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Patient's Compliance with Diabetes Self-Management in the Primary Care Setting

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Abstract

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in the Primary Care Setting

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MS, Bowie University, 2014

BS, Howard University, 2008

Project Submitted in Partial Fulfillment

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Abstract

Diabetes is a chronic disease that can be self-managed to control the disease and its adverse consequence. The purpose of this systematic literature review was to examine the barriers to patients' successful adherence to the self-management plan and to examine strategies used to improve patients' compliance with self-care behaviors. Three practice-focused questions focused on the personal characteristics or factors influencing patients' compliance with self-management, the barriers to patient compliance regarding diabetes self-management, and the effective strategies used to improve patients' compliance with diabetes self-management at primary care clinics. The literature review used the preferred reporting items for systematic reviews and meta-analyses model and the Johns Hopkins nursing evidence-based practice models. Findings showed that implementation of strategies using technology messages and texts can significantly decrease hemoglobin A1c levels, reduce complications of people with diabetes, and bring about social change by minimizing the prevalence of diabetes in the United States. The implementation of the project's outcomes can improve proper self-management practices among patients with diabetes, decrease the diabetes incidence among adults, and minimize health-related complications.

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Section 1: Nature of the Project

Introduction

Diabetes is a clinical and health care problem affecting adults, youths, and adolescents. According to the Center for Disease Control and Prevention (CDC, 2017), 12.6% of the population has diabetes, which accounts for 12% of the deaths in the United States. As of 2013, the World Health Organization (WHO) estimated that 346 million people globally were diabetic and projected that this number might double by 2030 if interventions were not implemented (as cited in Shrivastava, Shrivastava, & Ramasamy, 2013). Additionally, the American Diabetes Association (ADA, 2013) reported that the diagnosed diabetes cases cost the U.S. health care system approximately $245 million. Diabetes is the third most leading cause of death, after cancer and heart disease; hence, there is a need for self-management practices to manage this condition (ADA, 2013). Complications resulting from uncontrolled diabetes include heart disease, renal disease, neuropathy, stroke, hypertension, blindness, peripheral artery disease, amputations, and untimely death (CDC, 2014).

Diabetes is a self-manageable chronic disease that can be controlled if the patient has the ability, skills, and knowledge required for self-care practices. However, obstacles, such as health literacy and social factors, influence a person's ability to self-manage diabetes (Polonsky & Henry, 2016). Patients who overcome these barriers can self-manage the condition through effective strategies that have been documented to improve patient compliance (Russell, Vess, Durham, & Johnson, 2017). Therefore, identification of these barriers to patients' self-management and the documented effective strategies for

diabetes self-management can improve patients' compliance with diabetes self-management and thus improve their health outcomes (Shrivastava et al., 2013).

The purpose of this DNP project was to conduct a systematic review of the literature to analytically identify, evaluate, and synthesize all high quality research evidence relevant to the hindrances in patients' compliance to diabetes self-management and identify the best practice strategies used to improve compliance with diabetes self-management in a primary care clinic. This doctoral project promotes self-management practices and social change by identifying barriers to patients' compliance to diabetes management in the primary care setting. Furthermore, I explored strategies that can be more effective in enhancing patients' adherence to self-management behaviors. The findings from the literature review were used to recommend changes in existing practices for improving patients' compliance with diabetes self-management and enhance patient health outcomes. Moreover, the findings can be used to enhance the primary tenet of nursing practice by contributing to the existing body of nursing knowledge.

Problem Statement

Diabetes is a progressive, chronic, metabolic disorder resulting from the deficiency of the insulin hormone. It cannot be cured, and it increases the risk of developing cardiovascular diseases; however, patients can use recommended measures to manage this illness (Yadollahpour, Hosseini, Tabasi, Shirali, & Saki, 2016). Primary health care settings contain professional support and tools essential for assisting diabetic patients in enhancing their health. For instance, the Diabetes Self-Management Education and Support (DSME/S) offered at primary health care clinics by nurses contains seven

self-care behaviors providing the foundation for helping diabetic patients to make decisions and engage in activities to enhance their health outcomes. The seven self-care behaviors include risk-reduction, effective problem-solving skills, compliance with medication, monitoring of blood sugar, increasing physical activities, and healthy eating (Hsu, Chang, Lee, & Wang, 2016; Messina, Campbell, Morris, Eyles, & Sanders, 2017). Compliance with self-care activities by patients at the DNP project site has been determined to be low, especially when long-term changes are required.

The providers at the DNP project site serve 16–32 patients a day, which amounts to approximately 480–900 patients per month. The total number of diabetic patients that the clinic manages is 300, while the number of patients with glycated hemoglobin (HbA1c) more than 9% is 150. The 2016 Comprehensive Diabetes Care Report by Health Care Effectiveness Data and Information Set (HEDIS) measures adult patients with diabetes (Type 1 and Type 2) with an HbA1c level greater than 9%. The Comprehensive Diabetes Care reports were broken down into patient population insured under commercial, Medicaid, and Medicare health insurances. The percentage was 75.5% for patients with A1C > 9% insured under commercial health insurance, 43.3% for patients insured under Medicaid health insurance, and 49.6% for patients insured under Medicare health insurance (The National Committee for Quality Assurance [NCQA], 2016).

Gap in Practice

The gap in practice for this project entailed addressing the low patient compliance with diabetes self-management. The most significant challenge faced by health care providers in the primary care setting and area of concern is addressing problems in

practice related to low patient compliance with diabetes self-care (Wagner, Austin, Davis, Hindmarsh, Schaefer, & Bonomi, 2001). Diabetes management requires the patients to perform daily self-care activities to manage their diabetes. These activities include following a healthy diet plan, daily exercise, monitoring self-glucose, medication and foot-care, and keeping regular follow up appointments with a health care provider (ADA, 2016).

Patient compliance with diabetes self-care is essential in preventing any long-term complications of the disease. Furthermore, the effective management of the diabetes is dependent on the degree of a patient's compliance with diabetes self-care activities (Hsu et al., 2016). Most patients with diabetes can significantly reduce their chances of developing long-term complications by enhancing self-care activities (Gucciardi, Chan, Manuel, & Sidani, 2013).

Noncompliance with diabetes self-management has a significant effect on the quality of life and medical costs (Brunisholz et al., 2014; Dobson et al., 2016; Fioravanti et al., 2015; Gucciardi et al., 2013). Furthermore, Saleh, Mumu, Ara, Hafez, and Ali (2014) concluded that patients who are noncompliant with diabetes self-care activities have a lower quality of life. Saleh et al. (2014) also indicated that a significant relationship exists between nonadherence to self-care and other activities including diet, foot care, exercise with poor mobility, pain/discomfort, and anxiety/depression. More than 50% of patients with diabetes presenting symptoms of poor mobility and pain/discomfort were noncompliant with the prescribed diet plan and foot care (Saleh et al., 2014).

Patients' noncompliance with diabetes self-management in the primary care setting could have negative consequences (Saleh et al., 2014). For instance, noncompliance can result in the increased cost of medical care followed by frequent readmissions into primary care units. To improve compliance with diabetes self-management among patients, it is imperative to first identify and understand the challenges that they face and the barriers to patient compliance with diabetes self-care activities. Understanding these barriers to self-care adherence and identifying evidence-based (EVB), effective diabetes self-management strategies can assist health care providers to make practice changes that can support patients in achieving beneficial lifestyle changes and improving their health outcomes.

Purpose

The purpose of this DNP project was to conduct a systematic review of the literature to analytically identify, evaluate, and synthesize all high quality research evidence relevant to the hindrances in patients' compliance to diabetes self-management and to identify the best practice strategies used to improve compliance with diabetes self-management in a primary care clinic. The practice problem of focus related to low patient compliance with diabetes self-management in a primary care setting, which may be associated with the presence of barriers to the same and the lack of effective diabetes self-management models/strategies. Health care providers play a role in helping patients with diabetes acquire self-care knowledge and skills pertaining to their disease. However, having the knowledge and skills without practicing self-care behaviors does not lead to enhanced treatment outcomes and reduced risk of diabetes-related complications (Hsu et

al., 2016). Therefore, it is essential to identify the factors influencing self-care that may create barriers in adhering to diabetes self-care management.

