about their child's diabetes. This information then has the potential to be used to reduce negative health outcomes for Nigerian children with diabetes by using it to inform education for these parents (Uloko et al., 2018; Williams et al., 2014). The results could be used to facilitate changes in attitudes, behaviors, and lifestyles of Nigerian parents regarding early detection of diabetes in their children and participation in diabetes management activities. Additionally, results may be used by Nigerian community stakeholders, including for-profit and non-profit organizations, to mobilize diabetes reduction, awareness, and advocacy.

Summary

In Chapter 1, I discussed the background, problem statement, purpose of the study, the research questions and hypotheses, the theoretical framework, nature of the study, definitions, assumptions, scope and delimitations, limitations, and the potential significance of the study. Chapter 2 contains a discussion of the theoretical foundation and the literature review related to the study. Chapter 2 also provides a detailed discussion of the HBM and TPB, and their relevance to the current study. The result outcomes may be used to generate treatments and/or interventions that will be beneficial for people with diabetes, and for the enhancement of health and social change.

Chapter 2: Literature Review

Introduction

Diabetes mellitus, otherwise known as diabetes, is a serious metabolic disorder that occurs when the blood sugar level is higher than normal, and abnormality in insulin production, secretion, and action. Diabetes is a health condition that continues to affect millions of people including children, teens, and adults, in the United States and worldwide. Diabetes is considered the epidemic of the 21st century (Lee et al., 2017). Researchers have indicated diabetes among children and adolescents is steadily on the rise and is the seventh leading cause of death in the United States (CDC, 2020; Gumbs, 2020). Diabetes affects the well-being of children, their family, and the community (ADA, 2021; Perm, 2013; Sahin et al., 2015; Ziegler & Neu, 2018). Some of the adverse outcomes related to diabetes include depression, low self-esteem, destructive behaviors, and other unhealthy choices/ lifestyles (Perm, 2013). Sahin et al. (2015) suggested that inappropriate attitudes of parents are related to adverse outcomes in their child's diabetes management and overall health. These include increased mistakes in self-care, decreased metabolic control, and non-compliance with the disease treatment. This disease is highly prevalent among those who are Black/non-Hispanic when compared to other groups (CDC, 2020).

Diabetes is also prevalent in Africa. Nigeria has the highest number of people with diabetes mellitus in sub-Saharan Africa, and 1 out of every 17 adult Nigerian have diabetes mellitus, and this rate continues to increase (Dahiru et al., 2016; Uloko et al., 2018). As of 2017, approximately 348,000 immigrants from Nigeria reside in the United

States (Pew Research Center, 2020). According to the Pew Research Center (2020), in 2018 45% of Nigerian adults surveyed indicated they were considering moving to another country within 5 years. In addition to having to assimilating to the culture of the United States, Nigerian immigrants also need to acclimate to a new healthcare system, and this may cause issues with helping their children have the best self-care possible with their diabetes (Alloh et al., 2019; Omenka et al., 2020). Therefore, the problem that will be addressed in this study is the negative outcomes such as decreased diabetic self-care, poor diabetes management, poor coping skills, depression, and health problems associated with diabetes in children and adolescents that can be exacerbated by incorrect or inconsistent diabetes management by their parents.

Diabetes requires specific care. Although researchers have examined the challenges related to parent attitudes in children with diabetes (Deeb et al., 2018; Gumbs et al., 2020; Sahin et al., 2015; Zhang et al., 2016) and negative outcomes of diabetes of children when parents provide incorrect or inconsistent care (Pereira et al., 2019; Uloko et al., 2018; Zhang et al., 2016), I found no researchers who have studied the relationship between parent demographics (age, gender, education level, gender of child, age of child, time since child's initial diagnosis), parent diabetes status, and attitudes about their child's diabetes in Nigerian parents who live in the United States. Researchers have also examined parental attitudes about diabetes in their children with other groups among immigrant Sikhs in Canada (Uppal et al., 2016), patients in Erode district of South India (Malathy et al., 2011), urban community of Southwest Ethiopia (Aynalem & Zeleke, 2018), among others (Adejoh, 2014; Firat et al., 2020; Gumbs et al., 2020; Malathy et al., 2011; Uppal et al., 2016; Yunka et al., 2020), but I found no literature in which the researchers studied Nigerian parents who live in the United States and their attitudes about diabetes in their children. Therefore, I focused on Nigerian parents' attitudes who live in the United States in their children with diabetes. Parental support has an impact on the performance of some self-care behaviors of children with diabetes (Sahin et al., 2015), some of which may include blood sugar checks, adherence to medication, healthy eating, healthy coping skills, and making healthy living choices. Thus, with established increase in the number of diabetes cases, and health disparities of Nigerians who live in the United States, it is intended that this study will help formulate strategies that promote appropriate attitudes in Nigerian parents in the care and management of children with diabetes thereby reducing complications of diabetes related diseases and mortality rates.

The purpose of this quantitative study was to examine the relationship between parent demographics (age, gender, education level, gender of child, age of child, time since child's initial diagnosis), parent diabetes status, and attitudes about their child's diabetes as measured by the PDDS in Nigerian parents who live in the United States. This is important because racial disparity exists in diabetes care and management among immigrant parents (Jasper et al., 2014; Uppal et al., 2017). Despite the lack of consensus on established guidelines for diabetes, Nigerian children are at a higher risk for acquiring and dying from diabetes. Previous researchers have found conflicting results regarding the associations between diabetes and racial/ ethnic background (Uppal et al., 2017). In this study I explored factors relating to participation in diabetes or adherence to recommended self-care or management methods (Brorsson et al., 2017; Deeb et al., 2018;

Sohn & Rowe, 2015). The results from this study may help inform targeted attitudes/ behaviors and culturally appropriate approaches to increase the awareness and care of diabetes among children of Nigerian parents and decrease the disparity observed between diabetic cases and death.

Literature Search Strategy

This literature review contains a discussion and summary of the relevant literature on diabetes, diabetes care management, and diabetes education. The databases that I searched included PsycINFO, SocINDEX, PUBMED, MEDLINE, Google Scholar, ProQuest, EBSCOhost, and ScienceDirect. Other databases I searched included Walden Library, samples of peer-reviewed articles, studies from New Jersey Public Health, New Jersey Diabetes Action Plan Report, American Diabetic Association, and internet database sources from Google Scholar, the WHO, and the CDC. Articles of qualitative and quantitative studies published in English language and within 10 years. Keywords included *Type 2 diabetes, Type 1 diabetes, Diabetes Mellitus, diabetes self-management, diabetes and self-care, diabetes in children, diabetes in adolescence, attitudes towards diabetes, diabetes care and education, African Americans and diabetes, attitudes of care givers, parental attitude, health education, parent, family, exercise, nutrition, income, age, gender*.

Theoretical Framework

The theories used for this study were the HBM and TPB. I covered not only the development of each theory but also the components of the theory, how the theory is applicable to the study, and previous relevant literature related to the theory. I also discussed how the two theories were used to interpret my results.

Development of the HBM

The first framework that I focused on was the HBM, which is one of the most widely utilized health behavior theories. The theory of the HBM was developed in the 1950s by social psychologists working in public health settings (Glanz & Rimer, 2005; Glanz et al., 2008). It was developed to explain why people did not participate in health-related preventions and treatments even though the overall program was in their best interest from a public health perspective (Glanz et al., 2008; Rosenstock, 1974). It was postulated that individual response is based on their perceived risks and perceived benefits of the disease and factors that played crucial role in motivating their actions (Glanz et al., 2008; Hayden, 2014).

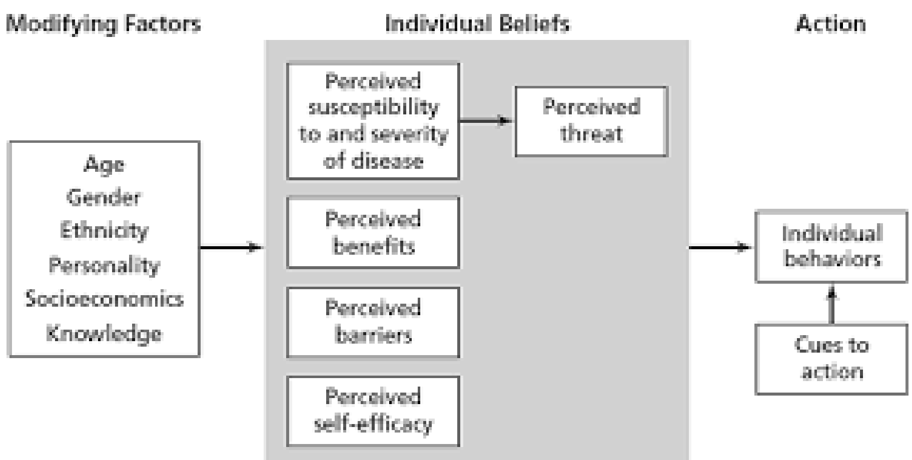
Professionals and researchers in public health use this model in researching factors of people who refuse to participate in some health behaviors (Glanz et al., 2015) and to promote effectiveness of health education programs (Glanz & Bishop, 2010). Researchers have indicated that, if used successfully, the HBM may be used to alleviate the problem associated with people's resentment to participate in health programs (Creswell, 2014; Glanz et al., 2015). For this study, the HBM is relevant because it has been used to explain readiness and self-efficacy to successfully perform the recommended diabetes care activities (Jalillian et al., 2014).

Components of the HBM

The fundamental basis of the HBM lies in the perceived beliefs of individuals about health issues and related behaviors as well as the benefits, and barriers, to their actions (Bistricky et al., 2018; Glanz & Bishop, 2010; Jones et al., 2015). The primary constructs of the HBM related to health behaviors include perceived benefits, perceived barriers, perceived severity, and perceived susceptibility (Glanz & Bishop, 2010). Creswell (2014) indicated that three other constructs were later added: cues to action, self-efficacy, and action. These concepts are the backbone of the HBM and are illustrated in Figure 1.

Figure 1

Health Belief Model Components & Linkages (Glanz et al., 2008)



Perceived Susceptibility

Perceived susceptibility is the first construct of the HBM. Perceived susceptibility refers to the perceived personal risk related to the disease (Hayden, 2014). Sheeran et al. (2014) stated that increased perceived risk of contracting a disease increase engaging in positive health behaviors to lower the risk that the person will contract the disease. People who believe their chances of getting a disease is high may then engage in health behaviors that reduce the risk of getting the disease such as washing hands more frequently, wearing masks, and taking Vitamin C. Likewise, when the chance of getting the disease is low or minimal, unhealthy and/or risky behaviors may occur (Hayden, 2014).

Perceived Severity

Next is perceived severity. The individual in this construct perceives the seriousness and the degree of abnormality resulting from the adverse health condition. Perceived severity is how the individual views the life-threatening potential of the disease (Glanz et al., 2008; Hayden, 2014). This can come from previous knowledge or experience of a disease, through knowing someone who experienced a disease, or from advice from medical professionals (Hayden, 2014). The perceived seriousness of the disease and the potential consequences may result in the individual engaging in behaviors that could prevent or reduce the severity of a disease or avoid the disease completely. The perceived severity can be subjective, and information does not have to be accurate to influence a person's perception (Karimy et al., 2021). An example of this would be conflicting messages about COVID-19 which results in different people having different perceptions about the disease, vaccines, and how to lessen the chance of getting the disease depending on the information they have heard and what they choose to believe (Bateman et al., 2021; Mercadante & Anandi, 2021).

Perceived Benefits

The construct of perceived benefit is defined by the individual's belief in the efficacy of advised health actions to reduce or eliminate risks to the seriousness of negative impact. Perceived benefits include perceived value, efficacy, or usefulness of engaging in health behaviors in relation to the amount of effort required to acquire the perceived benefits (Hayden, 2014). For a behavior to change, potential benefits of engaging in changing the behavior are considered by the individual (Glanz et al., 2008). The construct of perceived benefits is about positive outcomes associated with the behavior in relation to the perceived threat and the benefit must outweigh the effort to get that benefit (CDC, 2004; Wang & Hagins, 2016).

Perceived Barriers

The perceived barriers are the tangible costs as well as the psychological costs perceived by the individual that will affect desired health actions. The perceived barriers that an individual believes that they may encounter when engaging in a health behavior change may result in them not attempting to make that change (Glanz et al., 2008). This relates to the personal effort that an individual would need to expend in relation to changing their behavior. The perceived barriers by the individual may prevent engaging in health promoting behaviors if they appear to be insurmountable or if they just do not wish to make the effort to overcome these barriers (Hayden, 2014).

Perceived Self-Efficacy

Perceived self-efficacy is when the individual believes in their ability to act towards recommended or advised health actions. Self-efficacy was not one of the original constructs of the HBM, but a later addition (Rosenstock et al., 1988). Self-efficacy is one's conviction that a behavior can successfully produce positive outcomes if organized and executed (Bandura, 1997). Bandura distinguished self-efficacy expectations from the outcome expectations. Self-efficacy is considered a major factor in initiation and maintenance of behavior change (Bandura, 1997; Glanz et al., 2008). For self-efficacy to be effective, and successful, people must feel threatened and the need to change current behavior patterns, and that there will be valued outcome beneficial to the individual initiating the specific behavior change. The individual must feel confident to overcome barriers or challenges to act and successfully change or modify prior lifestyle behaviors (Janz & Becker, 1984).

Cue to Action

Cue to action identify strategies utilized by the individual to activate their willingness and readiness to act. Cues to action may include internal or external stimuli needed to trigger appropriate health behavior in the individuals. The stimulus activates the decision-making process for a suggested health action to be implemented. These signals might be internal (personal health problems/ experiences) or external (advice from others, media item/ information). This construct contributes immensely to behavior changes in the individual. Cues to action is a powerful part of the HBM that also factors into increased severity of a particular risk and increased perceived susceptibility of a disease risk (Glanz et al., 2008). Cues to action are otherwise known as strategies to activate readiness (Glanz et al., 2008).

Action

This demonstrates one's confidence in their ability to act towards desired healthy behaviors. The individual successfully executes the behavior the produces positive outcomes (Bandura, 1997). The main parts of the HBM may be used to build or alter primary prevention or disease preventive programs based on these actions. The HBM may be used in isolation or in conjunction with other theories or models, depending on preference. Identifying cues to action that are relevant and suitable for the target group is critical for the model's success (Glanz et al., 2008).

Interaction Between the Components

As shown in Figure 1, the arrows in the diagram indicate existing interaction between the components of the HBM. The modifying factors include factors of sociodemographic and knowledge that influence perceived benefits of a health action and perceptions (Glanz et al., 2008; Rosenstock, 1974). Perceived susceptibility combines with perceived severity to identify perceived threats as shown in Figure 1. These perceptions of individuals beliefs are affected by modifying factors including the factor of cues to action. Glanz (2008) posited the combination of individual beliefs lead to individual behaviors. Although the constructs that lead to behavior outcomes are identified in the HBM, the relationship among the construct are ambiguous and undefined which leads to variations in the application of HBM. For instance, whereas some researchers attempted to establish the major constructs of the HBM as independent (Glanz et al., 2008), others have tried to use the multiplicative approach (Jones et al., 2015; Rosenstock et al., 1994). However, identifying relationship between the constructs will help advance the use of the HBM to predict behaviors.

HBM and Diabetes

HBM and Personal Diabetes

Diabetes is a disease that is very demanding both to the individual and caregivers. Individuals who have been diagnosed with diabetes should regularly check their blood sugar levels, consistently watch their eating habits, and maintain steady blood sugar levels with medication regimen to control the disease and potential negative outcomes of the disease (ADA, 2021; CDC, 2020). The HBM assumes an individual's behavior is guided by the individual's perception of expected consequences of the change in behavior or adoption of new practices in relation to disease and this applies to self-management of diabetes (Mimiaga et al., 2009).

The HBM has been used as a framework to help design intervention programs that help individuals with diabetes improve adherence to self-care behaviors (CDC, 2020). In addition to the other components of the HBM, self-efficacy plays a crucial role in developing self-care behaviors (Glanz et al., 2008; Stretcher et al., 1986). Self-efficacy determines whether an individual initiates coping behavior, how much effort is expended, and the duration of its sustenance when faced with obstacles (Bandura, 1977). Other researchers have suggested self-efficacy is an important trait to have to modify health behavior practices in health-related issues such as cigarette smoking, contraception, weight control, exercise behaviors, and alcohol abuse (Coelho, 1984; Glanz et al., 2008; Hagger et al., 2011; Hayden, 2004; Stretcher et al., 1986). To promote the likelihood for individuals to adhere to self-care behaviors, in addition to the other components of the HBM, it is important that educational programs focus more on the component of self-efficacy (Karimy et al., 2016).

HBM and Diabetes of Loved One

The CDC (2020) reported the difficulties in caring for family members with diabetes including giving meds, injecting insulin, checking blood sugar, keeping appointments with care providers, providing healthy foods, and ensuring the individual eats healthy and the right amount, and engages in regular exercise (CDC, 2020). The ability to manage diabetes often depends on the support from others (CDC, 2020). However, the most difficult part of assisting someone to manage their diabetes is that the individual with diabetes may not be willing to participate in the appropriate behaviors to control their diabetes (Golin et al., 1996).

HBM and Demographics

HBM and Age

Age has been found to be related to participation in health management activities (ADA, 2012; CDC, 2021; Chew et al, 2013). It has been found to be more challenging to maintain a healthy lifestyle as individuals get older due to acute and chronic cardiovascular and microvascular complications (ADA, 2012; CDC, 2021; Chew et al., 2013). Consequently, the risk of living with disease is higher among the older population in comparison to younger populations living in the United States (CDC, 2021).

The older an individual gets the more susceptibility they may have to disease (CDC, 2021). Some group of researchers posited that older adults perceived increased severity and mortality risks than younger adults (Bechard et al., 2021). Although perceived susceptibility and severity may be of greater concern to the middle-aged and older adults, the economic impact of the illness outcome can be greater for young people (Bechard et al., 2021).

The perception of increased risk of contracting a disease can contribute to increased participation by the individual to engage in healthy behaviors to lower the contraction of disease (Glanz et al., 2008). The consequences and potential risks associated with contracting disease (perceived severity) are what make the individual consider engaging in healthy behavior change. Prior personal knowledge of people who have suffered from these diseases and educational awareness (cues to action) may also help trigger the individual's decision-making process to engage in a behavior change (Glanz et al., 2008). For example, although young adults are equally exposed to consequences of acquiring sexually transmitted disease due to their inability to practice safe sex and reported for their increased use of illicit drugs/ substance abuse, it is reported that a lower percentage of this group seek help and treatment (CDC, 2020; Farrer et al., 2008; Terlizzi & Zablotsky, 2020).

The perceived benefit of wellness and staying healthy are some of the values that encourage the individual to engage in healthy behaviors to attain positive outcomes as against perceived barriers/obstacles to be encountered while seeking to achieve behavior change (Hayden, 2014; Wang & Haggins, 2016). Some of these barriers include lack of funds, inability to access care, and educational programs, lack of support. For individuals to affect behavior change, the individual must have a high level of confidence in their ability to successfully perform a behavior (self-efficacy; Glanz et al., 2008). There must be some level of conviction by the individual that the changed behavior will produce successful outcomes. The individual may utilize internal stimulus (personal experiences/ encounters) or external stimulus (information/ advice from family and media). Cues to action comprise of important strategies that prompt individuals of various ages to act towards illness/ disease (Bandura, 1997).

HBM and Gender

Gender has been found to be related to how individuals respond to the possibility of acquiring disease in relation to their health behaviors (Kautzky-Willer et al., 2016). Women have been found to have a greater understanding of health-related issues such as cancer (Sharifikia et al., 2019). Women often perceive themselves to be more susceptible to being at risk (in many areas of their lives) and are more apt to engage in behaviors that promote safety (Schwarzer, 2001). However, men do not feel the same level of risk in relation to disease (and in other areas of their lives) so they do not engage in behaviors as much that would reduce their risk of a disease (Schwarzer, 2001). Women are more likely than men to engage in behavior change based on cues to action such as hearing stories told in media or knowing someone with a disease (Carpenter, 2010; Janz et al., 1984). Such internal and/or external cues spur individuals to take precautionary measures to engage in behavior change. Self-efficacy is another factor that helps women realize they possess the power to prevent or reduce the risk of a disease (Glanz et al., 2008; Rosenstock et al., 1988).

HBM and Education Level

An individual's level of education is also important in determining health beliefs and related behaviors (Nielson et al., 2016; United States Census Bureau, 2021). Education has been found to be related to skills like critical thinking that help individuals make decisions about their ongoing health related behaviors. The education level of an individual can help them to better understand their perceived susceptibility, severity, barriers, benefits, cues to action, and self-efficacy to a disease (Abood et al., 2003; Baghiani et al., 2014; Sadeghi et al., 2014).

