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Relationship of Provider-Patient Communication and Health Literacy to Self-Management in Black Adults with Type-2 Diabetes

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This is to certify that the doctoral dissertation by

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and that any and all revisions required by
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Walden University
2025

Abstract

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by

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MSN, Emory University, 2005

BSN, Emory University 2001

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

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Abstract

Black adults in the United States are nearly twice as likely to receive a diagnosis of type 2 diabetes mellitus (T2DM) and are more susceptible to severe diabetes-related complications. Health literacy and patient-provider communication (PPC) are extremely important for self-management in patients of all ethnicities however, 58% of non-Hispanic Blacks have basic or below-basic health literacy skills compared to 28% of non-Hispanic Whites. The purpose of this descriptive correlational study, with was guided by the interaction model of client behavior, was to determine (a) if there is relationship between PPC during the healthcare encounter to health literacy among Black adults with T2DM and (b) if there is a relationship between PPC during the healthcare encounter and self-care behaviors among Black adults with T2DM. Data from 58 participants were analyzed using simple linear regression and showed a significant relationship ($p < .001$], and R^2= .126. between PPC during the healthcare encounter to health literacy among Black adults and a significant relationship ($p < .001$], and R^2= .285 between PPC during the healthcare encounter and self-care behaviors among Black adults. Future research should examine how both health literacy and PPC jointly influence self-management behaviors among Black adults with T2DM. This study provides further evidence that both health literacy and PPC are essential components of effective self-management in individuals with T2DM. Adequate health literacy and quality PPC contribute to reducing health disparities and improving health outcomes among Black adults with T2DM which affects positive social change.

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Chapter 1: Introduction to the Study

Introduction

Type 2 diabetes mellitus, a chronic and life-threatening disease, disproportionately affects Black adults in the United States. It has significantly higher prevalence and complication rates compared to non-Hispanic Whites. National statistics indicate that diabetes is the seventh leading cause of death, and Black adults are 2.5 times more likely to experience long-term complications and hospitalizations (CDC, 2023; ADA, 2023; Office of Minority Health, 2021).

Limited health literacy and poor patient-provider communication negatively influence self-management behaviors, leading to poorly controlled diabetes, increased morbidity, and higher mortality rates (Alsaedi & McKeirnan, 2021; Reid et al., 2021). This study aims to determine the extent of the relationship between health literacy, patient-provider communication, and self-management. By examining this phenomenon, we can inform strategies to strengthen health literacy, enhance patient-provider communication, and ultimately improve self-management behaviors and health outcomes in this high-risk population.

This dissertation begins by outlining the problem, purpose, research questions, and theoretical framework. It then reviews the literature from previous studies. The research design, findings, and discussion connecting the results to existing literature are presented. Finally, recommendations for practice, policy, and future research are concluded.

Background

Type 2 diabetes mellitus (T2DM) is a long-term chronic illness that occurs when the pancreas produces insulin, but the body struggles to use the insulin produced effectively, leading to insulin resistance (American Diabetes Association [ADA], 2023c; Centers for Disease Control [CDC], 2023, September 5). According to the CDC, the human body needs glucose for the body cells to use as energy and to signal the pancreas to make insulin (2023, September 5). When the body fails to consume insulin as it should, it produces high insulin levels in the bloodstream, which causes the body's cells to stop responding (CDC, 2023, September 5).

In the United States, the incidence of T2DM is concerning, particularly in Black adults. The CDC (2023, April 18) reported that 37 million people in the United States have diabetes, and T2DM accounts for 90 to 95% of the United States population diagnosed with diabetes . Additionally, the ADA (2023b) indicated that in 2019, diabetes was listed as an underlying cause of 282,801 deaths, thus making diabetes the seventh leading cause of death in the United States . The CDC indicated that diabetes is more common in some ethnic groups, with Black adults being among the ethnic groups that are at a greater risk for being diagnosed with T2DM (2023, May 4). Furthermore, the ADA found that 12.1% of non-Hispanic Black adults live with diabetes in the United States compared to 7.4% of non-Hispanic Whites (2023b).

T2DM is a chronic disease, and when poorly controlled, it increases the patient's risk for further harm. According to the ADA (2023a), diabetes can lead to life-threatening complications that can increase an individual's risk for chronic morbidities and mortality, and Black adults are at a higher risk of experiencing diabetes-related complications. The Office of Minority Health (2021) reported that non-Hispanic Blacks were 2.5 times more likely to suffer from long-term diabetes-related complications and more likely to be hospitalized as a result than non-Hispanic Whites .

Additionally, diabetes-related complications are a major cause of heart disease and strokes (World Health Organization, 2023). Patients with T2DM are at risk for developing heart disease at a younger age and are twice as likely to be diagnosed with heart disease (National Institute of Diabetes and Digestive and Kidney Diseases, 2021). Heart disease is the leading cause of mortality in patients with T2DM (ADA, 2023a), and Black adults are 30% more likely to die from heart disease than non-Hispanic White adults (Office of Minority Health, 2021). Additionally, patients with T2DM are twice as likely to have a stroke (ADA, 2023a). Yang et al. found that Black adults were 9.4% more likely to die from a stroke compared to 6.9% of White adults with T2DM during the COVID-19 pandemic as a result of complications associated with T2DM (2023).

Moreover, blindness and chronic kidney disease are also serious complications of T2DM (World Health Organization, 2023). Research indicated that T2DM is the primary cause of new-onset blindness in working adults in the United States, with diabetic retinopathy being a major contributing factor (ADA, 2022, May; CDC, 2022, December 19). The ADA (2022, May) reported that diabetic retinopathy has been diagnosed in more than 800,000 Black adults, a number that is expected to increase to 1.2 million by 2030. Additionally, the ADA (2023a) indicated that T2DM is the leading cause of chronic kidney disease. Reports have indicated that one out of every three adults with T2DM has chronic kidney disease (CDC, 2022, December 30; National Institute of Diabetes and Digestive and Kidney Diseases, 2021). Black adults with T2DM and chronic kidney disease are 3.2 times more likely to be diagnosed with end-stage kidney disease, which is a serious progressive complication compared to non-Hispanic Whites (Office of Minority Health, 2021).

Additionally, limb amputations are also a serious diabetes-related complication associated with T2DM. The ADA (2022, September 22) reported that “every three minutes, a limb is lost to diabetes” and that Black adults are at a four times higher risk of having a limb amputated (p. 1). Blacks are at risk of having a limb amputated due to a diabetic foot ulcer or diabetic foot infection (Bonner et al., 2017; Tan et al., 2020). Limb amputations from diabetes-related complications are serious and irreversible threats to the health of patients with T2DM. However, despite the grim complications of T2DM, more can be done to combat the risk of diabetes-related complications through diabetes self-management, regular screening, diet, and diabetes medications (ADA, 2023a; World Health Organization [WHO], 2023).

Health literacy and patient-provider communication (PPC) are extremely important for self-management in patients of all ethnicities when diagnosed with a grave chronic illness such as T2DM. Nonetheless, the 2003 National Assessment of Adult Literacy found that 58% of non-Hispanic Blacks had basic or below-basic health literacy skills compared to 28% of non-Hispanic Whites (Kutner, 2006). Research validates that limited health literacy disproportionately affects Black adults, and Black adults are more likely to be diagnosed with T2DM (Ajuwon & Insel, 2022; Han et al., 2019).

Furthermore, Black adults diagnosed with T2DM are at a greater risk of experiencing diabetes-related complications and are more likely to die from complications due to poor T2DM self-management (Ajuwon & Insel, 2022; Han et al., 2019). Health literacy is important for every T2DM patient to manage, appraise, and make informed decisions about their health (Abdullah et al., 2019), and PPC is an essential component for patient-centered care that, when effective, can increase patient activation in self-management to manage their T2DM successfully (Agency for Healthcare Research and Quality [AHRQ], 2020; Hong et al., 2020; Yağar, 2021). Therefore, effective PPC is crucial for adequate health literacy in Black adults so that they can understand the importance of T2DM self-management to reduce diabetes-related complications and deaths related to these complications.

Problem Statement

T2DM has negatively affected the health of Black adults, which is a population disproportionally affected by the disease. There are 28.5 million adults in the United States who have been diagnosed with diabetes (ADA, 2022 July 28), and non-Hispanic Blacks account for 12.1% of those diagnosed with diabetes (Office of Minority Health, 2021). T2DM is a serious and potentially debilitating disease. Moreover, the Office of Minority Health (2021) indicated that non-Hispanic Blacks are more likely to be diagnosed with diabetes, experience diabetes-related complications, and have a higher mortality rate than non-Hispanic Whites. Therefore, it is imperative that Black adults with T2DM understand how uncontrolled T2DM can lead to diabetes-related complications and morbidity, much of which is avoidable.

One in three adults with T2DM have difficulty with diabetes self-management (Abdullah et al., 2019). Poor diabetes self-management can exacerbate problematic symptoms and accelerate the health risks of diabetic-related complications among Black adults. Some researchers found that poor diabetes self-management skills are the likely cause of higher morbidity and mortality rates in Black adults with diabetes (Abdullah et al., 2019; Ajuwon & Insel, 2022). The implication is that once a non-Hispanic Black adult is diagnosed with diabetes, the patient may encounter issues controlling diabetes symptoms, thus leading to severe complications and possibly death. Moreover, researchers indicated that non-Hispanic Blacks are more likely to have poorer diabetes control than non-Hispanic Whites and, therefore, are more likely to encounter serious diabetic complications that increase their risk of diabetes-related mortality (Cunningham et al., 2018; Office of Minority Health, 2021). Additionally, studies have found that diabetes self-management education can help improve Black adults' participation in self-management and health outcomes (Cunningham et al., 2018), which suggests that diabetes self-management skills are important components for controlling T2DM and reducing morbidity and mortality.

Health literacy is defined as the extent to which an individual can find, understand, and use health-related information to make informed decisions about managing their health (CDC, 2021; Health Resources and Services Administration, 2022; National Institute of Health, 2021). Therefore, this suggests that health literacy is the cornerstone for all decisions for disease self-management, specifically diabetes self-management. However, when health literacy is limited in patients with T2DM, it can negatively impact their ability to self-manage their T2DM. In fact, the Association of Diabetes Care and Education Specialists and Kolb (2021) found that problem solving is a behavior needed for diabetes self-management. Individuals need the ability to understand and apply information obtained through adequate health literacy to effectively self-manage their T2DM. However, researchers Ajuwon and Insel (2022) indicated that poor self-management skills, particularly in Black adults with limited health literacy, are linked to negative illness perceptions of T2DM and an increased risk of depression. Thus, limited health literacy can severely impact the ability to manage diabetes effectively.

Additionally, T2DM patients with limited health literacy are more likely to have poorly controlled diabetes and are more likely to be hospitalized due to diabetes complications (Alsaedi & McKeirnan, 2021). Consequently, T2DM patients with limited health literacy are at a greater risk for improperly self-managing their diabetes and, therefore, are vulnerable to experiencing diabetes-related complications. Limited health literacy was associated with decreased disease-related self-management behavior and increased mortality rates (Cutilli et al., 2018). Patients with T2DM and limited health literacy are subject to experiencing poor self-management skills that are needed to control their disease. Therefore, adequate health literacy is paramount to improving health outcomes in patients with T2DM.

The best health outcomes are achieved when T2DM patients have sufficient disease-related knowledge to self-manage their disease through health literacy, which is known to influence patients' ability to self-manage their chronic health condition (Abdullah et al., 2019; Caruso et al., 2018; Cutilli et al., 2018). However, in Black adults, the 2003 National Assessment of Adult Literacy report found that among non-Hispanic Blacks, 58 % had basic or below basic health literacy skills, while only 28% of non-Hispanic Whites were at those levels (Kutner, 2006). Good diabetes self-management requires intensive self-management skills to make diabetes-related health decisions daily (Abdullah et al., 2019; Tefera et al., 2020). However, Black adults may lack the adequate health literacy they need to essentially self-manage their T2DM effectively to improve their health outcomes.

Several healthcare initiatives mentioned in the Healthy People 2030 campaign have targeted health literacy as the central component for determining individuals' health outcomes. For example, one of the Office of Disease Prevention and Health Promotion's (2023) Healthy People 2030 campaign initiatives was to improve individuals' participation in shared decision making with their healthcare providers to experience better health outcomes. The components of health literacy involve using and targeted health literacy as the central component for determining individuals' health outcomes CDC, 2021; Health Resources and Services Administration, 2022). Additionally, the Office of Disease Prevention and Health Promotion's Healthy People 2030 campaign initiative was focused on ensuring that patients understood the health information presented during patient-provider encounters . Hence, another component of health literacy is that patients understand the health information (CDC, 2021; Health Resources and Services Administration, 2022; National Institute of Health, 2021). The Office of Disease Prevention and Health Promotion's Healthy People 2030 initiative indicated that patients who lacked understanding of their basic health information were more likely to experience problems managing their health condition. Notably, the Office of Disease Prevention and Health Promotion's Healthy People 2030 initiative promotes and highlights the importance of adequate health literacy in patients. Moreover, they emphasized the significance of PPC's impact on health literacy, self-management, and health outcomes. Therefore, effective PPC is a part of health literacy information and is critical for improving the self-management of T2DM in Black adults.

However, patients who experienced poor PPC also had limited health literacy, lacked the skills needed for successful T2DM self-management, and were more likely to encounter potentially harmful disease-related complications (Abdullah et al., 2019; Bonner et al., 2017; Paiva et al., 2019). Therefore, good PPC in the patient-provider encounter can significantly affect the health and well-being of adults diagnosed with T2DM. Furthermore, good PPC is the foundation of high-quality patient-centered care (Agency for Healthcare Research and Quality, 2020; Yağar, 2021). Also, good PPC can likely increase an individual's understanding of their health, encourage active participation in self-care, and improve health outcomes (AHRQ, 2020; Cutilli et al., 2018; Paiva et al., 2019; Yağar, 2021). However, researchers have found that Black patients received poorer PPC during patient-provider encounters when compared to non-Hispanic White patients, and this poor PPC may have contributed to the reduction of Black patients' participation in shared clinical decision-making (Cooper et al., 2012; Howson, 2021). Therefore, Black patients who experienced poor PPC may have limited health literacy that is needed to effectively participate in conversations with their providers that revolve around their health decisions and managing their T2DM.

appropriately. Further, Black adults need good PPC and adequate health literacy to understand self-management's important role in achieving favorable health outcomes.

Purpose of the Study

The purpose of this quantitative study were to determine (a) if there is relationship between PPC during the healthcare encounter to health literacy among Black adults (18 years and older) with T2DM and (b) if there is a relationship between PPC during the healthcare encounter and self-care behaviors among Black adults (18 years and older) with T2DM. The independent variable, PPC, were defined as exchanging information, verbal and nonverbal cues, understanding, listening, and decision making (see Baessler et al., 2020; Creswell & Creswell, 2018; Hagiwara et al., 2018; Raphael-Grimm & Zuccarini, 2015). The independent variable, health literacy, were defined as a patient’s understanding and use of health information to make informed decisions to manage their health (see CDC 2021; Creswell & Creswell, 2018; Health Resources and Services Administration, 2022; National Institute of Health, 2021). The dependent variable, self-management, were defined as patients engaging in problem-solving, disease-related monitoring, medications management, and disease-related diet and exercise management, (see Association of Diabetes Care and Education Specialists & Kolb, 2021; Creswell & Creswell, 2018; Jones, 2022).

Research Questions and Hypotheses

RQ1: What is the relationship of health literacy to self-management in Black adults with type 2 diabetes mellitus?

$H_0$1: There is no relationship between health literacy and self-management in Black adults with type 2 diabetes mellitus.

$H_1$1:There is a relationship between health literacy and self-management in Black adults with type 2 diabetes mellitus.

RQ2: What is the relationship of PPC to self-management in Black adults with type 2 diabetes mellitus?

$H_0$2:There is no relationship between PPC and self-management in Black adults with type 2 diabetes mellitus.

$H_1$2: There is a relationship between PPC and self-management in Black adults with type 2 diabetes mellitus.

In this study, the two independent variables were health literacy and PPC, and the dependent variable is self-management. Health literacy was measured with the Consumer Assessment of Healthcare Providers & Systems (CAHPS) Health Literacy survey. The CAHPS Health Literacy survey is a continuous variable that measures a mean score from the overall score. Permission to use the CAHPS Health Literacy survey is in Appendix B The second independent variable in this study was PPC was measured using the Communication Assessment Tool (CAT). The CAT is a 15-item survey, which measures a mean score from the overall score. Permission to use the Communication Assessment Tool 15-item survey is in Appendix A. Lastly, the dependent variable is self-management which was measured with the Diabetes Self-Management Questionnaire (DMSQ). The DMSQ is a continuous variable that measures the overall sum of scores. Permission to use the DMSQ survey is in Appendix C.

Theoretical Framework for the Study

The theories that ground my study included Cox's (1986) Interaction Model of Client Behavior (IMCB). The concepts in Cox's IMCB model include client singularity, client-professional interaction, and health outcomes. Cox explained that client singularity is the client's unique interaction within their environment and social network. Client-professional interaction comprises the health professional's interventions, exchanging information, interpersonal relationships, valuing and promoting the client's involvement, and the quality and quantity of information in the health encounter. Cox explains that health outcomes in the IMCB are broad and depend on client-professional interaction.

Cox (1986) developed the IMCB to direct and test nursing interventions, and now the IMCB has been used predominantly in healthcare in various healthcare. In a study Vance (2020) sought to describe women veterans' interactions with civilian providers using the IMCB as a framework. In Vance's study, client singularity was the female veteran; client-professional interaction was the provider communication that included the quantity, quality, and approach to delivery and participation in decision-making; and health outcomes were associated with self-management, utilization of services, and satisfaction. The researchers found the participants' descriptions of patient-provider interactions included listening, exchanging communication, understanding, support, and decision-making. Additionally, Vance found that participants described health outcomes as positive or negative based on their experience during the patient-provider interaction.

The IMCB model has been used to frame studies involving chronic conditions, health literacy, and self-management behaviors in the past. For example, Shen et al.

(2021) evaluated self-management behaviors and health outcomes in patients with secondary coronary heart disease (CHD) and used nursing interventions based on Cox's IMCB. Shen et al. found that self-management behaviors and health outcomes were significantly improved in participants who received interventions guided by the IMCB model. Moreover, researchers Hickman et al. (2016) examined the validity of IMCB in adults with hypertension. Hickman et al. found that the IMCB was a valid framework for examining behavior changes in adults with hypertension. The researchers also found that the IMCB was a valid framework for examining health literacy and PPC. Results indicated that the IMCB constructs of client singularity and client-professional interaction were significant factors in predicting health outcomes in adults with hypertension.

The logical connection between the framework presented and the nature of my study include Cox's (1986) IMCB model has been used in research studies to examine the client because client-health professional interactions influence health outcomes. This study aims to examine the relationship between health literacy, PCC, and self-management in Black adults with T2DM. Cox's IMCB model can provide a structural framework to determine the impact of health literacy and PPC on self-management. Cox's IMCB model concepts are client singularity, client-professional interaction, and health outcomes.

The first concept in the IMCB model is client singularity which is associated with the client's individuality (Cox, 1986). The Office of Minority Health (2021) reported that 12.1 % of Black adults in the United States have been diagnosed with diabetes. Therefore, client singularity was associated with the participants' racial background and medical diagnoses, the Black adult with T2DM. The second concept in the IMCB model is client-professional interaction (Cox, 1986). Research shows that 58% of Black adults have limited or low health literacy (Kutner, 2006; Lopez et al., 2022; Muvuka et al., 2020), and poor diabetes self-management increases morbidity and mortality in this population (Abdullah et al., 2019; Bonner et al., 2017). Patient-provider communication (PPC) is foundational to health outcomes (Agency for Healthcare Research and Quality, 2020; Yağar, 2021). Cox (1986) emphasized that health information exchange within the client-professional interaction influences decision-making, making both health literacy and PPC central to this concept. The final IMCB concept, health outcomes, is influenced by client singularity and client-professional interaction and correlates with self-management. Therefore, the IMCB model is a suitable framework for examining the relationship between health literacy, PPC, and self-management. A detailed overview of the IMCB model is provided in Chapter 2.

Nature of the Study

A quantitative descriptive correlational study was conducted to explore the relationship between the variables of interest within a single group (see Gray & Grove, 2021). Correlational research designs are used to describe and measure the extent of the relationship among the variables to determine the direction and strength of the relationship, and to quantify the effect of the independent variable on the dependent variable (Creswell & Creswell, 2018; Curtis et al., 2016; Gray & Grove, 2021). In this study, the variables of interest are health literacy, PPC, and self-management. The purpose of the study were to (a) determine if there is a relationship between PPC during the healthcare encounter and health literacy in Black adults with T2DM and (b) determine if there is a relationship between PPC during the healthcare encounter and self-care behaviors among Black adults with T2DM. Therefore, a descriptive correlational research design is the most appropriate approach for this study. The single group that was studied is Black adults with T2DM.

The data was collected during a single period of time until the minimum sample size is reached using convenience sampling (see Creswell & Creswell, 2018; Gray & Grove, 2021). I recruited participants from Amazon's Mechanical Turk (MTurk) and Walden University Participant Pool. Amazon's MTurk served as a cost-effective platform for recruiting research participants (Amazon, 2024). Additional participants were recruited from the Walden University Participant Pool through convenience sampling. The sample of participants consisted of Black adults 18 years of age and older, who are English-speaking, reside in the United States, have been diagnosed with T2DM and have had an encounter with a healthcare provider (physician, nurse practitioner, or physician assistant) within the past 5 years.

I conducted a simple linear regression test to analyze the data and answer my research questions (Field, 2013). The minimum sample size required for this study based on $\alpha = .05$, a power of .80, and a medium effect size of .15, was 55 (see Faul et al., 2009; G*Power, 2020).

For my research design, I needed to collect data once from each participant using online self-administered surveys with three data collection instruments. The first instrument I used the CAHPS Clinician and Group 3.0 Health Literacy Survey, Adult and

English Version (AHRQ, 2018) to measure health literacy. The CAHPS's Health Literacy survey was designed to assess the healthcare literacy of adults aged 18 years or older (AHRQ, 2018). Moreover, the CAHPS's Health Literacy survey's English Version is free to download and use within the United States without permission (AHRQ, 2022).

The second data collection instrument I used was the CAT 15-item survey to measure PPC. The CAT survey is free to download with the source being referenced (Makoul et al., 2007). Makoul et al. (2007) developed the CAT to measure patients' perceptions of physicians' interpersonal communication skills. The CAT survey measures patient perceptions of provider communication by focusing on exchanging information, verbal and nonverbal communication, understanding, and shared decision-making. The CAT 15-item survey allows respondents to rate the patient experience with doctor communication on a 5-point response scale from 1 to 5 (1 = poor to 5 = excellent) with scores ranging from 0 (minimum) to 75 (maximum). Makoul et al. recommend reporting an overall mean for the summary score. The researchers' study reported mean scores ranging from 3.97 to 4.68 (Makoul et al., 2007). In this study, I calculated a mean score from the CAT 15-item survey sum of each respondent's scores.