Compliance with self-management may be influenced by multiple socioeconomic, social support, and demographic factors. However, given the problem's multifaceted nature, a systematic and integrated approach is needed to promote diabetes self-management in primary care settings in order to prevent long-term complications of the disease (Shrivastava et al., 2013). Addressing the problem is relevant, because compliance with DSM can be improved with proper identification of barriers to diabetes self-management and effective diabetes self-management models/strategies (Brunisholz et al., 2014; Dobson et al., 2016). Understanding these barriers to self-care adherence and identifying the EVB, effective diabetes self-management strategies can assist health care providers to make changes in practice supporting patients in achieving positive lifestyle changes and improving their health outcomes.

Practice-Focused Questions

The three questions that this dissertation focused on are mentioned below:

1. What personal characteristics or factors influence patients' compliance with DSM?
2. What factors are hindrances to patients' compliance with DSM?
3. What strategies have been documented that improve patients' compliance with DSM?

This doctoral project has the potential to address the gap-in-practice by answering these project-focused questions. A systematic review of the literature was performed to

identify multiple socioeconomic, social support, and demographic factors that influence patient compliance with DSM. Through an exhaustive summary of scholarly literature related to patients' compliance to self-management, I examined the barriers to patient compliance with self-care activities and identified effective approaches for DSM. Given the problem's multifaceted nature, a systematic and integrated approach is required to improve DSM in primary care settings and prevent long-term complications of the disease (Shrivastava et al., 2013). Addressing this problem is relevant because compliance to DSM can be improved by the proper identification of barriers to DSM and effective DSM models/strategies (Brunisholz et al., 2014; Dobson et al., 2016). Understanding these barriers to self-care adherence and identifying the EVB, effective DSM strategies can assist health care providers to make changes in practice supporting patients in achieving positive lifestyle changes and improving their health outcomes.

Nature of the Doctoral Project

The anticipated outcomes of this DNP project were to identify the barriers to patients' compliance with DSM and strategies that have been used to improve patient's compliance with DSM and, subsequently, enhanced health and clinical outcomes. A qualitative, systematic review design was used for this project to analytically identify, evaluate, and synthesize all high quality research evidence relevant to the hindrances in patients' compliance to DSM and to identify the best practice strategies that have been used to improve such compliance in primary care clinics. A qualitative design was chosen, because the framework for this study involved the application of transparent procedures to search, examine, and compile findings from various relevant research

studies. Six steps were followed under the qualitative systematic review design. The first step entailed the formulation of three practice-focused questions that guided the systematic review (Crawford, Boyd, & Jonas, 2015). Step 2 comprised the development of the eligibility criteria that were made up of the inclusion and exclusion criteria. The inclusion criteria entailed studies that addressed DSM in the primary care or outpatient setting, available in full text and in the English language, and published from 2013–2017. Step 3 entailed a comprehensive search for studies that met the eligibility criteria. I searched for studies in subject related databases and citation databases. The search was performed using the following databases: EBSCOhost, PubMed Central (PMC), ProQuest, Google scholar, and ResearchGate. The search terms used included *strategies for improving patient compliance with DSM, DSM practices, DSM education for quality care improvement*, *hindrances to patient compliance with DSM, and factors influencing the patient's compliance to DSM.* The fourth step included screening the literature and assessing the quality of the studies. I selected studies that met the eligibility criteria to ensure quality and reliability of the study.

The settings were adjusted in each database to obtain journal articles published after 2013. The inclusion criteria for the selected articles included studies with randomized controlled trials, quasi-experiments, case-control studies, or systematic reviews designs to enhance the level of evidence in the study (Liberati et al., 2009). To complete the systematic review of the literature, the retrieved sources were examined to identify possibilities of biases based on the preferred reporting items for systematic reviews and meta-analyses (PRISMA) model. A fellow nurse practitioner, who served as

a second reviewer, and I sorted out replicated articles before choosing the sources that were finally included in the project.

The fifth step was summarizing the evidence from each of the selected studies. The step also entailed extraction of data in terms of the research design, sample, size, weaknesses, and strengths. A literature review matrix was composed of the articles revealed in each search, articles that were excluded along with the reasons for exclusion, and articles that were used in the project (Liberati et al., 2009).

The sixth step comprised of synthesis and interpretation of the results. Articles that were analyzed using the PRISMA tool were synthesized, and studies were classified in either qualitative or qualitative research designs. The studies were also rated in accordance to the quality of evidence. Data synthesis consisted of tabulation of study characteristics, effects and quality, and the use of statistical methods in order to explore the differences between various selected studies and then combining their effects. I also explored for heterogeneity to determine if the overall summary of evidence presented in the project could be trusted.

The goal was to conduct a systematic review of the literature to analytically identify, evaluate, and synthesize all high quality research evidence relevant to the hindrances in patients' compliance with DSM and to identify the best practice strategies used to improve compliance with diabetes self-management in a primary care clinic. The DNP project site is a full-service, family practice clinic located in suburban Maryland. The practice serves adult patients with various health conditions, ranging from acute illnesses to chronic diseases including hypertension, cardiovascular diseases, and diabetes

(Types 1 and 2). The clinic is owned and managed by a nurse practitioner with a DNP degree. The practice staff included two other nurse practitioners, a scheduler, a case manager (RN), an office manager, a front desk clerk, and four medical assistants. The providers at the clinic serve a total of 16–32 patients a day and 480–900 patients a month. The expert panel for this DNP project consisted of the three nurse practitioners at the project practice site; the nature and process of the DNP project were presented to these nurse practitioners to get their approval in implementing the project implementation and achieving consensus on the use of evidence from the DNP project site.

The purpose of this project was to conduct a systematic review of the literature to analytically identify, evaluate, and synthesize all high quality research evidence relevant to the hindrances in patients' compliance with DSM and to identify the best practice strategies that have been used to improve compliance with DSM in a primary care clinic. The anticipated findings from the systematic review project will applied to make recommendations for changes in practice to improve patients' compliance with DSM, improve patient health outcomes, reduce the number of persons affected by diabetes, and enhance the primary tenet of nursing practices by contributing to the existing body of nursing knowledge.

Significance

The practice setting for the doctoral project was a primary care clinic. The nurses, the primary care providers, and the administrators can use the systematic review findings to implement effective strategies for DSM in primary care to improve patients' compliance. This improvement is more likely to enhance the control and prevention of

diabetes, thus lowering risks for complication and reducing financial costs incurred by the government, patients, other family members, and the health care facility itself.

An integrated and systematic approach is required to improve compliance to DSM and to prevent long-term diabetes-related complications (Shrivastava et al., 2013). The identified gap in practice relates to low patient compliance with DSM. In this project, I focused on identifying the barriers and effective strategies for improving DSM that can help clinicians make practice changes to improve patient compliance with DSM and subsequently improve patients' health outcomes (Shrivastava et al., 2013). The doctoral project contributes to nursing; thus, health care providers can apply the evidence-based findings in primary care to improve compliance to self-management of diabetes. Diabetes self-management education (DSME) is an evidence-based standard clinical practice method that can be used to equip patients with the skills, ability, and knowledge for DSM (ADA, 2014).

Compliance with self-care management activities has been low, which is attributed to factors such as poor health literacy in addition to other concerns affecting a person's ability to understand and apply diabetes education (Shrivastava et al., 2013). The levels of adherence to self-care activities have been low, particularly where long-term changes are needed (Shrivastava et al., 2013). Poor compliance should not be blamed on the patients without first striving to identify factors that cause it. The project has potential implications for social change in nursing practice by conducting a systematic review of the literature to identify barriers and to explore strategies that can be more effective in enhancing patients' compliance with DSM. Subsequently, the findings

have been applied to make recommendations for practice changes to enhance patients' compliance with DSM, improve patient health outcomes, reduce the number of persons affected by diabetes, and promote the primary tenet of nursing practice by contributing to the existing body of nursing knowledge.