Health literacy has also been found to be related to components of the HBM and education programs and interventions have been developed to increase health literacy with the components of the HBM informing that program/intervention (Krishnan et al., 2007; Williams et al., 2006). These programs and interventions are built so that participants are educated about the potential for them to get the disease based on certain behaviors (perceived susceptibility), followed by creating awareness to involved risks and associated complications (perceived severity), understanding the value and usefulness applicable to employing preventive behaviors (perceived benefits), and the obstacles in engaging in behavior change as being less costly than the gains (perceived barriers; Sadeghi et al., 2018). Other information that is included in these types of programs and interventions include positive messages relating to the issue that are disseminated from around their surroundings (cues to action), and about the power they possess to ultimately perform or engage in preventive behaviors (self-efficacy). Not only are these individuals becoming more health literate about the disease but also learning information that apply to the different components of the HBM to, hopefully, result in the individual engaging in the correct behaviors to avoid the disease.

HBM and Parental Status

The HBM is applicable to the likelihood of parents being more involved in generating positive health related behaviors in their children (Brock & Beazley, 1995). Parents who model positive health behaviors can make positive impacts on their child's health behaviors and vice versa (Brock & Beazley, 1996). Modeling positive health behaviors are more likely to occur if the parents perceive their children are exposed or vulnerable to developing problems (perceived susceptibility) and if they believe that the perceived problems will have adverse or negative impacts on their children's well-being (perceived severity; Salari & Filus, 2017).

If parents perceive obstacles to engage in achieving healthy practices are unattainable or too demanding, then it becomes difficult to engage in behavior change (perceived barriers) as barriers have also been identified to affect parent engagement (Andrews et al., 2010; Hung et al., 2015; Randolph et al., 2009). Parents apply the use of important tools/ information to make informed decisions to engage in positive health behaviors that affect their children (Pelarti et al. 2019). Cues to action are events that spur the parents towards acting. If parents feel confident that they can achieve positive outcomes, then they engage in positive behavior change (self-efficacy; Salari & Filus, 2017).

Self-efficacy is the confidence the individual needs in determining an action can be carried out successfully, however, if the individual does not believe an action cannot be carried out successfully, does not engage in behavior change (Rimer et al., 2002; Salari & Filus, 2017). Although schools and other learning environments help influence children's behaviors, parents play a major role in childhood learning/ experiences (Bronfenbrenner, 1977). It is postulated that parents are a vital determinant to the growth and development of the child from a young age and often throughout their life (Brock & Beazley, 1995; King et al., 2012; Salari & Filus, 2017; Weihrauch-Bluher et al., 2018). Therefore, it is important that parent's model positive behaviors since children mirror the actions of their parents.

HBM and Culture

Different cultural beliefs about disease contraction, treatment, and prevention affect the level of understanding an individual has about disease prevention and treatment (Armstrong et al., 2006; Champion, 1993; Etowa et al., 2021; Johnson et al., 2008; Lim et al., 2009; Musa et al., 2009; Rosenstock, 1966; Umeh & Rogan Gibson, 2001). Individual perceptions have cultural relevance and are important to the level of reception and utilization of such information. Perception of illness differs by culture, which affects the individual's belief on the susceptibility and severity of the disease (Bailey, 2002; Westerlund, 2006).

The United States and other industrialized western societies advocate treatments that use sophisticated technology and medical treatments in disease treatment and diagnosis based on scientific principles (McLaughlin & Braun, 1998). Many other cultures attribute illnesses and diseases to supernatural phenomena (Bailey, 2002). This belief on supernatural phenomena explains their dependency on supernatural cure that promote prayers, spiritual interventions to counter the illnesses/diseases as presumed to emanate from supernatural forces on the disfavored individual or group of people, or a punishment to a current or previous sinful acts/ behaviors (Bailey, 2002; McLaughlin & Braun, 1998).

Some cultures accord respect and full authority to the oldest male member of the family, they rely on older family member to make important decisions on health and illness treatment options, and such decisions are vital in the individuals wellness (McLaughlin & Braun, 1998). Some other cultures believe that the individual's state of health exists when there is absolute harmony between the individual and nature (Chen et al., 2015). Illness is believed to occur because of imbalance in the body or failure to fulfill a spiritual obligation (Chen et al., 2015), usually between the sick and the natural or supernatural powers and not alteration in the individual's physiological state (McLaughlin & Braun, 1998). These varying cultural beliefs explain the influence of culture specific values and beliefs in one's attitude towards illness, treatment, and wellness (Baily, 2002; McLaughlin & Braun, 1998).

Development of the TPB

The TPB is the second framework I used in this study. The TPB provides the basis on which behaviors are predicted and explained. The theory proposes there are three main factors that influence a person's intentions or desire to participate in a behavior. These include attitudes, subjective norms, and perceived behavioral control.

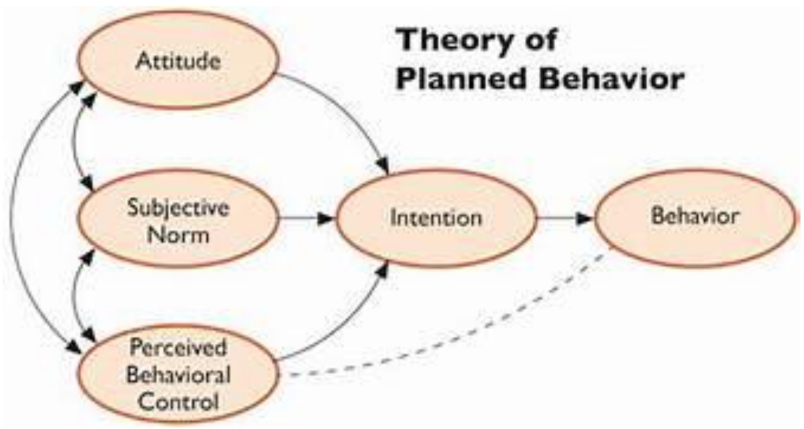
The TPB is an extension of the theory of reasoned action (Ajzen & Fishbein, 1980). It is a psychological theory that links a person's belief to their behaviors and focusses on motivational factors associated to the individual, which determines the likelihood of the individual performing a given task or specific behavior (Ajzen, 1991; Glanz et al., 2015; Lash et al., 2016). This theory has been used to predict health related behavioral intentions, as well as improve intention predictions in health-related behaviors such as prediction in condom use (Albarracin et al., 2001), choice of leisure activities (Ajzen, 1991, Ajzen & Fishbein, 1980), exercises, and diet or nutrition related interventions (Albarracin et al., 2001; Ajzen & Fishbein, 1980).

Components of the TPB

The TPB posits that behaviors are driven by intentions, where behavior intentions are determined by three components: the individual's attitude towards the behavior, the subjective norms, and the perceived behavioral control (Ajzen, 1991; Glanz et al., 2008). Therefore, perceived behavioral control, in conjunction with behavioral intentions, can be used to predict behavioral achievement (Ajzen, 1991; Ajzen & Fishbein, 1980). The TPB focuses on three core constructs of attitudes, subjective norms, perceived behavioral control, intentions, and behavior (Ajzen, 1991; see Figure 2).

Figure 2

Theory of Planned Behavior Constructs (Ajzen, 1991)



Attitudes

This is the overall positive or negative assessment of the individual's behavior. Attitudes are determined by the beliefs and attitudes of the individual in their ability to overcome the given behavior. The stronger the desire to engage in (or avoid) a certain behavior, the more likely it is for the individual to perform that behavior (Ajzen, 1991). Attitude towards the behavior is referred to the person's own feelings and evaluation of the behavior which are the perceived good and bad associated with the behavior is the likelihood to performing the specific task (Ajzen, 1991; Glanz et al., 2008).

Subjective Norms

The second construct of the TPB is the subjective norm (Ajzen, 1991). Subjective norm is the individual's belief on whether their behavior is approved or disapproved by most people. This construct is determined by a person's normative belief on whether to engage in a certain behavior. It is influenced by the extent to which other people support or disapprove of a given behavior (Topa & Moriano, 2012). Such positive or negative appraisal of the behavior affects one's attitude towards performing the behavior. The subjective norm is comprised of normative beliefs and the motivation to comply (Ajzen, 1991).

Perceived Behavioral Control

Perceived behavioral control is the overall measure of perceived control over the person's behavior. It is the person's perception on if the given behavior can be performed with or without difficulty (Ajzen, 1991; Asare, 2015). Behavioral control is the critical determinant in the individual's ability to perform a given task (Ajzen, 1991; Lin et al., 2020; Wongrith, 2019). This construct of perceived behavior control increases if an individual perceives substantial resources and confidence is available to the individual (Ajzen, 1985; Hartwick & Barki, 1994; Lee & Kozar, 2005). This also includes instances where the individual may have control over a behavior (Glanz et al., 2008).

Intention

Intention refers to the perceived likelihood of the individual performing the desired health behavior. Attitudes, subjective norms, and perceived behavioral control all work together to determine if the individual intends to perform the behavior (Ajzen, 1991; Glanz et al., 2008). Intentions are assumed to be motivational factors that influence behavior change and they are instrumental to the willingness of individuals to change a behavior, as well as how hard or how much effort they exert in performing the behavior (Ajzen, 1991). The stronger the intention of the individual to engage in a behavior, the more likely it is for the individual to perform the behavior (Ajzen, 1991). The TPB assumes behavioral intentions to be the most direct determinant of any behavior (Glanz et al., 2008; Lee et al., 2017).

Interaction of Components (Behavior)

The TPB assumes a chain that links the constructs (attitudes, subjective norms, and perceived behavioral control) to intentions which then result in behavior (Ajzen, 1991; Glanz et al., 2008; Montano & Kasprzyk, 2002). While the TPB assumes that behavioral intention is the main determinant of behavior, the predictive success of the planned behavior theory is dependent on the individual's ability to exert full control over a given behavior (Montano & Kasprzyk, 2002). Where the individual perceives a high degree of control over performing a behavior, the individual makes greater effort to achieve the desired change in behavior. The individual who perceives lack of, or less control over a given behavior, is less likely to perform the behavior, thereby proving the theory less helpful and ineffective (Ajzen, 1991; Ajzen & Madden, 1986; Glanz et al, 2008; Montano & Kasprzyk, 2002).

TPB and Demographics

TPB and Age

A higher number of older adults suffer chronic illness in comparison to those of a younger age (CDC, 2021; Tian et al., 2018; Xu et al., 2018). In addition, there is an increased likelihood of older adults than younger people seeking health care and treatment to address health challenges (Mackenzie & Gekoski, 2006). Though younger adults are reportedly being exposed to health problems, there is a notable lower number of young people who seek treatment (Luquis & Kensinger, 2019).

Young adults show an increased favorable attitude to certain activities, and support/ approval of friends (Aunos & Feldman, 2002; Fishbein & Cappella, 2006; Glanz et al., 2008; McLallan & Fishbein, 2008; Murray & Minnes, 1994; Topa & Moriano, 2010). A high proportion of older people are not physically active unlike young people. A sedentary lifestyle which increases with ageing, is attributed to functional disability or inactive lifestyle in the older people (Motalebi et al., 2014). Overall, researchers posited the TPB as beneficial to direct and maintain health care interventions among people of different ages (Ajzen, 1991; Glanz et al., 2008; Lee et al.,2017).

TPB and Gender

Researchers have found gender needs as a factor in seeking health treatment (Ang et al., 2004; Kessler et al., 1981; Liu et al., 2021). Females are more likely to engage in activities that reduce or prevent illness compared to males. They are also more receptive to health teachings and treatment options to enhance healthy lifestyles and wellness than the male counterparts (Nigg et al., 2008).

Females are more likely to seek help or treatment than men, as men are more inhibited by their masculinity and gender role (Ang et al., 2004; Albizu-Garcia et al., 2001; Leong & Zachar, 1998; Sagar-Ouriaghli et al., 2019; Shepherd & Rickard, 2012; WHO, n.d.). Males may have the inability, or decreased interest, to follow health guidelines or seek medical assistance when compared to female counterparts (Hawkins, et al., 2017). Men are also less likely to engage in habits that promote quality of life than women (Craft et al., 2014; Lee et al., 2006; National Institute of Mental Health Disorder, 2022; Rosenfield & Smith, 2009).

TPB and Parental Status

Various factors impact parents' behaviors to encourage positive health behaviors in their child (Hamilton et al., 2020). Children learn from their parents and in most cases depend on their parents' performing habits that foster their health (Andrews et al., 2010; Bracke & Corts, 2012). Parents can use their position to enhance positive behavior in their child by promoting healthy behaviors and discouraging unhealthy behaviors. If parents are empowered when they know their attitudes can make positive impact in the lives of their children (Bracke & Corts, 2012).

Stronger affective attitudes have been found to be a predictor of intentions in men than women (Bassett-Gunter et al., 2013). New and established parents are more inclined to adopt healthy behaviors than non-parents (Bassett-Gunter et al., 2013). Transition to parenthood can be a motivating factor to making positive lifestyle changes to create healthy environment for the child/children (Bassett-Gunter et al., 2013). To some individuals, parental status may exacerbate challenges that may cause deterioration in activities. It may be difficult for some individuals who newly assumed the role of parenthood to successfully multitask or successfully fit into the new role (Bassett-Gunter et al., 2013; Ibrahim, 2020; Perry & Langley, 2013).

TPB and Education Level

An individual's attitude related to health care can be influenced by the education level of the individual (Champion & Skinner, 2008). Individual behaviors are conscious, reasoned, and planned (Ajzen, 1991; Brookes, 2021). Individuals that have attained a high education level are more exposed to, and have a better understanding of, wellness information/ awareness and can subsequently seek help and treatment unlike individuals with lower education level (Dursun et al., 2018; Fletcher & Frisvold, 2009; Raghupathi & Raghupathi, 2020; Zeidi et al., 2020). Individuals with higher educational attainment have been found to have an advantage with better health outcomes and lifespan than those with lesser education attainment (Raghupathi & Raghupathi, 2020).

The benefits of enhanced education include reduction in health disparities and improved lifestyle/ wellness of the individuals (CDC, 2012). Education may allow the individual to identify illness and seek medical treatment in a timely manner, as well as access resources and support systems (Fletcher & Frisvold, 2009; Raghupathi & Raghupathi, 2020). Education is the tool individuals need to live fulfilled lives and avoid negative consequences, and individuals with high education level understand its importance (Fletcher & Frisvold, 2009). Individuals with less education suffer an array of vulnerabilities and inequalities compared to their counterparts (Raghupathi & Raghupathi, 2020). An individual's ability to easily access, comprehend, and utilize information from varying sources greatly affects their habits and overall health (Harding et al., 2007; Skoglund et al., 2020). Poor health literacy results in the individual having lower functioning related to various health behaviors (CDC, 2012).

TPB and Culture

Culture provides social context that can influence engaging in certain health related behaviors (Airhihenbuwa & Obregon, 2000; Glanz et al., 2008; Topa & Moriano, 2010). While some cultures believe that illness may be because of punishment for past or current sinful acts by an individual or a group of people, other cultures view illness as an imbalance in healthy lifestyle (Bailey, 2002; Chen et al., 2015; McLaughlin & Braun, 1998). Beliefs about risks or consequences of the illness may prompt the individual to consider engaging in preventive behaviors or to avoid healthcare or healthy behaviors (Kasprzyk et al., 1998; von Haeften et al., 2001). However, additional research is required to delineate other cultural antecedents related to health behaviors.

Similarities and Differences Between the HBM and the TPB

The HBM was initially developed to predict the likelihood of individual engagement in programs that help disease detection and prevention (Gerend & Shepherd, 2012; Rosenstock et al., 1988). The TPB is used to predict health related behaviors (Ajzen, 1988; Ajzen, 1991; Fishbein & Ajzen, 1975). However, each of the models measure individual beliefs, behaviors, and outcomes, showing similarities and differences (Weinstein, 1993).

The HBM and the TPB both adopt individual level approach that predict individual health behaviors (Gerend & Shepherd, 2012). There are overlaps in specific constructs that are associated with the HBM and TPB (Weinstein, 1992). Both indicate that when individuals put in more effort in behaviors or activities that are perceived to have value and the ability to succeed (Brewer et al., 2008; Cooper et al., 2017) and assume that individual health behavior decision making is mostly based on deliberate and rational process (Abraham et al., 2005; Brewer et al., 2008).

For example, the self-efficacy construct of the perceived behavioral control in the TPB overlaps with the construct of perceived barriers in the theory of the HBM (Ajzen, 1991; Ajzen & Madden, 1986; Gerend & Shepherd, 2012; Noar & Zimmerman, 2005).

This similarity reflects the individual's confidence of control and ability in performing health behaviors even when faced with obstacles/ challenges (Gerend & Shepherd, 2012). Similarly, cues to action of the HBM may not formally be represented in the TPB but are reflected in the constructs of attitudes and subjective norms of the TPB. Both attitudes and norms can be defined by the individual's exposure to others, including family, friends and professionals/ care-providers, and media (Abraham et al., 2005; Gerend & Shepherd, 2012).

The HBM and TPB also have distinct differences. The main difference is the construct of behavioral intentions in the TPB. This is a factor associated to closely predicting individual behaviors (Gerend & Shepherd, 2012). Behavioral intentions are considered the best predictor of individual behaviors as postulated by the TPB (Ajzen, 1988; Ajzen, 1991; Fishbein & Ajzen, 1975; Gerend & Shepherd, 2012). The original constructs of the HBM did not include intentions (Abraham et al., 2005; Gerend & Shepherd, 2012; Glanz et al., 2015). Researchers have argued that the health belief constructs of perceived susceptibility and perceived barriers may be appropriate to consider as intentions to act (Abraham et al., 2005; Gerend & Shepherd, 2012).

Another notable difference is the absence of a construct that directly captured self-efficacy (perceptions of control) in the HBM (Champion et al., 2008; Gerend & Shepherd, 2012; Rosenstock et al., 1988). Despite the similarities and differences existing in the theories of the HBM and the TPB, many researchers have been guided by these health behavior theories, but few studies are found to have compared both theories (Noar & Zimmerman, 2005; Weinstein, 1993) although they complement one another, overlap, and fill in gaps of one another. Hence why I included both as theoretical frameworks for my study.

The two identified theories will be applied to the current study to explore parental attitudes in children with diabetes. The theories will be useful in understanding and predicting health behaviors, as well as guide interventions through identifying potentially modifiable antecedents of health behaviors (Abraham et al., 2005; Conner et al., 2005). This is because health behaviors and behavior changes have been found to be related to beliefs and reasoning (Glanz et al., 2008). Because parents are responsible for their child's health care (Aarthun et al., 2018; Power & Franck, 2008), as well as things like diet and exercise (Hopper et al., 1996; Perry et al., 1988; Raber et al., 2016), it makes sense that their beliefs and reasoning would filter to, and be learned by, their children (Grusec, 2006; Vaughn et al., 2016). These attitudes of the parents may be intentional or unintentional, but they influence the beliefs, attitudes, and behaviors of the child (Vaughn et al., 2018).

Literature Review Related to Key Variables and/or Concepts

Diabetes

Diabetes is a chronic health condition that affects how the body turns food to energy (ADA, 2022; CDC, 2021). Most food is broken down to sugar (also known as glucose) which is released in the bloodstream (CDC, 2021). Blood sugar is the main source of energy that comes from food. The pancreas (hormone making insulin) releases insulin when the blood sugar level is high. Insulin helps sugar from food get to the body cells and be used as energy (CDC, 2021).

Sometimes the body does not produce enough insulin or none at all (Cleveland Clinic, 2018). If the body is unable to make enough insulin or cannot use insulin effectively, too much blood sugar is retained in the bloodstream (Galicia-Garcia et al., 2020). If the pancreas does not produce enough insulin in the body, it makes it difficult for the uptake of glucose to take place thereby accumulating glucose in the blood stream which in turn can lead to other symptoms and complications related to diabetes (Unger & Orci, 2013). Diabetes results when the excesses blood sugar in the body is not utilized (Bullard et al., 2018; Singer et al., 2018)

Types of Diabetes

There are three main types of diabetes: Type 1 diabetes, Type 2 diabetes, and gestational diabetes (CDC, 2021; WHO, 2021). Some individuals may have one or two different types of diabetes (Davenport, 2018). Although there is no cure for diabetes, it can be managed through weight loss, healthy eating, regular exercise, medication, and regular health care appointments (ADA, 2022; CDC, 2021).

Type 1 Diabetes. Type 1 diabetes (also known as childhood or juvenile diabetes) is characterized by a deficiency in insulin production thereby requiring insulin administration (Bullard et al., 2018; WHO, 2022). In Type 1 diabetes the pancreas does not produce insulin by itself (ADA, 2022; WHO, 2022). Although Type 1 diabetes may occur at any age and in people of any race, it is usually diagnosed in children and young adults (ADA, 2022). Those with a family history of Type 1 diabetes are also at risk for developing Type 1 diabetes (CDC, 2021).