The CAT 15-item survey is a reliable and valid instrument. Makoul et al. (2007) reported the CAT 15-item survey had been tested-retested on patients and physicians. They found that the overall means score average was 4 in both groups, reinforcing the CAT survey's internal consistency. Moreover, research confirmed that the CAT survey's internal consistency was good, with a total mean score of 3.6 and Cronbach's alpha greater than .90 (Cubaka et al., 2018). Furthermore, the CAT survey has validity. Makoul et al. (2007) indicated that the exploratory factor analysis revealed that CAT survey one-factor model explains 78.8% of the variances. Also, they reported that the overall scale reliability was high (Cronbach alpha = .96, p <.01). Additionally, Makoul et al. reported that the scale validity of the CAT survey was also high with physicians, Cronbach alpha ranged from .80 to .99. Other research conducted a test-retest confirmatory factor analysis for the CAT survey one-factor model and confirmed scales high scale validity with Cronbach alpha > .90 (Cubaka et al., 2018).

The final data collection instrument in this study was the Diabetes Self-Management Questionnaire (DSMQ). The DSMQ was designed to assess the self-care behaviors of adults with diabetes and is available for use with permission only. Schmitt et al. (2013) indicated the DMSQ is a 16-item survey that contains questions regarding diabetes self-management activities such as glucose monitoring, diabetes medication and diet adherence, and physical activity.

I collected data from primary sources consisting of English speaking Black adults 18 years or older living in the United Stated and diagnosed with T2DM, who have had a visit with a health care provider in the past 5 years. I used convenience sampling to recruit participants from Amazon's Mechanical Turk and Walden University Participant Pool.

Definition of Key Terms

Health Literacy: Health literacy is the extent to which an individual can find, understand, and use health-related information to make well-informed decisions about managing their health (Centers for Disease Control and Prevention, 2021; Health Resources and Services Administration, 2022; National Institute of Health, 2021).

Healthcare Encounter: Healthcare encounter is the face-to-face interaction that occurs between the patient and the healthcare provider during a medical examination (Cutilli et al., 2018; Hong et al., 2020; Paiva et al., 2019).

Patient-Provider Communication: PPC is the manner in which the health professional presents information to the patient or targeted audience and the impact this information has on the patient based on the presentation (Guenther et al., 2021).

Self-Management and Self-Management Behavior: Self-management in chronic diseases involves the individual closely monitoring their symptoms and, if a problem is detected, responding with the appropriate actions such as adjusting medications or contacting their healthcare provider. Also, self-management behavior in chronic diseases is taking medications as prescribed, maintaining regular visits with the doctor or specialist, and obtaining diagnostic tests as ordered (AHRQ, 2014; Jones, 2022).

Self-Care and Self-Care Behavior: Self-care behavior is an individual's capacity to care for oneself to promote health, prevent diseases, and maintain optimal health through active self-management behaviors (Martínez et al., 2021; Merriam-Webster, 2024; WHO, 2024). Self-care behavior in T2DM is having self-awareness through knowledge gained to self-manage and cope with the day-to-day complexity of T2DM by actively monitoring blood glucose levels, taking medications as prescribed, being physically active, engaging in healthy eating habits and avoiding high-fat foods to prevent, maintain, and promote health (Ahmad & Joshi, 2023; Ahmad et al., 2020; Wilson, 2021).

Assumptions

The first assumption of my study was that participants provided truthful responses when answering the questions. The second assumption was that Black adults over the age of 18 with T2DM were motivated to control their disease by understanding the necessary steps for managing their condition. The final assumption was that all participants have had at least one healthcare encounter with a provider since being diagnosed with T2DM.

Scope and Delimitations

In this quantitative study, I used a descriptive correlational research design to examine the strength of the relationship between health literacy and PPC has impacted self-management behaviors in Black adults with T2DM. Although Peplau's theory of interpersonal relations was critically appraised as a framework for this study, the constructs of this theory did not align with the concepts of interest in my study; therefore, I selected the IMCB to provide the boundaries needed to remain in the scope of this study's concepts of interest. While I also considered conducting a qualitative study, prior qualitative research has already explored the lived experiences of individuals in the community. My interest lies in quantifying data to capture numerical insights that can help assess the impact on a generalized population. Additionally, I opted for a quantitative approach due to time constraints and practical considerations. These factors contribute to the delimitations of this study.

The inclusion criteria were (a) participants had to be Black adults who are 18 years or older, (b) have a diagnosis of T2DM, (c) had a healthcare provider, (d) could read and understand English, (e) reside in the United States, and (f) had internet access and sufficient computer skills to answer online questions. These inclusion criteria fit within the scope of interest to conduct this descriptive correlational study to examine the relationships between health literacy, PPC, and self-management in Black adults with T2DM.

Limitations

Limitations in this study are those associated with self-administered surveys. The data in self-administered surveys depended on the participants' truthfulness in answering each question (Queirós et al., 2017). Additionally, challenges with self-administered surveys are that participants may not complete the survey or may leave the survey questions unanswered (Andrade, 2020).

Access to the internet is another limitation. Participants were required to have access to the internet to participate in the self-administered online surveys. Oliveri et al. (2021) reported that online surveys can create barriers to participants with limited or no access to the internet and people with little technical proficiency.

Significance

The findings of this study increased awareness among healthcare providers and the discipline of nursing in broadening their understanding of the relationship between PPC, health literacy, and self-management in Black adults with T2DM. Despite advances in diabetes management, ethnic minorities are still at a high risk of being diagnosed with diabetes, experiencing diabetes-related complications, and diabetes-related mortality (ADA, 2017; Taylor et al., 2018). Moreover, studies show that effective PPC is more likely to increase disease self-management behaviors and improve health outcomes (Cutilli et al., 2018; Paiva et al., 2019; Yağar, 2021). Furthermore, researchers found that Black adults valued receiving health information and support from their healthcare providers to help them understand and self-manage their diabetes (Taylor et al., 2018). Therefore, increasing awareness of healthcare professionals of the significant role effective PPC has in improving health literacy and self-management strategies will help bolster the providers' ability to inform Black adults with T2DM about diabetes self-care and ultimately reduce healthcare disparities.

Additionally, understanding the relationship between health literacy, PPC, and self-management contributes to the discipline of nursing by emphasizing the importance of the nurse's role. Nurses can assist patients and help them improve the self-management of their T2DM. Researchers suggested that nurses can assess patients' knowledge and understanding of their diabetes and educate diabetic patients based on the patients' level of preference (Ahmad et al., 2020). Moreover, studies found that nurse-led diabetes interventions and education improved diabetes knowledge and self-management behaviors in patients with T2DM (Ahmad et al., 2020; Han et al., 2019; Tamiru et al., 2023).

Furthermore, by understanding the positive effects PPC has on health literacy and self-management, nurses can advocate for T2DM patients and act as a liaison between the patient and the healthcare provider. Oruche and Zapolski (2020) pointed out that nurses are the most trusted healthcare professionals within the healthcare system. The researchers also reported that diversity in the United States is growing and suggested that nurses can empower, support, and be the voice of culturally diverse patients so that they can participate in shared healthcare decision making. Therefore, the nursing discipline can develop culturally targeted educational courses and training for practicing nurses, nursing students, and medical staff to address and improve PPC.

Further, the results of this study contributed to positive social change in the United States healthcare policies aimed at decreasing healthcare disparities by providing research to substantiate and support the need for improvements in PPC. Moreover, this study built on similar PPC research and added to the body of knowledge that healthcare policies can improve to create a more equitable healthcare system that better serves not only Black adults, but all ethnicities diagnosed with chronic illnesses. Finally, the results of the study supported improving local, state, and national healthcare policies and advancing strategic clinical practice changes that improve the quality of care in Black adults with a chronic illness such as T2DM and bolsters the need for effective PPC for patients to have adequate health literacy to self-manage their disease and reduce healthcare disparities successfully.

Summary

In Chapter 1, I discussed the rate of T2DM in the United States and the high percentage of Black adults who are plagued by chronic disease. Also, there is a high percentage of Black adults with limited health literacy. Furthermore, I explained importance of quality PPC and good self-management skills in patients diagnosed with

T2DM. I also presented the purpose, research questions, and included the significance of the study. In Chapter 2, I provide an exhaustive review of the literature to justify this study's need to add to the body of research, hopefully bringing positive social change.

Chapter 2: Literature Review

Historically, T2DM has a negative impact on individual's health and has disproportionally affected Black adults (Office of Minority Health, 2021). In the United States, 37.3 million adults have been diagnosed with diabetes, and non-Hispanic Blacks account for 12.1% of those diagnosed with this chronic illness (ADA, 2022 July 28; Office of Minority Health, 2021). The Office of Minority Health (2021) indicated that non-Hispanic Blacks are more likely to be diagnosed with diabetes, experience diabetes-related complications, and have a higher mortality rate than non-Hispanic Whites. T2DM is a serious, potentially debilitating, and lethal disease in which Black adults are at risk for higher morbidity and mortality (Ajuwon & Insel, 2022). Therefore, Black adults with T2DM must understand how uncontrolled T2DM can lead to diabetes-related complications and morbidity, much of which is avoidable. The purposes of this quantitative study was to determine (a) if there is relationship between PPC during the healthcare encounter to health literacy among Black adults (18 years and older) with T2DM and (b) if there is a relationship between PPC during the healthcare encounter and self-care behaviors among Black adults (18 years and older) with T2DM.

In Chapter 2, I present the literature search strategy, an exhaustive review of the literature and the theoretical framework that guided this study.

Literature Search Strategy

For this study literature review strategy, I searched the databases at Walden University Library, Google Scholar, Safari, and Google for full-text, peer-reviewed academic journals published between 2016-2024. The key terms used for the search strategy were: *health literacy, low health literacy, health knowledge, non-adherence, non-compliance, self-management, diabetes self-management, diabetes management, diabetes care, patient-provider communication, provider communication, healthcare communication, patient-provider relationship, diabetes, diabetes type 2, type 2 diabetes mellitus, type 2 diabetes, blood sugar, hemoglobin A1c, glycemic control, chronic diseases, diabetes complications, adults, Black, African American, Black American, ethnic minorities, English,* and *the interaction model of client behavior*. The search strategy brought forth databases from MEDLINE with full text, Academic Search Complete, Science Direct, CINHAL Plus with Full text, PubMed, Direct Open Access, and Complementary Index. A total of 3,859 results were yielded; however, Google Scholar yielded over 20,000 results. Only literature relevant to this study's interest was extracted from the data for review.

Theoretical Foundation

The theoretical framework I chose to use was the IMCB. The IMCB is a middle-range nursing theory developed in 1982 by Cox, a nurse researcher, who determined a theoretical framework was needed that centrally focused on client health behavior to help guide nursing research and other nonnursing disciplines (Carter & Kulbok, 1995; Cox, 1982). Cox posited that other nonnursing health behavior theories were too narrow and focused on a specific discipline (Carter & Kulbok, 1995; Cox, 1982). For instance, Cox (1982) indicated that a health behavior theory derived from psychology focused on the effect of cognition and memory on health behavior but did not account for how the patient's social, environmental, or personal factors may influence health behavior. Also, Cox suggested that the factors in a patient’s background could influence their cognition and memory, which may affect their health behavior and influence their health decisions. Furthermore, health behavior theories did not address the client's characteristics, such as the client's demographics, and overlooked the health professional's role that may have affected the client's health behavior and health outcome disciplines (Carter & Kulbok, 1995; Cox, 1982).

In IMCB, the central focus is the client and the client-professional interaction. The purpose of Cox’s IMCB is to (a) identify factors that make the individual client unique, (b) identify elements in the client-professional interaction that can influence health outcomes, and (c) demonstrate the collective influence of the relationship between the individual client and client-professional interaction impact on health outcomes and health behavior (1982, 1986). The IMCB has broad variables associated within three constructs of (a) client singularity, (b) client-professional interaction, and (c) health outcomes disciplines (Carter & Kulbok, 1995; Cox, 1982, 1986).

Client Singularity

Cox (1982) reported that the IMCB construct of client singularity has various background variables that can be any combination in the client's background that makes the client unique. These unique characteristics in the background variables include the client's demographics, social influences, previous healthcare experiences with provider(s), and environmental resources (Cox, 1982, 1986). Cox indicated that the client's background variables occur before any antecedents, such as intrinsic motivation, cognitive appraisal, affective response, and constructs in the IMCB model. For example, Cox also noted that a client's previous healthcare experience (background variable) with a specific health problem will likely influence the client's health behavior before, for instance, cognitive appraisal (antecedent).

The antecedents that proceed with client singularity are the client's intrinsic motivation, cognitive appraisal of the health concern, and the client's affective response to the health concern (Cox, 1982). Intrinsic motivation is a primary element in the IMCB model, which includes factors in the client's background that can affect the client's motivation to engage in a certain behavior (Carter & Kulbok, 1995; Cox, 1982). Cox (1982) proposed that these background variables can interact simultaneously, cumulatively, or independently to produce a specific health behavior. For instance, a researcher conducting a study on coping may be interested in the relationship between the client's religious group (social influence) and financial resources (environmental resources) influence the client's motivation to engage (Cox, 1986).

Client-Professional Interaction

Cox (1982) hypothesized that the IMCB constructs of client-professional interaction are the major dominating influence over client health behavior. Cox indicated that four components in the IMCB model that define the client-professional interaction are (a) provision of information, (b) affective support, and (c) decisional control.

Provision of Information

Provision of information in the client-professional interaction is defined as imparting knowledge to the client about the health threat and treatment options to address the health threat, with the understanding that the knowledge presented to the client by the health professional is adequate and meaningful. Sufficient knowledge could assist the client and health professional in formulating actionable goals; this also gives the client a sense of competency to activate self-care that could influence positive health behaviors. However, those aspects of client singularity may influence how a client processes and uses health information (Cox, 1982).

Affective Support

Affective support in the client-professional interaction is defined as the client's level of emotional arousal. A client's affective support could likely prevail over the appraisal of the health problem. If this is the case, the health professional must implement health interventions to decrease the client's emotional arousal. This intervention should provide the client with essential and adequate health information to help develop a more accurate perception of the health threat, decreasing their affective response and giving them decisional control (Cox, 1982). However, healthcare professionals must consider the client's singularity to determine the client's level of need for affective support.

Decisional Control

Decisional control in the client-professional interaction allows clients to participate in the decision making and allows them to choose between treatment options (Cox, 1982). Allowing clients to participate in decision-making increases the client's self-efficacy, commitment, motivation, and self-determination while promoting self-relevant health behaviors. However, decisional control may be limited and the clients' view of the severity of their health problem can be inaccurate when they receive insufficient or inadequate health information (Cox, 1982).

Cox (1982) explained that these four components that define the client-professional interaction will vary in strength and direction and depend on the client's singularity and the healthcare needs expressed during the encounter. Therefore, the four components in the client-professional interaction signify the value of exchanging health information, interpersonal relationships between the client and health professional, and the health professional valuing and promoting the client's involvement in decision-making. Furthermore, Cox indicated that the relationship between the client-provider interactions may involve continuous reciprocal exchanges between internal and external aspects of client singularity and health outcomes that can interlock and operate as determents of each other.

Health Outcomes

Health outcomes are the final construct in the IMCB. Cox (1982) defined health outcomes as a client's positive or negative health behavior. Cox posited that positive behavior is when the client exhibits health behaviors that maintain or promote their current health state. In contrast, Cox explains that negative behavior is activities that place the client's health at risk and decreases the client's capacity for self-actualization.

The five health outcome variables in the IMCB include (a) the client's utilization of healthcare services, (b) the client's clinical health status indicators, (c) the severity of the client's health problem, (d) the client's adherence to medical regimen, and (e) the client's satisfaction with medical care (Cox, 1982). The variables in health outcomes can vary broadly and depend on the study's objective. However, only one health outcome variable can be the single interest of the study. Also, the client's health outcome will depend on the mutual influence of client singularity and client-professional interaction (Cox, 1982, 1986).

IMCB Assumptions

The IMCB has several assumptions. First, the IMCB includes the assumption that the client is independent and has the competency to make choices about their health behavior (Cox, 1982). These health behavior choices are influenced by the unique and various elements of client singularity (Carter & Kulbok, 1995; Cox, 1982). Another assumption in Cox's (1982) IMCB is that the client should have maximum control over their health decisions within the limitations of their internal and external environment. The client's internal environment is explained as the client's perception of their health problem and taking personal responsibility for decisions to promote positive health behaviors. When clients have maximum control over their health decisions within their internal environment, the IMCB assumes that their actions must be demonstrated in their external environment to preserve that health state. The final assumption in the IMCB is that clients progressively begin to take personal responsibility for their health behavior by actively engaging in self-care practices and health care decisions (Carter & Kulbok, 1995; Cox, 1982). Cox assumed that as the client continues to progressively demonstrate positive health behavior, the healthcare professional becomes more of a teacher and less of a decision-maker.

The objective of the IMCB is to identify, suggest, and explain the relationship between the client singularity and elements in the client-professional interaction that subsequently impact the client's health outcomes (Cox, 1982). Furthermore, the IMCB can provide an empirical foundation for further nursing research and interventions (Carter & Kulbok, 1995; Cox, 1986).

Previous Use of Theory

The IMCB has been used in various studies and disciplines that examined PPC health literacy, and self-management. In a recent study, Vance (2020) conducted a study to describe women veterans' interactions with civilian providers using the IMCB as a framework. In Vance's study, client singularity was the female veteran; client-professional interaction comprised provider communication, which included the quantity, quality, and approach to delivery and participation in decision making; and health outcomes were associated with self-management, utilization of services, and satisfaction. The researchers found that the participants' descriptions of patient-provider interactions included listening, exchanging communication, understanding, support, and decision-making. Additionally, Vance found that participants described health outcomes as positive or negative based on their experience during the patient-provider interaction.

Shen et al. (2021) evaluated self-management behaviors and health outcomes in patients with secondary coronary heart disease and used nursing interventions based on Cox's IMCB. Shen et al. found that self-management behaviors and health outcomes were significantly improved in participants who received interventions guided by the IMCB model.

Moreover, Hickman et al. (2016) examined the validity of IMCB in adults with hypertension. The researchers posited that the IMCB would offer new insights into social and behavioral determinants in adults with poorly controlled hypertension. Hickman et al.

discovered that the IMCB was a valid framework for examining health behavior changes in adults with hypertension. In their study, client singularity was health literacy, client-professional interaction was the professional's communication skills and the relationship quality, and health outcomes were health behavior activation and blood pressure control. Hickman et al. revealed that the client singularity (health literacy) directly and indirectly affected the quality of client-professional interactions (communication and relationship), which subsequently impacted health outcomes (health behavior activation and blood pressure control). Hickman et al. found that the IMCB constructs of client singularity and client-professional interaction/communication were significant factors in predicting health outcomes in adults with hypertension.

Mahone (2004) used the IMCB theoretical framework to evaluate decision-making in individuals with severe mental illnesses. Results showed that the IMCB was useful in focusing on the client's unique characteristics, the competency of the professional when exchanging health information with clients, and the client's ability to control their decisions. Healthcare professionals could develop tailored individualized care plans and promote good client self-management choices and behavior based on client singularity and client-professional interactions.

Rationale for the Theory

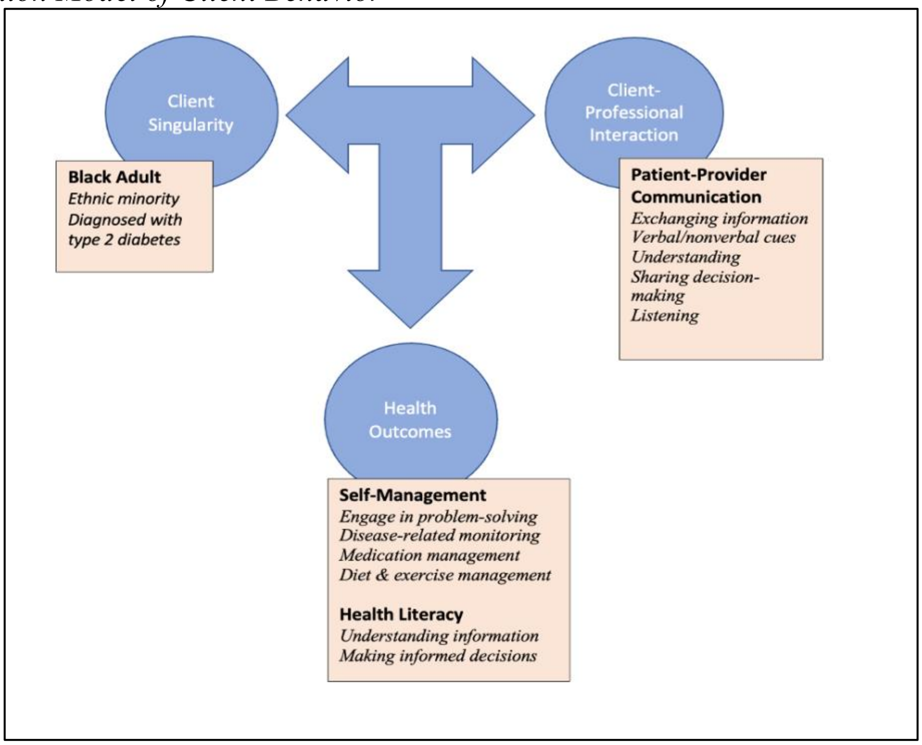
The rationale for choosing the IMCB for this study is the three constructs in the IMCB: client singularity, client-professional interaction, and health outcomes. The IMCB will guide my study to explain the relationship between client singularity and client-professional interaction impact on health outcomes.

I used the IMCB to guide me in critically appraising the client's uniqueness and client-professional health interaction connection to health outcomes. Black adults have been disproportionally diagnosed with T2DM and are more likely to experience greater morbidity and mortality secondary to diabetes-related complications (Abdullah et al., 2019; Ajuwon & Insel, 2022; American Diabetes Association; 2022). Moreover, data indicate that 58% of Blacks have limited and low health literacy (Kutner, 2006). Health literacy is crucial for helping Black adults understand the importance of diabetes self-management and the consequences when T2DM is poorly managed. Research has demonstrated that effective PPC is the foundation for health outcomes (Agency for Healthcare Research and Quality, 2020; Yağar, 2021). Effective PPC is particularly necessary for assisting Black adults in becoming well-informed of the benefits and risk complications associated with T2DM.

Figure 1 shows the IMCB relationship to the variables in this study, which are health literacy, self-management, and provider communication and self-management. The element of IMCB, client singularity, relates to the participant's demographics, which is the Black adult that is an ethnic minority that is diagnosed with T2DM. Client-professional interaction relates to PPC in the healthcare encounter that includes verbal and nonverbal communication, two-way exchange of information, and shared-decision making. Lastly, the element of health outcomes relates to how client singularity and client-professional interaction mutually impact self-management health behaviors the client with T2DM that involve engaging in problem solving, disease-related monitoring, medication management, and lifestyle management, and health literacy which is the client's understanding and using the health information to make an informed health decision.