Summary

Diabetes is a significant clinical and health problem resulting from the impairment in the body's ability to regulate the insulin hormone. Nurses in primary care play a role in controlling diabetes and in the self-management of the disease. The adoption of DSME can improve patient's compliance to self-management in primary care if implemented. The literature reviewed for this project consisted of current research articles related to hindrances to such self-management compliance in primary care. Section 2 of this study presents the concepts, models, and theories used in this project; the relevance to nursing practice; the local background and context; my role as the student; and the role of the project team.

Section 2: Background and Context

Introduction

Health care providers have several duties and responsibilities including educating the patients, patients' families, and communities about disease prevention and management strategies (Messina et al., 2017). Addressing the practice problem related to low patient compliance with diabetes self-care has been cited as an area of concern and as one of the most significant challenges faced by health care providers in the primary care setting (Wagner et al., 2001). Understanding the barriers to adherence and identifying evidence-based strategies for improving patients' compliance with self-management can contribute to an enhanced patient involvement in self-management of the disease, which would result in improved health outcomes (Shrivastava et al., 2013). The practice-focused questions used to address the nursing practice gap are as follows:

1. What personal characteristics or factors influence patients' compliance with DSM?
2. What factors are hindrances to patients' compliance with DSM?
3. What strategies have been documented that improve patients' compliance with DSM?

In this project, I conducted a systematic review of the literature to analytically identify, evaluate, and synthesize all high-quality research evidence relevant to the hindrances in patients' compliance to DSM and to identify the best practice strategies that have been used to improve compliance with DSM in a primary care clinic. The goal was to identify the effective strategies that have been documented to improve patient

compliance with DSM in primary care and subsequently apply these findings to make recommendations for practice changes. The recommendations will help to improve compliance with DSM, improve patient health outcome, and reduce the number of persons affected by diabetes.

Concepts, Models, and Theories

Preferred Reporting Items for Systematic Reviews and Meta-Analyses

The systematic literature review was guided by the PRISMA and JHNEBP models. The PRISMA statement was designed by a group of 29 review authors, clinicians, methodologists, consumers, and medical editors in 2005 (Liberati et al., 2009). The group developed a 27-item checklist PRISMA focusing on the means that can be used to ensure the complete and transparent reporting of meta-analyses and systematic reviews. The PRISMA was selected because the use of checklists improves the reporting quality of a systematic review and offers transparency in the process of selecting papers in such a review (Moher, Liberati, Tetzlaff, & Altman, 2009). Furthermore, this model was used as it ensures the reliability of the published papers and increases the transparency of the research process with regard to the reviewed articles (Moher et al., 2015). The PRISMA statement was used to review the retrieved sources to identify possibilities of biases and analyze the evidence in the selected articles (Liberati et al., 2009).

Johns Hopkins Nursing Evidence-Based Practice (JHNEBP)

The JHNEBP model is a problem-solving approach to clinical decision making developed to meet the needs of the practicing nurses (Dang & Dearholt, 2017). The

model is a three-step process: practice question, evidence, and translation. I used this model to identify the latest research findings and best practices that can be incorporated into practice for identifying the barriers and strategies to DSM compliance in primary care settings (Dang & Dearholt, 2017). It was useful in identifying the levels of evidence in the reviewed articles.

Definition of Terms

Compliance and adherence: The degree to which a patient follows set procedures and standards correctly (Shrivastava et al., 2013). Conversely, such adherence is the extent to which an individual's behavior corresponds with agreed recommendations from a health care provider (Poupoulas, 2013). Adherence to self-care practices for diabetes can be applied to control the disease prevalence. Compliance issues, including health literacy and cost, hinder effective control and prevention of diseases.

Diabetes self-management education (DSME): The ADA (2014) described DSME not only as an evidence-based standard, but also as the ongoing process used to improve the skills, knowledge, and ability essential to self-manage diabetes. The primary goal of DSME is the promotion of active participation in disease management via education, active collaboration with health care personnel, and behavior modification (ADA, 2014).

Self-management: Russell et al. (2017) described self-management as an ongoing process that facilitates the acquisition of knowledge and skill necessary for diabetes self-care. The self-management process incorporates the goals, needs, and life experiences of the individuals diagnosed with diabetes and are guided using evidence-based standards.

The process of self-management entails taking on responsibility and care for a person's own wellbeing and behaviors.

Relevance to Nursing Practice

The majority of patients diagnosed with diabetes can reduce the risk of developing long-term complications by improving self-care activities (Shrivastava et al., 2013). Due to insufficient knowledge on methods to self-manage diabetes, the patients' compliance to recommended behaviors has been low. Noncompliance with DSM is diverse, and an integrated and systematic approach is required to address this problem (Shrivastava et al., 2013). Health professionals in primary care need to customize the support provided to each individual's self-care management. The identified gap in practice relates to a decreased patient compliance with self-care activities at primary care clinics.

The current state of nursing practice with regard to the identified practice problem has been cited in various scholarly works. According to Messina et al. (2017), nurses perform a variety of roles and have a multitude of responsibilities. Educating patients, their families, and communities about disease prevention and management is one of the core responsibilities. Educational intervention on DSM can be used to improve patient compliance with diabetes self-care activities (Messina et al., 2017). Additionally, increased interaction between patients who have diabetes and their primary care nurses has been found to promote patients' involvement in effective self-management of diabetes, subsequently improving health outcomes (Shrivastava et al., 2013).

Education programs have been used to improve the skills and knowledge of patients to self-manage the disease and to improve health outcomes (Powers et al., 2015). People with diabetes are required to make various, daily self-management decisions and execute complex care activities. DSME offers the foundation to assist patients with diabetes to make decisions and to perform activities that can improve health outcomes (Powers et al., 2015).

Self-management support offered by medical assistant health coaches in the primary care setting may help to improve patients' clinical outcomes. Willard-Grace et al. (2013) established that medical assistants are a part of the untapped resource that can be used to offer self-management support for diabetic patients. Medical assistants can work with patients and educate them on the importance of self-management activities. Medical assistants can be trained and mentored as health coaches to work with patients diagnosed with uncontrolled diabetes to help them with their care plan (Willard-Grace et al., 2013). Furthermore, they can work with the diabetic patients during and between medical visits to create action plans for lifestyle changes encouraging medication and self-care activities adherence.

Mobile health systems can be used in the primary care settings to promote compliance to self-management activities for diabetes. Fioravanti et al. (2013) established that mobile health systems have been used to promote adherence to self-management, enhancing the compliance to the medical prescription. Additionally, automatic messaging can be used to encourage and stimulate patients to embrace healthy lifestyles and promote empowerment. Self-management skills among patients can also be significantly

improved through the application of the active, consistent use of telemedicine programs. Smith and Satyshur (2016) established that innovative telemedicine programs have improved access to care, patient outcomes, and health care costs.

The current project aimed to advance nursing practices by exploring strategies that can be more effective in enhancing compliance with DSM at primary care clinics. Furthermore, the findings of this doctoral project can be applied by health care providers to make changes in practice that will improve compliance to DSM and patient health outcomes and assist in the reduction of persons affected by diabetes. The primary tenet of nursing practice will be enhanced by this contribution to the existing body of nursing knowledge.

Local Background and Context

The purpose of this project was to improve DSM and health outcomes in primary care settings. I identified limited initiatives and resources as the primary causes of poor patient compliance with DSM. The providers at the DNP project site serve 16–32 patients a day and approximately 480–900 patients per month. The total number of diabetic patients managed at the clinic was 300, and the total number of patients with glycated hemoglobin (HbA1c) greater than 9% was 150. The Comprehensive Diabetes Care Report (HEDIS, 2016) reported that adults with Type 1 and 2 diabetes had HbA1C levels greater than 9%. The Comprehensive Diabetes Care Reports indicate data by patient populations insured under commercial, Medicaid, and Medicare health care insurances. The percentage was 75.5% for patients with A1C > 9% insured under commercial health

insurance, 43.3% for patients insured under Medicaid health insurance, and 49.6% for patients insured under Medicare health insurance (NCQA, 2016).

At the institutional level, primary care facilities focus on initial treatment and management of medical ailments. Self-management support is an essential element of chronic care management; however, many primary care practices do not provide this support consistently due to limitations of time, training, and resources (Willard-Grace et al., 2013). There is a need to improve patients' compliance with self-management activities to reduce the consequences of diabetes. Effective strategies such as DSME and education training can be used to promote self-management care for diabetes in primary care settings. The mission and strategic vision of the DNP project site is to offer quality, value-priced, primary health care based on patients' needs, beliefs, and values. The adult population is prone to diabetes; therefore, self-management activities are required to control and prevent the disease (CDC, 2017).