Type 1 diabetes symptomology includes excessive thirst, frequent urination, weight loss, constant hunger, fatigue, blurred vision, and weakness (CDC, 2021; WHO, 2021). Early detection of Type 1 diabetes reduces risk of complications related to the diabetes due to being able to better control insulin levels and diet (CDC, 2021). Treatment for Type 1 diabetes is comprised of regular blood sugar monitoring, eating healthy foods, regular exercise, medication, and insulin therapy (ADA, 2022; CDC, 2022).

Type 2 Diabetes. Type 2 diabetes is the most common form of diabetes and is prevalent among middle aged and older adults (ADA, 2022; WHO, 2021). Type 2 diabetes is a disease in which the blood glucose or blood sugar levels in the body are too high as the body does not produce enough insulin, or when the insulin produced cannot be effectively utilized (Bullard et al., 2018; WHO, 2021). In Type 2 diabetes, cells do not respond normally to insulin as they become insulin resistance (CDC, 2021). The pancreas makes more insulin to try to get the cells respond and, eventually, the pancreas cannot keep up with insulin production (Bullard et al., 2018; CDC, 2021; Gilmer et al., 2018).

Type 2 diabetes risk factors include being overweight, genetics and family health history, and physical inactivity (CDC, 2021; WHO, 2021). While some may be able to control their Type 2 diabetes through healthy eating and exercise, others may need medication and/or insulin therapy (ADA, 2022). Symptomology of Type 2 diabetes may include increased thirst and urination, increased hunger, feeling tired, blurred vision, sores that heal slowly or do not heal, numbness or tingling in the extremities (feet and/or hands), and unexplained weight loss (CDC, 2021; WHO, 2021). Health complications and damages to vital organs are often a result of having Type 2 diabetes when it is not managed appropriately (Afroz et al., 2018, Bullard et al., 2018; CDC, 2021)

Gestational Diabetes. Gestational diabetes usually develops in women during pregnancy who do not already have diabetes (CDC, 2021). Gestational diabetes occurs when the body is unable to make enough insulin during pregnancy (CDC, 2021; Noctor & Dunne, 2015). More hormones are made during pregnancy which cause the body to go through changes such as increased body weight (ADA, 2022; CDC, 2021). These body changes cause the body's cells to ineffectively use insulin, thereby increasing the body's need for insulin (Noctor & Dunne, 2015).

Blood glucose values are higher than normal (but below Type 2 diagnostic values) in women experiencing gestational diabetes and those where were diagnosed gestational diabetes often no longer have the disease after they deliver the baby (CDC, 2021). However, they have a higher risk of developing Type 2 diabetes later on (CDC, 2021; WHO, 2021). Gestational diabetes can be managed through regular blood sugar monitoring, baby monitoring, appropriate exercise, healthy diet, and medication when other methods do not reduce blood sugar levels (CDC, 2021; WHO, 2021). Gestational diabetes is treatable and manageable through prenatal appointments and following treatment plans (ADA, 2022; CDC, 2022; WHO, 2022).

Prevalence of Diabetes

Approximately 422 million people globally are estimated to have diabetes, with the majority of the people living in low and middle-income countries (Lee et al., 2017; WHO, 2022). According to the International Diabetes Federation [IDF], (2021), the number of diabetes cases is projected to rise to 643 million by 2030 and 783 million by 2044. In the United States, approximately 28.7 million people (8.7%) have been diagnosed with diabetes (CDC, 2021) and this number is expected to continue to increase (Cho et al., 2018; Ginter & Simko, 2012; Saeedi et al., 2019; Sun et al., 2021).

Over 130 million U.S. adults (diagnosed and undiagnosed cases) are estimated to be currently living with diabetes or prediabetes (includes diagnosed and estimates of undiagnosed cases (CDC, 2022). The racial group with the highest prevalence of diagnosed diabetes in the United States is American Indians/Alaskan Natives (14.5%) followed by non-Hispanic Blacks (12.1%; CDC, 2021). Families who live below the United States poverty level have the highest prevalence of diagnosed diabetes (13.7% men, 14.4% women; CDC, 2022; Spanakis & Golden, 2013). Adults who have less than a high school diploma (13.4%) have the highest prevalence of diagnosed diabetes of any education level group (compared to 9.2% of adults with high school education; CDC, 2021; Spanakis & Golden, 2013).

In Africa, the prevalence of diabetes is projected to rise to approximately 34.2 million cases by 2040 (Bello-Ovosi et al., 2017). This estimated rise also includes the population of Nigeria (Fasanmade & Dagogo-Jack, 2015). The number of individuals in Nigeria living with diabetes is estimated at 4 million (Uloko et al., 2018). Researchers have found that advanced age, unhealthy lifestyles, and socioeconomic determinants are the main factors associated with developing diabetes in Nigeria (Olufemi et al, 2015; Ugwu et al., 2019; Uloko et al., 2018).

The global cost of diabetes is estimated at 966 billion USD (ADA, 2022; IDF, 2021). The global projection for diabetes care by the year 2045 is estimated to be one trillion USD (ADA, 2022; IDF, 2021). The cost of diabetes in the U. S. continues to rise (ADA, 2022). Diabetes related healthcare expenditures in the United States is estimated at 380 billion dollars per year (ADA, 2022). Diabetes care place economic burdens on individuals and families as there are often out of pocket medical expenses related to diabetes care and medication (Aregbeshola & Khan, 2018).

In Africa, it was reported that in the year 2021, USD 13 billion was spent on health care for people with diabetes (IDF, 2021; Mapa-Tassou et al., 2019). In Nigeria the cost of diabetes treatment may typically cost about $350 per month (Okoronkwo et al., 2015) The cost of care and management of diabetes in Nigeria can affect access to treatment due to high cost of living for a population living below poverty line (Aregbeshola & Khan, 2018). Disadvantaged Nigerian families find it difficult or unable to pay out of pocket expenses, and may sometimes resolve to self-medication, or seek low quality care thereby leading to practices associated with increased morbidity and mortality rates (Abolghasemi & Sedaghat, 2015; Chinenye & Young, 2016).

Complications of Diabetes

If not appropriately managed, diabetes can damage vital organs of the body which may result in various acute and chronic complications (CDC, 2021, Yurkevicz et al., 2018). Many individuals who have diabetes are more negatively affected by the complications associated with diabetes than diabetes itself (Abbasi et al., 2018; CDC, 2021). Individuals with diabetes who do not do a good job at controlling their diabetes may suffer from heart disease, kidney disease, nerve damage, eye problems, teeth/ oral disease, lower limb amputations, and more (Agyemang et al., 2016; Bullard et al., 2018; CDC, 2021; Siddique, 2019). Maintaining blood glucose levels at or close to normal can delay or prevent complications. Therefore, it is important for people with diabetes to monitor blood glucose regularly (ADA, 2022; WebMD, 2022).

Diabetes is a major cause of heart attacks, kidney failure, blindness, stroke, and limb amputations (CDC, 2022, Rowley et al., 2017; WHO, 2021). Cardiovascular disease cause serious complications in people with diabetes and is often the main cause of death for these individuals (ADA, 2022; CDC, 2022, WebMD, 2022). Increased risk of cardiovascular disease may result from high blood glucose, high blood pressure, and high cholesterol (ADA, 2022; CDC, 2022, WebMD, 2022). Kidney disease can also be a complication of diabetes (ADA, 2022; CDC, 2022, WebMD, 2022). Diabetic neuropathy is nerve damage that occurs in the body when blood sugar and blood pressure are extremely high. This sometimes causes erectile dysfunction, digestion problems and nerve damage to lower extremities, particularly the feet otherwise known as peripheral neuropathy (ADA, 2022; CDC, 2022, WebMD, 2022). This problem causes pain, tingling, and loss of feeling which allows injuries to these areas to go unnoticed, leading to infections and possible limb amputation (ADA, 2022; CDC, 2022, WebMD, 2022).

Eye disease related to diabetes can lead to blindness (ADA, 2022). Increased levels of blood sugar, blood pressure and cholesterol are the main causes of diabetic retinopathy. Regular eye exams and blood sugars maintained at lower or close to normal levels are used to manage eye disease (ADA, 2022; CDC, 2022, WebMD, 2022). Oral complications can also affect people with diabetes. If blood glucose is not managed, the individual is at a great risk of periodontitis or inflammation of the gums, which is also associated with the risk of cardiovascular disease. Therefore, people with diabetes need regular oral checkups and/or annual visits to ensure early detection and prompt management of prevalent oral complications (ADA, 2022; CDC, 2022, WebMD, 2022).

Diabetes also can affect the mental health of the individual with diabetes (ADA, 2022). Diabetes may cause emotional disturbance, a feeling of helplessness and hopelessness, loss of interest or pleasure, lack of concentration, loss of energy, depression, and suicidal thoughts or suicide (ADA, 2022). Understanding the emotional health of people with diabetes and finding solutions to the emotional state of the individual, improves the relationship between the individual and health care providers, family, and others allow for a better successful management of diabetes overall quality of life (Penckofer et al., 2007).

Mortality from Diabetes

An estimated 1.5 million deaths worldwide were directly attributed to diabetes in 2019 (WHO, 2021). Death related to diabetes is more prevalent in low- and middle-income countries (Burns, 2016; WHO, 2021). This number has increased from 108 million to 422 million between 1980 and 2014 and is more prevalent in low- and middle-income countries (Burns, 2016; WHO, 2021).

United States. Diabetes is the seventh leading cause of death in the United States (ADA, 2022; Campbell & Egede, 2020; CDC, 2022). In 2019 in the United States diabetes was listed as the cause of death in 282,801 death certificates (ADA, 2022;

Rowley et al., 2017) and approximately 87,000 as underlying cause of death (ADA, 2022). Diabetes mortality rate is rapidly on the rise among Africans with diabetes (King et al., 2018; Ogbera & Ekpebegh, 2014; Pheiffer et al., 2018). In 2019, diabetes was responsible for 63,958 deaths in Nigeria (Muanya, 2020).

Nigeria. Nigeria is among the 48 international diabetes federation countries in the African region with a higher rate of diabetes (Uloko et al., 2018). Diabetes (all types) has been found to affect 8-10% of Nigerians. Approximately 5.8% adult Nigerians live with Type 2 diabetes (Adeloye et al., 2017; IDF, 2022; Okeoghene & Ekpebegh, 2014; Ugwu et al., 2020). Researchers have shown that there are risk factors that are more prominent in Nigerians such as unhealthy eating habits, obesity, living in urban settings, cigarette smoking, and being physically inactive (Uloko et al., 2018). These behaviors come with individuals from Nigeria when they move to the United States.

The financial situation of individuals in Nigeria makes it difficult to engage in healthy eating behaviors (Latunji & Akinyemi, 2018; Seguin et al., 2014). The health status of individuals is closely associated with being able to afford engaging in health seeking behaviors (Aregbeshola & Khan, 2018; Eze et al., 2017; Latunji & Akinyemi, 2018). The economic cost of individuals living with diabetes in Nigeria can hamper access to health care due to inability to pay out of pocket medical expenses (Fasanmade & Dagogo-Jack, 2015; Okoronkwo et al., 2015).

When Nigerians relocate to the United States, they are faced with a paradigm shift from traditional African lifestyle to western lifestyle (Jasper et al., 2014; Otaigbe & Imafidon, 2011). They may still have difficulty engaging in healthy eating and recommended activity behaviors (Jasper et al., 2014; Otaigbe & Imafidon, 2011). Some get into the routine of life and may adopt some American eating practices that may negatively affect their health (Swierad et al., 2017). Some may engage in buying and consuming unhealthy foods and skipping meals (Eze et al., 2017; Jasper et al., 2014). They may also not enough income or insurance to pay for health care or may not know how to get access to or pay for healthcare in the United States system (Adeniyi, 2013; Poncian, 2015; Swierad et al., 2017). The United States healthcare system can also be difficult for immigrants to understand and afford (Hill et al., 2021; Khullar & Chokshi, 2019).

Demographics and Diabetes

Age and Diabetes. Diabetes and the complications of diabetes can be more serious in older individuals (Mordarska & Godziejewska-Zawada, 2017). People who are older have worse prognoses and higher mortality rates than younger individuals (Afanasiev et al., 2018; Chentli et al., 2015; Xu et al., 2018). Physical inactivity and inconsistent eating quality and frequency can cause insulin resistance as individuals age (Chentli et al., 2015). Older individuals may experience barriers that make it difficult to adhere to treatment regimen including varying functional capabilities, limited mobility, limited support, and limited income that can exacerbate diabetes and comorbid conditions (Afanasiev et al., 2018; Chentli et al., 2015; Mordarska & Godziejewska-Zawada, 2017).

Gender and Diabetes. Researchers have identified gender as one of the risk factors related to the probability of developing diabetes (Hawkins et al., 2017; Tian et al., 2018; Tramunt et al., 2020). Diabetes is more prevalent in men than women (Nordin et al., 2019; Nordstrom et al., 2016). In 2017, approximately 12.3 million more middle aged men than women were living with diabetes (Tramunt et al., 2020). A higher prevalence rate of Type 2 diabetes in men of older age has been found to be related to the larger amount of visceral fat present in men as they age (Nordstorm et al., 2016). Body mass index (BMI) and waist circumference are risk factors of obesity that contribute to increased prevalence of Type 2 diabetes, and these differ between the genders with men having larger numbers in these areas (Tian et al., 2018).

Race/Ethnicity and Diabetes. Diabetes prevalence is higher among Blacks/African Americans (12.1%) and Hispanics (11.8%) than in whites (7.4%; Meng et al., 2016; Spanakis & Golden, 2013). Blacks and other minority groups are identified to have higher risk of diabetes tied to factors related to low socioeconomic status such as poor nutrition, low participation in exercise, lack of health insurance, food insecurity, lack of affordable healthy foods, and lack of or limited access to affordable and/or safe exercise venues (Assari et al., 2017; Hawkins et al., 2017).

Children of African American and Hispanic descents are more likely than their counterparts to develop diabetes and suffer from diabetes related complications at an early age (Cali & Caprio, 2008; Haw et al., 2021). Minorities face many risk factors that may be barriers to diabetes care, and effective diabetes management such as lack of access to adequate care or health care, cultural attitudes, and socioeconomic status (Meng et al., 2016). Therefore, a higher diabetes burden is on minorities because they are more likely to experience diabetes health related complications than their white counterparts (Khanolkar et al., 2017; Meng et al., 2016).

Education Level and Diabetes. People with poor/lower education have been found to be more likely to make unhealthy choices related to diabetes risk factors (diet, exercise, healthcare), medication errors, or may delay seeking health care or professional advice except when they are very sick (Berkman et al, 2011). The higher the education level of the individual, the better health literacy they have been found to have (ADA, 2022; Al Sayah et al., 2013; Bailey et al.; CDC, 2014, 2018, 2021; Porter, 2017; Zikmund-Fisher et al., 2014). Adequate health education and health literacy can promote more effective diabetes self-care (ADA, 2022; CDC, 2022; Moss 2014; Olesen et al., 2017). A higher prevalence of diabetes is seen among individuals with less than high school level of education (13.4%) than those with a high school education (9.2) or more than high school education (7.1%; 2018-2019 National Health Interview Survey).

Socioeconomic Status and Diabetes. Socioeconomic status is closely tied to the probability of the development of diabetes (Assari et al., 2017). Socioeconomic status is often a determining factor for quality of life, medical comorbidities, medication adherence, glucose control, diabetes health related complications, and mortality (Assari et al., 2017; Caraballo et al., 2020). Diabetes requires continuous monitoring, patient participation, involvement of health care professionals, and non-health care providers which require adequate finances and/or insurance coverage (CDC, 2021; Peters et al., 2021). Lower finances can also affect living and lifestyle conditions that can lead to health disparities (Acquah et al., 2021; Caraballo et al., 2020; Khera et al., 2018; Mszar et al., 2020; Peters et al., 2021). For instance, low income often leads to dietary choices that may raise their risk of developing diabetes or exacerbating their diabetes (Peters et al., 2021).

Management of Diabetes

Medical Management of Diabetes. Management of diabetes is dependent on maintaining blood sugar within normal limits. Controlling blood sugar level is achieved through healthy diet, oral medication, and/or insulin (CDC, 2021). Medical management of diabetes can reduce the risk of long-term complications, including neuropathy, cardiovascular, retinopathy, kidney disease, disability of the extremities (Christensen et al., 2020; Powers et al., 2016; Weaver et al., 2014). Maintaining appropriate hygiene and seeking regular screening/ professional care are also important in the treatment and management of diabetes (WHO, 2022).

Behavioral Management of Diabetes. Effective behavior management is fundamental to achieving successful outcomes in the treatment of diabetes (ADA, 2020; McSharry et al., 2020). Behaviors that need to consistently occur to have effective management of diabetes include healthy eating, adherence to medication regimen, active exercises/physical activities, active monitoring of blood sugar, and being aware of changes in physical health (Andriyanto et al., 2019; Christensen et al., 2020; Hailu et al., 2019; Hilliard et al., 2016; Pavithra et al., 2020; Vanstone et al., 2017). Close adherence to a diabetes regimen can improve quality of life and prevent complications related to diabetes (ADA, 2020; Hilliard et al., 2016; Hunter, 2016).

Diabetes self-management education (DSME) programs, medical nutrition therapy, routine regular physical activities, and psychosocial counseling and care are important as it creates educational awareness and support for people with diabetes to effectively manage diabetes and health related conditions (ADA, 2022, CDC, 2018; Haas et al., 2014; Musenge et al., 2016). DSME has been found effective in enhancing self-care behaviors among individuals with diabetes (Haas et al., 2014). DSME services help to support the individual with informed decision towards management of diabetes and enhance knowledge and skills necessary for optimal management and self-care in people with diabetes (ADA, 2020). A structured and designed activity helps improve glycemic control, maintain body weight, reduce risk of cardiovascular disease, and improve overall well-being (ADA, 2020). Integrating patient-centered collaborative psychosocial issues that optimize health outcomes and quality of life is important for people with diabetes. Psychosocial issues include an individual's attitudes toward diabetes, expectations about quality of life, medical management outcomes, and available resources (ADA, 2020).

Attitudes Towards Diabetes Management

Attitudes and Self-Management of Diabetes. Attitudes are determined by beliefs that a performed behavior will cause positive or negative outcomes (Bai et al., 2011; CDC, 2022; Hamilton et al., 2011; Heinig et al., 2006; Miller, 1995; Perry et al., 1988). These beliefs are strong underlying factors for determining adherence to health guidelines. Individual attitudes and self-management of diabetes are linked to the mental, physical, social, and spiritual factors of the individual (Abolghasemi & Sedaghat, 2015). An individual's knowledge, attitudes, and experience towards diabetes are factors associated with disease management. Individuals with negative attitudes about diabetes, and related health monitoring, have been found to have subsequently difficulty with managing the disease (Abolghasemi & Sedaghat, 2015, CDC, 2022; Chinenye & Young, 2016).

Researchers have found that increased knowledge about diabetes, positive attitude, and adherence to health care practices are related to the effective management of diabetes (Abolghasemi & Sedaghat, 2015, CDC, 2022; Chinenye & Young, 2016). Attitudes held about diabetes, the severity of the disease, and the complications that could occur if diabetes is not managed effectively are related to the behaviors that those with diabetes (or care for those with diabetes) exhibit (Abolghasemi & Sedaghat, 2015). Negative attitudes and poor health practices have been found to be related to an increase morbidity rate in patients with diabetes (Abolghasemi & Sedaghat, 2015, CDC, 2022; Chinenye & Young, 2016). A poor understanding of diabetes impedes successful management practices thereby resulting to poor outcome (Patel et al., 2015).

Attitudes and Management of Diabetes by Parents in Their Children. The family environment is related to health risks and outcomes for all members of that family (CDC, 2021). Researchers have shown the importance of family involvement in the health care of children (Knafl et al., 2017; Young et al., 2014). More time and resources are needed with collaborative efforts to manage diabetes in children and adolescents as they may not wish to be cooperative with necessary diet, medication, and management of behaviors needed to control the diabetes (Anderson et al., 1990). Part of the reason for this may be that they want to engage in the same behaviors and activities as their peers or they believe that they are treated differently because of their diabetes (ADA, 2011; Reynolds & Helgeson, 2011). Optimal health outcomes related to diabetes management have been found to be reached with parental involvement, family support, and collaboration with health professionals and other caregivers (Clark & Hampson, 2003; Jasper, 2011; Hanna, 2003; Young et al., 2014).

Cultural Attitudes. The health behavior of people from the sub-Saharan region is influenced by cultural beliefs and myths (Issaka et al., 2016). Nigerian culture beliefs related to food affects their diet and eating habits (Adegboye et al., 2016; Onyeaka et al., 2021). Nigerians mainly consume staple which means that they are exposed to monotonous diets which can result in inconsistent nutrition (Adegboye et al., 2016; Akerele et al., 2017; Mekonnen et al., 2021; Onyeaka et al., 2021; Stephenson et al., 2010). It is estimated that over 200,000 people die yearly in Nigeria from food related illness (Adegboye et al., 2016; Onyeaka et al., 2021). The prevention of chronic diseases and enhanced good health is attainable with a wider diet (Adegboye et al., 2016).