Figure 1

Interaction Model of Client Behavior



Note. Theoretical framework interaction model of client behavior relationship to variables. Adapted from "An interaction model of client health behavior: Theoretical prescription for nursing", by Cox, C. L, 1982, *Advances in Nursing Science*, *5*(1), 41–56 (https://doi.org/10.1097/00012272-198210000-00007).

Literature Review Related to Key Variables and/or Concepts

Health Literacy

Health literacy is the ability to analyze the health information received, decode health instructions, and weigh the risks against the benefits so that patients can make a decision to act (National Institute of Health, 2021). Bohlman and the Institute of Medicine (IOM, 2004) defined health literacy as the degree to which an individual has the capacity to obtain health information, process health information, and understand the information they received to make an informed health decision. Furthermore, Bohlman and the IOM described the context of health Stormacq et al., (2019) visual and auditory acuity that is functional and combined with literacy skills of reading, writing, numeracy, speech, and speech comprehension that includes all interactions with a person regarding their health such as engaging in health-related tasks, communicating, as well as the provider communication skills, and listening. Provider communication skills and listening components of health literacy are characterized as basic/functional literacy, interactive literacy, and critical literacy (Nutbeam, 2008; Rachmawati et al., 2019). Additionally, the WHO (2023) described health literacy as levels of health knowledge, personal skills, and a person's confidence to take action to improve health. Health literacy is an individual's ability to obtain, process, and understand health information (Han et al., 2019). Individuals of all ages, ethnicities, and educational backgrounds can struggle with health literacy due to new health information that is often complicated and multifaceted (Office of Disease Prevention and Health Promotion, 2010).

Limited Health Literacy and Type 2 Diabetes Mellitus

Limited health literacy is present when a patient has a poor understanding of treatment recommendations (Alsaedi & McKeirnan, 2021). For example, patients with limited health literacy may experience difficulty when reading medication labels, taking medications as prescribed, and with following treatment instructions (Abdullah, Liew et al., 2019; Ajuwon & Insel, 2022). Limited health literacy can also affect the ability of patients diagnosed with chronic diseases to understand and comprehend healthcare decisions (Hickey et al., 2018). The results of limited health literacy include poorer overall health status, increased risk of hospitalizations, and increased use emergency services, which results in higher healthcare costs (Alsaedi & McKeirnan, 2021; McDonald & Shenkman, 2018). In patients with T2DM, limited health literacy can negatively impact the control they have of their chronic disease. Ajuwon and Insel (2022) stressed that T2DM patients with limited health literacy are at a greater risk for poor glycemic control and poor comprehension of medical instructions and are significantly at risk for taking T2DM medications at the wrong time or taking the incorrect medication dose. Additionally, T2DM patients may not recognize cautionary signs of impending problems associated with poorly controlled T2DM, such as hypoglycemia or hyperglycemia, or the greater risk of being diagnosed with diabetes-related complications. The limitations of Ajuwon and Insel's study were that they used a brief tool to assess health literacy that consisted of four questions, and the researchers were unfamiliar with collecting data from social media online during COVID-19. In T2DM, difficulty following medical treatment as recommended can be a serious health threat for patients with chronic diseases. Therefore, T2DM patients must have adequate health literacy to prevent further complications, particularly Black adults who are at greater risk of experiencing limited health literacy (Muvuka et al., 2020).

Limited health literacy has been associated with healthcare disparities that can predict a patient's health behavior and health outcomes (Muvuka et al., 2020). Nelson et al. (2019) examined disparities in health literacy in non-Hispanic Whites and non-Hispanic Blacks with T2DM after equally adjusting socioeconomic status and found that non-Hispanic Blacks had limited health literacy, poor decisional control (particularly over dietary choices), and higher hemoglobin A1c readings when compared to non-Hispanic Whites. After controlling for socioeconomic status, Nelson et al. (2019) revealed that inequity in healthcare may account for the non-Hispanic Blacks' higher hemoglobin A1c readings and suggest that the dietary decisional control of non-Hispanic Blacks was more problematic than non-Hispanic Whites. The findings suggested that Black adults with limited health literacy are more likely to encounter complications from poorly controlled T2DM. However, the limitation of this study was that the researchers were unable to determine other factors that contributed to limited health literacy after socioeconomic status was ruled out.

Socioeconomic status, education, and ethnicity have strongly influenced health literacy. In fact, studies revealed that education level, demographics, ethnicity, socioeconomic status, primary language, and social support influenced health literacy (Park et al., 2018; Sabaghinejad, 2023; Stormacq et al., 2019). Moreover, clarity of the provider’s explanation of health information and perception empowerment were additional factors that influenced patients' health literacy and management of T2DM (Xu et al., 2018). Several studies confirmed that health literacy influences diabetes knowledge in patients with T2DM (Abdullah et al., 2020; Kim et al., 2020). There is an abundance of evidence pointing to inequities and societal status as factors that substantially influence the causes of limited health literacy in patients. However, further studies demonstrating other causes of limited health literacy in Black Americans with T2DM are needed to provide a clearer understanding of this phenomenon. Therefore, my study is important in determining PPC's association with low health literacy and how these factors collectively influence self-management behavior in Black adults with T2DM.

Health Literacy and Type 2 Diabetes Mellitus

Adequate health literacy is crucial in controlling diabetes-related complications and mortality. However, a study by Abdullah et al. (2019) that examined health literacy skills in T2DM patients found that one out of three patients in the United States with T2DM had limited functional health literacy and difficulty managing their care and making decisions about their T2DM. Research indicates that 28.9% of patients with T2DM in the United States have limited health literacy (Abdullah et al., 2019) and that 58% of Black adults in the United States have basic or limited health literacy (Kutner, 2006). Abdullah et al. (2019) indicated that more research is needed to improve health literacy in patients with T2DM. Health literacy in T2DM directly affects diet and glucose monitoring and indirectly impacts hemoglobin A1c (Williams & Egede, 2020). Patients with adequate T2DM health literacy are 1.85 times more likely to achieve glycemic control compared to those with limited health literacy (Marciano et al., 2019; Tefera et al., 2020). Limited health literacy can further increase the T2DM patient's risk of experiencing diabetes-related complications and mortality.

In T2DM, limited health literacy is associated with poor adherence to medications and a poorer understanding of treatment recommendations and disease prevention (Alsaedi & McKeirnan, 2021; Ajuwon & Insel, 2022; Doubova et al., 2019; Selvakumar et al., 2023) and patients with limited health literacy were unlikely to report side effects or discuss concerns about their medications with their providers (Selvakumar et al., 2023). To influence glycemic control directly and indirectly, T2DM patients need adequate health literacy to extract meaning from their diagnosis, sufficiently use disease-related information in their everyday lives, communicate encountered problems with healthcare providers, and engage in shared-decision making with their healthcare providers (Doubova et al., 2019; Wang et al., 2019; Williams & Egede, 2020). Therefore, adequate health literacy is essential for understanding the importance of T2DM treatment and properly discussing problems encountered with the provider's prescribed regimen.

Gomes et al. (2020) conducted a quantitative study to identify factors influencing health literacy and glycemic control in Type 1 diabetes and T2DM patients. While the researchers found no factors influencing health literacy, they discovered that glycemic control was influenced by education, age, and race, in which Whites had higher health literacy scores than non-Whites. Also, Gomes et al. revealed that only 18% of Type 1 diabetes patients had inadequate health literacy compared to 55.2% of T2DM patients. The limitation of this study was that the researchers were unable to determine the factors that caused most T2DM participants to demonstrate inadequate health literacy. Even with those limitations, the results are a critical assessment of the influence of PPC on health literacy in patients with T2DM.

Limited Health Literacy Impact on Illness Perception and Knowledge

People with T2DM and limited health literacy also have a lower perception of their chronic disease. T2DM patients with a lower perception of their illness have been found to minimize T2DM, the seriousness of health risks associated with T2DM, and life-threatening complications that are directly caused by T2DM (Ochieng & Crist, 2021). T2DM patients with limited health literacy may not fully understand the disease threats associated with their chronic disease. For example, research has found that limited health literacy increases T2DM patients' risk of developing cardiovascular disease (Vieira et al., 2021) and the presence of cardiovascular disease increases their risk of mortality (Tsai et al., 2023). Therefore, it is necessary for T2DM patients' perceptions must improve to grasp the fact that T2DM can be pose a serious threat to their health and life. However, research explained that poor perception of T2DM still exist in T2DM patients with limited health literacy. For instance, a study found that Black American female participants newly diagnosed with T2DM with limited health literacy believed T2DM was an acute illness that could be cured after completing their T2DM medications (Ochieng & Crist, 2021). Other studies found that T2DM patients with limited health literacy who have a poorer perception of their illness were more likely to be nonadherent with medications (Ajuwon & Insel, 2022; Shiyanbola et al., 2018), more likely to demonstrate lower comprehension of medical instructions, and were more likely to have depression (Ajuwon & Insel, 2022). Therefore, T2DM knowledge is critical for improving T2DM patients' illness perception and may prevent other serious diabetes-related complications, including depression symptoms.

Diabetes knowledge is described as glucose monitoring, glycemic control, and monitoring for signs and symptoms of complications (Jeffers et al., 2019). However, studies indicated that patients with T2DM reported that the information received from providers was basic, primarily focused on medications and glucose monitoring, and did not discuss diet or foods to avoid (Jeffers et al., 2019; Ochieng & Crist, 2021). Moreover, the information T2DM patients received from providers was more focused on biomedical data than providing diabetes knowledge of managing T2DM daily (Jeffers et al., 2019). T2DM patients reported advocating and learning about T2DM for themselves (Ochieng & Crist, 2021).

T2DM is a grim chronic illness that can be life-threatening if not taken seriously; therefore, improving the patient's perception and knowledge of T2DM is of the utmost importance, particularly in Black Adults. However, Jeffers et al. (2019) examined how diabetes knowledge is conceptualized in Black Americans with T2DM. Jeffers et al. discovered that participants learned how to manage their T2DM by suffering from the consequences of uncontrolled T2DM, observed other individuals with complications, obtained T2DM information from family or friends, and had poor knowledge of how to manage their T2DM daily. Learning about T2DM from a non-clinical layperson or results from trial and error after suffering consequences should not be the gold standard for improving health literacy in T2DM patients. Also, research indicates that having specific T2DM knowledge is linked to higher health literacy in different populations (Caruso et al., 2018). The findings in Jeffers et al. study is valuable, however, the sample size was too small to be generalized to a larger population of Black adults.

Patient-Provider Communication

The concept of PPC is defined as verbal and nonverbal communication cues, verbal tones, perception, and body language of the patient and provider that occurs during the healthcare encounter (Abhishek et al., 2019; Afriyie, 2020; Cuevas et al., 2016; Hagiwara et al., 2018; Kautt, 2019). Effective PPC involves listening and respectfully engaging in a two-way exchange of information to promote the patient's understanding of their health condition so that the patient can participate in the shared decision-making concerning their health (Afriyie, 2020; Baessler et al., 2020; Cuevas et al., 2016; Chandra et al., 2018). Effective PPC also includes mutual understanding, respectful dialogue, and interaction between the patient and provider in the clinical encounter (Hong et al., 2020).

Effective PPC can benefit patients and the healthcare system. PPC has been described as the central and the most vital component of medicine (Adebayo et al., 2020; Yağar, 2021). The benefits of effective PPC include decreased healthcare utilization and costs, improved patient ability and willingness to activate self-management of their health condition (Yağar, 2021), and effective PPC improved patient health outcomes (Lie et al., 2022; Sharkiya, 2023; Chandra et al., 2018). Therefore, it is essential for patients to receive effective PPC so that they can better understand their diagnoses and actively participate in managing their disease to improve their health outcomes.

However, poor healthcare interactions can present a barrier to effective PPC in the encounter. For example, Paiva et al. (2019) explored the facilitating and constraining factors of patient-centered communication during patient-provider encounters in patients with T2DM. Paiva et al. found that the barriers that interfered with effective PPC were (a) power imbalance, (b) disease minimization, (c) perception of aggressive behavior, and (d) the use of jargon. The researchers also revealed that power imbalance between the patient and provider played a significant role in patients refraining from asking questions, especially when their glycemic values were abnormal, which made them fear being reprimanded by their provider. Similar studies support barriers to quality PPC in healthcare encounters. Keshavarzi et al. reported barriers that interfered with PPC included providers unprofessional behavior, providers ignoring the patients' questions, providers' having a sense of superiority, bias against the patient, or cultural differences (2022). Some providers may lack empathy, improperly use verbal and non-verbal communication skills, demonstrate a lack of respect, or disregard the patients in the shared decision-making in the healthcare encounter (Kee et al., 2018; Keshavarzi et al., 2022). Results from Kee et al. were that providers demonstrated poor listening skills and lacked in providing the patient with quality of the health information (2018). Poor communication exchanges, power struggles, lack of compassion, and poor listening skills devalues patients' health concerns and participation in the healthcare encounter have limited benefits in improving the patient's health outcomes. In fact, poor PPC significantly delays much-needed medical care for Black adults. (Rhee et al., 2019).

Other barriers to effective PPC are the patients' educational level and language proficiency (Aelbrecht et al., 2019; Keshavarzi et al., 2022;). Some argue that the patient's race is a barrier to effective PPC and that ethnic minorities are more likely to receive poor-quality PPC in healthcare encounters (Keshavarzi et al., 2022; Pérez-Stable & El-Toukhy, 2018; Schut, 2021). To illustrate this barrier to effective PPC in ethnic minorities, a study concerning Black immigrants found that Black immigrants encountered the same healthcare PPC challenges as Black Americans and that Black immigrants' overall health worsened over time despite their health status upon arrival to the United States (Adebayo et al., 2020). Additionally, studies found that Black adult patients experienced poor PPC in the domains of quality of communication, received less information from providers, and were unlikely to be involved in the shared-decision making (Brown et al., 2023; Pérez-Stable & El-Toukhy, 2018; Shen, Peterson, et al., 2021). PPC should be effective in spite of a patient's primary language, race, ethnicity, or socioeconomic background and not a risk factor for receiving quality care.

Nonetheless, Black adults are at risk for experiencing poor PPC in the healthcare encounter, and numerous studies point out this phenomenon. Black Americans often felt rushed and believed their health concerns were unheard during primary provider healthcare encounter (Cuevas et al., 2016; J. Mitchell et al., 2019). Mitchell et al. (2019) also found that Black adult patients were more likely to receive negative talk, be verbally dominated in the patient-provider encounter, receive less respect and support, experience unfavorable non-verbal communication, and have shorter visits with providers than non-Hispanic White adult patients. Although studies showed a difference in PPC Black adults received in healthcare encounters compared to non-Hispanic White adults, this study only included a subset of Black adults, therefore cannot be generalized to all ethnicities in the Black population.

Even with chronic illnesses such as T2DM, effective PPC is crucial for successful health outcomes. T2DM patents are more likely to accept and adhere to diabetic treatment when they received quality PPC (Mathew et al., 2022). Also, non-Hispanic White patients are more likely to report that providers always explained information in a manner they understood and were more confident in managing their T2DM compared to Black adults and other ethnicities (Kindratt et al., 2023). Moreover, Black Americans reported that they often felt discredited and had to constantly remind the provider to acknowledge their perspective to receive fair medical treatment (Cuevas et al., 2016). Zisman-Ilani et al. (2021) found that in the healthcare encounter, Black adults were often excluded from shared decision-making and received inconsistent information from providers, which created barriers to successfully managing their T2DM. Moreover, they indicated Black adults preferred provider communication that was empathetic, respectful, and open to help them successfully self-manage their T2DM in day-to-day life. Also, Black adults with T2DM who received quality PPC—characterized by clear explanations of their treatment plans and test results, delivered in an understandable and unhurried manner—had lower A1c levels than those with poorer PPC experiences (Reid et al., 2021).

Moreover, Bonner et al.'s (2017) exploratory study revealed that the knowledge deficit of Black adults diagnosed with T2DM impacted their self-management behaviors. Bonner et al. discovered that most of the participants in their study lacked basic health knowledge about foot care and lacked knowledge about how diabetes-related complications can lead to lower extremity amputations. Additionally, they found that

PPC was a significant factor in the participants' perception of their T2DM. Although Bonner et al. found that Black Americans often lacked the information needed to effectively monitor and manage T2DM, further research is needed to quantify PPC's impact on health literacy and self-management in this population.

Patient-Provider Communication and Health Literacy

The key to effective health literacy is successful PPC. However, White et al. (2016) reported that in the patient-provider encounter, the speed of provider speech, how the provider explained and gathered health information from patients, and an unwelcoming presence in the decision-making during the patient-provider encounter limited patient knowledge and health literacy about their disease. White et al. (2016) also revealed that participants reported that the health information received from the providers was insufficient and that providers did not check the participants' understanding of the information presented. It is also important to note that White et al. (2016) concluded that individuals with limited health literacy received poorer PPC than individuals with adequate health literacy.

Providers may need to be made aware of the patient's level of health literacy. Mor-Anavy et al. (2021) examined the association between healthcare providers' awareness of health literacy and healthcare providers' communication skills with limited health literacy patients. Mor-Anavy et al. (2021) found that 48% of the participants (providers and health administrators) had insufficient skills in identifying patients with limited health literacy, and one-third needed to be made aware of the connection between limited health literacy and inappropriate healthcare utilization. Similar studies also found that one-third of providers had difficulty recognizing patients with limited health literacy and explained that providers were unable to tailor their communication style to adjust to patients with limited health literacy (Leslie et al., 2019; Murugesu et al., 2022). In chronic illnesses like T2DM, the quality of PPC is crucial for comprehending and gaining knowledge about the health risks associated with the disease. As previously noted, Reid et al. (2021) found that Black adults with T2DM who experienced effective PPC had lower hemoglobin A1c levels compared to those who reported poor PPC. When providers rarely used plain language or teach-back methods, it reflected a lack of understanding about how limited health literacy affects patients' disease knowledge (Leslie et al., 2019). Therefore, increasing provider awareness of limited health literacy and determining if there is a relationship with PPC is vitally important to improve health outcomes.

However, providers suggested that limited health literacy may stem from the patients themselves. For instance, providers believed that limited health literacy was a patient problem and not a problem associated with poor PPC (Leslie et al., 2019). As a result of this perception, when providers encountered patients with limited health literacy, they reported that these patients had difficulty comprehending medical instructions, communicating during the healthcare encounter, and following up with care (Murugesu et al., 2022). Also, providers' communication skills were more effective towards patients with higher levels of health literacy (Mor-Anavy et al.,2021), and these high level health patients were less likely to rate their health literacy as limited and had fewer hospital admissions (Cronin et al., 2020). Consequently, patients with limited health literacy may not understand the essential threat their chronic disease poses if they present with a poorer understanding of their illness in the healthcare encounter. They may also be at risk of receiving poorer PPC. Therefore, more research is warranted to determine PPC's impact on health literacy.

Self-Management

Typically, self-management involves losing or maintaining a healthy weight, modifying diet, exercising regularly, and smoking cessation (Agency for Healthcare Research and Quality, 2014; Centers for Disease Control and Prevention, n.d.; Jones, 2022). However, in chronic diseases, self-management comprises of (1) ongoing problem-solving skills that include of active learning, frequent adapting, and self-reflection and (2) having healthy coping skills to handle the day-to-day stress of living with a chronic disease (Agency for Healthcare Research and Quality, 2014; Ayre et al., 2022; CDC, n.d.; Kumar & Mohammadnezhad, 2022; Nguyen et al., 2022).

T2DM is a chronic disease that requires active self-management behavior. Self-management in T2DM is embracing self-care behaviors that include medication adherence, monitoring blood glucose, problem-solving, being physically active, and having the mental capacity to manage T2DM on a daily basis (Centers for Disease Control and Prevention, 2023, January; Nguyen et al., 2022). Also, T2DM self-management is eating a healthy diet to control blood glucose levels and understanding the risk of diabetes-related complications (Centers for Disease Control and Prevention, 2023, January; Kumar & Mohammadnezhad, 2022). T2DM is a stressful disease that requires good coping skills to manage the ongoing daily tasks and decisions that are necessary to successfully manage T2DM. Therefore, it is essential for T2DM patients to engage in active self-management activities to prevent further complications and mortality (Kumar & Mohammadnezhad, 2022).

Self-Management and Health Literacy

Self-management and adequate health literacy are essential for successful activation of T2DM. Adequate health literacy can lead to T2DM patients having a better understanding and knowledge needed to implement active self-management behavior (Rachmawati et al., 2019). Moreover, adequate health literacy is important for activating T2DM self-management behavior, such as monitoring blood glucose on a regular basis and adhering to medications and dietary guidelines (Kim, 2021). In Black adults, adequate health literacy can influence good self-management behavior (Tseng et al., 2022), thus highlighting the importance of adequate health literacy in promoting the understanding of active self-management of T2DM.

Conversely, poor health literacy contributes to problems with self-management activities. Health literacy significantly affects medication adherence, self-efficacy, and illness perception in T2DM patients (Shiyanbola et al., 2018). In Black adults, poor illness perception, poor knowledge, and poor medication adherence are linked to poor self-management and limited health literacy (Ajuwon & Insel, 2022; Bosun-Arije et al., 2019). Nelson et al. (2019) discovered that non-Hispanic Blacks had lower health literacy and poorer diabetes self-management skills in medication adherence and made poorer dietary decisions than non-Hispanic Whites. Results also showed that lower health literacy and poorer diabetes self-management skills in medication adherence may have contributed to higher hemoglobin A1c levels in non-Hispanic Blacks than non-Hispanic

Whites Therefore, limited health literacy can lead to very poor decision-making in self-managing T2DM factors that may potentially affect controlling blood glucose levels.

Health literacy is an essential factor in effective T2DM self-management behavior. T2DM patients with limited health literacy misunderstand the basics of self-management that include glucose monitoring, belief in holistic T2DM remedies, and difficulty seeking and obtaining detailed information about T2DM (M. Kim et al., 2020). More importantly, these patients are unaware that T2DM can lead to far more serious health problems (Kim et al., 2020). For instance, Vieira et al. (2021) found that limited health literacy was strongly connected with the development cardiovascular disease, which is the leading cause of death in patients with T2DM. Poor self-management interfered with patients' abilities to understand this inherent health risk (Vieira et al., 2021). Being oblivious to the importance of the knowledge, understanding, and health risks associated with T2DM can pose serious life-threatening complications particularly when T2DM is poorly self-managed; therefore, having adequate health literacy is crucial.