The DSME is the recommended, evidence-based standard at state and federal levels used to improve skills, knowledge, and ability to self-manage diabetes (Russell et al., 2017). The main goal of DSME is to encourage the active participation in disease management via behavior modification, education, and active partnership with health care professionals (ADA, 2014). Additionally, the ongoing collaboration and communication is recommended as it enhances a reduction in hemoglobin (HbA1c) levels, diabetes-related complications, and health care costs (ADA, 2014).

Role of the DNP Student

I am an advanced practitioner registered nurse (APRN) and a certified nurse practitioner (CNP) currently pursuing a DNP degree. As a part of the curriculum, a project was conducted to facilitate a change in nursing practices at the DNP project site. This project was in collaboration with a full-service primary care clinic located in the suburban Maryland. The practice serves adult patients with various health conditions ranging from acute illnesses to chronic diseases, including hypertension, cardiovascular diseases, and diabetes (Types 1 and 2). The clinic is owned and managed by a nurse practitioner. The practice staff includes two other nurse practitioners, a scheduler, a case manager (RN), an office manager, a front desk clerk, and four medical assistants. I am trained to offer continuous primary care to diabetic patients. As the project leader, I was responsible for sorting out articles before choosing the final sources that will be finally be included in the project. A systematic literature review was conducted to examine the barriers to patient compliance and to identify the best practice strategies to improve patients' compliance and their self-management activities in the primary care setting.

A systematic approach was used to search and appraise primary research studies and systematic review studies for the project. Research articles that were relevant to the project questions were used as sources of evidence. To avoid bias, I analyzed the data using the PRISMA framework.

It was my responsibility to ensure quality, safe care and work for patients to improve health outcomes. Patient education in a primary care setting can improve patient's compliance with diabetes self-management activities. The use of leadership

skills acquired through the DNP program helped me lead this project. The motivation for undertaking this DNP project was the need to serve patients and improve their quality of life and health outcomes. Additionally, the gap in practice addressing low patient compliance with DSM compelled me to conduct this project.

Role of the Project Team

Several different stakeholders were involved in this project. The project team members offered input based on their expertise. The team was composed of the preceptor and two nurse practitioners, who were also members of the expert panel for the DNP project. The expert panel members were relevant because their approval and consensus were required to use evidence from the project site. The project team cross-checked the selected research articles for consistency, accuracy, and inclusiveness. The manuscript will be read before it is submitted to a nursing journal to point out areas that may need further improvement.

Summary

The purpose of this DNP project was to conduct a systematic review of the literature to analytically identify, evaluate, and synthesize all high-quality research evidence relevant to the hindrances in patients' compliance with DSM in a primary care clinic. The project was guided by two theories: (a) PRISMA statement and (b) the JHNEBP model. Different databases were used to provide sources of evidence applicable. Section 3 (collection and analysis of evidence) provides the practice-focused questions used in this project, sources of evidence, and the analysis and synthesis.

Section 3: Collection and Analysis of Evidence

Introduction

Health care providers have various duties and responsibilities, including educating patients and their families, and communities about disease prevention and management (Messina et al., 2017). Patients' compliance to self-care activities has been low, but an increased interaction between diabetic patients and the primary care nurses can contribute to enhanced patient involvement in self-management of diabetes, which results in improved health outcomes (Shrivastava et al., 2013). Effective strategies can be used at primary care clinics to improve compliance to self-management by diabetic patients, the quality of health, and patients' outcomes. The practice-focused questions are mentioned below:

1. What personal characteristics or factors influence patients' compliance with DSM?
2. What factors are hindrances to patients' compliance with DSM?
3. What strategies have been documented that improve patients' compliance with DSM?

The purpose of this DNP project was to conduct a systematic review of the literature to analytically identify, evaluate, and synthesize all high-quality research evidence relevant to the hindrances in patients' compliance to DSM and to identify best practice strategies that have been used to improve compliance with DSM in a primary care clinic. The goal was to provide information about effective strategies that can be used at primary care clinics to improve compliance with self-management for patients

who have diabetes. This section comprises of the practice-focused questions, sources of evidence, analysis and synthesis of findings, and summary.

Sources of Evidence

Data were extracted by two reviewers (myself and a fellow nurse practitioner) from peer-reviewed primary research articles, journals, dissertations, theses, and systematic review studies to address the practice-focused questions. According to Levac, Colquhoun, and O'Brien (2010), in a systematic review of the literature, the literature search and data extraction processes should be free from bias and as reliable as possible. To reduce the risk of bias and to achieve a reliable search result, Cronin, Ryan and Coughlan (2008) recommended that the literature review process is performed with a second reviewer. Not only does this approach reduce errors, but it also saves time during the research process (Cronin et al., 2008). The evidence retrieved was adequate to address the three practice-focused questions and to help provide recommendations for the best applicable practices in primary care. The use of the evidence-based findings can be used to improve patients' compliance with DSM in primary care settings and to improve health care outcomes. The analysis, evaluation, and synthesis of all relevant research evidence allowed for the identification of barriers to patient compliance with DSM and the effective strategies that have been documented to improve the same.

Published Outcomes and Research

Journal articles were sourced from the EBSCOhost, PubMed Central (PMC), CINAHL, and Research Gate databases. The sources were comprised of peer-reviewed primary research articles, journals, dissertations, theses, and systematic review studies

published within the last 5 years. The evidence for analysis and synthesis are offered with the evidence-based practice findings to support this project.

The following search terms were used to retrieve the relevant research articles: *strategies for improving patient compliance with DSM, DSM practices, diabetes self-care activities, hindrances to patient compliance with DSM, and factors influencing the patient's compliance to DSM.* The journal articles published after 2013 were selected, and the retrieved sources were reviewed to identify possibilities of biases based on the PRISMA statement for reporting systematic reviews and meta-analyses of studies (Liberati et al., 2009). An initial screening was performed to sort out replicated articles before choosing the sources to be included in the study. During the initial screening, the journal titles, the abstracts, and the content of the articles that matched with the inclusion criteria were the main points of focus. The data extracted were cross-checked by the nurse practitioner colleague for consistency, accuracy, and inclusiveness. Furthermore, the selected studies were examined for any possible confounding elements that might present bias and inconsistencies. Relevant studies from the search result were recorded and presented in a table form, including the studies features as study design, sample, sample size and setting, study findings, limitations, study quality, and evidence level.

After conducting the search, all bibliographies and reference lists of the studies sourced were reviewed to increase the scope and relevance of the selected materials. The data extracted were cross-checked by my colleague for consistency, accuracy, and inclusiveness. The inclusion criteria included studies addressing DSM in the primary care or outpatient setting, published from 2013–2017, available in full text and in the English

language. Studies with randomized controlled trials, quasi-experiments, case-control studies, or systematic reviews designs were also included. The exclusion criteria included pediatric patients, patients with gestational diabetes, patients with prediabetes diagnosis, research studies performed outside of the United States, and specialty care practice settings such as endocrinology specialty and diabetic care centers.

Participants

The participants of this DNP project included the three nurse practitioners who are also members of the expert panel for the DNP project. The expert panel members were relevant in this DNP project process because their approval and consensus were required to use evidence from the DNP project site.

Procedures

The research articles based on the topic on compliance with DSM were reviewed and evaluated by me. The studies were evaluated based on the following criteria: design, intervention(s), outcome measure, participants, sample size, application of statistical tests and results, findings, and relevance. After the evaluation of the search results, a table was used to identify the level and quality of evidence. The PRISMA tool was used to improve the quality of reporting the systematic review and to provide transparency required when selecting articles (Moher, et al., 2009). The PRISMA framework ensured reliability of published papers and enhance transparency of the reviewing process. Relevant studies were analyzed and synthesized by identifying the existing gaps, strengths, and weaknesses.