Attitudes about diet can be cultural which can cause issues for children with diabetes. In many African cultures, children that are heavier are considered healthier, thereby indicating good parenting (Baughcum et al., Benton, 2004; Nabiwemba et al., 2014; Redsell et al., 2010; Sullivan et al., 2011). They also believe that lower weight children must be forced to eat more food to become what that culture determines to be an appropriate weight (Chang et al., 2017; Fildes et al., 2015). This can cause issues when a child has diabetes as these things may be contradictory to appropriate diet and diabetes management behaviors for the child.

Some cultural groups may hold the belief that diseases are controlled by external forces and outside of the control of the individual (Abdurehman et al., 2016). For example, African have been known to believe that external forces are responsible for inflicting illnesses or maintaining health (Kate et al., 2012; Lucas et al., 2013; Wagner et al., 2011). These beliefs make it difficult, if not impossible, for individuals with diabetes to adopt health care behaviors that promote management of diabetes as they would rather wait on God to cure their disease (van Esch et al., 2014).

Summary and Conclusion

Researchers have indicated diabetes among children and adolescents is steadily on the rise and is the seventh leading cause of death in the United States (CDC, 2020; Gumbs, 2020). Diabetes affects the well-being of children, their family, and the community (ADA, 2021; Perm, 2013; Sahin et al., 2015; Ziegler & Neu, 2018). This disease is highly prevalent among those who are Black/non-Hispanic when compared to other groups (CDC, 2020).

Nigeria has the highest number of people with diabetes mellitus in sub-Saharan Africa, and 1 out of every 17 adult Nigerian have diabetes mellitus, and this rate continues to increase (Dahiru et al., 2016; Uloko et al., 2018). As of 2017, approximately 348,000 immigrants from Nigeria reside in the United States (Pew Research Center, 2020). Although researchers have examined the challenges related to parent attitudes in children with diabetes (Deeb et al., 2018; Gumbs et al., 2020; Sahin et al., 2015; Zhang et al., 2016) and negative outcomes of diabetes of children when parents provide incorrect or inconsistent care (Pereira et al., 2019; Uloko et al., 2018; Zhang et al., 2016), I found no researchers who have studied the relationship between parent demographics (age, gender, education level, gender of child, age of child, time since child's initial diagnosis), parent diabetes status, and attitudes about their child's diabetes in Nigerian parents who live in the United States.

I used the HBM and TPB for this study. The HBM was initially developed to predict the likelihood of individual engagement in programs that help disease detection and prevention (Gerend & Shepherd, 2012; Rosenstock et al., 1988). The TPB is used to predict health related behaviors (Ajzen, 1988; Ajzen, 1991; Fishbein & Ajzen, 1975). However, each of the models measure individual beliefs, behaviors, and outcomes, showing similarities and differences (Weinstein, 1993). The theories were useful in understanding and predicting health behaviors, as well as guide interventions through identifying potentially modifiable antecedents of health behaviors (Abraham et al., 2005; Conner et al., 2005).

The purpose of this quantitative study was to examine the relationship between parent demographics (age, gender, education level, gender of child, age of child, time since child's initial diagnosis), parent diabetes status, and attitudes about their child's diabetes as measured by the PDDS in Nigerian parents who live in the United States. In Chapter 3, I discussed the research design for this study. This includes a discussion of the research design chosen, the methodology of the study, procedures for data collection and data analyses, discussion of instruments used, potential threats to validity, and ethical procedures.

Chapter 3: Research Method

Introduction

The purpose of this quantitative study was to examine the relationship between parent demographics (age, gender, education level, gender of child, age of child, time since child's initial diagnosis), parent diabetes status, and attitudes about their child's diabetes as measured by the PDDS in Nigerian parents who live in the United States. This is important because racial disparity exists in diabetes care and management among immigrant parents (Jasper et al., 2014; Uppal et al., 2017). Despite the lack of consensus on established guidelines for diabetes, Nigerian children are at a higher risk for acquiring and dying from diabetes. Previous researchers have found conflicting results regarding the associations between diabetes and racial/ ethnic background (Uppal et al., 2017). In this study I explored factors relating to participation in diabetes or adherence to recommended self-care or management methods (Brorsson et al., 2017; Deeb et al., 2018; Sohn & Rowe, 2015). The results from this study may help inform targeted attitudes/ behaviors and culturally appropriate approaches to increase the awareness and care of diabetes among children of Nigerian parents and decrease the disparity observed between diabetic cases and death.

Research Design and Rationale

The independent variables in this study were the demographics age, gender, education level, gender of child, age of child, time since child's initial diabetes diagnosis, and parent's diabetes diagnosis status. The dependent variable for this study was attitudes of parents towards their children with diabetes as measured by the PDDS.

The research design used for this study was a correlational research design of a cross-sectional nature. A correlational design is used to determine if relationships exist between variables through a systematic statistical investigation of relationships between variables (Creswell, 2009; Frankfort-Nachmias et al., 2015, Simon 2012). The strengths and directions of the relationship or association between variables can be determined using quantitative statistical tests (Campbell & Stanley, 1963). The weaknesses of this design are that correlations do not equal causation so only relationships between variables can be determined and not if one factor causes another (Campbell & Stanley, 1963; Crawford, 2014).

A cross-sectional design is used to collect data from multiple sources at one point in time (Frankfort-Nachmias et al., 2015; Shivaji & Ford, 2015; Simon, 2012). Once I had institutional review board (IRB) approval, my survey was open until I had enough responses that meet the predetermined sample size to meet statistical power requirements (Frankfort-Nachmias et al., 2015). The strengths of a cross-sectional research design include that it can save a researcher time and costs when compared to other quantitative research designs (Frankfort-Nachmias et al., 2015; Shivaji & Ford, 2015). It is also an appropriate research design to be used to establish preliminary evidence for future studies which my study is hoped to do (Wang & Cheng, 2020). The weaknesses of this design are that comparison or control group data is not collected (Wang & Cheng, 2020). Also, because data is not collected over time from the same group, the data analyses will only show the relationships between variables from one group of participants from one point in their lifetime (Laerd, n.d.).

Other research designs I considered for this study included a qualitative design and an experimental quantitative design. Qualitative designs allow for the researcher to observe, document, and interpret experiences as told to them by participants (Frankfort-Nachmias et al., 2015). A strength of the qualitative design is the possibility of conducting in-depth analysis of the experiences of the participants (Frankfort-Nachmias et al., 2015). Weaknesses of a qualitative design include requiring few respondents to reach saturation of data (Bhandari, 2022; Streefkerk, 2022). However, this design was not the most appropriate for my study because I collected data on variables that were measured quantitively and am not studying participant experiences.

A quantitative experimental design is where the researcher manipulates independent variables to measure its effects on the dependent variables (Bhandari, 2022; Streefkerk, 2022). The strengths of this design are that the researcher has control over variables and there is the ability to determine causation between variables (Claydon, 2015). The weaknesses of the experimental design include results that are subjective to the possibility of human error, data collected can be skewed, data can be inaccurate or corrupted. Experimental research can be expensive, and time consuming, human responses can be difficult to measure, and participants can be influenced by their current situation/ extraneous variables. Also, there may be ethical or practical problems with the variables and control in experimental research. The experimental design was not appropriate for my study as I could not ethically manipulate my variables.

Methodology

Population

Nigeria is the most populous country in the whole of Africa and has the largest number of immigrants living in the United States (United States Census Bureau, 2020). The number of Nigerian immigrants, including adults and children, living in the United States continue to increase (Migration Policy Institute, 2014; United States Census Bureau, 2020). The Nigerian population in the United States rose from 265,973 in 2015 to 382,820 in 2020, with a prediction of 499,667 by the year 2025 if the increase continues at the same rate (United States Census Bureau, 2020).

Sampling and Sampling Procedures

Sampling Strategy

I used purposeful convenience and snowball sampling methods to recruit participants for this study. A purposeful sampling method means that a researcher will only recruit participants that have specific knowledge related to the variables in their study (Etikan et al., 2016; Robinson, 2014; Schatz, 2012). A strength of this sampling method is that only individuals with the knowledge being studied were included in the study. However, there may be the potential for research bias with purposeful sampling since participants are not randomly selected (Faber & Fonseca, 2014).

Convenience sampling is when participants self-select to participate in the study if they see the recruitment materials and meet the inclusion criteria. A strength of this sampling method is that individuals who are motivated to participate will be given the opportunity to participate. However, weaknesses of this sampling method include potential biases in results due to individual self-selection to participate decreased generalizability of results (Oppong, 2013).

Snowball sampling was included to let those who saw my recruitment materials and/or participate in the study know they could let others who have the knowledge and may qualify for my study about the study (Laerd, n.d.; Marcus et al., 2017). A strength of snowball sampling is that it can help the researcher access individuals who may otherwise be difficult to access as individuals in certain life circumstances often know others in similar circumstances (Griffith et al., 2016). A weakness is that participants who know each other may have similar experiences and attitudes which could decrease the generalizability of results (Frankfort-Nachmias et al., 2015).

Another sampling method that could have been appropriate for this study that I did not choose was random sampling. In random sampling, participants having equal chances of being selected or recruited so findings can be more accurately generalized to a wider and population (Frankfort-Nachmias et al., 2015). This method promotes increased generalizability of study results (Oppong 2013). However, the researcher faces the problem of determining a list of possible participants who meet the inclusion criteria for the study (Oppong, 2013). The process of randomization is expensive and time-consuming, making this method inappropriate for the study (Frankfort-Nachmias et al., 2015).

Inclusion/Exclusion Criteria

To participate in this study, an individual had to meet all these inclusion criteria:

- be at least 18 years of age

- have been born in Nigeria
- have moved to the United States at the age of 15 or later
- have lived in the United States for at least one year
- have at least one child who is between 3 years old and 17 years who has been diagnosed with diabetes
- can read and understand English

Those not meeting one or more of the above inclusion criteria were excluded from study participation.

Sample Size and Statistical Power

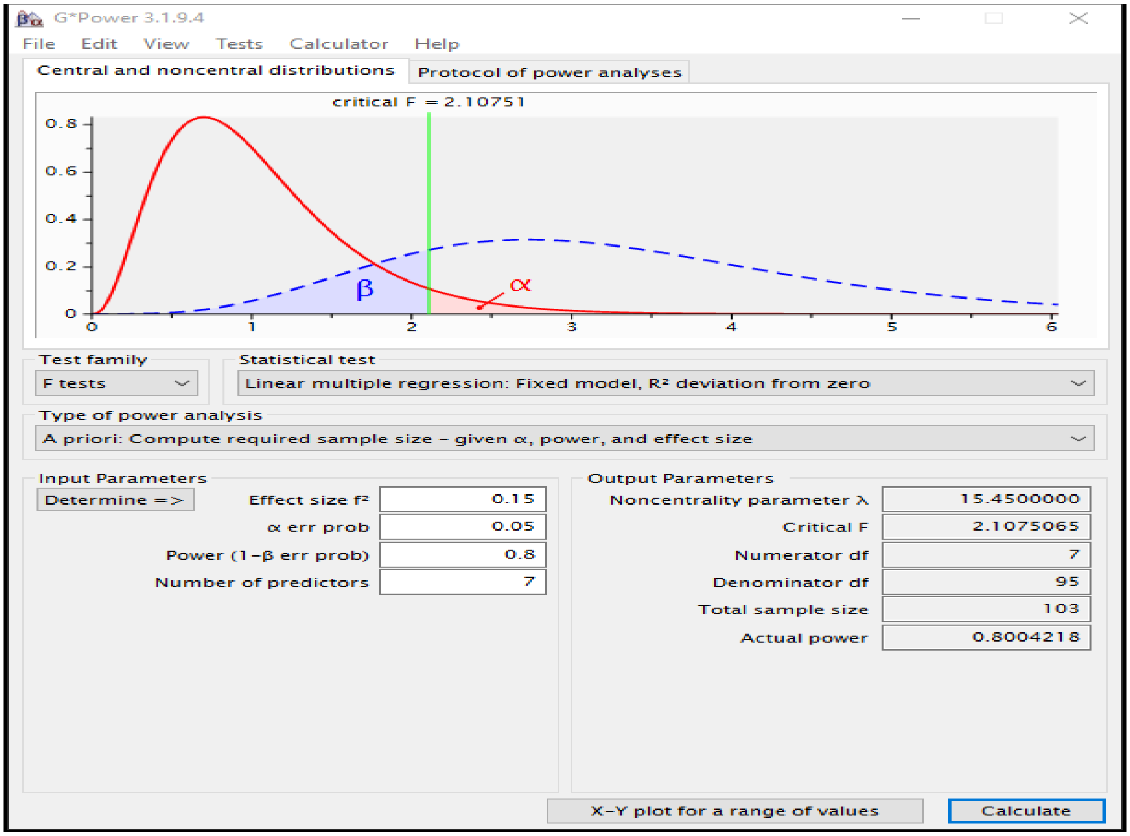
Determining the appropriate sample size was an important consideration in any research study. Sample size is an important factor that relates to the validity and reliability of the study results as well as the generalizability of those results (Burkholder, 2009; Frankfort-Nachmias et al., 2015; Serdar et al., 2021). Power analysis is important to determine the appropriate sample size in quantitative research (Kyonka, 2019). Thus, to determine the appropriate sample size needed for this study, the G*Power tool was used to calculate needed sample size for a multiple linear regression (Faul et al., 2009).

For the multiple linear regression, an alpha of .05, effect size of 0.15, and a desired statistical power of .80 were used to calculate the sample size (Serdar et al., 2021). Alpha level in most academic research is set at .05 (Anaesth, 2016; Suresh & Chandrashekara, 2012). This means there was a 5% chance that there is the risk of concluding a statistical significance exists when this is not the case (Field, 2013; Keesler, 2018). Alpha indicates a value or threshold for statistical significance, with common values of 0.05 and 0.01 (Field, 2013; Keesler, 2018). An alpha of .05 will be used for this study. A larger effect size means that research finding has practical significance while a small effect size indicates minimal practical application (Bhandari, 2022). Knowing the effect size to use in a study is important to help determine the right statistical power to detect an effect of the size (Bhandari, 2022). A medium effect size of .15 is appropriate for this study (Bhandari, 2022; Schäfer & Schwarz, 2019). The desired statistical power of .80 means there is an 80% possibility of correctly identifying if there is a statistical relationship between the variables and indicates that test results are not determined by chance (Balkin & Sheperis, 2011; Burkholder, 2009; Faul et al., 2009; Gupta et al., 2016; Kang, 2021; Sureh & Chandrashekara, 2012)/).

G*Power was used to calculate the necessary sample size to achieve the desired statistical power for this study (Serdar et al., 2021). The calculated sample size uses G*Power for multiple linear regression (see Figure 3) with seven independent variables, a medium effect size (.15), alpha of 0.05, and a desired .80 statistical power is 103 (Faul et al., 2007, 2009; Kang, 2021). Once data were collected, I ran the statistical power calculation again to determine the final statistical power.

Figure 3

GPower Sample Size Analysis: Multiple Linear Regression



Procedures for Recruitment, Participation, and Data Collection

Recruitment

Recruitment was done through postings of flyers in public places like libraries, churches, community centers, and businesses where notices can be posted but permission is not necessary. I also posted my study recruitment materials through social media sites like Facebook, LinkedIn, Instagram, and other sites also posted in the Walden University Participant Pool.

Participation

The survey tool that was used is Qualtrics (Qualtrics.com). The study materials have been built in Qualtrics and can be found in Appendix F. Appendix F indicates exactly what the participant saw once they entered the link to the study. To access the study materials, the potential participant clicked on the link provided in the electronic recruitment material or typed the link to the survey into an Internet browser when they saw the non-electronic recruitment materials.

Once the potential participant clicked the link to the study, they were asked inclusion questions (see Table 1 and Appendix F). If the individual answered all of the questions "yes" they were move on to the informed consent. If they answered any of the inclusion questions "no" they were thanked for their time and exited from the study.

Table 1

Inclusion Questions

Inclusion question	Answer choices
Are you at least 18 years of age?	Yes/No
Were you born in Nigeria?	Yes/No
Did you reside in Nigeria until at least 15 years of age?	Yes/No
Did you move to the United States at the age of 15 or older?	Yes/No
Have you lived in the United States for at least 1 year (12 months)?	Yes/No
Do you have at least one child who is between 3 years old and/or 17 years old that has been diagnosed with diabetes?	Yes/No
Can you read and understand English?	Yes/No

After the inclusion items the potential participants were provided with the informed consent form. If they answered "yes" to the question at the bottom of the informed consent, they were moved on to the demographic items. If they answered "no," they were thanked for their time and exited from the study. Because no names or signatures were collected from participants, their participation was anonymous.

Data Collection

After the participant answered “yes” to the question at the bottom of the informed consent form, they were then asked the demographic items (see Table 2 and Appendix F). Once demographic items were completed, they moved on to the PDDS (see Table 4 and Appendices A and F. After they completed the different sections of the survey they were thanked for their time.

Participants were allowed to leave the study at any time. If a participant left the study part way through (blank items within the instrument) I did not use their data in the data analyses. If they did not complete some of the demographics but completed the instrument, I used their data in data analyses. Determining if a participant’s data were excluded from the data analyses was done during the data cleaning part of the process. I continued data collection until I reached the necessary sample size of 103 and got permission from my committee chair to end data collection.

Instrumentation and Operationalization of Constructs

Demographic Form

Participant demographic information including age, gender, education level, gender of child, age of child, time since child’s initial diabetes diagnosis, and parent’s diabetes diagnosis status are included in the demographic form items. This was created by the researcher and reviewed by the committee. Items and coding can be found in Table 2 (see also Appendix F).

Table 2

Demographic Items and Coding

Variable	Question	Choices and coding	Recoding (if applicable)
Age	What is your age in years?	Actual age in years	18-24 = 0 25-29 = 1 30-39 = 2 40-49 = 3 50-59 = 4 60+ = 5
		99 = Prefer not to answer	99 = Missing
Gender	What is your gender?	0 = Male 1 = Female 99 = Prefer not to answer	0 = Male 1 = Female 99 = Missing
Education Level	What is the highest level of education you have completed?	0 = Below High School 1 = High school/GED 2 = Some College 3 = Associates Degree 4 = Bachelor's Degree 5 = Master's Degree 6 = PhD/PostDoctoral 99 = Prefer not to answer	0 = Below HS/HS/GED 1 = Some College/Assoc 2 = Undergraduate Degree 3 = Graduate Degree 99 = Missing
Gender of child	What is the gender of your child with diabetes?	0 = Male 1 = Female 99 = Prefer not to answer	0 = Male 1 = Female 99 = Missing
Age of child	What is the age of your child with diabetes in years?	Actual age in years 99 = Prefer not to answer	Recode into months (Years x 12) 99 = Missing
Time since child's initial diabetes diagnosis	How long ago was your child diagnosed with diabetes (in years and months)?	Actual years and months	Recode into months (Years x 12 plus additional months)
Parent's diabetes diagnosis status	Do you have diabetes?	0 = No 1 = Yes 99 = Prefer not to answer	0 = No 1 = Yes 99 = Missing

Parent Diabetes Distress Scale

The PDDS is a 20-item self-report scale that highlights four critical dimensions of parent-related distress around diabetes management: personal distress, teen management distress, parent/teen relationship distress, and health care team distress (Hessler et al., 2016). The tool was developed for parents of teens with diabetes in consultation with patients and professionals from multiple disciplines (Polonsky et al, 2005). Permission to use the instrument can be found in Appendix B. Permission to edit the instrument to change “teen” to “child” can be found in Appendix C.

The total score on the overall instrument ranges from 0-80 (20 items x maximum score of 4 on each item = 80; minimum score of 0 on each item = 0). Scores on each of the scales depend on the number of items in that scale (see Table 4). Moderate distress is determined by calculating the mean for the entire instrument (or scale) with a mean score of 2 or greater indicating moderate distress in that area. For the purpose of this study, only total instrument score was used in the linear regression to answer the research question. However, scale scores and means for the overall instrument and scales were calculated and reported in the sample descriptives.

Table 3

Scoring of the PDDS

Scale	Number of items	Range of scoring	Distress
Overall Instrument	20	0-80	
Personal Distress Scale	6	0-24	
Teen Management Distress Scale	4	0-16	Mean>2=Moderate distress or greater
Parent/Teen Relationship Distress Scale	8	0-32	
Healthcare Team Distress Scale	2	0-4	

The PDDS is a useful tool in promoting clinical practice and providing care among people with diabetes (Chin et al., 2017). The PDDS is reported to be a valid and reliable instrument (Chin et al., 2017; Hedge et al., 2022). The validity and reliability of the PDDS has been established through extensive testing (Chin et al., 2017; Fisher et al., 2012; Schmitt et al., 2016; Zhou et al., 2017). The reliability statistics of the overall instrument have been reported to be 0.920 (Chin et al., 2017) through .94 (Hessler et al., 2016).