Successful T2DM management should be the ultimate goal because T2DM patients. Shiyanbola et al. (2018) and Visscher et al. (2020), found that T2DM patients with adequate health literacy are more likely to report concerns about their T2DM medications, whereas patients with limited health literacy have insufficient medication self-management skills. Moreover, T2DM patients with adequate health literacy are more likely to remain motivated and actively engage in effectively self-managing their T2DM compared to patients with limited health literacy (Ayre et al., 2022). Adequate health literacy in the domains of being able to seek, obtain, and appraise health information, having enough information, and having provider and social support can increase the T2DM patients' confidence to self-manage the daily tasks associated with managing T2DM (Debussche et al., 2022; Dinh & Bonner, 2023). Therefore, good self-management behavior is built on the foundation of adequate health literacy to inspire T2DM patients' confidence to engage in the continuous and ongoing management of T2DM.

Self-Management and Patient-Provider Communication

Effective PPC is an important component of self-management in patients with T2DM. However, despite the providers' best efforts to communicate effectively with T2DM patients, *vast improvements must be made* to activate self-management behaviors. Patients with T2DM found PPC more useful when their providers communicated using words that helped them understand health information and included them in the T2DM shared decision-making process (Taylor et al., 2018). Also, T2DM patients were more confident in T2DM self-management when providers spend adequate time communicating risks associated with T2DM and are given the proper tools and guidance to help them understand self-management of their diagnoses (Kindratt et al., 2022; Peimani et al., 2020; Walker et al., 2022). Kindratt et al. further explained that non-Hispanic WhitesT2DM patients had better active self-management behaviors when measuring PPC in the context of listening and spending time explaining treatment. These studies suggest that quality PPC can effectively influence self-management behavior with sufficient provider support to help patients increase their knowledge and understanding of self-management's important role in successfully controlling their T2DM. However, patients receiving quality PPC is not always the case.

Some elements of PPC may be counterintuitive to effective self-management in T2DM patients. Studies indicated that disrespecting, reprimanding, or talking down to patients and hurried communication during PPC encounters presented barriers to patients activating self-management behaviors (Kirk et al., 2023; Peimani et al., 2020). Also, patients who encountered poor PPC lacked the confidence required to self-manage their T2DM (Peimani et al., 2020). Consequently, these poor, ineffective PPC elements could seriously hamper patients' abilities to feel secure in self-managing their T2DM.

Effective PPC can improve the patient's perception of T2DM and motivate them to activate self-management. For example, in a global quantitative study, researchers Bartkeviciute et al. (2023) found that although some providers scored high on respect and creating a comfortable environment, providers scored lowest in encouraging patients to ask questions and participate in shared decision-making. The study also indicated that patients' perception of the quality of the providers' communication during the healthcare encounter impacted their perception of their T2DM and their approach to diabetes self-management care. Also, in Black patients with T2DM, providers who had an increased understanding of the burden T2DM has on Black adults who can effectively communicate disease knowledge in the patient-provider encounter were more likely to activate self-management behavior (Hawkins et al., 2018). Therefore, this undergirds the implication that the quality of PPC can make a marked difference in self-management behaviors. Additionally, active self-management behaviors are more likely to occur when PPC is perceived as being honest, sensitive to culture, supportive, non-judgmental, and includes a willingness to allow the patient to participate in shared decision-making

(Bhaloo et al., 2018; Peimani et al., 2020). More importantly, T2DM patients who experienced effective PPC in healthcare encounters had better self-management behaviors and, ultimately, better health outcomes (Kindratt et al., 2023; Peimani et al., 2020). The research presented highlights PPC's vital role in informing, reinforcing, supporting, increasing understanding, and motivating patients in their journey to manage their T2DM and improve their health outcomes successfully.

Health literacy, Patient-Provider Communication, and Self-Management

In patients with T2DM, PPC is a valuable foundation for health literacy that can impact good self-management behaviors. Effective PPC can be a motivating factor that can improve T2DM patient's health literacy level and activate good self-management behavior in T2DM (Bhaloo et al., 2018; Kirk et al., 2023). Also, effective PPC has been shown to improve T2DM patients with limited health literacy levels to adequate health literacy when the providers are consistent in their approach and used culturally tailored communication that increased the patient's knowledge and understanding of T2DM and resulted in the promotion of good self-management behaviors (Alsaedi & McKeirnan, 2021). Additionally, effective PPC can influence adequate health literacy and good self-management behaviors in Black adults. For instance, research found that Black Adults with T2DM experienced effective PPC when providers were willing to listen, answer questions, and not make assumptions about the patient's disease knowledge, which influenced good self-management behaviors in this population (Ochieng & Crist, 2021). Thus, confirming that when PPC is effective, it can increase the T2DM patient's health literacy level and activate good self-management behaviors necessary for favorable health outcomes in patients with T2DM.

Synthesis

Adequate health literacy and quality PPC that is effective is such a crucial component when diagnosed with T2DM, which is a potentially debilitating and deadly disease. However, providers that demonstrate uncalled-for behavior in PPC encounters, such as verbally dominating the patient, ignoring the patient's concerns, using jargon that may be difficult for the patient to understand, not including the patient in shared decision-making, or giving the patient insufficient information increases the likelihood of the patient having a poorer understanding of their T2DM (Kee et al., 2018; Keshavarzi et al., 2022; Paiva et al., 2019; White et al., 2016). Furthermore, the PPC that Black adults have received in the healthcare encounter is even more concerning. During the PPC encounter, Black adults often received poorer communication, experienced hurried or negative communication, felt rushed and disrespected in the healthcare interaction, healthcare concerns were disregarded and were excluded from the shared decision-making process (Cuevas et al., 2016; Jeffers et al., 2019; Mitchell et al., 2019). Furthermore, Black adults with T2DM and limited health literacy often had a lower perception of their illness and often sought out pertinent health information from sources other than their healthcare provider (Jeffers et al., 2019), thus, lessening the seriousness of the danger complications that T2DM poses to their health (Ajuwon & Insel, 2022; Ochieng & Crist, 2021; M. Kim et al., 2020; Shiyanbola et al., 2018). Non-Hispanic Black and White patients with type 2 diabetes mellitus that reported that their healthcare providers demonstrated effective PPC consistently indicated that their providers clearly explained health information, attentively listened to their concerns, and actively involved them in shared decision-making; had better health literacy levels and good self-management behaviors that were further validated by controlled hemoglobin A1Cs and improved health outcomes (Doubova et al., 2019; Gomes et al., 2020; Hong et al., 2020; Marciano et al., 2019; Nelson et al., 2019; Reid et al., 2021; Tefera et al., 2020; Wang et al., 2019). However, patients with limited health literacy are in jeopardy of having different and unfavorable health outcomes. Limited health literacy can leave T2DM patients vulnerable to experiencing poor PPC and serious complications or death from uncontrolled hemoglobin A1cs as a result of poor self-management behaviors (Jeffers et al., 2019; Mor-Anavy et al., 2021; McDonald & Shenkman, 2018; Nutbeam, 2008; Ochieng & Crist, 2021; Xu et al., 2018).

Other factors can also influence health literacy and self-management behaviors. Studies indicated that the patient's age, income, language, and race play a significant role in determining the level of the patient's health literacy level that can influence self-management behaviors (Abdullah et al., 2019; Adedayo et al., 2020; Gomes et al., 2020; Park et al., 2018; Pérez-Stable & El-Toukhy, 2018; Sabaghinejad, 2023; Schut, 2021; Stormacq et al., 2019). However, there is limited research specifically examining whether a relationship exists between PPC during healthcare encounters and Black adults with type-2 diabetes mellitus, as well as whether this communication is linked to self-care behaviors among Black adults with type-2 diabetes mellitus.

Summary and Conclusions

In summary, evidence has shown that health literacy is a significant factor in T2DM patients' ability to understand and process information received from their PPCs in the healthcare encounter. PPC is vital in the healthcare encounter is vital because health information can guide patients to the actions necessary to self-manage their chronic illness towards the goal of improving their health outcomes (Agency for Healthcare Research and Quality, 2020; Lie et al., 2022; Sharkiya, 2023; Yağar, 2021). However, many T2DM patients have limited health literacy in the United States, and Black adults account for more than half of patients with limited health literacy. T2DM patients with limited health literacy may have a poor perception of their illness, may not fully understand medical regimen or instructions, may not take medications as prescribed, may have problems controlling blood sugars, and may not communicate their needs or concerns in the patient-provider healthcare encounter which places patients in imminent danger of experiencing diabetes-related complications and even death. Consequently, the PPC received in the healthcare encounter plays a significant and fundamental role in the health outcomes of T2DM patients. In the meantime, providers may not be aware of their communication style's positive or negative influences regarding health literacy or self-management. Adequate health literacy can increase T2DM patients' knowledge and understanding of the dangers of T2DM. It may also provide patients with the confidence to cope with the tasks associated with the daily self-management of T2DM and help prevent further complications.

Previous research findings also strongly indicated that limited health literacy is acutely associated with socioeconomic status and ethnicity (Park et al., 2018; Sabaghinejad, 2023; Stormacq et al., 2019). There is limited research on other causes of poor self-management in T2DM patients, further strengthening this study's need. Moreover, the research indicates that more needs to be done to determine additional influences that may be associated with limited health literacy, especially in Black adults with T2DM, when socioeconomic status is not an issue (Nelson et al., 2019). Therefore, the aim of this study is to determine the relationship between health literacy, PPC, and self-management in Black adults with T2DM.

In Chapter 3, I discuss the research design and the rationale for the selected research design. I also described the study’s population, the sampling procedures used for the study, the recruitment process, and the reliability and validity study's instruments. Finally, I provide an analysis of the data and address the study's ethical concerns as well as the procedures used to protect the data and confidentiality of participants.

Chapter 3: Research Method

The purposes of this quantitative study were to determine (a) if there is relationship between PPC during the healthcare encounter to health literacy among Black adults (18 years and older) with T2DM and (b) if there is a relationship between PPC during the healthcare encounter and self-care behaviors among Black adults (18 years and older) with T2DM. In Chapter 3, I present the research design and rationale, methodology, data analysis plan, and threats to validity. I described the procedure for recruiting participants for my study.

Research Design and Rationale

I selected a descriptive correlational design. A descriptive correlational research design assisted in determining the relationship between the variables of health literacy, PPC, and self-management. A correlational approach assisted in measuring the degree and direction of the relationship between the variables and quantifying the effect the independent variable has on the dependent variable (Creswell & Creswell, 2018; Curtis et al., 2016; Gray & Grove, 2021).

Predominantly, the foundation of this study is the examination of the relationship between health literacy, PPC, and self-management. I sought to understand the relationship between the variables in the research questions. The descriptive correlational research design method maximized the depth in which the connection can be studied and assist in describing and measuring the relationship between the selected variables (Curtis et al., 2016). The independent variables were health literacy and PPC and the dependent variable was self-management.

Additionally, I selected online surveys for this non-experimental quantitative research design to collect the data gathered to answer the research questions. These surveys were self-administered and were completed online. SurveyMonkey delivered the online surveys using a uniform resource locator (URL) link. To access the survey, participants followed the URL link provided through Amazon's Mechanical Turk (MTurk) or the Walden University Participant Pool. This URL address then linked participants to the CAHPS Clinician and Group 3.0 Health Literacy Survey, the CAT Survey, and the DSMQ Survey that are directly related to the study's research questions.

A quantitative study with a descriptive correlational research design using cross-sectional methods has advantages and limitations. The advantage of this research design choice is the rapid turnaround of the data within a selected timeframe and the recruitment of participants on MTurk (Amazon, 2024). The limitations of this approach are that using cross-sectional methods could lead to an over or undersaturation of participants in the specified timeframe and time constraints. Another advantage of this descriptive correlational design is that I could use multiple linear regression analysis and analyze this study’s data using IBM Statistical Package for Social Sciences latest software, Version 29. This design approach assisted in examining the relationship among the multiple variables in this study and the strength of this relationship (Gray & Grove, 2021). However, the limitation of the design choice is that multiple linear regression is not adequate in determining causality (Gray & Grove, 2021).

There were other limitations in this quantitative study's descriptive correlational research design. The limitation associated with the design choice of online self-administered surveys is dishonesty when answering the survey questions. The efficacy of the data received from the self-administered surveys depends on the participants' truthfulness in answering the items on the survey questionnaire (Queirós et al., 2017). Additionally, participants taking self-administered surveys may not complete the survey or leave survey questions unanswered (Andrade, 2020). Consequently, too many incomplete surveys may limit the ability to collect the amount of data needed for this study.

Another limitation is that participants may have limited access to the internet with a computer device. Participants must have a computer device with internet access to complete self-administered surveys online. Consequently, administering surveys online presents a two-way barrier for participants . The first participants may have limited or no internet access and the second is participants may have limited technical knowledge (Oliveri et al., 2021) and encounter technical challenges. Hence therefore, the limitations mentioned may lead to an underrepresentation of this study's target population (Oliveri et al., 2021), and thus by skewing the data.

In conclusion, previous studies have used non-experimental quantitative descriptive correlational research design to study various relationships. For example, researchers used descriptive correlational research to examine the relationship between health literacy, the source of health information, and variables related to health literacy and health disparities (Cutilli et al., 2018). The descriptive correlational research method was also used to examine the association between health literacy, illness perception, depression, and other concept variables related to self-management in T2DM patients

(Ajuwon & Insel, 2022). Patients preferred healthcare providers as their primary source of health information (Cutilli, et al., 2018)., Ajuwon and Insel (2022) found a significant association between PPC, health literacy, and self-management.

The research design choices in both studies give consensus that the research design is appropriate for this study. More research is needed to determine the relationship between health literacy, PPC, and self-management in Black adults with T2DM, and a non-experimental quantitative descriptive correlational research design can assist with understanding this phenomenon's trajectory.

Methodology

Population

The target population for this present study was Black adults 18 years and older who were diagnosed with T2DM. I recruited participants in the United States through Amazon's MTurk, which has over 80,000 anonymous contracted Human Intelligence Task workers aged 18 years and older with diverse racial backgrounds (Amazon, 2024) and Walden University Participant Pool.

Additionally, there are over 28.5 million adults in the United States living with T2DM (American Diabetes Association, 2022, July 28), and Black adults account for 12.1% of those diagnosed with T2DM (ADA, 2022, July 28; Office of Minority Health, 2021). Accordingly, this percentage indicates that in the United States, an estimated 356,250 Black Adults are living with T2DM.

Sampling and Sampling Procedure

I used convenience sampling to obtain a sample representative of this study's target population. When using convenience sampling, researchers can obtain samples until they reach their desired sample size (Gray & Grove, 2021). Furthermore, I extracted the convenience sample from a pool of participants affiliated with Amazon MTurk as an MTurk Worker and Walden University Participant Pool. This sampling approach permits this study to select participants based on convivence and availability (Creswell & Creswell, 2018). Additionally, in accordance with Amazon MTurk policy (Amazon, 2024), each MTurk participant was assigned a unique code affiliated with their MTurk account. This code was submitted upon completion of the study. In contrast, participants recruited from the Walden University Participant Pool were required to provide their email addresses after completing the survey in SurveyMonkey. Convenience sampling of participants from Amazon MTurk and Walden Participation Pool was based on availability and accessibility to acquire a larger sample size of the target population.

The inclusion criteria for participants in this study were: (a) Black adults 18 years old or older; (b) had a diagnosis of T2DM; (c) had a healthcare provider; (d) had proficient computer skills; and (e) were able to read and comprehend written English language. Conversely, this study excluded participants who did not meet the eligibility requirements. Black adults with T2DM are at a higher risk of experiencing diabetes-related complications diabetes-related death from those complications than non-Hispanic Whites (Abdullah et al., 2019; Cunningham et al., 2018; Office of Minority Health, 2021). Because of this, the basic tenet of this study is to determine the extent of the relationship between health literacy, PPC, and T2DM self-management behaviors in Black adults and a rationale for including the Black adult population. Moreover, patients with Type-1 diabetes have better health literacy and glycemic control than patients with T2DM (Gomes, 2020); therefore, they were excluded from this study, and participants with no medical history of T2DM for recognizable reasons.

To determine the sample size for this quantitative descriptive correlational study, I used a G*Power analysis Version 3.1.9.7. The G*Power analysis results revealed that the minimum sample size required based on $\alpha = .05$, a power of .80, and a medium effect size of .15, is a sample size of 55 (see Cohen, 1992; Faul et al., 2009; G*Power, 2020; see Appendix D). A similar previous study examined the association between health literacy, self-management, and health outcomes in T2DM patients had an effect size of .15 for their linear regression correlational analysis for their study (Jones, 2022). Therefore, a power of .80 and an alpha value of .05 were appropriate. Also, selecting an alpha value of .05 indicates a 5% probability that the null hypothesis can be confirmed as true (Frankfort-Nachmias et al., 2020; Gray & Grove, 2021). Moreover, a power level of .80 indicates an 80% chance that the effect size is true, signifying a relationship among the variables in this study (Gray & Grove, 2021). Knowing this, a minimum sample size of 55 with an effect size of .15 ($ES = .15$) and alpha of .05 $p <.05$) based on the G*Power analysis is an applicable estimation of an accurate generalized representation of the finding that can be generalized to the larger population of Black adults.

Recruitment Procedure

The procedures for recruiting participants for this study were web-based through Amazon's MTurk and Walden University's Participant Pool. When using Amazon MTurk, I was signed on as an MTurk Requester. As an MTurk Requester, I posted my survey invitation (see Appendix E) as a task on Amazon's MTurk website, which is open to all MTurk Workers in the United States. Qualified MTurk Workers who are potential participants first voluntarily viewed the survey's title. I offered $5.00 thank you card for participating in the survey (see Appendix H). Next, the MTurk Worker learned more about the survey by clicking on the preview to view the invitation of the study and samples of survey questions in the overview section.

Participants from Walden University's Participant Pool were able to preview the study invitation on the Walden University Participant Pool (see Appendix G) website. If interested, they clicked on the SurveyMonkey link provided to access the survey. Individuals were able to preview the study's purpose, volunteer requirements, time commitment, contact information for the principal investigator, and inclusion criteria. Qualified individuals provided informed consent. Walden University Pool participants who fully completed the survey received a $5.00 Amazon eGift card. To receive the Amazon eGift card, Walden University participants provided their email address. Additionally, all individuals interested in participating were directed to SurveyMonkey where they are asked the following screening questions:

1. Are you a Black adult 18 years old or older?
2. Do you have a diagnosis of Type-2 Diabetes?

3. Do you have a healthcare provider?

Potential participants from Amazon MTurk or Walden University's Participant Pool who were interested in taking the survey must click the SurveyMonkey link however, Amazon MTurk Workers had to "accept & work" in order to be directed to the link. Once the potential participant accepted the work, they were redirected to SurveyMonkey. In SurveyMonkey, the individuals were asked the following prescreening questions: (a) Do you have Type-2 Diabetes that has been diagnosed by a healthcare provider? (b) Are you or do you identify your race as Black, and (c) Are you 18 or older? If the individual answers "no" to any of the screening questions, they were thanked for their time and the screen closed. No monetary compensation was rendered.

After accepting the consent form, the participant completed the demographic data sheet (see Appendix F) and CAHPS Health Literacy survey, Communications Assessment Tool (CAT), and the Diabetes Self-Management Questionnaire (DSMQ). After completing all of the required information, the screen will close. The survey should take the participant about 10-12 minutes to complete. Additionally, once the survey is done, I reviewed the surveys to validate that they are fully complete on Amazon's MTurk and Walden University's Participant Pool before releasing payment. For Amazon MTurk participants, payments were processed directly through Amazon, while Walden University participants received their eGift cards via the email address provided. The $5.00 compensation was distributed to both MTurk workers and Walden University participants through their personal payment methods within 3-5 days following their participation in the study.

Instrumentation and Operationalization of Constructs

I used three instruments to collect data from participants in this study: the CAHPS Health Literacy Survey, the (CAT) survey, and the (DSMQ). Weidmer et al. (2012) developed the CAHPS Health Literacy survey who sought to improve health literacy among individuals in the United States. The development of the CAHPS Health Literacy survey stemmed from (a) the astounding number of individuals with limited health literacy living in the United States and (b) recognizing the impact provider communication has on patients' understanding of health information (Weidmer et al.).

The CAHPS Health Literacy survey was tested and retested for reliability. During the development phase of the survey, Weidmer et al. (2012) interviewed health literacy experts, healthcare professionals, and health literacy advocates to draft the new CAHPS Health Literacy survey in English. Subsequently, the researchers created a Spanish language version of the CAHPS Health Literacy survey and tested that version of the survey in several Spanish countries worldwide. When consensus of the CAHPS Health Literacy survey English and Spanish versions was reached, the English version of the survey was cognitively tested using individual interviews to determine how the instrument impacted a person's ability to process, understand, and respond to information on the survey. Once the CAHPS Health Literacy survey was tested, retested, and proven to be reliable in the developmental phase, the researchers moved onto the next phase of testing the instrument field testing.

During the field testing phase, the validity and internal consistency of the CAHPS Health Literacy survey was tested. Weidmer et al. (2012) conducted a 12-month field test with the CAHPS Health Literacy survey in low-income and Medicaid patients living in a minority community in the United States with participants who spoke English or Spanish. Weidmer et al. reported testing the CAHPS Health Literacy constructs for PPC, communication of health problems, disease self-management, and how well the provider communicated about medicine and test results. They found that the subscales accounted for 51% to 90% of the variance in health literacy and provider core communication skills, thus indicating that the CAHPS Health Literacy survey's constructs were high in validity. Additionally, Weidmer et al. conducted a two-factor confirmatory factor analysis, revealing that the CAHPS Health Literacy survey was a good fit to collect data. After field testing the survey, the researchers began to evaluate the internal consistency of the CAHPS Health Literacy survey.

In the next phase, the reliability of the CAHPS Health Literacy survey was tested. Weidmer et al. (2012) indicated that the CAHPS Health Literacy survey demonstrated good internal consistency and reliability in three composite items: communication to improve health literacy .88; how well the provider communicates about medicines .71; and communication to improve health literacy .79. The overall internal consistency of the CAHPS Health Literacy survey was .88, which indicates good reliability. Therefore, the CAHPS Health Literacy survey has been established as a highly reliable instrument and deemed suitable for the purposes of this study. Permission to use the CAHPS Health Literacy survey can be found in Appendix B.

The final version of the CAHPS Health Literacy survey yielded a 20-item instrument comprising multiple subscales. The subscale items relate to health literacy which is the independent variable for this study. CAHPS Health literacy subscales are comprised of items that reference the provider's use of medical jargon, easy-to-understand medical instructions, and the quality of information given by the provider during the healthcare encounter.

The CAHPS Health Literacy 20-item survey is an interval-ratio level of measurement with multiple subscales that relate to the health literacy construct in this study. The CAHPS Health Literacy 20-item survey has subscales that are comprised of dichotomous variables 1= 'yes' and 2 = 'no. The remaining CAHPS Health Literacy four subscale items are rated on a 4-point Likert scale that rates from 1= 'never,' 2 = 'sometimes,' 3 = 'usually,' and 4 = 'always.' Altogether, the combinations of the subscales in the CAHPS Health Literacy survey and the recoding of two subscales, the interval-ratio level of measurement with scores that can range from 0 to 70. The sum of the total score is calculated based on the items of each respondent and then divided to obtain an overall mean score (Yount et al., 2020). This overall mean score represented the population's experience with health literacy. For instance, a sum of composite scores calculated into percentages in which 10% = never, sometimes; 25%; 25% = usually, yes, somewhat; and 65% = always, yes, and definitely is a good indication of their health literacy level. One of the purposes of this study is to determine the relationship health literacy has with self-management in Black adults with T2DM. Therefore, the CAHPS Health Literacy survey was the instrument used to collect data in this study.