From the findings, recommendations related to the presented evidence were developed to address the low patients' compliance with DSM. It was established whether these would improve clinical practice by solving the identified clinical practice problem. The findings and recommendations from the qualitative systematic review were presented to the DNP expert panel to determine their level of support for performing the project.

Protections

It is mandatory to adhere to the ethical requirements when performing a systematic literature review project and to obtain ethical approval from relevant authorities. For this project, approval was obtained from the DNP Project Committee and the Walden University's Institutional Review Board (IRB) through the standard university procedures. The project was approved by the Walden University's IRB. The IRB approval number for this project is 05-22-18-0721554. This IRB approval only permitted the collection and analysis of data from public reports and published literature. This systematic review project did not involve the use of a survey or interview for individuals. Furthermore, there was no collection of any form of data from human subjects. Privacy, confidentially, and anonymity are the primary principles of ethics, which were also ensured. There was no use of personal identification details in the reviewed literature during the data collection process, analysis, and publication of the results. I applied necessary measures for ensuring that no proprietary, sensitive, or confidential information is disclosed in the doctoral project document. The nature and the process of the DNP project were presented to the expert panel for their approval and consensus on the use of evidence from the DNP project site.

Analysis and Synthesis

I analyzed and synthesized the findings from the systematic review. Meta-analysis and narrative analysis are two commonly used approaches for analysis and synthesis. However, given the possible heterogeneity in selected studies, a meta-analysis was not possible. Therefore, the results were presented in narrative form. Additioanlly, due to possible variations in study designs and differing outcomes of the searched studies, a narrative analysis was undertaken. Narrative synthesis was used to analyze both the experimental and quasi-experimental studies and the quantitative and qualitative studies included in a systematic review. Synthesizing narratively the results of various studies in a review was not for simply describing or summarizing the main features. Instead, the results of each study were assessed systematically and comprehensively, highlighting significant characteristics, similarities, and differences of the reviewed studies.

Summary

The purpose of this DNP project was to conduct a systematic review of the literature to analytically identify, evaluate, and synthesize all high quality research evidence relevant to the hindrances in patients' compliance with DSM and to identify the best practice strategies used to improve such compliance in a primary care clinic. Evidence was sourced from databases and used to answer the practice-focused questions. The PRISMA statement was used to establish the reliability of the sources selected. Privacy, anonymity, and confidentiality were ensured. Section 4 provides the findings and implications, recommendations, contributions of the doctoral project team, and the

strengths and limitations of the project. Narrative analysis was used to conduct the synthesis of the search and the selected sources of evidence.

Section 4: Findings and Recommendations

Introduction

Health care providers educate patients and their families about disease prevention and management (Messina et al., 2017). The gap in practice in this project comprises of low patient compliance with DSM in primary care. Patients' compliance to self-care activities is low. Therefore, understanding the barriers to self-care adherence and other factors that affect patient compliance with self-care is important in ensuring improved health outcomes (Messina et al., 2017). Low patient compliance with diabetes self-care is a challenge faced by health care providers in the primary care setting. Self-management education for adults with Type-2 diabetes results in the improvement in glycemic control at immediate follow-ups (Shrivastava et al., 2013). However, the observed benefits decline within 1 to 3 months after the intervention is stopped, suggesting that continuing education is important in enhancing compliance (Polonsky & Henry, 2016). Furthermore, the identification of evidence-based strategies for improving patients' compliance to self-management is important, because it would contribute to enhanced patient involvement (Shrivastava et al., 2013). The practice-focused questions used to address the nursing practice gap are as follows:

1. What personal characteristics or factors influence the patient's compliance to DSM?
2. What factors are hindrances to patients' compliance with DSM?
3. What strategies have been documented that improve patients' compliance with DSM?

The purpose of this DNP project was to conduct a systematic review of the literature to analytically identify, evaluate, and synthesize all research evidence relevant to the hindrances to patient's compliance to DSM in a primary care clinic. The goal of the project was to identify effective strategies that have been documented to improve patient compliance with DSM in primary care and subsequently apply the findings from the systematic review of literature to make recommendations for practice change.

A literature search was performed on peer-reviewed primary research articles, journals, dissertations, theses, and systematic review studies to address the practice-focused questions. The peer-reviewed articles were published within the last 5 years and were sourced from the EBSCOhost, PMC, CINAHL, and Research Gate databases. The information obtained from the analysis and synthesis of the retrieved articles provided evidence-based findings that supported the project's practice-focused questions highlighted above.

The sourced evidence was gathered using the following search terms: *strategies for improving patient compliance with DSM, DSM practices, diabetes self-care activities, hindrances to patient compliance with DSM, and factors influencing the patient's compliance to DSM.* Inclusion and exclusion criteria were used to narrow the scope of articles that might be relevant to this project.

Regarding relevance, the studies had to have been published within the last 5 years and had to be related to compliance with self-management for diabetes patients. There was no limit to the sample size because the primary focus was on compliance with self-management practices and possible interventions. The articles selected had to be

primary studies that had either qualitative or quantitative research methods, although randomized controlled trials (RCTs), retrospective case-control study, and systematic reviews were prefered. All the evidence was classified as Level III evidence.

After conducting the search, 210 peer-reviewed articles were retrieved. Additionally, 176 articles were excluded after considering the relevance of the studies in the project, supplication of sources in databases, and the risk of bias. From the 24 eligible articles meeting the inclusion criteria, four full-text articles were excluded due to insufficient relevance to compliance to self-management practices. A total of 20 articles were selected for the study. The PRISMA framework was used to ensure reliability of published articles and to enhance transparency of the reviewing process. The findings are provided in the PRISMA Flow Chart in Figure 1. Narrative analysis was used to analyze and synthesize both experimental and quasi-experimental studies and quantitative and qualitative studies included in a systematic review. Following the literature search, the flow chart below represents the articles used in the systematic review. A total of 20 peer-reviewed articles were selected based on the inclusion/exclusion criteria. A summary of the reviewed 20 articles that met the inclusion and exclusion criteria were presented in a table (Appendix B) form. The articles were analyzed using PRISMA flow chart (Appendix A) with regard to the evidence type, design of the research, sample, sample size, setting, and limitations of the study, the level of evidence, and how the study findings helped in answering the EBP questions.

Evidence Synthesis

A total of 19 articles were analyzed using PRISMA: 11 were qualitative in nature, whereas eight were quantitative research studies. Four of the quantitative studies (Dobson et al., 2016; Munshi et al., 2013; Van Olmen et al., 2013; and Willard-Grace et al. 2013) were RCT, while one by Brunisholz et al. (2014) was a retrospective case-control study. The evidence level of the selected studies ranges from level I to level VII evidence using the Melnyk Fineout –Overholt's level of evidence model. The procedure of collecting and summarizing the research evidences was extensively elaborated; also the conclusion and recommendations are consistent with the reviewed literature. All the qualitative studies reviewed have definitive conclusions, reasonably consistent results, and their conclusions and recommendations are founded on the findings. The sample populations used in all qualitative and quantitative research relate to patients diagnosed with diabetes and their diabetes self-management.

Findings

Factors that Influence Patient's Compliance to Diabetes Self-Management

Santhanakrishnan, Lakshminarayanan, and Kar (2014) found that low compliance to pharmacological treatment was associated with challenges related to forgetting medications, side-effects, and the inability to collect medications from the center. Personal issues including inability to come to the primary care clinic and collect medications also affected the level of compliance to self-management. Furthermore, the lack of health literacy significantly affected compliance. The drawbacks associated with noncompliance to diabetic management are the increased complications and costs of

health-care and the decline in productivity of the person affected (Santhanakrishnan et al., 2014). Similarly, Sohal et al. (2015) noted that personal factors, including poor mobility, anxiety and depression, pain and discomfort, and limited education influence the patients' compliance. Additionally, there was a closer link identified between nonadherence by diabetic patients to foot care and challenges with self-care, mobility, and pain/discomfort..

Personal factors such as fear, confusion, and difficulties associated with food cravings affected patients' ability to comply with self-management activities (Reyes et al., 2017). Low-income persons with diabetes compared to those with high levels of income faced many challenges to diabetes self-management. The challenges include strong emotional reactions, difficulty in translation of provider advice into practical self-management tasks, depression, and the inability to balance self-management and family obligations (Reyes et al., 2017).