In relation to the subscales of the instrument, eight items centered on personal distress deal with parents' concerns on their personal quality of life, a feeling of diabetes taking up their mental and physical energy (these items, Cronbach's a = .96; Hessler et al., 2016). Teen management distress has six items that focus on parent's worries on their teen's diabetes management while away from home (these items, Cronbach's a = .88; Hessler et al., 2016). The three items on parent/teen relationship distress focus on conflicts and disagreements between parents and their teens regarding their inability to work well due to their diabetes (these items, Cronbach's a = .75; Hessler et al., 2016), and two Healthcare team distress items bothered on parent's concern on the inadequacy of medical help/ professional support available for their teen with diabetes (these items, *r* = .75; Hessler et al., 2016).

Table 4

PDDS Reliability Statistics

Scale	Reported reliability	Source
Overall Instrument	0.920 - .94	Chin et al., 2017; Hessler et al., 2016
Personal Distress Scale	.96	Hessler et al., 2016
Teen Management Distress Scale	.88	Hessler et al., 2016
Parent/Teen Relationship Distress Scale	.75	Hessler et al., 2016
Healthcare Team Distress Scale	.75	Hessler et al., 2016

Because I revised the instrument from "teen" to "child" I calculated the Cronbach's alpha once I collected my data. This was done to determine if the instrument was still reliable. I had permission from the original author of the instrument to make these revisions (see Appendix C). I shared the revised instrument and the reliability statistics with the author of the instrument after I received CAO approval of my study. Where the reliability statistics were not within the acceptable values for reliability, I addressed the limitation of the study in Chapter 5.

Data Analysis Plan

Data Cleaning

Once I reached the calculated sample size of at least 103 participants with all survey items completed, I downloaded the data from Qualtrics in the SPSS dataset format. I used SPSS (IBM Version 23) to clean and analyze my data. Before conducting the statistical analysis to answer my research question, I coded and recoded variables as indicated in the instrumentation sections above so that they are correctly coded to report sample descriptives as well as use reliability analyses (for the instrument-overall score and scales) and multiple linear regression analysis. I ensured that the coding of the data was consistent with the coding used in the research instrument.

Sample Descriptives

Aggregate frequencies of participant demographics were provided in order to provide context for generalizability of results. Independent *t* tests were also utilized to determine differences in PDDS scores based on groups within the participant of independent variables of gender (males vs. females); gender of child (males vs. females); education level (<HS vs. >HS), and participant diabetes status (does not have vs. has diabetes) was used to provide more information about the characteristics of the sample.

Multiple Linear Regression (RQ)

The research question for this study is *What is the relationship between parent demographics (age, gender, education level, gender of child, age of child, time since child's initial diagnosis), parent diabetes status, and attitudes about their child's diabetes as measured by the Parent- Diabetes Distress Scale (DDS) in Nigerian parents who live in the United States?* To answer this research question, I utilized multiple linear regression analysis.

Before I proceeded to run the analysis, I needed to first test the assumptions and ensure they were not violated.

Assumption Testing

To analyze data using multiple regression, eight assumptions needed to be met (Laerd Statistics, 2018).

- Assumption 1 states that the independent variable must be measured on a continuous scale (Laerd Statistics, 2018). This is met as the PDDS has a continuous score of 0-80 (Laerd Statistics, 2018).
- Assumption 2 states that there should be two or more independent variables that may be measured at either the continuous or categorical level (Laerd Statistics, 2018). This study has seven independent variables that meet these criteria.
- Assumption 3 is the independence of observation. This assumption was checked using the Durbin-Watson statistic to check independence of residuals (Laerd Statistics, 2018). If this assumption is not met, it is important to ensure no variable is over differenced (Laerd Statistics, 2018).
- Assumption 4 is the need for a linear relationship between the independent and dependent (Laerd Statistics, 2018). This was checked using scatterplots to check for linearity (Laerd Statistics, 2018). If the assumption is not met, the models will need to be revisited. The predictor variable may not be included in the model (Laerd Statistics, 2018).
- Assumption 5 is that there is need for homoscedasticity in the data where variances of residuals are constant. In this case, homoscedasticity was checked by plotting standardized residuals against the unstandardized predicted values

(Laerd Statistics, 2018). Homoscedasticity if not met the response variable can either be transformed or redefined by taking the log, cube/ square root of all values of the response variable, and/or use a rate rather than the raw value to make predictions (Laerd Statistics, 2018).

- Assumption 6 is the absence of multicollinearity which will be done by checking the correlation coefficients and tolerance/VIF values to ensure that two or more independent variables are not highly correlated with each other (Laerd Statistics, 2018). If two or more variables are highly correlated with each other, one or more of the highly correlated variables will be removed from the analysis. If the assumption is not met, it is imperative to remove the predictor variable with the high VIF value (Laerd Statistics, 2018).
- Assumption 7 is that there should be no significant outliers, high leverage points. or highly influential issues, the unusual observed data set (Laerd Statistics, 2018). This unique observation adversely affects the regression equation used to predict the dependent value based on the independent value. I checked this by performing a Durbin-Waformal Durbin-Watson test, if the residuals exhibit autocorrelation (Laerd Statistics, 2018).
- Assumption 8 the residuals need to be normally distributed and not a histogram with super imposed normal curve and Normal P-P Plot, or a normal Q-Q Plot of the studentized residual (Laerd Statistics, 2018). I checked this using plotting in SPSS. In other words, if a normal probability plot of the residuals is approximately linear, it is assumed that the error terms are

normally distributed. If the assumption is not met, it is skewed because the error terms are not normally distributed (Laerd Statistics, 2018).

Multiple Linear Regression Analysis

A multiple linear regression analysis was conducted to address the research question to determine if a statistically significant predictive relationship exists between the independent variables and dependent variables. An alpha level of .05 was used to determine statistical significance (Ferrill et al., 2018). I used the enter method when adding variables to the analysis. The enter method is one of the popular recommended methods utilized for multiple regression analysis (Laerd Statistics, 2018; Ranganathan et al., 2017) and is also a default option on many statistical programs (Ranganathan et al., 2017). The enter method process allows for all variables in a block to be entered simultaneously in a single step, providing equal importance to independent and dependent variables (Ranganathan et al., 2017). The enter method is typically used to test variables and give equal importance without making presumptions (Laerd Statistics, 2018; Ranganathan et al., 2017).

Threats to Validity

External Validity

External validity implies to the extent to which study conclusions can be applied to different circumstances such as population, study locations, and time periods, or the generalizability of a study (Bermingham, 2020; Frankfort-Nahmias et al., 2015; Surbhi, 2017). External validity includes testing reactivity, interaction effect of selection and experimental variables, specificity of variables, reactive effects of experimental arrangements, and multiple treatment interference, as appropriate to the study (Bermingham, 2020; Frankfort-Nahmias et al., 2015). Some of the potential external threats to validity of this study may include the inability for potential participants to complete surveys online due to lack of access to a computer and/or Internet (Qualtrics surveys are internet based, and allows potential participants use secured format to input responses, and complete survey online thereby reducing threats of external validity (Settanni et al., 2018). Although using online surveys was cost effective and convenient, as the identity of participants was anonymous, it might pose a threat to participants who may not be computer savvy or who do not have access (Frankfort-Nahmias et al., 2015).

Purposeful convenience sampling and snowball sampling methods may also be a risk to external validity of the study due to selection bias (Frankfort-Nahmias et al., 2015). Selection bias in this case means that the sampling method is not randomized, and participants who self-selected to participate in the study may not fully represent the characteristics of the overall population (Frankfort-Nahmias et al., 2015). The characteristics of the sample were compared to the population information that was discussed earlier in Chapter 3 and, if the characteristics of the sample did not represent the overall population, I addressed this as a potential limitation of the study in Chapter 5.

Internal Validity

Internal validity which refers to the extent the conclusion of the single study is accurate (Bermingham, 2020; Frankfort-Nahmias et al., 2015; Surbhi, 2017). One way I ensured internal validity was to calculate the Cronbach’s alpha for the overall diabetes distress scale as well as the subscales to ensure that they are at acceptable levels. If they were not, I addressed these as limitations in Chapter 5.

Another potential internal validity issue related to this study was item non-response (Frankfort-Nahmias et al., 2015). In order to avoid this issue, I reviewed the data collected and only included cases where all of the responses on the items on the Diabetes Distress Scale were answered. This could mean that some of the overall population may not be represented in the sample if certain groups do not fill out the survey completely. If they were not, I addressed these as limitations in Chapter 5.

Construct and Statistical Conclusion Validity

Construct validity is the extent to which a theory or a hypothesis is tested or measured using a testing or measuring instrument (Ginty, 2013). It may be said that using a single method for measurement of the dependent variable in this study is a threat to construct validity. Though using this single test measurement instrument may create some concern, the PDDS has been found to be reliable in measuring the attitudes of parents towards the diabetes of their teens (Chin et al., 2017; Hessler et al., 2016). Because I revised the instrument from “teen” to “child,” I calculated the Cronbach’s alpha once I collected my data. This was done to determine if the instrument was still reliable. I have permitted the original author of the instrument to make these revisions (see Appendix C). I shared the revised instrument and the reliability statistics with the author of the instrument after I received the CAO approval of my study. If the reliability statistics are not within the acceptable values for reliability, I addressed this as a limitation of the study in Chapter 5.

Ethical Considerations

The recruitment of research participants and collection of data was not started until after approval was received from the IRB. Recruitment and data collection was completed following the steps outlined previously in this chapter. Participation is voluntary and no incentives were offered for participation. Since no participant identifying information (name, address, email, phone number, etc.) was collected, participation in the study was anonymous. Once potential participants have entered the survey through the provided link, they were asked for inclusion items when they entered the survey to ensure that they qualify to participate in the study. Any individuals who did not answer “yes” to any of the inclusion questions were exited from the survey. Those individuals who met the inclusion criteria had the opportunity to review the informed consent and either responded yes or no to the question asking if they consented to participate in the study. If they answered “no,” they were exited from the survey and thanked for their time. If they answered “yes,” they proceeded with the additional parts of the online survey. The survey in Qualtrics (and corresponding data) was password protected. Any data downloaded was password protected on my computer. Data will be stored per Walden University guidelines for 5 years after CAO approval and then destroyed. A summary of the study findings was provided on the sites where recruitment occurred after CAO approval of the final study (social media sites and physical sites).

Summary

The purpose of this quantitative study was to examine relationship between parent demographics (age, gender, education level, gender of child, age of child, time since child's initial diagnosis), parent diabetes status, and attitudes about their child's diabetes as measured by the PDDS in Nigerian parents who live in the United States. This was important because racial disparity exists in diabetes care and management among immigrant parents (Jasper et al., 2014; Uppal et al., 2017). In Chapter 3, I provided a detailed description of the research design and rationale as well as my plan on how the data needed to answer the research questions were collected and analyzed. Chapter 4 includes a discussion of the data collection process that occurred as well as a discussion of the results including a discussion of the characteristics of the sample and results related to the research question and hypotheses.

Chapter 4: Results

Introduction

The purpose of this quantitative study was to examine the relationship between parent demographics (age, gender, education level, gender of child, age of child, time since child's initial diagnosis), parent diabetes status, and attitudes about their child's diabetes as measured by the PDDS in Nigerian parents who live in the United States. The research question for this study was: What is the relationship between parent demographics (age, gender, education level, gender of child, age of child, time since child's initial diagnosis), parent diabetes status, and attitudes about their child's diabetes as measured by the PDDS in Nigerian parents who live in the United States? The null hypothesis was: There is no statistically significant relationship between parent demographics (age, gender, education level, gender of child, age of child, time since child's initial diagnosis), parent diabetes status, and attitudes about their child's diabetes as measured by the PDDS in Nigerian parents who live in the United States. The alternative hypothesis was: There is a statistically significant relationship between parent demographics (age, gender, education level, gender of child, age of child), parent diabetes status, and attitudes about their child's diabetes as measured by the PDDS in Nigerian parents who live in the United States. In this chapter, I discussed data collection and results of the study.

Data Collection

I received IRB approval on September 8, 2023 (Approval No. 09-08-23-0508775). I continued to post and repost my electronic recruitment materials on

Facebook and Instagram on a regular basis. Printed recruitment materials were also dropped off at physical sites such as laundromats, African grocery stores, and libraries in my community that did not require permission to post flyers. I could not post on LinkedIn even though it was listed as one of the potential recruitment sites because of my nonmember status. Facebook suspended my account at one point during the recruitment period but later reinstated it after they confirmed the authenticity of the account.

Participation was slow even though recruitment materials indicated that individuals who saw my recruitment materials could forward them to others. My committee chair and I communicated via email often to discuss how many individuals had completed all elements of my survey (following the completion guidelines discussed in Chapter 3). On February 26, 2024 (approximately 6 months of data collection), it was decided by my committee (and program leadership) that I could stop data collection as I had 57 responses with the understanding that I would calculate the final statistical power with this sample size and address sample size/statistical power as a limitation of the study. Data collection was officially closed on February 27, 2024.

Descriptives

Sample Demographics

The demographic characteristics of the participants in the study include age, gender, highest level of education and gender of child with diabetes (Table 5). The largest number of participants were in the 50 to 59 age group (36.8%). The majority were female (64.9%), and the majority have a Bachelor's degree (54.4%). The majority of my participants do not have diabetes themselves (75%). Nearly half (49.1%) of the participants reported that their child with diabetes is a male and the mean age of the child with diabetes for the sample is 12.6 years. The mean number of months since diagnosis for the children of my participants was 36.6 (slightly over 3 years).

Table 5

Sample Demographics (n = 57)

Variable	Category	Percent (*n*)
Age	18-24	--
	25-29	3.5% (2)
	30-39	10.5% (6)
	40-49	29.8% (17)
	50-59	36.8% (21)
	60+	12.3% (7)
	Prefer not to answer	7.0% (4)
Gender	Male	35.1% (20)
	Female	64.9% (37)
	Prefer not to answer	--
Education level	Below High School	--
	High School? GED	12.3% (7)
	Some College	12.3% (7)
	Associate Degree	21.1% (12)
	Bachelor Degree	54.4% (31)
Parent diabetes status	Yes (diabetes)	63.2% (36)
	No	21.1% (12)
	Prefer not to answer	15.7% (9)
Gender of child living with diabetes	Male	49.1% (28)
	Female	45.6% (26)
	Prefer not to answer	5.3% (3)
Mean age of child with diabetes (Years)	12.6 years (48)	
Mean months since child diabetes diagnosis	36.6 months (48)	

Table 6 contains the frequencies of responses for each of the questions on the PDDS). It also contains the number of responses for each item and the mean score for each item.

Table 6

Parent Diabetes Distress Scale (PDDS) Frequencies and Means (N = 57)

#	Item	Not at all (0)		A little (1)		Somewhat (2)		A lot (3)		A great deal (4)		*M*
1	Feeling that my child and I just don't work well together when it comes to diabetes.	28.1%	(16)	24.6%	(14)	35.1%	(20)	7.0%	(4)	5.3%	(3)	1.37
2	Feeling unappreciated for all the ways I try to help my child manage diabetes.	40.4%	(23)	21.1%	(12)	15.8%	(9)	17.5%	(10)	5.3%	(3)	1.26
3	Feeling that I can't trust my child to take good care of his/her diabetes.	10.5%	(6)	15.8%	(9)	24.6%	(14)	28.1%	(16)	21.1%	(12)	2.33
4	Worrying about my child's low blood sugars when he/she is away from home.	5.3%	(3)	7.0%	(4)	7.0%	(4)	47.4%	(27)	33.3%	(19)	2.96
5	Worrying that my child will ignore or forget diabetes if I don't keep reminding him/her.	8.8%	(5)	10.5%	(6)	12.3%	(7)	38.6%	(22)	29.8%	(17)	2.70
6	Feeling that diabetes is taking up too much of my mental and physical energy every day.	10.5%	(6)	14.0%	(8)	21.1%	(12)	33.3%	(19)	21.1%	(12)	2.40
7	Feeling that trying to help my child with his/her diabetes is always a battle.	10.5%	(6)	15.8%	(9)	24.6%	(14)	35.1%	(20)	14.0%	(8)	2.26
8	Worrying about my child's low blood sugars when he/she is sleeping.	15.8%	(9)	17.5%	(10)	10.5%	(6)	33.3%	(19)	22.8%	(13)	2.30
9	Feeling that no one notices that diabetes is hard on me, not just on my child.	8.8%	(5)	21.1%	(12)	22.8%	(13)	28.1%	(16)	19.3%	(11)	2.28
10	Feeling that my child doesn't do enough to manage his/her diabetes.	8.8%	(5)	12.3%	(7)	21.1%	(12)	33.3%	(19)	24.6%	(14)	2.53
11	Worrying that my child doesn't have the right doctor for him/her.	52.6%	(30)	14.0%	(8)	17.5%	(10)	14.0%	(8)	1.8%	(1)	.98

#	Item	Not at all (0)		A little (1)		Somewhat (2)		A lot (3)		A great deal (4)		*M*
12	Worrying that others will blame me if my child's diabetes is not well controlled.	7.0%	(4)	5.3%	(3)	12.3%	(7)	21.1%	(12)	54.4%	(31)	3.11
13	Worrying that my child will soon leave home and I cannot protect him/her.	15.8%	(9)	10.5%	(6)	14.0%	(8)	35.1%	(20)	24.6%	(14)	2.42
14	Frustrated because my child ignores my suggestions about diabetes.	12.3%	(7)	15.8%	(9)	29.8%	(17)	29.8%	(17)	12.3%	(7)	2.14
15	Frustrated by the lack of understanding and support for diabetes I get from friends and family members.	17.5%	(10)	17.5%	(10)	22.8%	(13)	38.6%	(22)	3.5%	(2)	1.93
16	Worrying that my child doesn't get all of the expert medical help he/she needs.	28.1%	(16)	29.8%	(17)	24.6%	(14)	14.0%	(8)	3.5%	(2)	1.35
17	Feeling uncertain about how to motivate my child to take better care of his/her diabetes.	14.0%	(8)	22.8%	(13)	22.8%	(13)	36.8%	(21)	3.5%	(2)	1.93
18	Concerned that my child is not prepared to deal with the world of insurance and doctors once he/she is an adult.	10.5%	(6)	10.5%	(6)	17.5%	(10)	36.8%	(21)	24.6%	(14)	2.54
19	Frustrated that I am the only one who takes responsibility for helping my child manage diabetes.	17.5%	(10)	19.3%	(11)	19.3%	(11)	28.1%	(16)	15.8%	(9)	2.05
20	Worrying that my nagging about diabetes is hurting my relationship with my child.	17.5%	(10)	15.8%	(9)	26.3%	(15)	29.8%	(17)	10.5%	(6)	2.00

Table 7 provides the means of the overall instrument as well as on each of the subscales of the PDDS instrument for my sample. The overall instrument score had a mean of 2.14, with 67% of respondents scoring 2.0 or higher.

Table 7

Parent Diabetes Distress Scale (PDDS) Total and Scale Mean Scores (N = 57)

Scale	Sample mean	0-1.99	2.0+
Overall instrument (0-80)	2.1430	33.3% (19)	66.7% (38)
Personal Distress Scale (0-24)	2.1725	33.3% (19)	66.7% (38)
Teen Management Distress Scale (0-16)	2.5570	19.3% (11)	80.7% (46)
Parent/Teen Relationship Distress Scale (0-32)	2.1579	35.1% (20)	64.9% (37)
Healthcare Team Distress Scale (0-8)	1.1667	70.2% (40)	29.8% (17)

Table 8 presents the results of conducting Cronbach's alpha. In general, a Cronbach's alpha value above 0.70 indicates satisfactory reliability, while values above 0.80 are considered good, and values above 0.90 are excellent (Nunnally & Bernstein, 1994). The overall instrument demonstrates high internal consistency, with a Cronbach's alpha of 0.893. Overall, these findings suggest that the PDDS has good reliability for the overall instrument (0.893) and parent/teen relationship scale (0.804) and less than satisfactory reliability for the personal distress scale (0.672), teen management distress scale (0.605), and healthcare team distress scale (0.510). Since I used the overall score from the PDDS, my study results were considered reliable. However, the Cronbach's alpha results for personal distress, teen management distress, and healthcare team distress scales are discussed further in the limitations of the study and recommendations for future research parts of Chapter 5.