The next instrument I used to collect data in this study is the CAT survey. Makoul et al. (2007) developed the CAT survey as a quality improvement initiative after dual accreditation physician boards identified interpersonal and communication skills as one of the six core competencies physicians must have to practice good medicine. In the early phase of the CAT survey, the researchers examined patient satisfaction surveys and instruments containing communication elements. After examining these surveys and models, they determined they needed a more relevant scale to capture the patient's view of the physician's communication style in the healthcare encounter. In response, Makoul et al. reviewed models like the Four Habits and patient satisfaction surveys along with the CAHPS survey, and extracted 30-items related to physician communication.

Next, Makoul et al. (2007) tested the CAT 30-item instrument in four diverse focus groups, resulting in 15 items being removed for being too narrow, and the remaining 15-items being revised, resulting in CAT being a 15-item instrument. Then Makoul et al. tested this revised CAT 15-item instrument in telephone interviews in which respondents found 12 of the 15-items of value. After reevaluating and rewording some items, Makoul et al. retested the CAT 15-item survey for readability, comprehension, and the response scale. Ultimately, they landed on a CAT 15-item survey with a fourth-grade reading level and a 5-point rating scale (poor-fair-good-very good-excellent).

The CAT 15-item survey was then tested for reliability and validity. Makoul et al. (2007) tested and retested the CAT 15-item instrument with 600 patients and physicians in different specialties, and the results revealed good internal consistency and reliability. Next, Makoul et al. tested the instrument's validity by comparing the CAT 15-item survey to patient satisfaction surveys with the lowest and highest scores. A high validity was found with the CAT 15-item instrument when it was compared against patient satisfaction surveys. For instance, Makoul et al. reported the lowest mean score of 4.28 on the CAT 15-item instrument was similar to the patient satisfaction survey that averaged 78%; also, the CAT 15-item instrument's highest mean score of 4.92 was comparable to the patient satisfaction survey that had an average score of 98%, indicating that the CAT 15-item instrument was high in validity. Overall, the CAT survey's internal consistency was acceptable based on the mean score average of 4 in both test groups. Moreover, another study confirmed that the CAT survey's internal consistency was good, with a mean score of 3.6 and Cronbach's alpha greater than .90 (Cubaka et al., 2018).

Furthermore, the CAT survey has a high scale for validity. Makoul et al. (2007) indicated that the exploratory factor analysis revealed that the CAT survey one-factor model explains 78.8% of the variances and that the overall scale reliability was high (Cronbach alpha = .96, $p < .01$). Additionally, Makoul et al. reported that when the validity of the CAT survey was tested in physicians, the scale validity was high with a Cronbach alpha that ranged from .80 to .99. Other research conducted a test-retest confirmatory factor analysis for the one-factor model and confirmed that the CAT survey indeed had high scale validity with Cronbach alpha > .90 (Cubaka et al., 2018). Permission to use the CAT survey is in Appendix A.

Makoul et al. (2007) final version of the CAT 15-item survey is related to the independent variable, PPC, in this study. For example, Makoul et al. CAT survey had subscale items such as "the doctor treated me with respect," and "the doctor checked to be sure I understood everything." Other subscales also entailed items related to exchanging information, verbal and nonverbal communication, and being involved in shared decision-making. Thusly, the items in the CAT survey are closely related to the construct variable PPC in this study.

The CAT 15-item survey is an interval-ratio level of measurement that consists of a rating scale that is centered around the patient's experience with PPC. Patients can rate their experiences with PPC on a 5-point Likert rating scale. The Likert rating scale has choices that range from 1 = poor 2 = fair, 3 = good, 4 = very good, to 5 = excellent. The scores obtained from the CAT 15-item survey then needed to be calculated to capture the patient’s experience with PPC. Scores are summed up and can range from 0 (minimum) to 75 (maximum). Makoul et al. recommended that researchers use the CAT 15-item survey to report an overall mean for the sum of scores. In their study, the CAT 15-item survey overall mean scores ranged from 3.97 to 4.68. The mean averages for the CAT 15-item survey are similar to the Likert rating scale. For instance, mean averages of 1 = poor, 2 = fair, 3 = good, 4 = very good, and 5 = excellent reflects the patient's experience with provider communication during the healthcare encounter. Nevertheless, for this study, I summed up the scores of each participant and then calculate the mean score. For instance, if I have 3 participants with sum scores of 62, 59, and 65, I divided their sum scores by 15 (15 items) to obtain an overall mean score, for example, 62/15 = 4.13, 59/15 = 3.93, 65/15 = 4.33. I then totaled the overall mean score and divided it by the number of participants in the study, for example, 4.13+3.93+4.33= 12.39/3= 4.13. The overall mean score for all participants in this study represented their experience with PPC.

Additionally, this study aims to determine the relationship PPC has with self-management in Black adults with T2DM.

The final instrument in this study is the DSMQ survey. Schmitt et al. (2013) developed the DSMQ survey in Germany after realizing that other diabetes self-care instruments were limited in connecting diabetes self-care to glycemic control. During the developmental phase, the researchers conducted a literature review of diabetes studies and extracted 37-items that were critical factors related to glycemic control, diabetes medications, diabetic diet, physical activity, and adherence to medical appointments. The DSMQ 37-items were then reviewed by patients, psychologists, and diabetes specialists and translated into English. Schmitt et al. determined that a 4-point Likert scale was a more appropriate rating for the DSMQ 37-item survey. The DSMQ 37-item 4-point Likert rating scale consisted of: "0 = does not apply to me, 1 = applies to me to some degree, 2 = applies to me a considerable degree, 3 = applies to me very much".

Schmitt et al. (2016) then tested the DSMQ 37-items instrument in five steps in patients with type-1 diabetes and type-2 diabetes. In step one, 10-items were removed for no correlation. In step two, 2-items were removed for poor internal consistency. In Step Three, 6-items were removed for factor analysis below .50. In Step Four, 1-item was removed for poor factor loading ratings. In the final step five, 2-items were removed for redundancy. This five-step process yielded a 16-item DSMQ related to glucose management, physical activity, healthcare use, and overall self-care.

Schmitt et al. (2016) field-tested the DSMQ-16-item survey with two groups against a frequently used Diabetes Self-Care Activities Measure survey and found that both instruments produced similar results. Schmitt et al. reported that the DSMQ 16-items survey had good internal consistency in the four subscales. They reported that the Cronbach alpha was .77 for glucose management, .77 for diet control, .76 for physical activity, and .60 for healthcare use, and the Cronbach's alpha for the whole sum of the scale was .84. Other studies also found that the DMSQ 16-item instrument had internal consistency and is a reliable survey. For instance, a study reported Cronbach's alpha of .84 for the sum of the scale as a whole, and in subscales, Cronbach alpha ranged from .75 to .91 (Mirzaei et al., 2022). Moreover, another study confirmed that the DSMQ had good internal consistency and reported a Cronbach alpha of .82 in the DSMQ subscales and Cronbach alphas, ranging from .65 to .7 in the subscales (Nakhaeizadeh & Khalooei, 2021).

Furthermore, the DSMQ survey scale has high validity. Schmitt et al. reported that the exploratory factor analysis four-factor model explains 60% of the variance on the DSMQ 16-item survey (2016). Another study also found the exploratory factor analysis that the four-factor model in the DSMQ scale explained 67.46 % of the total variance, and the confirmatory analysis confirmed that the four-factor model was a good fit (Mirzaei et al., 2022). When the DSMQ was tested globally, studies revealed a Cronbach alpha greater than .82 and had good test-retest reliability (Nakhaeizadeh & Khalooei, 2021; Schmitt et al., 2016).

The final version of the DSMQ is a 16-item survey. The DSMQ16-item survey includes four subscales. These subscales are items that relate to self-management, which is the dependent variable in this study. Chiefly, the 4-items related to diabetic diet management behavior, 5-items related to glucose monitoring and medication adherence, 3-items related to physical activity for diabetes management; 3-items related to provider contact and adherence to diabetes-related appointments, and 1-item addressing overall diabetes self-care (Schmitt , 2016). Permission to use the DSMQ survey is in Appendix C.

Schmitt et al. (2016) reported that the DSMQ 16-item subscales are scored on a Likert rating scale from 0 = does not apply to me,1 = applies to me to some degree, 2 = applies to me to a considerable degree, and 3 = applies to me very much; and also measured on an interval-ratio level. The researcher recommends using reverse scores for negative items and higher scores for positive diabetes self-management behaviors. Moreover, researchers suggested calculating a total summation of the four subscale scores of the DMSQ survey (Schmitt, 2018; Schmitt et al., 2013;). The possible summation of scores can range from 0 to 48. Once the summation of scores is calculated, Schmitt et al. (2018) recommended dividing the actual sum of scores by the maximum sum of scores multiplied by 10 to obtain the scale score. For example, 37(actual score)/48 (max score) x 10 = 7.7 (scale score). However, Schmitt et al. reported reverse scoring for negative items, for which three points should be deducted from the total score if an item is skipped. The researchers indicated that the transformed score in the DSMQ 16-item survey can range from 0 to 10. The DSMQ survey's scale score is a comprehensive view of diabetes self-management; a higher score indicates a higher level of diabetes self-management. In that respect, this study seeks to determine the level of self-management in Black adults, and the results of the DSMQ 16-item survey assisted in quantifying the relationship health literacy and PPC have on self-management.

Data Analysis Plan

I used IBM's Statistical Package for Social Sciences (SPSS) software Version 29 to analyze my data. SPSS is a software program that provided a statistical analysis of the data collected to determine the strength of the relationship between variables of health literacy, PPC, and self-management in Black adults with T2DM (Gray & Grove, 2021).

To accurately determine the relationship among the variables in this study the data collected must be cleaned for errors. I cleaned the data by evaluating the random codes assigned to each participant to protect their identity. Next, I crosschecked the data random codes created for these participants, seeking to identify unassigned, incomplete, missing, and duplicate codes and then clean these inaccurate codes from the data (Gray & Grove, 2021; University of South Florida, 2021). Cleaning the data is vital for accuracy and reduced the chances of errors (Gray & Grove, 2021). Also, to reduce the risk of errors in the data, I selected 'force a response' on MTurk and SurveyMonkey to eliminate missing data that may interfere with the accuracy of the data collected for this study. Once the data collected were cleaned of errors, I analyzed the data using SPSS.

Since the purpose of this quantitative study was to determine (a) if there is relationship between PPC during the healthcare encounter to health literacy among Black adults (18 years and older) with type-2 diabetes mellitus and (b) if there is a relationship between PPC during the healthcare encounter and self-care behaviors among Black adults (18 years and older) with type-2 diabetes mellitus. The research questions were:

RQ1: What is the relationship of health literacy to self-management in Black adults with type 2 diabetes mellitus?

$H_0$1: There is no relationship between health literacy and self-management in Black adults with type 2 diabetes mellitus.

$H_1$1: There is a relationship between health literacy and self-management in Black adults with type 2 diabetes mellitus.

RQ2: What is the relationship of PPC to self-management in Black adults with type 2 diabetes mellitus?

$H_0$2:There is no relationship between PPC and self-management in Black adults with type 2 diabetes mellitus.

$H_1$2: There is a relationship between PPC and self-management in Black adults with type 2 diabetes mellitus.

A simple linear regression analysis was most appropriate to test the hypothesis in this quantitative study and use SPSS to analyze the data. A simple linear regression analysis requires one independent variable that predicts the outcome of a single dependent variable (Laerd Statistics ,2015).

The first RQ was: What is the relationship of health literacy to self-management in Black adults with type-2 diabetes mellitus?'. This RQ has one independent variable, health literacy, and one dependent variable, self-management. The second RQ was 'What is the relationship of PPC to self-management in Black adults with type-2 diabetes mellitus?'

The second RQ also has one independent variable, PPC, and one dependent variable, self-management. The null hypotheses for the research questions were there is (1) no relationship between health literacy and self-management and (2) no relationship between PPC and self-management. However, the alternative hypothesis was, there is a relationship between health literacy and self-management and whether there is a relationship between PPC and self-management in Black adults with T2DM. A simple linear regression analysis requires one to state the alternative hypothesis that predicts the study's outcome (Creswell & Creswell, 2018; Laerd Statistics, 2015).

To test the hypothesis in this study, I performed a simple linear regression analysis in SPSS. However, before I performed the simple linear regression analysis, I completed the descriptive statistic procedure in SPSS. The descriptive statistic procedure provided information such as the minimum, maximum, mean, and standard deviation scores from the sample and variables in this study (Gray & Grove, 2021). Next, I converted the CAHPS Health Literacy survey dichotomous variables ‘yes' and 'no' into dummy variables using the K-1 method to convert dichotomous variables that denote 1 = ‘yes' and 0 = 'no’ (Warner, 2013). Dichotomous variables in the CAHPS Health Literacy survey was recoded, provided that 'yes' corresponds with the highest score (Agency for Healthcare Research and Quality, 2017). However, the CAT and DSMQ surveys instruments were not recoded or modified in this study.

Additionally, I used Cohen’s *d* because this study's population standard deviation is unknown and reveal the set Cronbach’s alpha (Warner, 2013). Cohen's *d* assisted in determining the difference between two mean scores to estimate the size of the target population's mean number from the standard deviation (Warner, 2013). For this study, the Cohen *d* effect size was .15, which is a medium effect size that indicates that a sample of 55 provided adequate statistical power to represent the target population (see Appendix D; Cohen, 1992). Also, alpha was set at p =.05, which signifies that the null hypothesis was accepted as true (Frankfort-Nachmias et al., 2020).

Threats to Validity

Internal Validity

A threat to internal validity is the probability of extreme scores on the instruments used to collect data (Gray & Grove, 2021). Therefore, to combat extreme scores on the instruments, I examined and compare extreme scores to non-extreme scores; when an extreme score is identified, I removed the extreme score to reduce the chances of extreme scores skewing the data for this study (Creswell & Creswell, 2018).

Another internal threat to validity is selection of participants (Gray & Grove, 2021). Participants may not be truthful when with their stated characteristics. Therefore, I listed the inclusion and exclusion for the study in the survey's invitations, and participants were pre-screened prior to taking the survey to limit untruthfulness; however, it is impossible to control and may interfere with generalizing the results of this study to the target population (Creswell & Creswell, 2018; Gray & Grove, 2021). Additionally, subject attrition is an internal threat to this study's validity (Gray & Grove, 2021). Participants may decide to drop out of the study due to the length of time required to complete the survey. When I saw attrition, I compared the difference between the participants who dropped out to those who completed the study (Gray & Grove, 2021).

An additional threat to validity is the statistical test selected for the research design (Gray & Grove, 202). In that case, I may violate the simple linear regression analysis assumptions. Because of this threat to violate the assumptions, I pilot-tested the variables in this study to attempt to resolve these statistical violations before administering the survey to participants (Gray & Grove, 2021). However, if the violations remain, I provided evidence supported in research for moving forward with the data analysis selected. Furthermore, the statistical results of the study may be nonsignificant. When nonsignificant or subtle statistical results are encountered, if necessary, I conducted a post hoc power analysis to validate if the sample size was appropriate for this study (Gray & Grove, 2021). Moreover, I evaluated the instrument items used to collect data for reliability. In order to establish if the instrument is a reliable measure, I examined each participant's responses to determine if the items on the instruments correlate with each other (Gray & Grove, 2021).

Ethical Concerns

I received IRB approval from Walden University on January 14, 2025, approval number 01-14-25-1059908. When conducting research, several ethical concerns must be discussed for this study. Prior to administering the study, I provided participants with the contact information of the principal investigator, the school that I am representing, the purpose and benefits of the study, and potential risks, and assure participants that they can drop out of the study at any time and that any information collected for the study remained confidential (Creswell & Creswell, 2018). Once the participant has reviewed the study’s invitation and decides to participate in this study, they must give consent.

For individuals who answered yes to all the screening questions, the next screen was the consent. If the individual answers "no" to any of the screening questions, they were thanked for their time, and the screen closed.

If individuals decided to participate, they completed an informed electronic statement outlining the intent of the study, minimizing risk to the participant and ensuring anonymity. If the individual gives consent (by clicking continue), the next screen was the demographic information. After the demographic information was completed, the participant began the (a) CAHPS Health Literacy Survey Scale, a 20-item instrument scored using a 4-point Likert scale from 1 to 4 points (1 = Never, 2 = Sometimes, 3 = Usually, and 4 = Always; and dichotomous variables, 1 = Yes, and 2 = No). Permission to use the CAHPS Health Literacy Survey scale is included in Appendix B. Next, the participant began the Communication Assessment Tool Survey (CAT) Scale, a 15-item instrument that is scored using a 5-point Likert scale from 1 to 5 points (1 = Poor, 2 = Fair, 3 = Good, and 4 = Very Good, and 5 = Excellent). Permission to use the CAT scale is included in Appendix A. Lastly, the Diabetes Self-Management Questionnaire Survey (DMSQ) Scale, a 16-item instrument scored using a 4-point Likert scale from 0 to 3 points (0 = does not apply to me, 1 = applies to me to some degree, 2 = applies to me to a considerable degree, and 3 = applies to me very much). Permission to use the DMSQ Survey scale is included in Appendix C. The maximum estimated time to complete all items is 10-12 minutes.

I collected data anonymously through an online platform (SurveyMonkey ® and MTurk). Additionally, no permission is required from IRB to recruit participants on

MTurk. Also, I used the feature that de-links the participants' information from the data. Data was stored electronically on a secured external device and secure cloud storage to which only I have access. All data storage is password-protected. All raw data collected will remain in my possession and will be maintained for 5 years as required by the Walden IRB. No monetary or similar form of compensation was offered. Furthermore, the data collected is stored electronically in a universal serial bus (USB) external hard drive that is password protected.

Summary

I conducted a descriptive correlational quantitative research study which was the most appropriate method to answer the hypothesis that seek to determine the relationship among the variables of interest, which are health literacy, PPC, and self-management. The CAHPS Health literacy survey, CAT survey, and DSMQ survey are the instruments that used to collect the data and are related to the concept variables in this study. For instance, the CAHPS Health literacy survey is related to the concept variable, health literacy; the CAT survey is related to the concept of PPC; and the DSMQ survey is related to the concept of self-management. I used SPSS to analyze the statistical data collected, and a simple linear regression was used to test the hypothesis. Additionally, threats to the validity of this study's research design could possibly arise based on the methods selected for this study. Also addressed were ethical concerns for participants' involvement in this study.

In Chapter 4, I discuss data collection and results of this study.

Chapter 4: Results

The purpose of the research was to examine (a) if there is a relationship between PPC during the healthcare encounter to health literacy among Black adults (18 years and older) with T2DM and (b) if there is a relationship between PPC during the healthcare encounter and self-care behaviors among Black adults (18 years and older) with T2DM. The two research questions were:

RQ1: What is the relationship of health literacy to self-management in Black adults with type 2 diabetes mellitus?

$H_0$1:There is no relationship between health literacy and self-management in Black adults with type 2 diabetes mellitus.

$H_1$1: There is a relationship between health literacy and self-management in Black adults with type 2 diabetes mellitus.

RQ2: What is the relationship of PPC to self-management in Black adults with type 2 diabetes mellitus?

$H_0$2: There is no relationship between PPC and self-management in Black adults with type 2 diabetes mellitus.

$H_1$2: There is a relationship between PPC and self-management in Black adults with type 2 diabetes mellitus

In Chapter 4, I present the methods used for data collection and cleaning, provides a description of the sample, and present the results of the statistical analysis along with the assumptions associated with the tests conducted in this study.

Data Collection

I administered my surveys via SurveyMonkey, and they took approximately 10 to 12 minutes to complete. Participants were given up to 40 minutes to finish the survey. I recruited participants from Amazon MTurk and the Walden Participation Pool. The surveys were launched on January 21, 2025. Walden Participation Pool respondents were able to view the posted survey, but the survey did not publish on Amazon MTurk participants. Amazon MTurk required a prepaid monthly spending limit to publish the survey to participants. I added a spending limit to the Amazon Mturk Billing account and the survey was published to Amazon MTurk on January 24, 2025. Finally, the survey was available to all participants from Amazon MTurk and Walden Participation Pool.

The survey was scheduled to remain open on SurveyMonkey for 30 days, with a closing date of February 22, 2025. During the first week, from January 25 to January 31, 2025, I received 31 surveys. However, after I scrubbed the data, I found that several participants that did not meet the inclusion criteria had completed surveys and skipped questions were noted. This was an error that had to be corrected through SurveyMonkey by updating the qualified and disqualified criteria. Once this information was corrected between February 3 and February 22, 2025, the survey's response rate slowed significantly to one to three per week and by February 22 this study only had 38 of 55 participants needed to meet the a priori power analysis. After meeting with the committee chair, an email request for a 60-day extension for more participants was sent to Walden IRB on February 24. The IRB approved this 60-day extension on February 26 and the new closing date to end the survey was April 28, 2025. On February 27, 2025, the survey was reopened on SurveyMonkey seeking more participants.

Within a week I received 33 responses on SurveyMonkey, in which nine of the 33 participants were disqualified after scrubbing the data. I scrubbed the raw data from SurveyMonkey several more times for the best accuracy, though accuracy was not guaranteed. Nonetheless, the data collection threshold was met, and participants were given their thank-you gift. The scrubbed list of raw participant data collected from SurveyMonkey yielded 57 out of 58 qualified participants, slightly exceeding the required threshold of 55 needed to achieve data saturation.

Despite efforts to ensure the accuracy of the survey, errors were identified. The first error occurred on the CAHPS Health Literacy Survey in the item that asked, “In the last 6 months, did you start a prescription medicine?” The response options for this item were incorrectly labeled as “never,” “sometimes,” “usually,” and “always,” which represents an inappropriate level of measurement. The correct response options should have been “yes” and “no.” As a result, this item was excluded from analysis and coded as “7” to indicate it was appropriately skipped (AHRQ, 2017a).

Another error identified in the DMSQ survey, where one item was inadvertently omitted. The missing item stated: “Regarding my diabetes care, I should see my medical practitioner(s) more.” According to the DMSQ Scoring Guide, if an item was skipped or missing, the score can be adjusted by subtracting three from the numerator to calculate the final value (Schmitt, 2018). While both the CAHPS and DMSQ items are important, the developers of each instrument have provided instructions for handling missing or skipped items. Therefore, the study proceeded with the data cleaning process in accordance with the instruments' guidelines.