Self-management of diabetes is complex and multidisciplinary approaches are required to enhance self-care. Alrahbi and Alghenaim (2017) identified eight factors influencing diabetes self-management—awareness of diabetes complications, ability to adapt, support, frustration and helplessness, fear of consequences, lack of care, poor planning, and compliance with sociocultural norms. The findings indicated that majority of the subjects expressed inability to adjust to the fact that they have to live with diabetes. Fear of the implications of diabetes-linked complications, including amputation, blindness, and death were mentioned as factors that influenced majority of the participants to comply with self-management. Culture has an influence on compliance to

self-management activities because social norms and beliefs challenge patients' ability to comply. Alrahbi and Alghenaim (2017) established that in Oman, observing religious and cultural rules such as exercising in public and eating healthy deter patients from complying with diabetes self-management. Support or absence of support from family members, health care providers, and friends influence compliance to self-management for diabetes (Alrahbi & Alghenaim, 2017; Reyes et al., 2017).

Wilkinson, Whitehead, and Ritchie (2015) explored actors that influenced the ability to self-manage the condition for adults diagnosed with type 1 or 2 diabetes. The study classified the factors as communication, education, personal factors, support, and provider issues. For instance, communication issues with health care providers with patients affected their ability to self-care because decision-making can be affected. Shared decision making requires health care providers and patients to decide together on self-management practices to be followed. Persons with diabetes and their family members need suitable, consistent, and understandable diabetes specific education to facilitate self-care (Wilkinson et al., 2015). Bagnasco et al. (2013) established that personal characteristics influence compliance with self-management of diabetes and can maximize educational intervention. For example, inadequate education on diabetes self-management can hinder compliance, hence increasing the prevalence of the disease.

Hindrances to Patient Compliance with Diabetes Self-Management.

Sohal et al. (2015) established that language and communication discordance with the health care provider, limited knowledge, lack of awareness, and culture hindered

compliance to diabetes self-management. Additionally, García-Pérez et al. (2013) found that poor adherence, communication issues, and high costs were personal factors that hindered diabetes self-management compliance. Mogre, Johnson, Tzelepis, Shaw, and Paul (2017) conducted a systematic review that focused on patients' adherence to diabetes self-care behaviors that hinder self-management of the disease. The most frequently reported barriers include the inadequate knowledge of a particular diet plan, frustration from lack of glycemic control, lack of understanding of the plan of care, and helplessness.

Reyes et al. (2017) found that fear of being unable to control their diabetes, difficulty managing their diabetes while caring for family members, and confusion about self-management hindered compliance and were barriers faced by diabetic patients. Munshi et al (2013) established that inadequate medication hindered compliance for diabetes self-management practices. The barriers interfered with the patients' abilities to execute self-care tasks, including glucose monitoring, following complex insulin regimen, and understanding the importance of exercise and modified diets on glucose excursions (Munshi et al., 2013; Reyes et al., 2017). When the barriers are not addressed, older adults with diabetes became prone to nonadherence with self-care recommendations and may even have experienced treatment complications leading to a decline in the overall health and quality-of-life (Munshi et al., 2013).

Poor vision, hearing problems and cognitive impairment can hinder compliance with diabetes self-management. These factors impede driving, reading food labels, exercising, and attending to foot care (Wilkinson et al., 2015). Increased age lead to

decreased physical and social functioning, which can limit self-care. Alrahbi and Alghenaim (2017) and Wilkinson et al.'s (2015) findings showed that spiritual and cultural beliefs held by individuals with diabetes-influenced compliance with self-management. Lack of support from family members and spouses hindered compliance with diabetes self-management, especially to older adults with mobility challenges (Wilkinson et al., 2015).

Strategies to Improve Patient Compliance with Diabetes Self-Management.

Van Olmen, et al. (2013), Dobson et al. (2016), and Fioravanti et al. 2015) reached a consensus that text messages are effective and text message-based diabetes self-management effectively supported diabetes management adherence. Dobson et al. (2016) established that Self-Management Support for Blood Glucose (SMS4BG) was an effective text message-based intervention supporting patients with diabetes to achieve optimum glycaemic control. The SMS4BG, which is a text message-based self-management support tool, provided individualized support to persons with diabetes and the findings can be replicated outside the clinic environment. Fioravanti et al. (2015) found that mobile health systems could effectively promote adherence and improve the self-management of diabetes and enhance compliance to the medical prescription. Moreover, messaging could be used to encourage and stimulate patients to change their behaviors by adopting healthy life styles. The use of an m-health adherence system increased adherence to prescriptions among T1DM and T2DM patients during the 4 weeks (Fioravanti et al., 2015).

The use of text messages is an effective strategy to increase compliance to diabetes self-management protocols. Van Olmen, et al. (2013) noted that that DSMS messages can increase knowledge about failure to comply with self-management practices and their effects and subsequently change the patients' behaviors. Russell et al. (2017) found that mobile phone technology was a feasible and sustainable means to enhance current diabetes management with text-messaging interventions promoting DSME. Gucciardi et al. (2013) noted that DSME intervention features influence self-management outcomes for women of African/Caribbean and Hispanic/Latin ethnicity. In support, Brunisholz et al. (2014) contended that standardized DSME was strongly linked with a considerable improvement in patients meeting all five elements of a diabetes bundle and reduction in HbA_1. The reviewed findings have thus established a gap in practice related to low patient's compliance to diabetes self-management.

Other than using technology, Willard-Grace et al. (2015) established that medical assistant coaching was effective to the management of uncontrolled diabetes, hyperlipidemia, and hypertension. Medical assistants have remained as untapped human resources who can be used to provide self-management support for patients with diabetes. Medical assistants can work closely with patients with diabetes and educate them on the importance of self-management activities. After patients received coaching for a period of 12 months from medical assistants, there was an in change in hemoglobin A1c and the systolic blood pressure among patients diagnosed with uncontrolled diabetes (Willard-Grace et al., 2015). The change in hemoglobin A1c and systolic blood pressure can be

attributed to coaching carried by diagnosed with uncontrolled diabetes. However, further research is required to support Willard-Grace et al. (2015) findings.

Psychological, telecare, and educational interventions can improve patients' compliance, thus lowers HbA1c (Viana et al., 2016). Psychological approaches can improve adherence to diabetes care treatment and reduce HbA1c among patients diagnosed with type 1 diabetes. Education and telecare interventions changed glycemic levels, therefore, are effective in self-management of diabetes (Viana et al., 2016).

Weller, Baer, Nash, and Perez (2017) established that reoffering diabetes education classes and provision of pill boxes as memory aids helped to improve poor control and management of diabetes. Furthermore, 62% of the patients stated that undertaking diabetes education class improved their compliance to management of diabetes. Education on topics such as glucose monitoring and medication adherence was effective in improving self-management of diabetes. Medication non-adherence is one of the leading public health challenges experienced the US. To enhance compliance to self-management practices such as adherence to medication, educational strategies can be employed, for instance, teach back and pictorial images (Zulling et al., 2015). Educational strategies can increase knowledge about diabetes and the compliance with medication and dietary recommendations among low literacy patients with type 2 diabetes.

Unanticipated Limitations and Their Potential Impact on the Findings

The major limitation was that most of the studies reviewed were not conducted in the US. This can affect the generalization of the findings. Nonetheless, the findings have positive implications to nursing practice because these intervention strategies can be used to improve health outcomes. There is also limited documented evidence on personal characteristics influencing patients' compliance to diabetes self-management. Therefore, further study is required in this area to improve the current findings.

Implications of the Findings

These findings have positive implications for individuals, communities, institutions and systems. For example, if the findings from the systematic review are implemented, this DNP project will potentially improve proper self-management behaviors among persons with diabetes. Compliance for diabetes self-management could minimize the risk of developing diabetes-related complications and other chronic diseases. Different detrimental effects associated with diabetes can be reduced following the implementation of this DNP project's findings. Financial costs on individuals, communities, institutions, and systems can also be minimized because patients with diabetes can be encouraged to start being complaint to self0management practices (Reyes et al., 2014).