Table 8

Parent Diabetes Distress Scale (PDDS) Reliability Results (N = 57)

Scale	Chronbach's alpha
Overall Instrument Score	0.893
Personal Distress Scale	0.672
Teen Management Distress Scale	0.605
Parent/Teen Relationship Distress Scale	0.804
Healthcare Team Distress Scale	0.510

Independent Sample *t*-Test Results

PDDS Score Difference by Gender

An independent sample *t*-test analysis was completed to determine if there were statistically significant differences in total score on the PDDS between male and female participants (see Table 9). Equal variances were assumed (p = .712) and there is a statistically significant difference in the total score between males and females (p = .033). The mean total score for male participants being higher (M = 48.30) than female participants (M = 39.92).

Table 9

Independent Sample t-Test Results for Total Score on PDDS by Gender

		Levene's Test for equality of variances		*t* test for equality of means						
									95% confidence interval of the difference	
		F	Sig.	*t*	*df*	Sig. (2-tailed)	*M* difference	*SE* difference	Lower	Upper
Total PDSS Score	Equal variances assumed	.138	**.712**	2.182	55	**.033**	8.38108	3.84111	.68333	16.07884
	Equal variances not assumed			2.223	41.218	.032	8.38108	3.76965	.76934	15.99282

PDDS Score Difference by Gender of Child

An independent sample *t*-test analysis was completed to determine if there were statistically significant differences in total score on the PDDS between gender of child (see Table 10). Equal variances were assumed (p = .385) and there is a statistically significant difference in the total score between parents of males and female children (p = .039). The mean total score for parents of male children (M = 47.71) was higher than parents of female children (M = 40.46).

Table 10

PDDS Score Difference by Gender of Child

		Levene's Test for equality of variances		*t* test for equality of means						
									95% confidence interval of the difference	
		F	Sig.	*t*	*df*	Sig. (2-tailed)	*M* difference	*SE* difference	Lower	Upper
Total PDSS Score	Equal variances assumed	.768	**.385**	2.115	52	**.039**	7.25275	3.42928	.37139	14.13410
	Equal variances not assumed			2.098	47.947	.041	7.25275	3.45750	.30078	14.20472

PDDS Score Difference by Education Level

An independent sample *t*-test analysis was completed to determine if there were statistically significant differences in total scores on the PDDS between different levels of parental education (see Table 11). Equal variances were assumed (p = .455) and there is no statistically significant difference in the total score of participants who completed high school or above and those who completed education below high school (p = .759).

Table 11

PDDS Score Difference by Educational Status

		Levene's Test for equality of variances		*t* test for equality of means						
									95% confidence interval of the difference	
		F	Sig.	*t*	*df*	Sig. (2-tailed)	M difference	SE difference	Lower	Upper
Total PDSS Score	Equal variances assumed	.567	**.455**	.308	55	**.759**	1.79429	5.81688	-9.86301	13.45158
	Equal variances not assumed			.399	9.710	.698	1.79429	4.49325	-8.25801	11.84658

PDDS Score Difference by Parental Diabetes Status

An independent sample *t*-test analysis was completed to determine if there were statistically significant differences in total score on the PDDS between participant diabetes diagnosis status (see Table 12). Equal variances were assumed (p = .730) and there is no statistically significant difference in the total score of participants who have diabetes and those who do not (p = .867).

Table 12

PDDS Score Difference by Parent Diabetes Status

		Levene's Test for equality of variances		*t* test for equality of means						
									95% confidence interval of the difference	
		F	Sig.	*t*	*df*	Sig. (2-tailed)	*M* difference	*SE* difference	Lower	Upper
Total PDSS Score	Equal variances assumed	.120	**.730**	.169	46	**.867**	.86111	5.10075	-9.40617	11.12839
	Equal variances not assumed			.164	17.990	.872	.86111	5.25611	-10.18201	11.90423

Research Question 1

Assumption Testing

Before completing multiple linear regression analyses, eight assumptions need to be tested (Laerd Statistics, 2018). I tested each of the assumptions of multiple linear regression and the results are below. If the assumption was not met, I indicated what actions were taken.

Assumption 1. The first assumption of a multiple linear regression is that the dependent variable must be measured on a continuous scale (Laerd Statistics, 2018). The PDDS total score is the dependent variable and is measured on a continuous scale. Therefore, this assumption is met.

Assumption 2. The second assumption of a multiple linear regression is that there should be two or more independent variables that may be measured at either the continuous or categorical level (Laerd Statistics, 2018). This study has seven independent variables that meet these criteria. Therefore, this assumption is met.

Assumption 3. The third assumption of a multiple linear regression is the independence of observation. This assumption was checked using the Durbin-Watson statistic to check independence of residuals (Laerd Statistics, 2018). The statistic ranges from 0 to 4 and the assumption is met when the value is close to 2 (Laerd Statistics, 2018). The Durbin-Watson value for this test was .913 which did not meet the assumption. Since this assumption is not met, it can be considered as a limitation, and the results need to be interpreted carefully.

Table 13

Durbin-Watson Test Results

Model Summary[b]

Model	R	R Square	Adjusted R Square	*SE* of the Estimate	Durbin-Watson
1	.474[a]	.225	.065	.66800	**.913**

[a] Predictors: (Constant), Parent diabetes status, Age of your child with diabetes, Months since child diabetes diagnosis, Level of education, Gender of child living with diabetes, Gender, Age. [b] Dependent Variable: Total PDDS Score--Distress Level Mean

Assumption 4. The fourth assumption is a need for a linear relationship between the independent and dependent variables (Laerd Statistics, 2018). This was checked using scatterplots to check for linearity (Laerd Statistics, 2018). The scatterplots showed that the assumption was met for each of the variables (see Figures 4-10 below).

Figure 4

Age and Total PDDS Score Linearity Assumption Testing

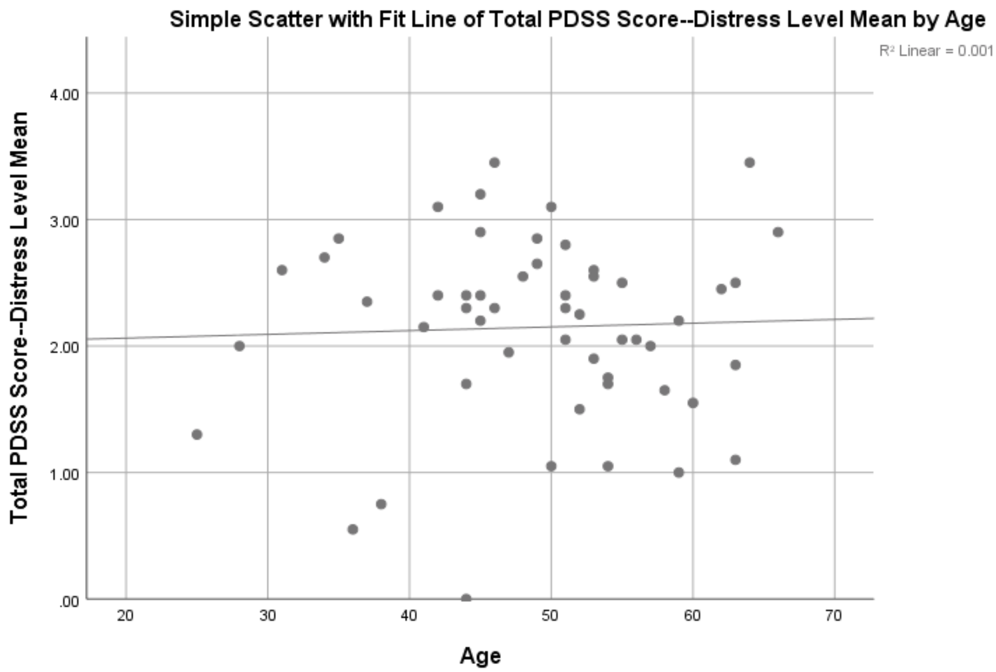


Figure 5

Gender and Total PDDS Score Linearity Assumption Testing

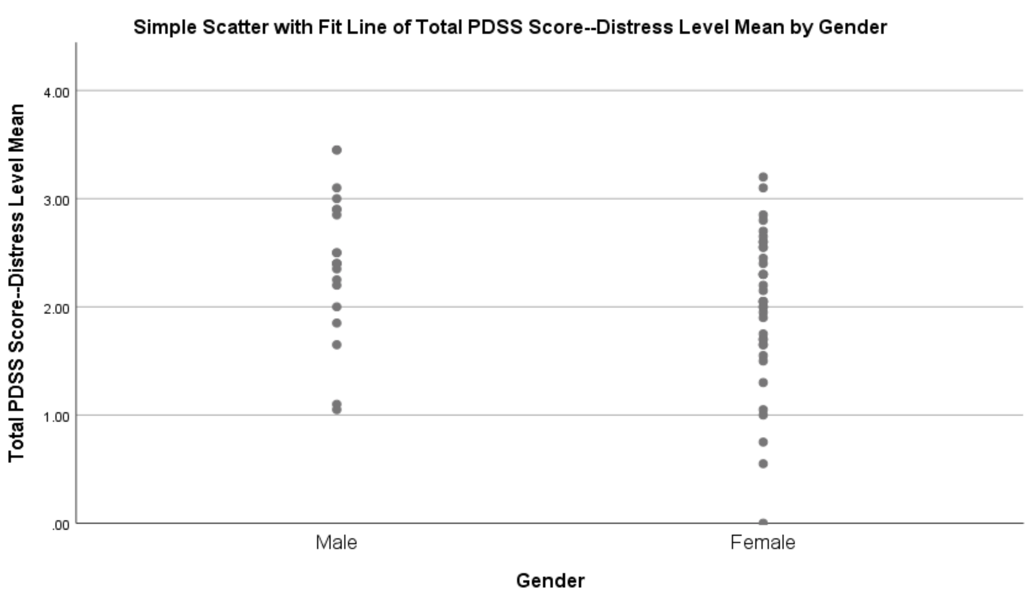


Figure 6

Level of Education and Total PDDS Score Linearity Assumption Testing

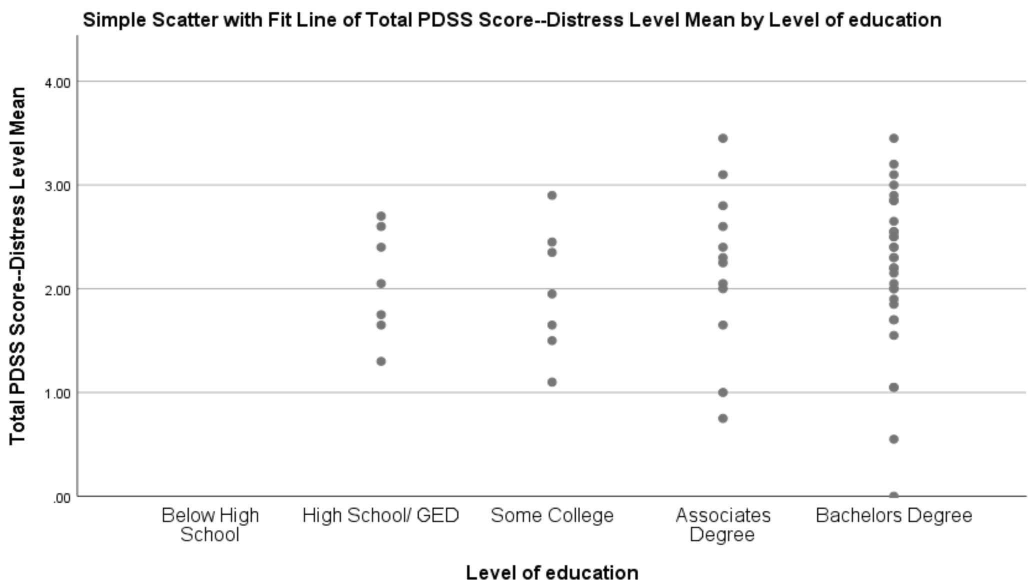


Figure 7

Gender of Child with Diabetes and Total PDDS Score Linearity Assumption Testing

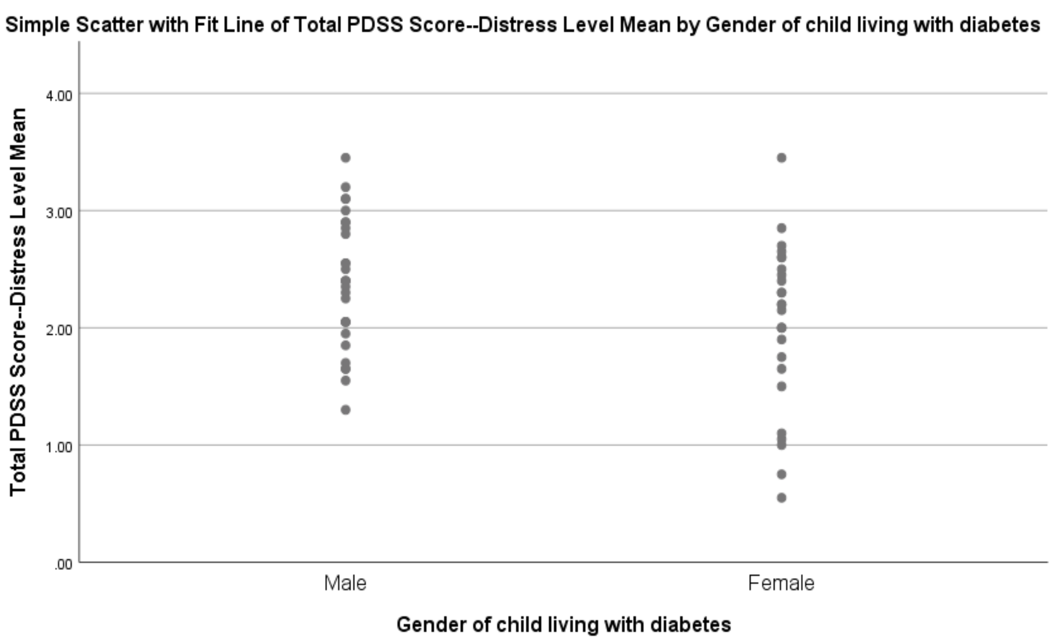


Figure 8

Age of Child with Diabetes and Total PDDS Score Linearity Assumption Testing

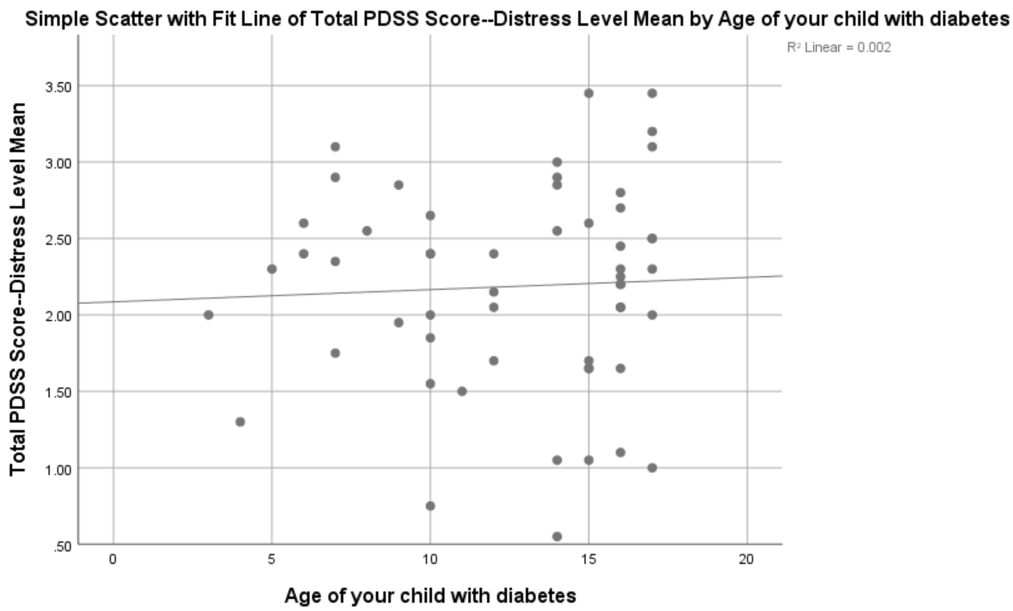


Figure 9

Months Since Child Diabetes Diagnosis and Total PDDS Score Linearity Assumption Testing

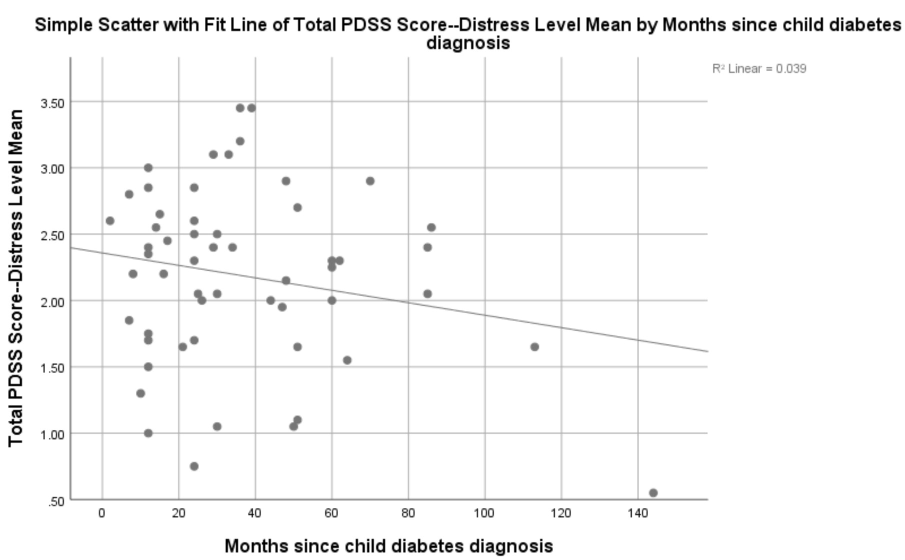
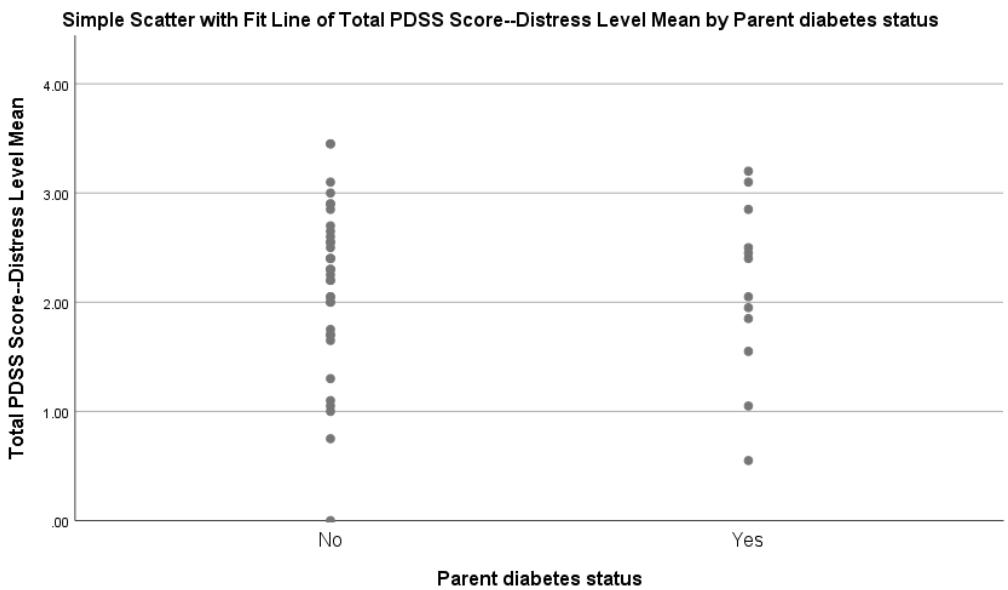


Figure 10

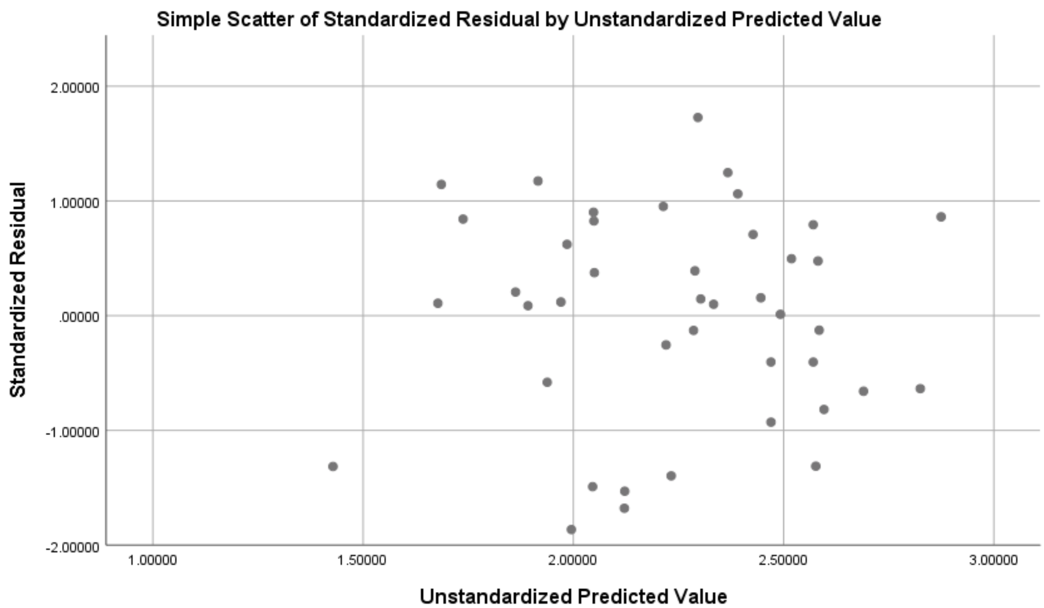
Parent Diabetes Status and Total PDDS Score Linearity Assumption Testing



Assumption 5. The fifth assumption of a multiple linear regression is that there is need for homoscedasticity in the data where variances of residuals are constant. In this case, homoscedasticity was checked by plotting standardized residuals against the unstandardized predicted values (Laerd Statistics, 2018). The graph (see Figure 11) reveals a random array of dots which indicates that the variation on the residuals is similar at each point of the model which indicates homoscedasticity is met.