Data Cleaning

I conducted data cleaning, a critical component of the research process, in three phases to ensure the accuracy and integrity of the collected data. In the first phase, I reviewed the raw data from SurveyMonkey, and ineligible participants were removed. After consulting with the methodology team and renewing the SPSS Version 29 license, participant identifiers were anonymized, and variable names were updated (e.g., "HL_askques"). The dataset was then prepared for further analysis. In the second phase, several variables required recoding due to missing data, incorrect levels of measurement, and sequencing issues. Original variables were transformed and recoded to address these problems, and new variables were created with properly ordered values. Frequency analyses were conducted to identify and resolve any remaining errors. This phase proved to be the most time intensive. In the final phase, I analyzed my data according to each instrument's scoring instructions, and results were reviewed and verified multiple times to ensure accuracy. Repeated data checks were essential for ensuring valid and interpretable findings.

After cleaning the data, the next step was to ensure that the items used in this study were properly reverse-coded. The CAHPS Health Literacy tool included two items that required reverse coding. For example, the questions asked, "In the last 6 months, how often did we use medical words you did not understand?" and "How often did this provider talk too fast when talking to you?" These items were reverse coded so that "never" received the highest score and "always" received the lowest score (AHRQ, 2017, p. 1). Additionally, eight items on the DSMQ also needed to be reverse coded. These items included those related to eating sweets frequently, avoiding diabetes-related doctor appointments, skipping diabetes medications, and reporting poor self-care (Schmitt, 2018). On the DSMQ, these items were reverse coded so that "does not apply to me" received the highest score, while "applies to me very much" received the lowest score.

Sample

Participants had to meet the inclusion criteria such as being a Black adult 18 years or older that is diagnosed with T2DM. A total of 103 respondents answered the surveys this study. However, 24 respondents were disqualified for not meeting the inclusion criteria. The number of respondents disqualified were Caucasian, 17; Hispanic, 1; Asian/Pacific Islander, 2; and, Native/Alaskan Native 4. Additionally, 21 respondent surveys were incomplete, resulting in their disqualification. Consequently, a total of 45 respondents were disqualified for failing to meet the inclusion criteria of this present study.

The final sample consisted of 58 participants who met all the inclusion criteria. This sample size was sufficient to reach data saturation and adequately represent the target population for the purposes of this study.

Descriptive Statistics

Demographic data collected from participants included ages, gender, highest level of education, and marital status. Participants' ages were grouped into the following categories: 18–24, 25–34, 35–44, 45–54, 55–64, and 65 years and older. The majority of participants were between the ages of 25–34, followed by those aged 35–44. In terms of gender, 39.7% of participants identified as female (n = 23), and 60.3% as male (n = 35). Education levels were categorized as: less than high school, high school graduate, some college, college graduate, master's degree, and doctoral degree. Most participants reported having a college education or higher. Marital status was categorized as divorced, married, never married, or separated, with the majority of participants indicating they were married.

Additionally, the duration of participants' T2DM diagnosis and whether they used diabetes medication were important aspects of this study. Participants reported how long they had been diagnosed, categorized as 0–1 year, 1–5 years, and more than 5 years. Most participants reported having diabetes for 1 to 5 years, followed by those diagnosed for more than 5 years. All participants indicated that they used diabetes medication as shown in Table 1(see Appendix I).

Table 1

Demographic Characteristics of Participants (N = 58)

Variable	Category	Frequency (*n*)	Percentage (%)
Race	Black or African American	58	100.0
Age	18–24	1	1.7
	25–34	32	55.2
	35–44	15	25.9
	45–54	6	10.3
	55–64	3	5.2
	65+	1	1.7
Gender	Female	23	39.7
	Male	35	60.3
Education level	Graduated from high school	2	3.4
	Some college	10	17.2
	Graduated from college	35	60.3
	Graduated with Master's	10	17.2
	Graduated with Doctoral	1	1.7
Marital status	Married	38	65.5
	Never married	12	20.7
	Divorced	6	10.3
	Separated	2	3.4
Years with T2DM	0 to 1 year	4	6.9
	1 to 5 years	41	70.7
	More than 5 years	13	22.4
Takes diabetes meds	Yes	58	100.0

Note. Table 1 list all participants self-identified as Black or African American. Percentages are based on a total sample size of 58. Values are rounded to the nearest tenth.

Research Question 1

The first research question and hypothesis was

RQ1: What is the relationship of health literacy to self-management in Black adults with type 2 diabetes mellitus?

$H_0$1: There is no relationship between health literacy and self-management in Black adults with type 2 diabetes mellitus.

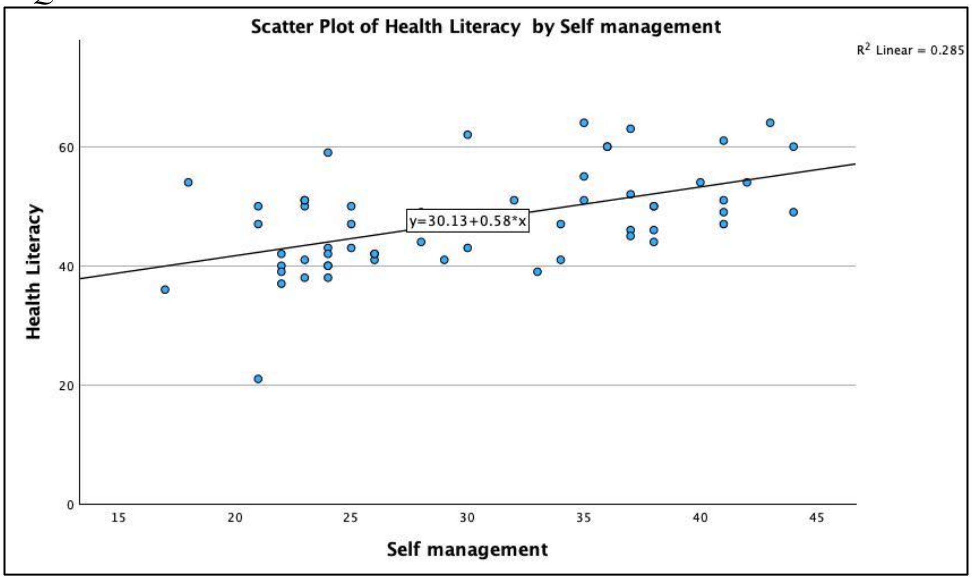
$H_1$1: There is a relationship between health literacy and self-management in Black adults with type 2 diabetes mellitus.

Assumptions: Research Question 1

The data analysis planned for this examination was a simple linear regression analysis using SPSS Version 29. The assumptions for simple linear regression, as outlined by Laerd (2015), were tested, I analyzed one independent variable, health literacy, and one dependent variable, self-management. Both variables were measured at the continuous level (Laerd Statistics, 2015). I tested the assumption of linearity by creating a scatterplot. Visual inspection of the scatterplot confirmed that the relationship was linear (see Figure 2).

Figure 2

Research Question 1: Scatter Plot



Note. Figure 2 demonstrates a scatter plot used to examine the relationship between health literacy and self-management. Visual inspection indicated a linear relationship between the two variables.

I assessed the independence of residuals using the Durbin-Watson statistic, which was 1.889, indicating independence of errors between the variables (health literacy and self-management; see Table 2). A Durbin-Watson value between 1 and 3 suggests that the assumption of independence of errors was met (Laerd Statistics, 2015).

Table 2

Research Question 1: Model Summary of Durbin-Watson Results for Health Literacy and Self-Management

Model Summary[b]

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	Durbin-Watson
1	.534[a]	.285	.272	6.526	1.889

a. Predictors: (Constant), HL Health Literacy

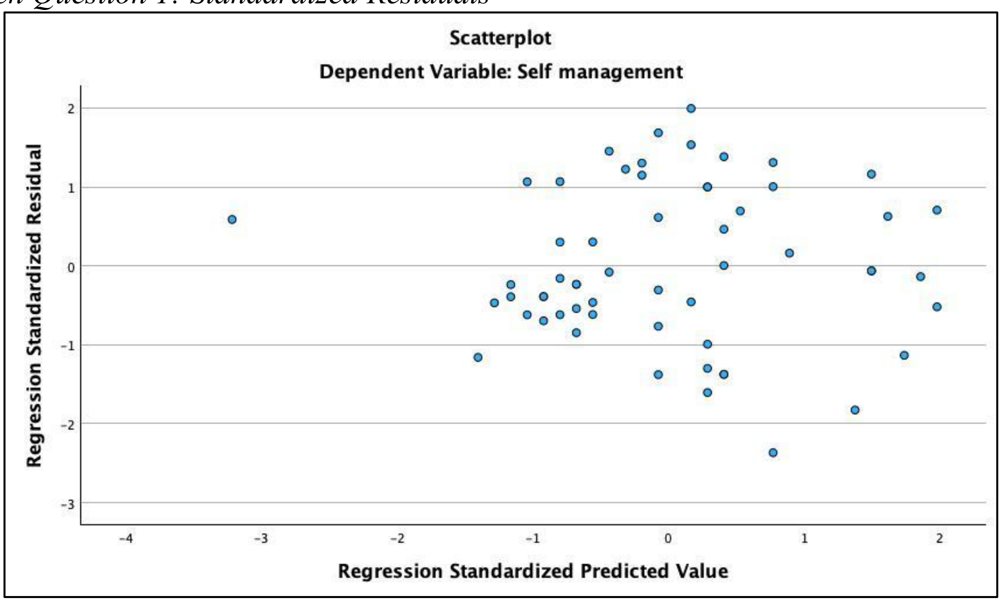
b. Dependent Variable: SM Self management

Note. Table 2 displays the Model Summary for Durbin-Watson statistic was within the range of 1 and 3 revealed health literacy and self-management were independence of residuals.

Homoscedasticity was assessed through visual inspection of a scatterplot of standardized residuals versus standardized predicted values. The plot indicated homoscedasticity, meaning the variability in self-management was consistent across levels of the predictor variable, health literacy (see Figure 3; Laerd Statistics, 2015).

Figure 3

Research Question 1: Standardized Residuals



Note. Figure 3 displays the scatterplot of standardized residuals versus standardized predicted values used to assess homoscedasticity. The visual pattern supports the assumption of homoscedasticity, indicating that the variability of self-management is consistent across levels of the predictor variable, health literacy (Laerd Statistics, 2015).

Normality was confirmed through visual inspection of a normal probability plot, which showed that the residuals were normally distributed. As shown in Figure 4, visual inspection of the histogram were normally distributed (*M* = 1.25; *SD* = 0.991). According to Laerd Statistics (2015), a mean and standard deviation should fall between 0 and 1. Because the observed values exceeded this range, a probability plot was performed to confirm that if there was, in fact, a normal normality and the absence of outliers. The plot showed that the residuals were closely aligned along the diagonal, supporting the assumption of normality (see Figure 5).

Figure 4

Research Question 1: Histogram

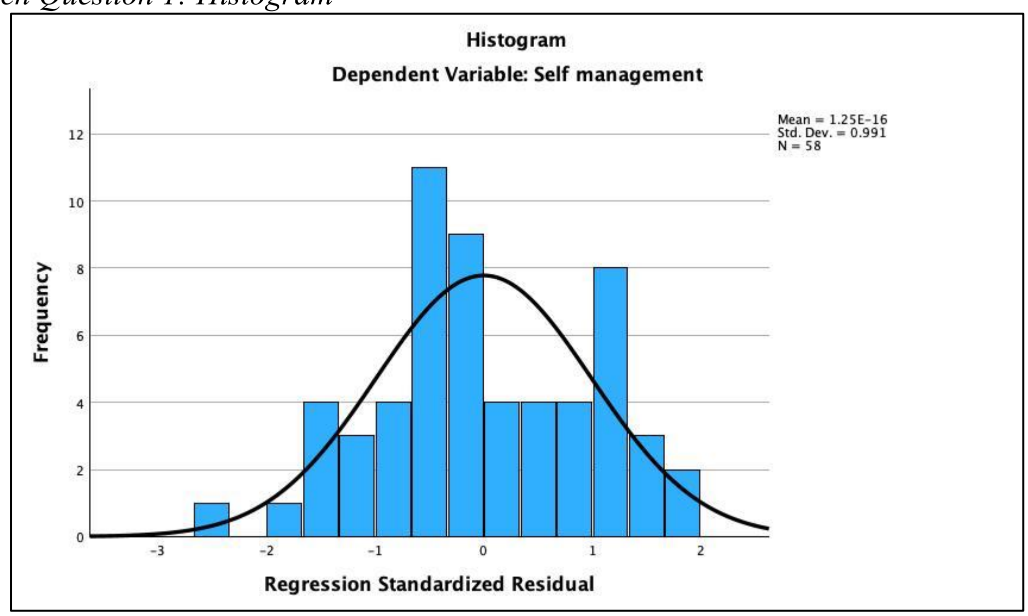
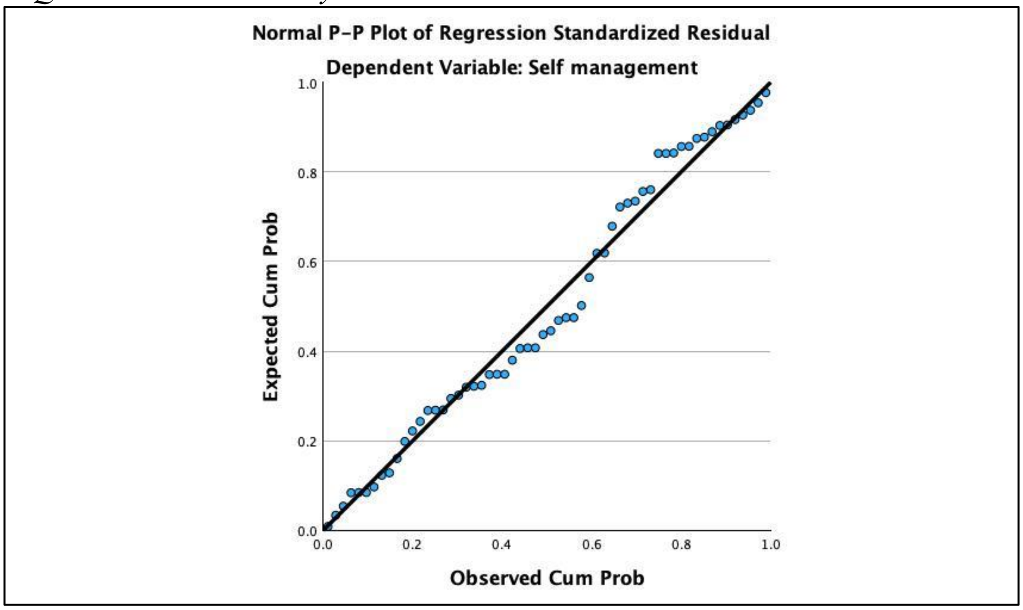


Figure 5

Research Question 1: Probability Plot



Note. Figure 4 displays a histogram of the standardized residuals, which appear to be normally distributed (*M* = 1.25; *SD* = 0.991). Although the mean and standard deviation exceed the typical range of 0 to 1 suggested by Laerd Statistics (2015), a normal probability plot was also examined to verify the assumption of normality. As shown in Figure 5, the residuals closely align along the diagonal line, indicating a normal distribution with no apparent outliers.

Results: Research Question 1

I conducted a simple linear regression. The predictor was [Health literacy] and the outcome was [self-management]. The predictor variable was found to be statistically significant [*B* = 0.494, 95% C.I. (0.284, 0.703), $p < .001$], indicating that for every one-unit increase in the [Health literacy sub-scale score] the [Self-management sub-scale] increased by approximate 0.5 units. The model explained approximately 28.5% of the variability [$R2$= .285 (see Appendix J)] which is a relatively small effect size (Cohen, 1992;). Therefore, the null hypothesis is rejected (see Table 3).

Table 3

Research Question 1: Model Summary of ANOVA Table

ANOVA[a]

Model		Sum of squares	*df*	Mean Square	*F*	Sig.
1	Regression	951.330	1	951.330	22.337	<.001[b]
	Residual	2385.083	56	42.591		
	Total	3336.414	57			

a. Dependent Variable: SM Self management

b. Predictors: (Constant), HL Health Literacy

Note. Table 3 shows the Model summary of the ANOVA demonstrated that health literacy significantly predicted self-management, p <.001.

Research Question 2

RQ2: What is the relationship of PPC to self-management in Black adults with type 2 diabetes mellitus?

$H_0 2$: There is no relationship between PPC and self-management in Black adults with type 2 diabetes mellitus.

$H_1 2$: There is a relationship between PPC and self-management in Black adults with type 2 diabetes mellitus.

Assumptions: Research Question 2

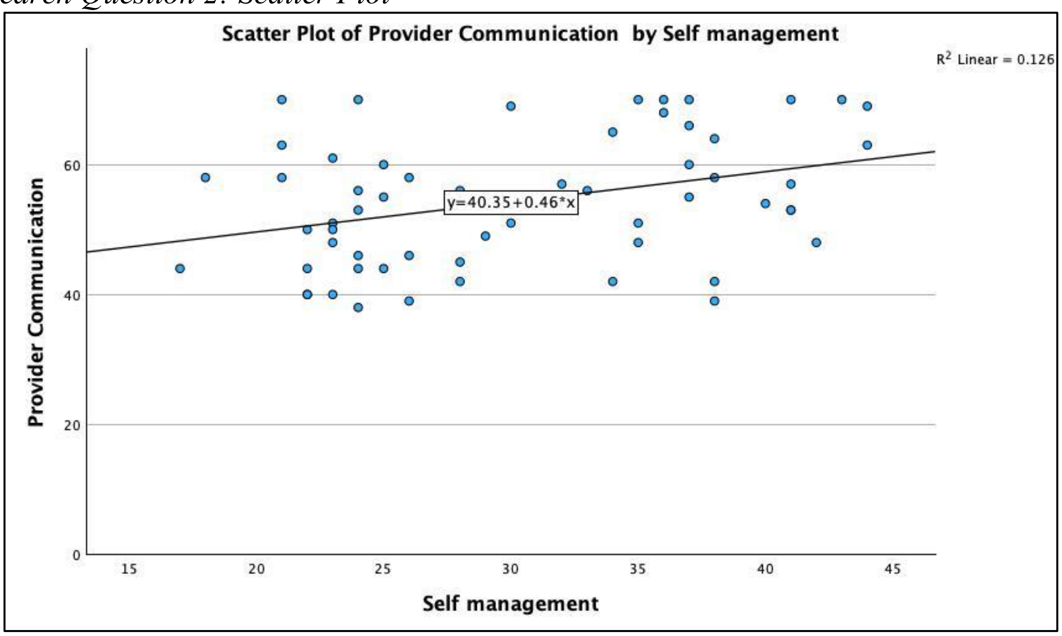
For the second research question, the data analysis plan reflected that of the first. I conducted a simple linear regression analysis using SPSS Version 29 to examine the relationship. The assumptions for simple linear regression, as outlined by Laerd (2015), were tested and revealed the following:

The analysis included one independent variable, PPC , and one dependent variable, self-management. Both variables were measured at the continuous level (Laerd Statistics, 2015).

To test the assumption of linearity, I used a scatterplot to assess the relationship between provider communication and self-management. Visual inspection of the scatterplot confirmed a linear relationship (see Figure 6).

Figure 6

Research Question 2: Scatter Plot



Note. Figure 6 displays the scatter plot used to examine the relationship between PPC and self-management. Visual inspection indicated a linear relationship between the two variables.

I tested independence of residuals using the Durbin-Watson statistic, which was 1.514, indicating independence of residuals (see Table 4). A Durbin-Watson value between 1 and 3 suggests that the assumption of independent errors was met (Laerd Statistics, 2015).

Table 4

Research Question 2: Model Summary of Durbin-Watson Results for Patient-Provider-Communication and Self-Management

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.355[a]	.126	.110	7.216	1.514

a. Predictors: (Constant), PC Provider Communication

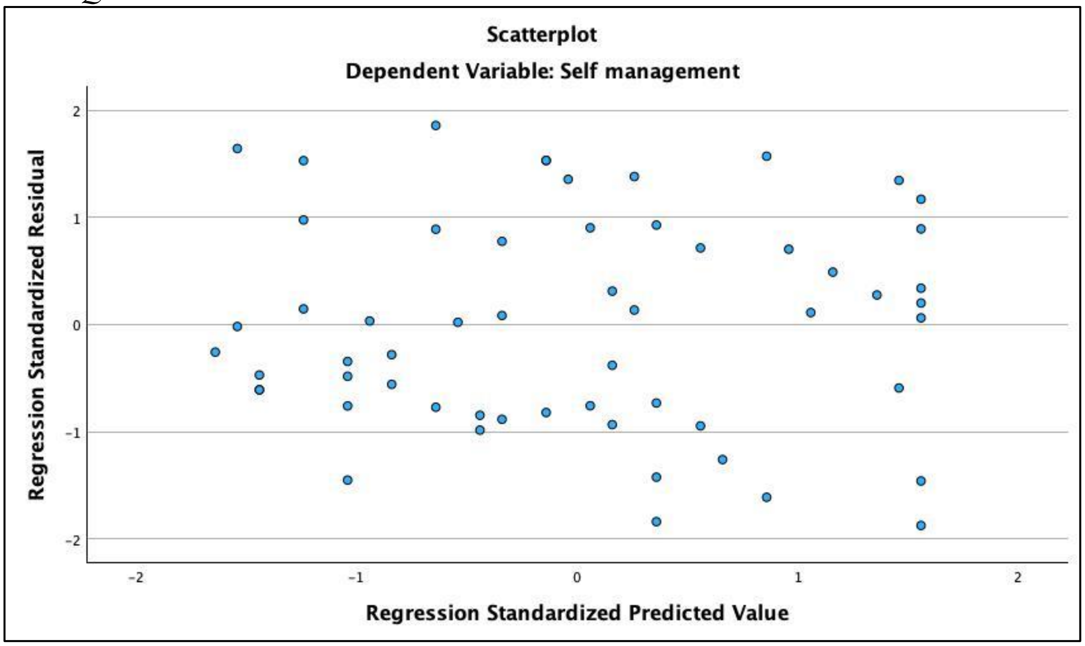
b. Dependent Variable: SM Self management

Note. Table 4 displays the Model Summary for Durbin-Watson statistic was within the range of 1 and 3 revealed PPC and self-management were independence of residuals.

Homoscedasticity was assessed through visual inspection of a scatterplot of standardized residuals versus standardized predicted values. The plot showed homoscedasticity, thus indicated that the variability in self-management was consistent across levels of the predictor variable, PPC (see Figure 7; Laerd Statistics, 2015).

Figure 7

Research Question 2: Standardized Residuals



Note. Figure 7 displays the scatterplot of standardized residuals versus standardized predicted values used to assess homoscedasticity. The visual pattern confirmed the assumption of homoscedasticity, indicating that the variability of self-management is consistent across levels of the predictor variable, health literacy (Laerd Statistics, 2015).