The DNP project may also inform policy makers and health care providers to adopt technology and messaging platforms to promote compliance to self-management for diabetes (Dobson et al., 2016; Fioravanti et al. 2015; Van Olmen, et al., 2013). The

project may help in decreasing the incidence of diabetes among adults and minimize the health disparity of diabetes in the US. Compliance to self-management practices has a positive impact on the wellbeing of patients and the quality of life and overall well-being of many people (Murray, Abadi, Blair, Dunk, & Sampson, 2011). The levels of adherence to self-care activities can be increased and positive long-term outcomes experienced (Shrivastava et al., 2013). Identification of factors that hinder patients' compliance with diabetes self-management can result in the use of strategies effectively enhance compliance with diabetes self-management. The findings from the systematic review of literature can thus be applied to make recommendations for practice changes for improving compliance to diabetes self-management, reducing the number of adults affected by diabetes, and improving patient health outcomes.

Implications to Positive Social Change

The DNP project can have positive influence on social change by reducing the number of patients with diabetes. Moreover, the implementations of strategies on the use of technology, medical assistants, and the use of messages and texts can significantly decrease hemoglobin A1c levels, reduce complications of people with diabetes, and minimize the prevalence of diabetes in the U.S (Fioravanti et al., 2015; Van Olmen, et al. (2013). Poor diabetes management and noncompliance to self-management practices have detrimental impacts on patients, families, and communities. The findings of this DNP project can improve compliance and create social change in the community. This

project may help in reducing the financial costs of diabetics on communities and families by decreasing the amount of finances spent on annual diabetic treatment.

Recommendations

The recommended solutions will potentially address the gap-in-practice and improve low patient compliance with diabetes self-management in primary care. Based on the findings from the systematic review, education on diabetes self- management can be used to improve patient compliance to diabetes self-care (Messina et al., 2017). Additionally, a medical assistant can be used in primary care to increase patients' involvement in self-management of the diabetes, and ultimately improve their health outcomes (Shrivastava et al., 2013). According to Willard-Grace et al. (2013), medical assistants remain untapped and they can be used to effectively enhance the management of uncontrolled diabetes and hyperlipidemia. The second recommendation is for health care providers in primary care to use text message-based diabetes self-management tools to increase compliance for diabetes management (Dobson et al., 2016; Fioravanti et al., 2015). Text messages provide information related to diabetes to patients, thus increasing compliance to diabetes self-management protocols. The text messages and technology platforms can increase knowledge related to the shortcomings of failing to comply with self-management practices and change the behaviors of the patients (Van Olmen, et al., 2013). Most people, especially adults in the US, have a mobile device. Therefore, mobile phone technology is recommended because it viable and sustainable approach to enhancing diabetes management compliance (Russell et al., 2017).

Contribution of the Doctoral Project Team

The doctoral project team comprised of the DNP project mentor, DNP chair, and project committee will read the manuscript before I have it submitted to a journal for publication. The project mentor and chair played a major role in making sure that the literature reviewed answered the three research-based questions. As the project leader, my role was to conduct a systematic literature review project, analyze, and synthesize findings on the barriers to patient compliance with diabetes self-management. I played an important role in identifying the best practice strategies to improve compliance with diabetes self-management in primary care. The project mentor provided guidance and insights related to the DNP project and highlighted areas that required improvement. The DNP Committee Chair guided me through decisions to effectively and efficiently build the foundational work, processes, and preparation required to complete my DNP project.

Strength and Limitations of the Project

Strengths.

The DNP project was based on a systematic review that applied different steps, including articles searches and inclusion and exclusion criteria. Thus, the findings are based on various peer-reviewed articles on different methodological approaches. Findings from different primary peer-reviewed sources increased the reliability and validity of the findings. For instance, the findings for each question are based on outcomes from various research studies. The principles of systematic review methodology, including transparency, rigor, and replicability and have been followed. This improves the strength

of the findings. The DNP student used PRISMA Model to improve the reporting quality of a systematic review to provide considerable transparency when selecting articles for the systematic review (Moher et al., 2009). The findings of the project are reliable because the PRISMA model helped in ensuring that the published papers reviewed were related to this study (Moher et al., 2015). This is so, as systematic reviews do not constitute a homogeneous approach, but instead have various levels of evidence.

Limitations.

The first limitation is that only 12 peer-reviewed articles were used to provide answers to the three questions of the project. The second limitation is that systematic reviews required a DNP student to have access to a wide range of peer-reviewed journal and databases. This was a problematic and expensive. Some of the suitable articles were in the form of abstracts and required subscription for access. This limits the number of accessible articles for this project. Other general limitations included inadequate details in the undocumented patient compliance rates, publications, and inadequate follow-up in longitudinal trials.

Recommendations for Future Projects

Future researchers should investigate the most effective documented strategy that can be used to improve patients' compliance with diabetes self-management. The investigation can be done using a systematic review and focusing on a single platform such as technology and how it enhances patients' compliance with self-management

activities. A future project could use the same approach and address this issue of compliance by investigating how education and behavioral interventions could be beneficial. The study can further investigate the effects of personal characteristics or factors on the patient's compliance to diabetes self-management. Providers and other trained staff provide diabetes patients with the tools required to make changes for improving their quality of health and wellbeing. Therefore, future researchers could focus on the role medical assistants and other trained staff plays in improving patient compliance with diabetes self-management.

Section 5: Dissemination Plan

Dissemination of nursing knowledge is encouraged by the DNP essentials, as it is beneficial for the health care system. Dissemination ensures that project outcomes are shared, thus contributing knowledge effectively to primary care nurses, staff, policymakers, and the public through publications. Furthermore, journal clubs, poster presentations, media interviews, and panel memberships are all important for the health care profession (Williams, 2016). For this DNP project, the dissemination of outcomes is to be conducted and presented as a PowerPoint presentation during the primary care staff meeting. The rationale is to communicate and collaborate with other health care professionals and clinical staff to improve the patients' outcomes via EBPs. Additionally, poster presentations and publications are two other important avenues used to communicate the project.

The main dissemination approach to be used is that of publications. There are various publication avenues that can be adopted to disseminate the project's outcomes and share them with the greater scholarly community (Gordon, Darbyshire, Saifuddin, & Vimalesvaran, 2013). For instance, the DNP project can be disseminated by using a scholarly nursing journal. The *Online Journal in Nursing* is a scholarly journal of the American Nurses Association (ANA) that is appropriate for the dissemination of findings to various interested parties. This journal is a peer-reviewed online publication covering a wide range of topics related to nursing and the health care sector. It has an interactive format that inspires a dynamic dialogue between nursing professionals. This can create an opportunity for the discussion of the topic, which can develop the field of nursing,

improve nursing knowledge, and improve the patients' health outcomes. Moreover, journal publication can be used to disseminate the projects' outcomes to various interested parties. A nursing journal is fit for the publication of this project's objectives, collected data, findings, and the implications of these findings that may affect social change and the nursing profession.

The project leader at local, state, and national levels can present the project. At the national arena, the ANA conference is the most appropriate platform that can be used to share the methodology, findings, and their implications to the largest association of nurses. This conference can equip stakeholders with the knowledge that can enhance safety, a possible quality after the implementation of the EBP interventions. At the state level, an ANA-based conference can be held to ensure the dissemination of the projects' outcomes to various stakeholders, including policy makers, patients, nurses, medical assistants, and other health care professionals (Ranse & Hayes, 2013). The project can be disseminated at the local level, such as at primary health care centers, by holding a conference. The findings can be presented to primary care nurses and other health care professionals to establish the factors that are hindrances to patient compliance with diabetes self-management (Ranse & Hayes, 2013). Poster presentations could also be used to provide guidelines and protocols that can be used to improve the patients' compliance with diabetes self-management.

Analysis of Self

Self-analysis is a process that allowed me, as an individual, to assess my personal experience, evaluate what I have done, and establish the level of personal growth

achieved. Following the development of the DNP project, self-analysis is significant for both professional and interpersonal growth. Such analysis of the self has addressed areas of my personal growth as a nursing practitioner, a scholar, and a project manager.