Figure 11

Homoscedasticity Assumption Testing



Assumption 6. The sixth assumption of a multiple linear regression is that the absence of multicollinearity which was carried out by checking the Pearson's correlation, tolerance, and variance inflation factor (VIF) values to ensure that two or more independent variables are not highly correlated with each other (Laerd Statistics, 2018). The highest value of correlation was .549 (age of child with diabetes and parents' age; see Table 14) which indicates no multicollinearity between any of these variables because all Pearson's correlations were below 0.7.

Table 14

Pearson's Correlation Results

	Total PDSS Score	Age	Gender	Level of education	Gender of child living with diabetes	Age of your child with diabetes	Months since child diabetes diagnosis	Parent diabetes status
Total PDSS Score	1							
Age	0.038	1						
Gender	-0.282	-0.332	1					
Level of education	0.075	0.184	-0.156	1				
Gender of child living with diabetes	-0.281	-0.052	0.125	-0.013	1			
Age of your child with diabetes	0.048	0.549	-0.181	0.168	0.064	1		
Months since child diabetes diagnosis	-0.198	0.024	-0.022	0.02	-0.047	0.152	1	
Parent diabetes status	-0.025	0.187	-0.149	0.137	-0.161	0.062	0.195	1

A VIF value of 5 or more and a tolerance level of 0.10 or lower represents a potential multicollinearity problem (Hair et al., 2014). All VIF values are below 5 and all tolerance values are above 0.10 for these data. This shows that multicollinearity does not exist. Based on the results of the VIF, and tolerance analyses (see Table 15), multicollinearity does not exist, and this assumption is met.

Table 15

VIF and Tolerance Test Results

Model		Collinearity statistics	
		Tolerance	VIF
1	(Constant)		
	Age	.711	1.406
	Gender	.843	1.186
	Level of education	.911	1.098
	Gender of child living with diabetes	.934	1.071
	Age of your child with diabetes	.760	1.315
	Months since child diabetes diagnosis	.907	1.102
	Parent diabetes status	.876	1.141

Note. Dependent Variable: Total PDDS Score--Distress Level Mean.

Assumption 7. The seventh assumption is that there should be no significant outliers (Laerd Statistics, 2018). This assumption was tested using casewise diagnosis. If a standardized residual is greater than ±3 standard deviations then this assumption would be violated (Laerd Statistics, 2018). The standardized residuals range between -1.864 and 1.727. Therefore, this assumption is met.

Table 16

Casewise Diagnosis of Residuals

	Minimum	Maximum	*M*	*SD*	*N*
Predicted Value	28.5675	57.4909	44.8333	6.54671	42
Residual	-24.90412	23.07788	.00000	12.16612	42
Std. Predicted Value	-2.485	1.933	.000	1.000	42
Std. Residual	**-1.864**	**1.727**	.000	.911	42

Note. Dependent Variable: Total PDDS Score.

Assumption 8. The eighth assumption is residuals need to be normally distributed and not a histogram with super imposed normal curve and Normal P-P Plot, or a normal Q-Q Plot, of the standardized residual (Laerd Statistics, 2018). The normal curve follows the pattern of the histogram and the P-P plot showed that the dots lie on the diagonal line which indicates that the standardized residuals are normally distributed (see Figures 12 and 13). Therefore, this assumption was met.

Figure 12

Normal Curve Normality of Residual Assumption Testing

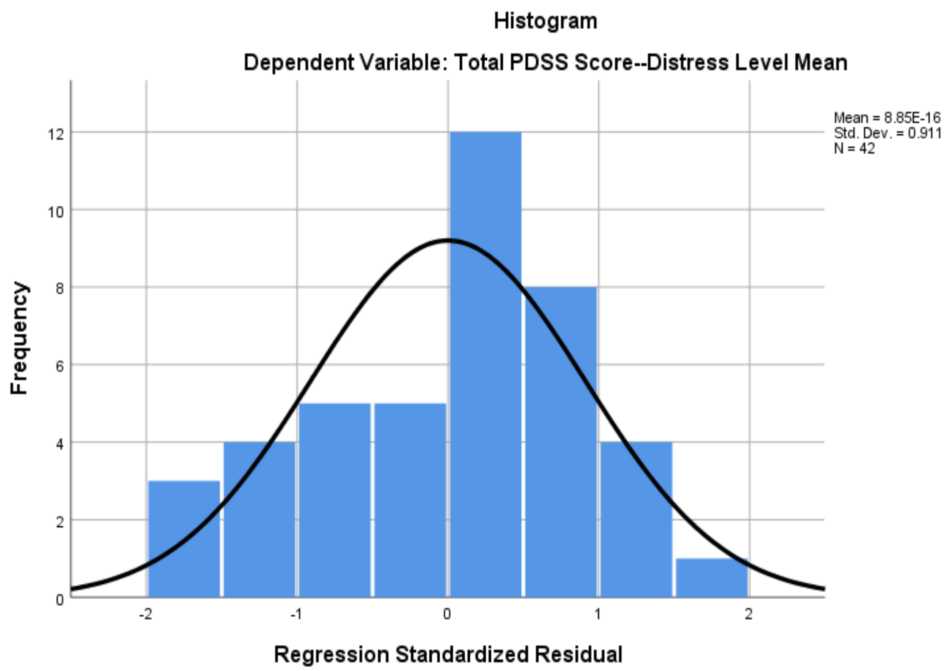
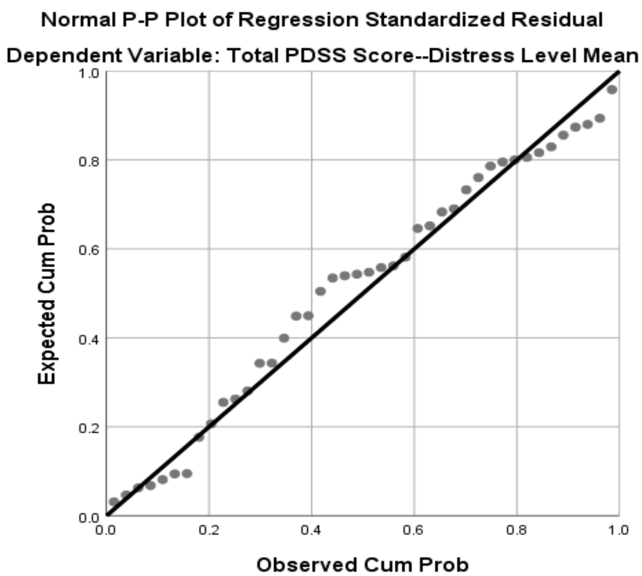


Figure 13

Normal P-P Plot Normality of Residual Assumption Testing



RQ1 Results of Multiple Linear Regression

A multiple regression analysis was conducted to determine if there was a statistically significant relationship between demographics (age, gender, education level, gender of child, age of child, time since child's initial diagnosis, diabetes status), and parents' attitudes about their child's diabetes as measured by the PDDS in Nigerian parents who live in the United States. With a sample size of 57, effect size of .15, alpha of .05, and 7 predictors the post hoc achieved statistical power was 47%. This was a limitation of the study, and the results should be interpreted cautiously. The gender of child living with diabetes ($\beta = -0.448$; $p = .044$) was the only independent variable related to parents' attitudes about their child's diabetes at a statistically significant level. Participants with a female child living with diabetes had a PDDS score that was predicted to be 44.8% less than participants with a male child living with diabetes (see Table 17).

Because all independent variables were not related to the dependent variable at statistically significant levels the null hypothesis was retained.

Table 17

Regression Coefficient and Test of Their Significance

Model	Unstandardized coefficients		Standardized coefficients		
	B	*SE*	Beta	*t*	Sig.
1 (Constant)	2.988	.802		3.724	.001
Age	-.007	.014	-.086	-.478	.636
Gender	-.310	.231	-.220	-1.339	.189
Level of education	.086	.104	.131	.829	.413
Gender of child living with diabetes	**-.448**	.214	-.327	-2.090	**.044**
Age of your child with diabetes	.030	.031	.172	.995	.327
Months since child diabetes diagnosis	-.004	.004	-.169	-1.068	.293
Parent diabetes status	-.278	.244	-.184	-1.139	.262

Note. Dependent Variable: Total PDDS Score--Distress Level Mean.

Summary

The purpose of this quantitative study was to examine the relationship between parent demographics (age, gender, education level, gender of child, age of child, time since child's initial diagnosis), parent diabetes status, and attitudes about their child's diabetes as measured by the PDDS in Nigerian parents who live in the United States. The results of the multiple linear regression analysis indicated gender of child living with diabetes (β =- 0.448; p = .044) was the only independent variable related to parents' attitudes about their child's diabetes at a statistically significant level. Participants with a female child living with disabilities had a PDDS score that was predicted to be 44.8% less than participants with a male child living with diabetes. Because all independent variables were not related to the dependent variable at statistically significant levels the null hypothesis was retained. In Chapter 5, I discuss the interpretation of the research findings, limitations of the study, recommendations, and implications of the study.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

In this quantitative study, I examined the relationship between parent demographics (age, gender, education level, gender of child, age of child, time since child's initial diagnosis), parent diabetes status, and attitudes about their child's diabetes as measured by the PDDS in Nigerian parents who live in the United States. Previous researchers have found conflicting results regarding the associations between diabetes and racial/ ethnic background (Uppal et al., 2017). In this study I explored factors relating to participation in diabetes or adherence to recommended self-care or management methods (Brorsson et al., 2017; Deeb et al., 2018; Sohn & Rowe, 2015). The results from this study may help inform targeted attitudes/ behaviors and culturally appropriate approaches to increase the awareness and care of diabetes among children of Nigerian parents and decrease the disparity observed between diabetic cases and death.

The research question for this study was: What is the relationship between parent demographics (age, gender, education level, gender of child, age of child, and time since child's initial diagnosis), parent diabetes status, and attitudes about their child's diabetes as measured by the PDDS in Nigerian parents who live in the United States? The null hypothesis was: There is no statistically significant relationship between parent demographics (age, gender, education level, gender of child, age of child, and time since child's initial diagnosis), parent diabetes status, and attitudes about their child's diabetes as measured by the PDDS in Nigerian parents who live in the United States. The results of the multiple linear regression analysis indicated the gender of child living with diabetes (p = .044) was the only independent variable related to parents' attitudes about their child's diabetes at a statistically significant level. Participants with a female child living with diabetes had a PDDS score that was predicted to be 44.8% less than participants with a male child living with diabetes. Because all independent variables were not related to the dependent variable at statistically significant levels the null hypothesis was retained. In this chapter, I provide an interpretation of my study findings, limitations of the study, recommendations, implications, and an overall conclusion for the study.

Interpretation of Findings

Interpretation of Findings in Relation to the Theoretical Foundation

In this study, I collected data from parents of children who had been diagnosed with diabetes, some of whom have been diagnosed with diabetes themselves. The demographics included in the multiple linear regression included parent demographics (age, gender, education level, gender of child, age of child, and time since child's initial diagnosis), parent diabetes status, and attitudes about their child's diabetes as measured by the PDDS. The results of the multiple linear regression analysis indicated gender of child living with diabetes (β = -0.448; p = .044) was the only independent variable related to parents' attitudes about their child's diabetes at a statistically significant level. Participants with a female child living with diabetes had a PDDS score that was predicted to be 44.8% less than participants with a male child living with diabetes. Based on the information I found, synthesized, and discussed in Chapter 2, the results of my study generally did not match with what I anticipated based on the tenets of the theoretical foundation (HBM and TPB) and previous research in both theories.

Health Belief Model

The HBM indicates that health behavior is primarily due to individual's beliefs or perception of threats to wellness or potential risks of health problems, and the potential outcome of their behavior (Glanz et al., 2008; Hayden, 2014). The components of the HBM and the similarities and differences in my results and the literature related to the theory are discussed below. These include perceived susceptibility, perceived severity, perceived benefits, perceived barriers, perceived self-efficacy, cue to action, and action.

Perceived Susceptibility. Perceived susceptibility is the perceived personal risk related to the disease (Hayden, 2014). The demographic variable that I would consider to be the most related to this component of the HBM would be the parent's diabetes status. If a parent has diabetes themselves then it would be logical that the parent may also be more likely to believe that their child could also develop diabetes (ADA, 2009). An individual who has diabetes, if they are under medical care, should know what types of behaviors would make one more susceptible to developing diabetes over time. For example, behaviors that have been found to be related to developing diabetes include being overweight, genetics and family health history, and physical inactivity (CDC, 2021; WHO, 2021). It would then seem that the parental diabetes status would have been related to the attitudes that parents have about their child's diabetes as measured by the PDDS at a statistically significant level. However, this was not the case as parental diabetes status was not related to the PDDS total score at a statistically significant level.

Although not related to the null hypothesis and research question, this was also seen in the independent *t*-test results where I did not find a statistically significant difference between PDDS scores from parents with and without a diagnosis of diabetes. This result surprised me when interpreted alongside the literature related to this component of the HBM.

Perceived Severity. Perceived severity is how the individual views the life-threatening potential of the disease (Glanz et al., 2008; Hayden, 2014). This can come from previous knowledge or experience of a disease, through knowing someone who experienced a disease, or from advice from medical professionals (Hayden, 2014). The perceived severity of the disease and knowledge of the potential consequences may result in the individual engaging in behaviors that could prevent or reduce the severity of a disease or avoid the disease completely (Glanz et al., 2008; Hayden, 2014). It was anticipated that parents who have diabetes would be more concerned about their child's blood sugar level and how likely the child's diabetes would worsen if the parent were not diligent in monitoring the health behaviors of the child.

However, the parent diabetes status was not found to be related to the PDDS total score at a statistically significant level and the results of my independent *t*-test results also did not indicate a statistically significant difference between PDDS scores from parents with and without a diagnosis of diabetes. Many individuals with diabetes have been found to fear the health risks and complications of diabetes while many others have fewer concerns that these will develop (Hayden, 2014). The complications may be acute or chronic, such as increase or low blood sugar, blurry or loss of eyesight, loss of limbs, renal problems, and/or cardiac problems (CDC, 2021; WHO, 2021). Parents who feared these complications or conditions for themselves have been found in previous studies to be wary of similar outcomes for their children with diabetes and have been found to be prone to better adhere to medical recommendations (Hayden, 2014; Sabzmaken et al., 2013; Sabzmakan et al., 2013). This perception is usually based on previous knowledge or experience of a disease, either from knowing someone who experienced the disease, or from medical/ professional advice. One thing that I did not include in my study was a measurement of the severity of the diabetes of the parent and/or if they have had any other medical issues related to their diabetes. If the parent had had medical complications due to their diabetes this may have resulted in a higher perceived severity of diabetes that may have been reflected in the results. Since I did not measure this, I will discuss this in the recommendations for future research section of Chapter 5 as something that researchers may want to include in future studies.

Perceived Benefits. Perceived benefits include perceived value, efficacy, or usefulness of engaging in health behavior in relation to the amount of effort required to acquire the perceived benefits of the behavior (Hayden, 2014). Glanz et al. (2008) explained that for a behavior to change and/or be maintained, potential benefits of engaging in need to be seen as a benefit to the individual. These benefits may be short term and/or long term and involve improving and/or maintaining health (Hayden, 2014). For a behavior to change, potential benefits of engaging in changing the behavior are considered by the individual (Glanz et al., 2008). The construct of perceived benefits is about positive outcomes associated with the behavior in relation to the perceived threat, and the benefit must outweigh the efforts to get that benefit (CDC, 2004; Wang & Hagins, 2016). In this study, parental education level was considered most relevant to this component of HBM. Some researchers have demonstrated that higher education levels are associated with increased literacy and a greater appreciation of the benefits of preventive health behaviors (Knowles et al. 2017). Contrary to expectations, I found no statistically significant relationship between parental education level and PDDS scores. This finding echoes previous researchers who found that while education influences knowledge of health benefits, it does not always translate into reduced stress or improved attitude towards chronic disease management (Ruggiero et al., 2015). Therefore, there is a need for further studies to investigate the potential relationship between education level and PDDS scores.

Perceived Barriers. The perceived barriers that an individual believes that they may encounter when engaging in a health behavior change may result in them not attempting to make that change based on the effort that an individual would need to expend in relation to changing their behavior (Glanz et al., 2008; Seguin et al., 2014). Researchers have found that parents face some barriers in how others will judge them if they did not take care of their children with diabetes or put measures in place that will enhance health maintenance of their diabetes (Theofilou & Vlastos, 2023). Parents can become frustrated by the lack of understanding and support for diabetes they get from friends and family members, and practical challenges such as financial constraints, limited access to care, and educational resources (Theofilou & Vlastos, 2023). I found that the gender of child living with diabetes (p = .044) was the only independent variable related to parents' attitudes about their child's diabetes at a statistically significant level. Participants with a female child living with diabetes had a PDDS score that was predicted to be 0.448 less than participants with a male child living with diabetes. This result may be related to the fact that societal gender roles often dictate different expectations for caregiving and health management (Sharma, 2016). For instance, parents of male children may feel heightened pressure due to traditional norms that emphasize that boys' health and prospects, lead to greater frustration when support systems are lacking (Sharma et al., 2016; Theofilou & Vlastos, 2023). Researchers have shown that parents perceive male children as more vulnerable to life threatening complications of diabetes due to traditional gender roles and expectations (Gombeseski et al., 2016; Johnson & Spector, 2019). Conversely, the lower distress levels reported by parents of female children could indicate different societal expectations that place less emphasis on their health or caregiving intensity.

Perceived Self-Efficacy. Self-efficacy is one's conviction that a behavior can successfully produce positive outcomes if changes are executed (Bandura, 1997; Janz & Becker, 1984). However, if the individual believes that an action cannot be carried out successfully, they may not engage in the behavior change or may do so partially which then can result in the positive outcomes not happening (Rimer et al., 2002; Salari & Filus, 2017). Higher levels of self-efficacy empower individuals to take proactive steps in disease management, as they believe their actions can influence outcomes (Rimer et al., 2002). Self-efficacy plays a critical role in fostering engagement in health-promoting behaviors, such as monitoring blood sugar levels, adhering to medical advice, and maintaining treatment regimens (Janz & Becker, 1984; Salari & Filus, 2017). It would be anticipated that parents who believe they can effectively manage their child's diabetes would be more likely to adopt and sustain positive behavior changes (Glanz et al., 2008; Hayden, 2014).

However, in my study, I did not measure self-efficacy related to being able to manage the child's diabetes. Parent education level has been found to be related to self-efficacy in relation to health behaviors in past studies (Glanz et al., 2008; Hayden, 2014). Despite this being something that could be expected, based on the results of previous studies, my findings did not indicate a statistically significant relationship between parent education level and PDDS. The absence of significant findings related to these variables highlights a limitation to the study. I would recommend that future researchers include a measure of self-efficacy to better understand how self-efficacy is related to the other variables that I included in my study. This will be discussed in the Recommendations section later in the chapter.

Cues to Action. Cues to action are triggers that activate the decision-making process and readiness for behavior change (Glanz et al., 2008). For parents managing a child's diabetes, such cues might include medical advice, support from health care providers, or witnessing the health challenges faced by others with diabetes (Salari & Filus, 2017). Women have been noted to respond more readily to cues to action than men, often engaging in protective behaviors influenced by their perceived susceptibility to health risks (Carpenter, 2010; Schwarzer, 2001). I did not measure cues to action as an independent variable, but parent diabetes status was something that may be related to cues to action (Glanz et al., 2008; Hayden, 2014). However, this does not consider how strong the cues to action were for parents with their own diabetes (if they have diabetes) or how strong the cues to action are for those parents who have not experienced having diabetes themselves. Like with other components of the HBM that I have discussed thus far, it may be beneficial for future researchers to include an instrument that can measure the parent's levels in relation to the different components of the HBM to see if those are related to the total score on the PDDS. This will be discussed in Chapter 5 in recommendations for future research as well.