Normality was confirmed through visual inspection of a normal probability plot, which showed that the residuals were normally distributed. As shown in Figure 8, visual inspection of the histogram were normally distributed (M = 1.21; SD = 0.991). According to Laerd Statistics (2015), a mean and standard deviation should fall between 0 and 1. Because the observed values exceeded this range, a probability plot was performed to confirm that if there was, in fact, a normal normality and the absence of outliers. The plot showed that the residuals were closely aligned along the diagonal, supporting the assumption of normality (see Figure 9).

Figure 8

Research Question 2: Histogram

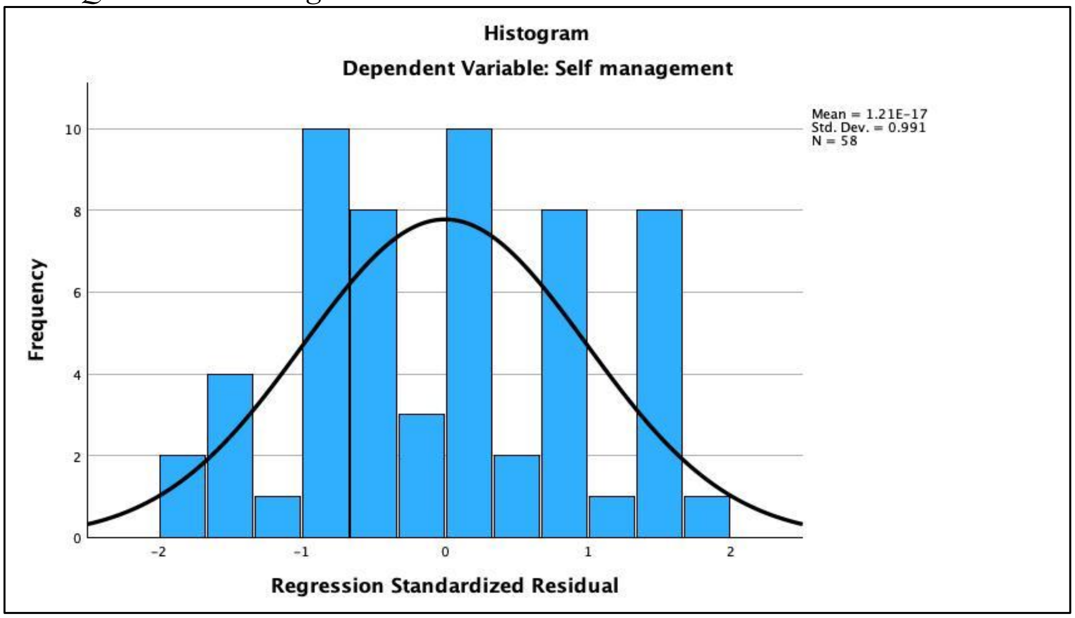


Figure 9

Research Question 2: Probability Plot

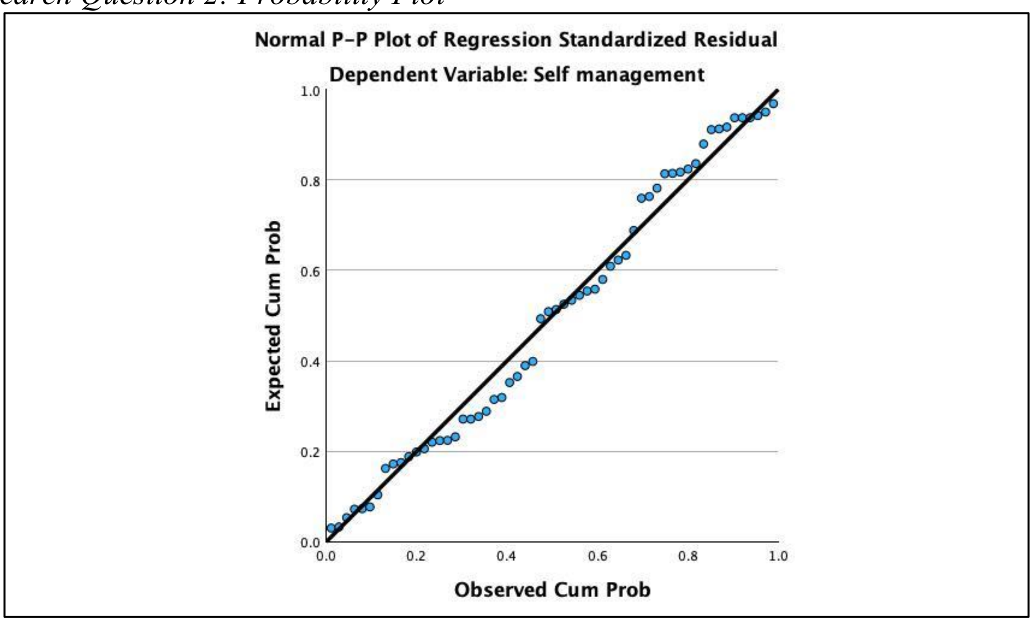


Figure 8 displays a histogram of the standardized residuals, which appear to be normally distributed (*M* = 1.21; *SD* = 0.991). Although the mean and standard deviation exceed the typical range of 0 to 1 suggested by Laerd (2015), a normal probability plot was also performed and verified the assumption of normality. As shown in Figure 9, the probability plot indicates that the residuals closely align with the diagonal line, suggesting a normal distribution and no evidence of outliers.

Results: Research Question 2

The relationship between PPC to self-management in Black adults with T2DM was statistically significant [B = 0.272, 95% C.I. (0.080, 0.463), $p < .05$], indicating that for every one-unit increase in the [PPC sub-scale score] the [Self-management sub-scale] increased by approximate 0.3 units. Therefore, the null hypothesis is rejected. The model explained approximately 12.6 % of the variability [$R2$ = .126] which is a small effect size (Cohen, 1992; see Table 5).

Table 5

Research Question 2: Model Summary of ANOVA Table

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	420.551	1	420.551	8.077	.006[b]
	Residual	2915.863	56	52.069		
	Total	3336.414	57			

a. Dependent Variable: SM Self management

b. Predictors: (Constant), PC Provider Communication

Note. Table 5 shows the Model summary of the ANOVA demonstrated that PPC significantly predicted self-management, $p < .05$.

Cronbach Alphas

This study evaluated the relationships between health literacy, PPC, and self-management among Black adults with T2DM using three instruments –the CAHPS

Health Literacy Survey, CAT Survey, and DMSQ Survey. The Cronbach's alpha in Figure 11 shows the CAHPS Health Literacy survey's good internal consistency. The 20-item scale yielded a Cronbach's alpha of .879, indicating good reliability (see Figure 10; Laerd, 2015). After removing one item, the revised 19-item scale also had a Cronbach's alpha of .873, further supporting its reliability (see Figure 11). These findings align with those of Weidmer et al. (2012), who found the CAHPS Health Literacy survey to have good internal consistency with a Cronbach's alpha of .88.

Figure 10

CAHPS Health Literacy 20-Item Survey

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.879	.890	20

Figure 11

CAHPS Health 19-Item Survey

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.873	.885	19

Note. Figure 10 and 11 displays the internal consistency of the CAHPS Health Literacy survey. Figure 10 displays the original 20-item scale demonstrated strong reliability with a Cronbach's alpha of .879. After the removal of one item, Figure 11 shows the revised 19-item scale maintained good reliability, yielding a Cronbach's alpha of .873.

The second instrument used in this study to measure PPC was the 14-item CAT survey. The CAT survey demonstrated high internal consistency with a Cronbach's alpha .933(Laerd, 2015; see Figure 12). This finding aligns with Makoul et al. (2007), who reported a similarly high reliability with a Cronbach's alpha .96.

Figure 12

Communication Assessment Tool: 14 Items, Patient Provider Communication

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.933	.933	14

Note. Figure 12 presents the internal consistency of the CAT survey, the second instrument used in this study to measure PPC. The 14-item CAT survey demonstrated high reliability, with a Cronbach's alpha of .933.

The final instrument used in this study to examine the relationship between health literacy and self-management, as well as PPC and self-management, was the DSMQ. The DSMQ is designed to assess self-management behaviors in individuals with diabetes. Although the original instrument consists of 16-items, one item was mistakenly omitted from the survey in this study. As a result, the version used included only 15 items. Despite the omission, the scale demonstrated a high level of internal consistency, with a Cronbach's alpha of .815 (Laerd, 2015; see Figure 13). This is comparable to findings by

Schmitt et al. (2016), who reported a Cronbach's alpha of .84 for the full 16-item DSMQ, indicating good internal reliability.

Figure 13

Diabetes Self-Management Questionnaire 15-Items

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.815	.801	15

Note. Figure 13 illustrates the internal consistency of the DSMQ, which was used in a modified 15-item version due to the omission of one item. Despite this, the scale demonstrated a high level of reliability, with a Cronbach's alpha of .815.

Summary

In conclusion, I examined the relationship between health literacy and self-management, as well as the relationship between PPC and self-management, among Black adults aged 18 and older with a diagnosis of T2DM. Qualified participants received a thank-you gift upon full completion of the online survey administered through SurveyMonkey. The survey was closed after achieving data saturation. The dataset was cleaned multiple times to correct errors, and adjustments were made in accordance with the scoring guidelines provided by the developers of the instruments used in this study. Data were subsequently recoded and cleaned again using SPSS Version 29.

I used simple linear regression analysis to address the research questions. The assumptions for both research questions were met, and the null hypotheses for Research Questions 1 and 2 were rejected. The effect sizes were small.

In Chapter 5, I provide an in-depth discussion of these findings, their implications for the broader population of Black adults with T2DM, the potential for positive social change, study limitations, and recommendations for future research.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this quantitative study is to determine (a) if there is relationship between PPC during the healthcare encounter to health literacy among Black adults (18 years and older) with T2DM and (b) if there is a relationship between PPC during the healthcare encounter and self-care behaviors among Black adults (18 years and older) with T2DM.

The motivation to conduct this research among Black adults was substantiated in the persistent and disproportionate burden of T2DM in this population. Black adults in the United States are twice as likely to be diagnosed with T2DM compared to non-Hispanic White adults and are more likely to experience severe complications and mortality related to poorly controlled T2DM (ADA, 2023a; Office of Minority Health, 2021). Despite this eminent health risk, there were limited studies that examined health literacy and PPC relationship to self-management behaviors among Black adults with T2DM.

Furthermore, this study was personally motivated by my professional experience as a geriatric nurse practitioner. Throughout my career, I have encountered numerous Black adult patients with limited health literacy and minimal understanding of the serious consequences of poorly controlled T2DM. Many of these patients also reported poor communication with healthcare providers, which seemed to influence their ability to engage in effective self-management their T2DM properly. These clinical encounters emphasized the need for empirical investigation into the relationship between health literacy, PPC, and self-management in this population. Therefore, the overarching purpose of conducting this study is to generate knowledge that supports improved diabetes-related health outcomes and reduce persistent health disparities in Black adults with T2DM.

Interpretations of the Findings

Health literacy was measured to determine how it influences the Black adult's ability to manage their T2DM effectively. Descriptive statistics revealed a mean health literacy score of 47.64 (*SD* = 7.61), placing 47.6% of participants in the "usually" category of the health literacy scale, based on proportional scoring (AHRQ, 2017b). This category suggests that nearly half of the Black adults possessed a moderate level of health literacy, which has significant implications for diabetes self-management behaviors. However, there are limited studies that used the CAHPS Health Literacy tool to measure health literacy in Black adults with T2DM**,** which highlights the need for this study's examination of health literacy in this population.

My findings are consistent with prior research conducted by Nelson et al. (2019), who found that limited health literacy, not socioeconomic status, was the primary contributor to poor diabetes self-management in Black adults with T2DM. Similar to my study, Nelson's participants were also predominantly college-educated and married, suggesting that education alone does not guarantee sufficient health literacy in Black adults with T2DM. Despite favorable socioeconomic factors, both Nelson and this present study found that limited health literacy significantly impacted Black adults' ability to manage their T2DM effectively.

Furthermore, the present study found that adequate health literacy among Black adults with T2DM was associated with a 28.5% increase in self-management capabilities. This aligns with the findings of Williams and Egede (2020), who identified a direct relationship between health literacy and diabetes self-management behaviors, such as glucose monitoring, dietary adherence, and medication compliance. The results reinforce the perception that improving health literacy is critical to improving diabetes-related outcomes in Black adults with T2DM.

Additionally, the current study supports the conclusions drawn by other studies that found that Black adults with poorly managed diabetes are more likely to experience serious health complications (Cunningham et al., 2018; Jeffers et al., 2019). My study also aligns with research from Ajuwon and Insel (2022), Abdullah et al. (2020), and Kim et al. (2020), which all emphasize that health literacy plays a central role in shaping individuals' diabetes knowledge and their ability to engage in effective T2DM self-care practices. Collectively, these studies highlight the broader consensus that health literacy is a critical component in health outcomes.

In summary, the first research question findings contribute to the growing body of evidence demonstrating that health literacy is a fundamental component of diabetes self-management in Black adults with T2DM. Health literacy is not simply about reading health information; it also encompasses one's ability to comprehend, evaluate, and use health-related information to make informed health decisions (CDC, 2021; Health Resources and Services Administration, 2022; Stormacq et al., 2019; WHO, 2023).

Therefore, improving health literacy may be one of the most effective strategies for reducing disparities and improving chronic disease outcomes in Black adults with T2DM.

The second research question in this study sought to examine the relationship between PPC and self-management among Black adults with T2DM. Understanding how communication impacts self-care behaviors in Black adults with T2DM was essential, especially given the disproportionate burden of diabetes-related complications among this population (Office of Minority Health, 2021).

The descriptive statistical analysis for research question two revealed that the overall mean score for PPC was 54.41 ($M = 54.41$), indicating that participants generally rated their communication with healthcare providers as 'very good to excellent' (Makoul et al., 2007). This high rating suggests that effective PPC may play a meaningful role in improving diabetes self-management in Black adults with T2DM. Indeed, the results demonstrated a statistically significant relationship between PPC and self-management behaviors in Black adults with T2DM ($p < .05$). Specifically, when PPC was rated as effectively good and perhaps grounded in the attributes of the mutual exchange of information, positive verbal and nonverbal cues, and active listening, self-management in Black adults with T2DM may improve. Consistent with the findings of my study, self-management behavior increased by 12.6%, representing a small yet meaningful effect size [$R^2 = .126$; see Appendix K)], in Black adults with T2DM.

Additionally, the findings in Black adults with T2DM self-management relationship to health literacy and PPC align with prior research on the importance of positive PPC in the healthcare encounter, particularly in chronic disease management. To illustrate, Kindratt et al. (2022) found that non-Hispanic White patients with T2DM were more actively engaged in managing their disease when they experienced good communication with their healthcare providers. Although the effect size in the current study was small, the overall impact of PPC on self-management remains significant. These results underscore that effective communication—regardless of race—positively influences how patients approach the management of T2DM.

Further supporting results in this present study, Peimani et al. (2020) found that patients who experienced poor communication with their providers often poorly managed their T2DM. When communication lacks reciprocity and shared decision-making—particularly among Black adults with T2DM—they may face difficulties with the problem-solving aspects of diabetes self-care. As a result, they may turn to less credible sources for information on managing their T2DM (Jeffers et al., 2019). Similar researchers Bartkeviciute et al. (2023) concluded that patients' perceptions of PPC directly influenced their understanding of disease seriousness and their engagement in self-management behaviors.

Jeffers et al. (2019) reported that some Black adults with T2DM relied on external sources for chronic disease information, rather than their healthcare providers, due to poor PPC during the healthcare encounter. The reliance on potentially inaccurate health information pertaining to the management of T2DM is not only concerning but also potentially life-threatening. As highlighted by the ADA (2017) and the Office of Minority Health (2021), Black adults with T2DM are more likely to experience diabetes-related complications and mortality. Fittingly, even though the effect size in this study was modest, it highlights the critical influence of PPC on self-management behaviors and the urgent need for improved health communication practices in Black adults with T2DM.

Moreover, my findings support Bartkeviciute et al.'s (2023) conclusion that patients' perceptions of their illness are shaped by the quality of their communication with providers. When PPC is perceived as dismissive or rushed, as documented in studies by Kirk et al. (2023) and Peimani et al. (2020), it creates barriers to self-management, particularly among Black adults with T2DM. Conversely, improved PPC can foster greater patient engagement, more effective disease management, and ultimately better health outcomes, as it has in other non-Hispanic populations (Cutilli et al., 2018; Paiva et al., 2019). Thus, improved PPC may potentially enhance engagement in self-management among Black adults with T2DM.

T2DM is a chronic illness that continues to have a disproportionate impact on the health of Black adults in the United States. As reported by the Office of Minority Health (2021) and ADA (2022, July 28), Black adults are more likely to be diagnosed with T2DM and to suffer from related complications, contributing to higher mortality rates than non-Hispanic White adults. Poor diabetes self-management has been identified as a critical factor that exacerbates these complications (Abdullah et al., 2019; Ajuwon & Insel, 2022; Cunningham et al., 2018). This suggests that once diagnosed with T2DM, Black adults may struggle to control their symptoms, which can put them at greater risk to experience adverse chronic disease-related outcomes such as coronary heart disease and chronic kidney disease, consequently leading to frequent hospitalizations, and even premature death (Office of Minority Health, 2021).

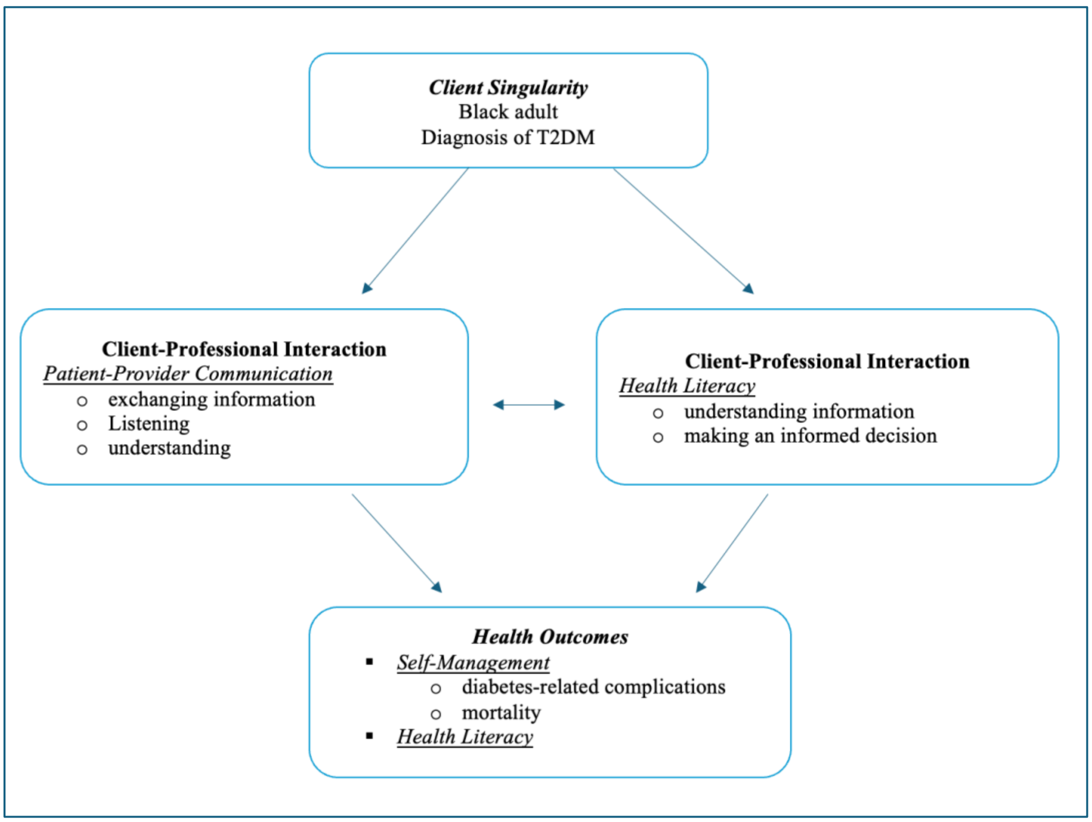
For this reason, I focused on elements that may be related to self-management in Black adults with T2DM: health literacy and PPC. Health literacy is essential for understanding and acting on health-related information received in the healthcare encounter, particularly when diagnosed with T2DM. Previous research has shown that one in three adults struggle with diabetes self-management due to limited health literacy (Abdullah et al., 2019). Furthermore, Black adults with limited health literacy are more likely to have poorly controlled diabetes and experience higher hospitalization rates as a result (Alsaedi & McKeirnan, 2021). My results confirmed that there is a significant relationship between health literacy and self-management behaviors which aligns with previous studies that found individuals with adequate health literacy demonstrated better diabetes self-management skills (Nelson et al., 2019; Shiyanbola et al., 2018; Visscher et al., 2020). These findings underscore the critical importance of adequate health literacy for effective disease control in Black adults with T2DM.

Similarly, PPC is a key component of effective in self-management in Black adults with T2DM. As emphasized by the AHRQ (2020), PPC is central to patient-centered care and is linked to improved understanding, greater health-related self-management engagement, and better health outcomes (Cutilli et al., 2018; Paiva et al., 2019; Yağar, 2021). However, PPC barriers between healthcare providers and Black adults can hinder shared decision-making and reduce patients' ability to self-manage their condition effectively (Cooper et al., 2012; Howson, 2021). I found that PPC was also significantly associated with self-management behaviors. Black adults who received good PPC during their healthcare encounters were more likely to engage in self-care activities related to managing their health condition (Bhaloo et al., 2018; Kirk et al., 2023). This underscores the significance of strengthening PPC when confronted with Black adults who have a chronic diagnosis of T2DM.

The theoretical framework of the IMCB was appropriate for this study, as both health literacy and PPC were found to be statistically significant relationship to self-management in Black adults with T2DM. The IMCB concepts –client singularity, client-professional interaction, and health outcomes aligned with the model’s emphasis on client singularity and client-professional interaction as a key influence on health outcomes (Cox, 1982). Figure 14 illustrates the direct connection within the IMCB between *c*lient singularity, namely the Black adult with a medical diagnosis of T2DM; the client-professional interaction which is health literacy and PPC ; and how PPC client-professional interaction influences self-management, and ultimately diabetes-related health outcomes. Notably, Figure 14 illustrates that client singularity—Black adults with T2DM—and the connection health literacy and PPC; in the client-professional interaction, both can influence self-management behaviors that impact health outcomes in this population. Furthermore, self-management behaviors in Black adults with T2DM are shaped by both health literacy and PPC during the client-professional interaction in healthcare encounters which highlights how health literacy and PPC work together to support or hinder positive health outcomes in this population. In particular, when health literacy is inadequate and PPC is poor, Black adults with T2DM face greater risks for diabetes-related complications and even mortality (Abdullah et al., 2019; Alsaedi & McKeirnan, 2021). Therefore, improving both health literacy and PPC is essential for enhancing self-management and reducing negative health outcomes in Black adults with T2DM.

Figure 14

Shaping of Health Literacy and Self-Management in the Interaction Model of Client Behavior



Note. Figure 14 illustration of the Interaction Model of Client Health Behavior showing the relationship between client singularity (Black adults with T2DM), the client-professional interaction (PPC and health literacy), and health outcomes (self-management practices and health literacy). Adapted from "An interaction model of client health behavior: Theoretical prescription for nursing", by Cox, C. L, 1982, *Advances in Nursing Science, 5*(1), 41–56 (https://doi.org/10.1097/00012272-198210000-00007).

The integration of Cox's IMCB in this study highlights that health literacy and PPC work together within the *client-professional interaction* to shape *health outcomes* of self-management in the *client singularity* –Black adults with T2DM. The IMCB provided a robust framework for understanding the complex relationship between *client singularity* factors, the *client-professional interaction*, and their influence on *health outcomes*. The model's emphasis on both health literacy and PPC underscores the need for multifaceted strategies to improve self-management behaviors and reduce disparities in this population.

Limitations

Although this study contributes valuable insights, several limitations should be considered when interpreting the findings. First, the recruitment method relied on convenience sampling and online platforms, which introduces the potential for selection bias. Participants without reliable internet access or with limited digital literacy may have been excluded, thereby limiting the diversity of the sample and affecting the generalizability of the results.

Secondly, the use of online surveys depended heavily on the trustworthiness of participants' responses. This dependence on participants' truthfulness raises the possibility of inaccuracies in the data (Queirós et al., 2017). Thirdly, the study's reliance on self-reported data introduces the risk of response bias. Participants may have overestimated or underestimated their health literacy, PPC, or self-management behaviors related to self-care to their T2DM.

Lastly, a limitation of this study is the combination of three surveys used: the CAHPS Health Literacy, the CAT Survey, and the DMSQ. This combination may have resulted in an extended questionnaire length, potentially leading to participant survey fatigue. Survey fatigue may have resulted in inaccurate responses to survey items. Additionally, errors in the survey instruments, such as the incorrect level of measurement listed for an item on the CAHPS Health Literacy survey and a missing item on the DMSQ survey, required the omission of these items from scoring. This omission may have affected the accuracy of the total scores and, consequently, the study results.

Recommendations

A notable strength of this study was the selection of a quantitative research design, which provided an efficient to collect data in a timely manner. Furthermore, the use of convenience sampling allowed the collection of data from Black adults with T2DM across the United States, supporting geographic diversity within the sample. However, convenience sampling was susceptible to selection bias, which may limit the generalizability of the findings to a larger population. Therefore, future research should consider employing other sampling procedures to reduce bias.

Another strength of this study was the use of online surveys. Online surveys disqualified participants who skipped questions and prohibited the submission of incomplete surveys. This approach enhanced the completeness of the data collected from these surveys. Simultaneously, this method may have inadvertently excluded individuals without reliable internet access, thereby creating a participation barrier for certain potential respondents. Consequently, future studies should explore alternative methods of survey administration to foster inclusivity and minimize barriers to participation.

While the survey's comprehensive nature facilitated a detailed evaluation of health literacy, PPC, and self-management in the data collection, the surveys' item length posed a limitation that could have potentially contributed to participant fatigue. Participant fatigue could have affected the quality of responses, particularly toward the end of the survey. To address this challenge, future research should prioritize the optimization of survey instruments. This entails reducing the number of items to more manageable sections to minimize the participant's burden.

Furthermore, an important and concerning finding of this study was that nearly 55% of participants were between the ages of 25 and 34, and approximately 70% reported living with T2DM for 1 to 5 years. This suggests that Black adults are at significant risk of being diagnosed with T2DM during young adulthood. Future research should focus on exploring the underlying causes and contributing factors associated with early T2DM diagnoses in this population, including social determinants of health, access to preventive care, and lifestyle factors.

This study revealed that health literacy plays a significant role within the client-professional interaction as theorized in Cox's IMCB (1982). This finding highlights the critical importance of health literacy in shaping self-management behaviors and health outcomes. Therefore, future research should further examine how both health literacy and PPC jointly influence self-management behaviors among Black adults with T2DM.

Implications

The results of this study have significant implications for healthcare organizations, healthcare providers, the nursing discipline, and policy. The statistically significant relationships revealed between health literacy and self-management; and PPC relationship to self-management behaviors in Black adults with T2DM emphasize that health literacy and PPC are both critical to engagement in self-management behaviors in this population. Previous studies have revealed that Black adults remain at higher risk for diabetes-related complications and mortality compared to other groups (Abdullah et al., 2019; ADA, 2017; Cunningham et al., 2018; Office of Minority Health, 2021; Taylor et al., 2018). Therefore, addressing both health literacy and the distinct impact of PPC on self-management in healthcare highlights the need for targeted interventions to promote positive self-management behaviors. Interventions aimed at improving health literacy and PPC in the self-management of chronic diseases such as T2DM are essential for reducing healthcare disparities and poor health outcomes among Black adults.

To address these health disparities, healthcare organizations and providers should implement routine health literacy screenings and develop culturally appropriate educational materials that empower Black adults and other populations with T2DM to better understand and manage their condition. After all, when PPC is culturally tailored, it increases the likelihood of positive PPC traits. For instance, good PPC is when both the patient and provider having a mutual dialogue during the healthcare encounter that is likely demonstrating positive verbal/nonverbal cues; this not only improves self-management, it also fosters a team approach through communication that is better understood and accepted by the patient. The ultimate result of good PPC is effective was marked positive health outcomes in Black adults with T2DM (Alsaedi & McKeirnan, 2021; Bhaloo et al., 2018; Kirk et al., 2023; Ochieng & Crist, 2021).

Enhancing PPC through healthcare provider training in culturally competent respectful communication can improve patient engagement, trust, and shared decision-making, ultimately promoting medical adherence, thereby improving self-management in Black adults with T2DM (Cutilli et al., 2018; Ochieng & Crist, 2021; Paiva et al., 2019; Yağar, 2021). Culturally competent training has the ability to increase health literacy and improve PPC, both of which contribute to better self-management practices in this population. Registered nurses, central to patient education and advocacy, are uniquely positioned to champion positive communication strategies for improving health literacy and PPC in Black adults with T2DM through culturally sensitive interventions.

Additionally, registered nurses play a vital role in improving health outcomes for Black adults with T2DM. Registered nurses can assess patients' knowledge, tailor education to patient preferences, and provide nurse-led interventions that improve diabetes knowledge and self-management behaviors (Ahmad et al., 2020; Han et al., 2019; Tamiru et al., 2023). Since registered nurses are widely regarded as the most trusted professionals within the healthcare system, as noted by Oruche and Zapolski (2020), their role in strengthening health literacy and PPC is essential. Additionally, registered nurses can serve as advocates and liaisons, helping bridge communication gaps between patients and providers while empowering Black adults with T2DM and other culturally diverse patients to participate in shared decision-making in the healthcare encounter.

Furthermore, social change is crucial for Black adults with T2DM. Developing positive communication strategies to increase health literacy and improve PPC must align with the calls for substantial and meaningful social change by informing healthcare policies at the local, state, and national levels. These policy shifts can reduce healthcare disparities and promote better health outcomes in Black adults with T2DM.

Finally, the results of this study validate the urgent need for policies that support adequate health literacy and good PPC to ensure self-care behaviors are facilitated to anyone faced with the health burden of self-managing T2DM. Also, the relationship of adequate health literacy to self-management; and good PPC to self-management behavior is likely to increase disease engagement as found by previous studies (Bhaloo et al.; Ochieng & Crist, 2021; Yağar, 2021). The findings suggest Black adults can successfully self-manage their T2DM and mitigate poor diabetes-related health outcomes when they have adequate health literacy and good PPC which affects positive social change.

Conclusions

The statistically significant correlations found between health literacy and self-management, as well as between PPC and self-management, underscore the importance of improving health outcomes in Black adults diagnosed with T2DM. The findings in this study adds to the growing body of evidence that both health literacy and PPC are critical factors that can affect self-management behaviors in this population. The relationship between health literacy and self-management, and PPC and self-management suggest that

Black adults with adequate health literacy and good PPC are more likely to engage in self-management practices, that includes problem-solving and disease-related monitoring, such as checking blood glucose levels as discovered in prior studies (Hawkins et al., 2018; Kirk et al., 2023; Marciano et al., 2019). Conversely, the results also suggested that limited health literacy; and poor PPC may hinder self-management behavior by weakening Black adults' understanding of the severe risks associated with poorly controlled T2DM as revealed in previous research (Mor-Anavy et al., 2021; McDonald & Shenkman, 2018; Xu et al., 2018).

Given the disproportionately high rates of diabetes-related complications and mortality in Black adults with T2DM, addressing gaps in health literacy and enhancing PPC represents a vital opportunity to implement strategies that improve health outcomes and reduce longstanding healthcare disparities in this population. Additionally, the findings of this study emphasize the urgent need to prioritize health literacy and strengthen effective PPC to foster trust and empower Black adults to actively manage their T2DM. A renewed emphasis on how health literacy impacts self-management and on how PPC impacts self-management presents a path toward constructing a more equitable healthcare system. This is especially important for a population that has historically been adversely affected by a T2DM diagnosis and who, consequently, experience a disproportionate burden of diabetes-related complications and mortality (Office of Minority Health, 2021). These findings are essential to healthcare organizations and lawmakers who are interested in achieving sustainable, positive social changes in diabetes self-management and advancing health equity for Black adults with T2DM.

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Appendix A: CAT Permission

Re: CAT Permission Request
Makoul, Gregory <[redacted]@yale.edu>
Fri 3/31/2023 1:37 PM
To: Linda Walker

1 attachments (25 KB)
CAT-English-doctor.docx;

Hi Linda, and thanks for reaching out. You are welcome to use the CAT for academic (research and education) purposes -- I've attached the standard version.
Please be sure to include the copyright line in any printed or electronic representations. And please keep me posted on your progress -- happy to help along the way.
-Greg
Gregory Makoul, PhD MS
Chief Transformation Officer | NRC Health
Faculty of Medicine | Yale School of Medicine

From: Linda Walker < >
Sent: Tuesday, March 28, 2023 12:20 PM
To: Makoul, Gregory <[redacted]@yale.edu>
Subject: CAT Permission Request

Hello Dr. Makoul,

My name is Linda Walker, and I am currently a Ph.D. student at Walden University with a research focus on patient-provider communication. The Communication Assessment Tool (CAT) 15-item survey you developed is a suitable instrument for my research study's concepts of patient-provider communication. Therefore, I would like to request permission to use the CAT survey for my proposed research study. Thank you in advance.

Kindly,
Linda Walker

Appendix B: CAHPS Health Literacy Permission

Supplemental Items for the CAHPS® Clinician & Group Survey 3.0

Topic: Health Literacy
Population Version: Adult
Language: English

Users of the CAHPS® Clinician & Group Survey are free to incorporate supplemental items in order to meet the needs of their organizations, local markets, and/or audiences. Some items cover events that occur with low frequency in the general population. You should include them only if your sample design is likely to yield a sufficient number of responses to those questions for statistical analysis and reporting

Appendix C: DSMQ Permission

SPECIAL TERMS No82768

These User License Agreement Special Terms (Special Terms) are issued between Mapi Research Trust ("MRT") and Linda Walker (User).

These Special Terms are in addition to any and all previous Special Terms under the User License Agreement General Terms.

These Special Terms include the terms and conditions of the User License Agreement General Terms, which are hereby incorporated by this reference as though the same was set forth in its entirety and shall be effective as of the Special Terms Effective Date set forth herein.

All capitalized terms which are not defined herein shall have the same meanings as set forth in the User License Agreement General Terms.

These Special Terms, including all attachments and the User License Agreement General Terms contain the entire understanding of the Parties with respect to the subject matter herein and supersedes all previous agreements and undertakings with respect thereto. If the terms and conditions of these Special Terms or any attachment conflict with the terms and conditions of the User License Agreement General Terms, the terms and conditions of the User License Agreement General Terms will control, unless these Special Terms specifically acknowledge the conflict and expressly states that the conflicting term or provision found in these Special Terms control for these Special Terms only. These Special Terms may be modified only by written agreement signed by the Parties.

1. User information

User name	Linda Walker
Category of User	Student
User address	100 Washington Ave South, Minneapolis, 55401, United States
User VAT number	
User email	linda.walker1@waldenu.edu
User phone	
Billing information	100 Washington Ave South, Minneapolis, 55401, United States

2. General information

Effective Date	Date of acceptance of these Special Terms by the User : 31 Mar 2023
Expiration Date (Term)	Upon completion of the Stated Purpose
Name of User's contact in charge of the request	Linda Walker

3. Identification of the COA

Name of the COA	DSMQ - Diabetes Self-Management Questionnaire
Author	Schmitt A
Copyright Holder	Dr. Andreas Schmitt
Copyright notice	DSMQ © Dr Andreas Schmitt, 2013
Bibliographic reference	Schmitt A, Gahr A, Hermanns N, Kulzer B, Huber J, Haak T. The Diabetes Self-Management Questionnaire (DSMQ): development and evaluation of an instrument to assess diabetes self-care activities associated with glycaemic control. Health Qual Life Outcomes. 2013 Aug 13;11:138 (Full text article) Schmitt A, Reimer A, Hermanns N, Huber J, Ehrmann D, Schall S, Kulzer B. Assessing Diabetes Self-Management with the Diabetes Self-Management Questionnaire (DSMQ) Can Help Analyse Behavioural Problems Related to Reduced Glycaemic Control. PLoS One. 2016 Mar 3;11(3) (Full text article)

Module(s)/version(s) needed	• DSMQ

4. Context of use of the COA

The User undertakes to use the COA solely in the context of the Stated Purpose as defined hereafter.

4.1 Stated Purpose

Other project

Title	Diabetes management
Disease or condition	
Planned Term*	Start: 06/2023 End: 12/2025
Description (including format or media)	Student research dissertation project

4.2 Country and languages

MRT grants the License to use the COA on the following countries and in the languages indicated in the table below:

Version/Module	Language	For use in the following country
DSMQ	English	the UK

The User understands that the countries indicated above are provided for information purposes. The User may use the COA in other countries than the ones indicated above.

5. Specific requirements for the COA

- The Copyright Holder of the COA has granted ICON LS exclusive rights to translate the COA in the context of commercial studies or any project funded by for-profit entities. ICON LS is the only organization authorized to perform linguistic validation/translation work on the COA.
- In case the User wants to use an e-Version of the COA, the User shall send the Screenshots of the original version of the COA to MRT or ICON LS for review and approval. The Screenshots review may incur additional fees.

Appendix D: G*Power Analysis

<u>G* Power</u>

[1] -- Thursday, March 07, 2024 -- 15:05:29

F tests - Linear multiple regression: Fixed model, R^2 deviation from zero

Analysis: A priori: Compute required sample size

Input:	Effect size f^2	=	0.15
	α err prob	=	0.05
	Power (1-β err prob)	=	0.80
	Number of predictors	=	1
Output:	Noncentrality parameter λ	=	8.2500000
	Critical F	=	4.0230170
	Numerator df	=	1
	Denominator df	=	53
	Total sample size	=	55
	Actual power	=	0.8050826

Appendix E: Recruitment Flyer Amazon MTurk Invitation

You are invited to participate in a research study about health literacy, patient and provider communication, and how these factors affect the ability to manage type-2 diabetes, provided that you answered "yes" to all of the following questions:

- Are you a Black adult 18 years old or older?
- Do you have a diagnosis of T2DM?
- Do you have a healthcare provider?

Overview of the Study:

- Consists of **one** online survey
- Estimated time to complete survey **10-12** minutes
- You will receive a **$5.00** thank-you gift for completing the survey in **fu**ll

This study seeks volunteers that meet these requirements:

- Diagnosed with Type-2 Diabetes
- Black person of color
- 18 years and older
- Had consulted with a healthcare provider

Potential Benefits of Study:

- Help improve healthcare communication and understanding for better outcomes
- Support better diabetes care for ethnic minority communities
- Reduce healthcare disparities

This study is being conducted by a researcher named Linda Walker, who is a doctoral student at Walden University. The study period for this survey will conclude in 90 days. Select the link below to complete the survey. At the end of the survey, you will receive a unique code to paste into the box below to receive credit for taking our survey.

Appendix F: Demographic Data Sheet

Demographic Data Sheet

1. What race/ethnicity best describes you?(Please choose only one)
   - Native American Indian or Alaskan Native
   - Asian/ Pacific Islander
   - Black or African American
   - Hispanic
   - White/Caucasian

2. What is your age?
   - 18-24
   - 25-34
   - 35-44
   - 45-54
   - 55-64
   - 65+

3. What is your gender?
   - Male
   - Female
   - Other

4. What is the highest level of education you have completed?
   - Less than high school
   - graduated from high school
   - Graduated from college
   - Graduated with a Master's degree
   - Graduated with Doctoral degree

5. Are you now married, widowed, divorced, separated, or have you never been married?
   - Married
   - Widowed
   - Divorced
   - Separated
   - Never Married

6. How long have you had type-2 Diabetes?
    - 0-1year
    - 1-5 years
    - 5 years or More

7. Do you take diabetes medicine prescribed by a doctor?
    - Yes
    - No

Appendix G: Recruitment Flyer Walden University Participant Pool

Purpose: To determine (1) if there is a relationship between patient-provider communication that occurs in the healthcare encounter that impacts health literacy among Black adults that are 18 years and older with type-2 diabetes mellitus and (2) if there is a relationship between patient-provider communication that occurs during the healthcare encounter that impacts self-management behaviors among Black adults that are 18 years and older with type-2 diabetes mellitus.
Volunteer Requirements: 18 years and older, diagnosed of Type-2 Diabetes, Black person of color, and has consulted with a healthcare provider
Time Commitment: 10-12 minutes
To volunteer: Email:

Appendix H: Thank-You Gift

Payment:

A thank-you gift of $5.00 will be given to 55 qualified participants. The compensation will be provided within 3 to 5 days upon FULL completion of all answered survey questions. However, participants with incomplete survey questions will be deemed ineligible for compensation. For participants recruited via Amazon's MTurk, the thank-you gift will be provided through Amazon's MTurk Worker, following Amazon’s MTurk policy. Participants recruited through the Walden University Participant Pool will receive an Amazon eGift card sent to the email address they provided for the study.

Appendix I: Descriptive Statistics

Table I1

Frequencies

Statistics								
		Z2 Race	Z4 age	Z5 Gender	Z6 Educ	Z7 Marital Status	Z8 Diabetes years	Z9 DM meds
N	Valid	58	58	58	58	58	58	58
	Missing	0	0	0	0	0	0	0

Table I2

Frequency Z2 Race

Z2 Race					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Black or African American	58	100.0	100.0	100.0

Table I3

Frequency Z4 Age

Z4 age					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-24	1	1.7	1.7	1.7
	25-34	32	55.2	55.2	56.9
	35-44	15	25.9	25.9	82.8
	45-54	6	10.3	10.3	93.1
	55-64	3	5.2	5.2	98.3
	65+	1	1.7	1.7	100.0
	Total	58	100.0	100.0	

Table I4

Frequency Z5 Gender

Z5 Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	23	39.7	39.7	39.7
	Male	35	60.3	60.3	100.0

	Total	58	100.0	100.0

Table I5

Frequency Z6 Education

Z6 Educ

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Graduated from college	35	60.3	60.3	60.3
	Graduated from high school	2	3.4	3.4	63.8
	Graduated with Doctoral degree	1	1.7	1.7	65.5
	Graduated with Master's degree	10	17.2	17.2	82.8
	Some college	10	17.2	17.2	100.0
	Total	58	100.0	100.0	

Table I6

Frequency Z7 Marital Status

Z7 Marital Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Divorced	6	10.3	10.3	10.3
	Married	38	65.5	65.5	75.9
	Never married	12	20.7	20.7	96.6
	Separated	2	3.4	3.4	100.0
	Total	58	100.0	100.0	

Table I7

Frequency Z8 Diabetes Year

Z8 Diabetes years

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0 to 1 year	4	6.9	6.9	6.9
	1 to 5 years	41	70.7	70.7	77.6
	5 years or More	13	22.4	22.4	100.0
	Total	58	100.0	100.0	

Table I8

Frequency Z9 DM Meds

Z9 DM meds

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	58	100.0	100.0	100.0

Appendix J: Simple Linear Regression Results for Research Question 1

Table J1

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
SM Self management	30.31	7.651	58
HL Health Literacy	47.64	8.277	58

Table J2

Correlations

Correlations

		SM Self management	HL Health Literacy
Pearson Correlation	SM Self management	1.000	.534
	HL Health Literacy	.534	1.000
Sig. (1-tailed)	SM Self management	.	<.001
	HL Health Literacy	.000	.
N	SM Self management	58	58
	HL Health Literacy	58	58

Table J3

Variables Entered/Removed

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	HL Health Literacy[b]	.	Enter

a. Dependent Variable: SM Self management

b. All requested variables entered.

Table J4

Model Summary

Model Summary

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.534[a]	.285	.272	6.526	.285	22.337	1	56	<.001

a. Predictors: (Constant), HL Health Literacy

Table J5

ANOVA

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	951.330	1	951.330	22.337	<.001[b]
	Residual	2385.083	56	42.591		
	Total	3336.414	57			

a. Dependent Variable: SM Self management

b. Predictors: (Constant), HL Health Literacy

Table J6

Coeffcients

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1 (Constant)	6.799	5.048		1.347	.183	-3.314	16.911
HL Health Literacy	.494	.104	.534	4.726	<.001	.284	.703

a. Dependent Variable: SM Self management

Appendix K: Simple Linear Regression Results for Research Question 2

Table K1

Linear Regression Results for Research Question 2

Descriptive Statistics

	Mean	Std. Deviation	N
SM Self management	30.31	7.651	58
PC Provider Communication	54.41	10.002	58

Table K2

Correlations RQ2

Correlations

		SM Self management	PC Provider Communication
Pearson Correlation	SM Self management	1.000	.355
	PC Provider Communication	.355	1.000
Sig. (1-tailed)	SM Self management	.	.003
	PC Provider Communication	.003	.
N	SM Self management	58	58
	PC Provider Communication	58	58

Table K3

RQ2 Variables Entered/Removed

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	PC Provider Communication[b]	.	Enter
a. Dependent Variable: SM Self management			
b. All requested variables entered.			

Table K4

Modal Summary for RQ2

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics: R Square Change	F Change	df1	df2	Sig. F Change
1	.355[a]	.126	.110	7.216	.126	8.077	1	56	.006
a. Predictors: (Constant), PC Provider Communication									

Table K5

ANOVA for RQ2

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	420.551	1	420.551	8.077	.006[b]
	Residual	2915.863	56	52.069		
	Total	3336.414	57			
a. Dependent Variable: SM Self management						
b. Predictors: (Constant), PC Provider Communication						

Table K6

Coefficients for RQ2

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B Lower Bound	95.0% Confidence Interval for B Upper Bound
1	(Constant)	15.533	5.285		2.939	.005	4.945	26.121
	PC Provider Communication	.272	.096	.355	2.842	.006	.080	.463

a. Dependent Variable: SM Self management