Action. Action is how the individual successfully executes the behavior that produces positive outcomes, and it demonstrates one's confidence in their ability to act towards desired healthy behaviors to produce these positive outcomes (Bandura, 1997). I considered parents' diabetes status was again identified as a relevant variable, as personal experience with diabetes could theoretically improve execution of health behaviors. Parents with chronic illnesses like diabetes are more knowledgeable of the disease and may be more eager to take action towards managing the disease in their child (ADA, 2009; Marcus et al., 2018). Interestingly, I did not find a statistically significant relationship between parents' diabetes status and PDDS scores which I recommend future researchers consider.

Theory of Planned Behavior

The TPB is widely used for its ability to explain as well as predict health behaviors (Ajzen, 1991; Ajzen & Fishbein, 1980; Albarracin et al., 2001; Gerend & Shephard, 2012; Glanz et al., 2015). There are three main factors that influence an individual's desire and/or intention to participate in a behavior. These are attitudes, subjective norms, and perceived behavioral control (Ajzen, 1991; Ajzen & Fishbein, 1980).

Attitudes. Attitudes are determined by the beliefs of the individual about their ability to overcome the given behavior and, the stronger their desire to engage in (or avoid) a certain behavior, the more likely it is for the individual to perform that behavior (Ajzen, 1991). Attitudes toward engaging in behavior can be based on the individual's evaluation of the potential positives and negatives associated with the behavior (Ajzen, 1991; Glanz et al., 2008; Gonzales et al., 2016; Hayden, 2014). It was anticipated that parents with the previous experience of having diabetes themselves would be more likely to help their child engage in positive health-related behaviors towards their diabetes (Gonzales et al., 2016; Hayden, 2014). I included parent diabetes status as one of my independent variables, but this variable was not related to PDDS score at a statistically significant level. One thing that I did not include as an independent variable in my study was a measure of the parent's own attitudes towards their diabetes and the diabetes health related behaviors that they engage in themselves. This is something that I recommend future researchers include in future studies.

Subjective Norms. Subjective norms are based on the extent to which other people support or disapprove of a given behavior and the person's desire to engage in those behaviors based on the opinions of others (Ajzen, 1991; Topa & Moriano, 2012). It is possible that the subjective norms of society that a parent is responsible for the health of their child can influence the behavior of the parent towards managing their child's health (Zeidi et al., 2021). Researchers have found that support of others, or disapproval of not following health regimens, enhance adherence to treatment regimen whereas lack of support predicts poor adherence to diabetes care (Fox et al., 2018; Graven & Grant, 2014; Song et al., 2017). I did not measure subjective norms as an independent variable, but parent diabetes status was something that may be related to subjective norms (Ajzen, 1991; Glanz et al., 2008; Hayden, 2014). However, this does not consider how strong the subjective norms were for parents with their own diabetes (if they have diabetes) or how strong the subjective norms are for those parents who have not experienced having diabetes themselves. Like with other components of the TPB that I have discussed thus far, it may be beneficial for future researchers to include an instrument that can measure the attitudes that an individual has about the subjective norms that society has about diabetes and how much they agree/disagree with those subjective norms. This will be discussed in Chapter 5 in recommendations for future research as well.

Perceived Behavioral Control. Perceived behavioral control is based on the person's perception on if the desired behavior can be performed with or without difficulty (Ajzen, 1991; Asare, 2015; Lin et al., 2020; Wongrith, 2019). It was also anticipated that parents with previous experience of having diabetes themselves may perceive that the diabetes desired behaviors can be performed by their child with difficulty or not and so would be more likely to help their child engage in positive health-related behaviors towards their diabetes (Gonzales et al., 2016; Hayden, 2014). I anticipated that parental diabetes status could be related to PDDS score because parents with diabetes may better understand what was necessary to control diabetes and those behaviors may be seen as things that were fairly easy to control as they had experienced with those behaviors. However, this variable was not related to PDDS score at a statistically significant level. One thing that I did not include as an independent variable in my study was a measure of how familiar the parent with or without diabetes were with the behaviors necessary to control diabetes and how easy or difficult they believed that it would be to engage in those behaviors. This will be discussed in Chapter 5 in recommendations for future research as well.

Interpretation of Findings in Relation to the Literature Review

Demographics and Diabetes

Age of Parent and Attitudes Towards Child's Diabetes. Previous researchers have suggested that age can influence health beliefs and behaviors (CDC 2021; Chew et al., 2013). Older parents may have greater awareness of the complications of diabetes, leading to increased vigilance in disease management while younger parents may struggle with distress due to their limited experience with chronic disease management (Tian et al., 2018). However, in my study, age of parent was not related to PDDS score (attitudes towards their child's diabetes) at a statistically significant level. Future researchers could explore whether differences in PDDS scores emerge over time by conducting longitudinal studies to compare attitudes about their child's diabetes over time. Additionally, examining measuring how much exposure to diabetes that a parent has had, not just their own diabetes status could help determine why a participant has the level of attitude as measured by the PDDS.

Gender of Parent and Attitudes Towards Child's Diabetes. Prior researchers have suggested that mothers generally assume more responsibility for managing their child's health than fathers, leading to higher levels of parental stress and emotional burden in mothers in relation to their child's health (Salari & Filus, 2017; Schwarzer, 2001). Researchers have also shown that women tend to perceive higher health risks and take a more active role in disease prevention (Carpenter, 2010). However, in my study, parent gender was not related to parent attitudes about their child's diabetes as measured by the PDDS at statistically significant levels. A possible explanation for my results being different than those in previous research (Carpenter, 2010; Salari & Filus, 2017; Schwarzer, 2001) is that cultural expectations within Nigerian immigrant families may place equal emphasis on both parents being involved in their child's health concerns. I would recommend that future researchers conduct a study where they interview Nigerian parents of children with diabetes to better understand the perceptions and beliefs about their child's diabetes. It would also be beneficial if the researcher also included the PDDS to look at the alignment between the qualitative data collected and the scores on the PDDS. It may be that the PDDS is not an appropriate tool for this population, and it may indicate that another tool, specific to Nigerian parents, may need to be developed.

Education Level of Parent and Attitudes Towards Child's Diabetes. I found in my review of the literature that higher education levels are often associated with better health literacy and disease management (Berkman et al., 2011; CDC, 2021). More educated parents tend to be better informed about diabetes, which could help them feel more confident in managing their child's disease condition. However, in my study, parent education level was not related to attitudes about their child's diabetes at statistically significant levels. This contradicts some prior research and suggests that education level may not be a sufficient predictor of distress in Nigerian parents or that additional variables may need to be included in the quantitate model. One possible explanation is that cultural factors, personal experiences, or access to healthcare resources may play a more critical role in attitudes that these parents hold than their formal education. Future researchers should examine health literacy levels directly, rather than using education as proxy, and investigate whether diabetes specific knowledge or cultural beliefs about health are related to attitudes about their child's diabetes more than formal education.

Gender of Child and Attitudes Towards Child's Diabetes. A key finding of this study was that the gender of the child living with diabetes was related to attitudes of Nigerian parents living in the United States with their attitudes towards their child's diabetes, with parents of male children reporting higher total scores than parents of female children. This aligns with previous findings of researchers that gender norms influence how parents perceive illness and caregiving responsibilities (Schwarzer, 2001). One possible explanation is that parents may perceive male children as less responsible for managing their diabetes, leading to increased concern while female children may be seen as "more responsible" and/or easier to manage diabetes related behaviors with than male children (Adegboye et al., 2016; Carpenter, 2010; Schwarzer, 2001). Cultural expectations in many Nigerian communities often emphasize greater independence for male children, potentially making parents more anxious about their ability to adhere to diabetes management routines (Adegboye et al., 2016).

Age of Child and Attitudes Towards Child's Diabetes. Younger children have been found to often require more hands-on caregiving, which could contribute to more concern from parents about their child's health if the child has a health issue (Young et al., 2014; Hanna, 2003). On the other hand, older children and adolescents may exhibit resistance to health management behaviors, leading to frustration and distress among parents in managing the child's diabetes (Anderson et al., 1990; Reynolds & Helgeson, 2011). However, I did not find a statistically significant relationship between child's age and parental attitudes towards their child's diabetes. The absence of statistically significant findings related to the age of the child could indicate that, within this population, a parent's attitude about their child's diabetes is not primarily influenced by the child's age but rather by other factors such as gender of the child or cultural expectations. Further researchers might benefit from examining the interaction between age of child and other variables, such as disease severity, to clarify this dynamic.

Time Since Child's Initial Diagnosis and Attitudes Towards Child's Diabetes. I did not find a statistically significant relationship between the amount of time that has passed since child's initial diagnosis and parental attitudes about their child's diabetes. This result contrasts with findings from previous researchers who suggested that attitudes about a child's diagnosis may decrease in severity over time as parents and children adapt to diabetes management routines (Clark & Hampson, 2003; Young et al., 2014). It would generally be expected that a parent's attitudes about their child's diabetes would improve over time as the parent and child become versed in managing the disease. It is possible that Nigerian parents encounter cultural or systemic barriers, such as unfamiliarity with the United States healthcare system or limited access to culturally tailored resources, persist regardless of the length of time since diagnosis. This highlights a potential area for future researchers to examine how acculturation and access to support networks impact parental distress over time in this population as well as study parental attitudes about their child's diabetes over time to see if they change.

Parent Diabetes Status and Attitudes Towards Child's Diabetes. I found no statistically significant relationship between a parent's diabetes status and their attitudes towards their child's diabetes. This result was unexpected as prior researchers have suggested that parents with personal experience managing diabetes for themselves might feel more competent and less distressed in managing their child's condition (Janz & Baker, 1984; Sabzmakan et al., 2013). However, the lack of statistically significant findings may indicate that cultural attitudes, rather than personal experience, play a more dominant role in shaping the attitudes among Nigerian parents in the United States. Additionally, I did not measure the severity of the parent's diabetes or any complications they may have experienced, which could influence their perceived ability to manage their child's condition. Future researchers should consider including measures of diabetes severity and complications to provide a more comprehensive understanding of the parental attitudes towards their child's diabetes.

Socioeconomic Status and Attitudes Towards Child's Diabetes. Low socioeconomic status has been found to be associated with attitudes about diabetes and worse diabetes management due to financial barriers and limited health care access (Assari et al., 2017; Caraballo et al., 2020; CDC, 2021). However, I did not specifically measure socioeconomic status or its relationship with parental attitudes towards their child's diabetes. Future researchers should directly measure income levels, health insurance coverage, and financial stressors to determine whether economic hardship contributes to the attitudes of Nigerian parents living in the United States about their child's diabetes.

Limitations of the Study

My study had several limitations that impacted generalizability, validity, and reliability. First, with a sample size of 57, effect size of .15, alpha of .05, and 7 predictors the post hoc achieved statistical power was 47%. This was a limitation of the study and the results should be interpreted cautiously. Also, the sample was limited to Nigerian parents residing in the United States who have children with diabetes. Getting the required number of participants to meet the calculated statistical power for this study was a concern as it did not allow for Nigerian parents who have children with diabetes from outside of United States to participate. This affected the generalizability of the study, so future researchers should include Nigerian parents from other places outside of the United States and include a variable that indicates where the participant lives, to gain a better understanding of if the results are related to where Nigerian parents live. This could help determine if the measured results are related to Nigerian culture or other experiences that the participants have had.

Another limitation was the use of online survey via Qualtrics. Collecting data online was cost effective and allowed for a faster rate of response. The challenge with my Facebook account made it difficult to get enough participants so I had to reach out to the

IRB to request additional online sites to reach participants for the study. The inability to participate in the study due to lack of computer or Internet access may have affected the desired number of participants. However, participants were encouraged to use public libraries and other public areas with secure sites to complete their surveys. Also, recruiting participants from additional social media sites and physical locations via my recruitment flyer allowed for more participants to participate in the survey, thereby meeting the statistical power calculated for the study.

The cross-sectional design of the study limits the ability to establish causality between the demographic factors and attitudes towards diabetes management. The study captures a snapshot in time, which does not account for changes in attitudes or behaviors over time. Purposive convenience sampling and snowball sampling methods can also impact validity due to selection bias (Frankfort-Nachmias et al., 2015). This method served the purpose of gathering specific information necessary for the study that other methods such as probability sampling would not otherwise satisfy.

Finally, response bias and/or incomplete responses from participants was a limitation to the study. I relied on self-reported data and hoped that participants provided accurate and honest responses. Participants may have provided socially desirable responses to make them look better (Tyson, 2020), rather than accurately and truthfully reporting their practices and attitudes towards their child with diabetes. This limitation could affect the reliability of the data. To mitigate this concern, I let participants know their participation/ responses were anonymous and hoped it would help reduce response bias thereby promoting more honest participation and disclosure. Though response bias may still have occurred with some of the participants.

Recommendations

Based on the findings of this study, I have provided several recommendations can be made for future research to further explore the relationship between parent demographics and attitudes towards their child's diabetes among Nigerian parents living in the United States. First it would be beneficial to replicate this study with a larger and more diverse sample of Nigerian parents, including those residing in Nigeria and other parts of the world. This could extend the generalizability of the findings and provide a more comprehensive understanding of how demographic factors and cultural attitudes influence diabetes management across different contexts.

I primarily focused on a quantitative approach to understanding the relationship between demographics and parental attitudes about their child's diabetes as measured by the PDDS. I recommend that future researchers consider using the mixed methods approach that includes both quantitative and qualitative data. Incorporating qualitative interviews may help gain deeper insights into the lived experiences, coping mechanisms, and challenges faced by Nigerian parents in managing their child's diabetes. This would provide context beyond numerical data and help explain the ideals behind the levels of parental attitudes towards their child's diabetes as measured by the PDDS (Frankfort-Nachmias et al., 2015).

The use of cross-sectional design for this study provided only a snapshot of parental attitudes at one point in time. I recommend that future researchers consider the use of a longitudinal study which would allow researchers to track changes in parental attitudes over time, providing more robust insights into how parents adapt to their child's diabetes diagnosis and management needs. Longitudinal research could also assess whether parental attitudes towards their child's diabetes improve as children become more independent in managing their diabetes.

In this study, I examined demographic factors, but did not measure psychosocial factors of the HBM such as perceived severity of the disease, perceived benefits, self-efficacy, cues to action, and action and I would recommend that future researchers incorporate ways to measure these concepts (Bandura, 1997; Glanz et al., 2008). In addition, some factors of the TPB (parent's own attitudes, subjective norms, and perceived behavioral control) were not measured. A recommendation for future researchers to incorporate validated psychological scales to examine and measure the emotional and cognitive factors influencing parental distress and diabetes management behaviors (Bandura, 1997; Glanz et al., 2008). Although this study examined parental diabetes status, it did not measure the severity of parental diabetes or whether their experiences influenced their child's diabetes management. Future researchers should measure parent's diabetes history, complications, and self-care behaviors to explore whether personal experiences with the disease shape their attitudes towards their child's diabetes care.

A key finding in this study was that parents of male children reported higher distress levels than parents of female children. Future studies should explore why gender differences exist in parental distress and whether traditional gender roles and expectations influence parental concerns regarding diabetes management. Researchers could examine whether parents perceive boys to be less responsible for self-care, leading to increased distress, or if societal expectations place different burdens on parents of male children versus female children (Carpenter, 2010; Schwarzer, 2001). In this study, I did not find a significant relationship between education level and parental diabetes distress, contrary to some previous research suggesting that higher education level correlates with better health literacy and management (Berkman et al., 2011). Future researchers should investigate socioeconomic barriers, such as insurance coverage, financial strain, and access to culturally appropriate healthcare, to determine how they impact parental distress and diabetes care practices among Nigerian immigrant parents in the U.S. with children with diabetes.

Implications

Implications for Practice

The understanding and recognition of parental attitudes towards their child's diabetes care is crucial for developing appropriate interventions and support systems (Zhang et al., 2024). Understanding different cultural attitudes and responses that parents hold about their child's diabetes care is also important so that any interventions used can be more successful and better the health outcomes for the child and lessen stress that the parent has about their child's diabetes care (Kalyva et al., 2016). Having a better understanding of the relationships between parent demographics, parent diabetes status, and attitudes about their child's diabetes in Nigerian parents who live in the United States could be used by diabetes education programs to create more effective resources for

Nigerian immigrant families. In this case of this study, there was only one statistically significant relationship and participants with a female child living with diabetes had a PDDS score that was predicted to be 44.8% less than participants with a male child living with diabetes. Health care providers/professionals, policy makers, and other service providers could use this information to create educational materials and implement programs that provide more information to Nigerian parents with a child with diabetes that address that any child with diabetes should be monitored and helped with their diabetes management no matter the gender of that child. Professionals could also help these parents by discussing with them strategies that they could use with a male versus female child (and vice versa) that may be more successful for that child to see if this changes the attitudes that parents have related to their child's diabetes to be more in alignment no matter the gender of the child.

Implications for Positive Social Change

The results from this study may be used by policy makers, stakeholders and health professionals to create initiatives that build communities and elevate social change outcomes locally and globally. Parents of a child with diabetes encounter a spectrum of lifestyle challenges when caring for their child with diabetes including physical and psychological challenges (Deeb et al., 2018; Harris et al., 2001). There is a need for healthcare professionals to implement strategies that improve parental competency levels around managing their child's diabetes and bolstering their mental health and well-being (de Wit et al., 2022). Some of these strategies/ interventions may include providing educational awareness, skills training, group training, targeted family support, and motivations that enhance successful outcomes on the overall diabetes care and management. Stakeholders of the Nigerian communities, including for-profit and non-profit organizations could use this information to support Nigerian immigrants who have children with diabetes to better understand supports, services, and medical treatment availability in the United States through training on diabetes awareness and advocacy with this population. This has the potential to strengthen continuity of care and help create a community support network to promote wellness.

Conclusion

Diabetes continues to be a complex and challenging disease, and it is one of the prevalent diseases challenging global health (Campbell & Egede, 2020). Engaging in healthy eating, regular physical activities, compliance with medication administration and frequent monitoring of blood sugars can be challenging (Clark & Utz, 2011; Jasper et al., 2014; Tang et al., 2008). Many people with diabetes struggle with how to achieve self-management diabetes goals (Ribu et al., 2019). Integrating diabetes management into everyday life can be overwhelming for parents and their children with diabetes as they try to adjust to healthy lifestyle changes and parents try to manage the behavior of their children in regards to the diabetes (Rintala et al., 2013). Children depend on their parents to help them manage their diabetes but also may resist their parents, especially as the child gets older and wants to be more independent (Deeb et al., 2018; Pereira et al., 2019). It is imperative to help parents have appropriate attitudes to support successful management of their child’s diabetes.

The research question asked in this study was, the relationship between parent demographics (age, gender, education level, gender of child, age of child, time since child's initial diagnosis), parent diabetes status, and attitudes about their child's diabetes as measured by the PDDS in Nigerian parents who live in the United States. The only statistically significant relationship (p = .044) was between gender of child and parent total score on the PDDS. Participants with a female child living with diabetes had a PDDS score that was predicted to be 44.8% less than participants with a male child living with diabetes. Professionals could also help these parents by discussing with them strategies that they could use with a male versus female child (and vice versa) that may be more successful for that child to see if this changes the attitudes that parents have related to their child's diabetes to be more in alignment no matter the gender of the child.

This discussion of the results of this study highlighted the importance of the HBM and the TPB, as appropriate in understanding the relationship between individual values and their expectations for engaging in healthy lifestyle behaviors. The discussion of the limitations of the study and recommendations also highlighted the need to develop or adapt existing measurement tools like the PDDS to better capture culturally specific factors that influence diabetes management in relation to different cultures. This could involve collaborating with experts in culture and health behavior, to ensure that the tools used are culturally sensitive and appropriate. Such adaptations could improve the validity of future studies and provide more accurate information on the factors that affect diabetes management in children of parents who are immigrants into the United States.

The results of this study have the potential to help promote Nigerian parent participation in diabetes care and management, by better understanding the relationship between parent demographics (age, gender, education level, gender of child, age of child, age of child, time since child's initial diagnosis), parent diabetes status, and attitudes about their child's diabetes. This information then has the potential to be used to reduce negative health outcomes for Nigerian children with diabetes by using it to inform education for these parents (Uloko et al., 2018; Williams et al., 2014). The results could be used to facilitate changes in attitudes, behaviors, and lifestyles of Nigerian parents regarding early detection of diabetes in their children and participation in diabetes management activities. Additionally, results may be used by Nigerian community stakeholders, including for-profit and non-profit organizations, to mobilize diabetes reduction, awareness, and advocacy.

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