Practitioner

As a certified registered nurse practitioner, my aim is to offer continuous primary care to patients with diabetes to improve their wellbeing. Based on my clinical expertise in primary care settings, this evidence-based project will add value to the nursing care delivery. The project entailed a systematic review to analytically identify, evaluate, and synthesize all high quality research evidence relevant to the hindrances in patient's compliance with DSM in a primary care clinic. The findings can be used to address the health needs for a target population of patients with diabetes. This would increase the compliance to DSM. As a DNP-prepared nurse, I am trained to advocate for patients. Therefore, I will ensure that the implementation of the project's findings will improve patients' compliance with DSM (Maryniuk, Mensing, Imershein, Gregory, & Jackson, 2013). Sharing my project outcomes in both the primary care setting and with other clinical staff in different health care settings would allow me to contribute positively to new knowledge on diabetes education in clinical practice. During the development of my DNP project, I have faced challenges that almost made it impossible to complete it. Notwithstanding these challenges and setbacks, I am a dedicated practitioner who has an interest in the identification of gaps in evidence to enhance nursing practices.

Scholar

The DNP capstone project is the final requirement for all students pursuing a DNP program as it offers the foundation for future scholarship and leadership (American Association of College of Nursing [AACN], 2006). The DNP program equips a student with the skills to undertake the capstone project to completion. This signifies that I have mastered the proficiency and knowledge required in the field. The main purpose of the DNP program is to provide the education that can help an individual reach his or her potential, be a nursing professional, and become a better leader (Zaccagnini & White, 2012). As pointed out by Chiasm (2013), the DNP program, comprising of the DNP project experience and the practicum, has assisted me in becoming a leader who can influence others to make the necessary changes.

As a DNP-prepared nurse, one of my roles is knowledge discovery as described in the essentials of nursing. I have been equipped with the skills to systematically advance the research, teaching, and practice of nursing via an inquiry that can be peer viewed (AACN, 2006). As a scholar, my plan is to use this information from the systematic review and advance both research and teaching aimed at improving knowledge and patients' outcomes. The integration, application, and dissemination of knowledge related to diabetes management are part of my role as a scholar (AACN, 2006). The completion of this capstone project has assisted me in exploring the importance of selecting the most suitable and current scholarly articles that can promote health care. The work of the DNP does not end with the implementation a project and the evaluation of the outcomes. Instead, my obligation extends to scholarship and the sharing of such findings.

Additionally, the developing of the project has enhanced an element of nursing scholarship—collaboration. As a scholar, I have collaborated with other nurses to ensure the success of this project.

Sharing the outcomes of my capstone project with other clinical staff in different health care settings will allow me to contribute to new knowledge on patients' compliance with DSM in the primary care setting in clinical practice (Terry, 2012). As a scholar, I have the capability to use critical thinking to appraise and synthesize existing literature and use this acquired knowledge to develop solutions to a health care problem. For instance, through the systematic review, I have established the factors that hinder patients' compliance towards diabetes management and assessed the most appropriate solution. The investigation and synthesizing of scholarly articles has allowed me to give meaning to isolated facts and make connections to establish gaps in practice through the scholarship of integration (AACN, 2006). I plan to apply knowledge to solve problems related to patients' compliance for DSM through the scholarship of practice in nursing (AACN, 2006). Such application would entail the translation of research into practice followed by the dissemination and incorporation of new knowledge acquired into practice. In accordance with Essential III, as a scholar, my focus would be to design, direct, and evaluate quality improvement methodologies to encourage timely, safe, efficient, effective, equitable, and patient-centered care.

Project Manager

As a leader, the process of developing this project has assisted me in having a deeper understanding of how a DNP-prepared nurse should be prepared in facing

challenges. As a project manager, the DNP project enhanced my leadership skills required in health care delivery and nursing practice (AACN, 2006). The project gave me insights into the challenges faced by patients with diabetes and how these hinder compliances with set self-management guidelines. This project has equipped me with the necessary skills required to manage a project to improve patients' health outcomes. In accordance with Essential II on Organizational and Systems Leadership for Quality Improvement and Systems Thinking, the DNP program and this project have improved my leadership and management skills and competencies (AACN, 2006). My long-term professional goals are to hold leadership positions and implement evidence-based findings in primary care to improve patients' wellbeing and health care outcomes. Another long-term professional goal is to use the developed advanced competencies to address the increasingly complex practice, leadership, and faculty roles.

Undertaking this project, from the beginning to the end, has taught me how to develop a quality improvement project and disseminate the project outcomes to improve the patients' quality of life. As a project developer, I had to undergo some challenges in various phases that enhanced my resilience as a nursing professional. The practical experience acquired in the process of developing a health improvement project and in undertaking a systematic review is vital in any organization. For instance, the systematic review has equipped me with the necessary skills as project developer required to evaluate organizational policies and apply evidence-based practice solutions to promote health care.

Challenges, Solutions, and Insights Gained

In spite of the added value associated with a systematic review approach, several practical problems were encountered in the process that could have limited the findings. For instance, the systematic review included the search, screening, and synthesis stages that were time consuming and tiresome. The other challenge faced were related to the time factor, because I was required to search for peer-reviewed articles, and screen, analyze, and synthesize the findings. Nonetheless, I was able to complete the project in time.

There is consistency in the findings analyzed, which indicate that text messages and message-based DSM strategies effectively support diabetes management compliance (Dobson et al., 2016; Fioravanti et al. 2015; Van Olmen, et al., 2013). The SMS4BG can be used to offer personalized support to individuals with diabetes. Furthermore, mobile health systems increase the compliance with DSM protocols through the provision of such messages. Mobile phone technology can be used to promote DSME (Gucciardi et al., 2013; Russell et al., 2017). Coaching and the use of medical assistances can play a role in improving patients' compliance with self-care practices. Psychological, telecare, and educational interventions are strategies that can be used to enhance patients' compliance with diabetes for self-management (Viana et al., 2016).

When conducting the systematic review, various insights were gained. I learned that the language and communication discordance with health care providers, lack of sufficient knowledge, and cultural factors hinder the patients' compliance with DSM. Moreover, cognitive impairment, poor vision, and hearing problems are barriers to such

compliance (Wilkinson et al., 2015). Cultural and spiritual factors may affect the ability of persons living with disabilities to comply with DSM practices.

Summary

The purpose of this project was to conduct a systematic literature review that identifies barriers and personal factors influencing patient's compliance with DSM and the effective strategies that could be used to improve such compliance in a primary care setting. The findings are consistent with past projects on patients' compliance with self-management with regard to diabetes. Low compliance is linked with personal factors such as forgetting medications, the inability to collect medications from the primary care clinic, and the lack of health literacy. Noncompliance to diabetic management is also caused by poor mobility, anxiety, depression, pain, discomfort, fear, confusion, and few difficulties associated with food cravings. Difficulties in the translation of provided advice for applicable self-management tasks can also influence the patient's compliance with DSM. The major hindrances to patients' compliance include language and communication discordance, limited knowledge, absence of awareness, and culture. Fear of being unable to control and manage diabetes and support family members hinders patients' compliance. Moreover, inadequate medication and inadequate education affects patients' abilities to perform self-care tasks. Such unaddressed barriers lead to nonadherence with self-care recommendations, poor quality of life, and poor health. The commonly applicable strategies for improving patient's compliance with diabetes management include the use of text message-based DSM, the SMS4BD, and the mobile technology to realize optimum glycemic control. A text message-based self-management

support tool provides personalized support to patients with diabetes and can be used to encourage and stimulate patients to improve their compliance to DSM. Additionally, medical assistants can be used to ensure the effective management of uncontrolled diabetes, hyperlipidemia, and hypertension.

The findings have implications for nursing practice, patients and their families, communities, and for social change. The implementation of the project's outcomes can improve proper self-management practices among diabetes patients. Compliance to DSM can help decrease the diabetes incidence among adults and minimize health-related complications. Compliance to self-management practices can further positively impact the quality of life, wellbeing of people, and lead to positive long-term outcomes. The DNP project positively influences social change by reducing the diabetes patient population. The use of technology, medical assistants, and messages or texts can increase DSM compliance and reduce the financial costs of diabetes in primary care clinics, in communities, and for patients and their family members. The recommended solutions addressing the gap-in-practice by improving low patient compliance with DSM in primary care are thus as follows—the use of education with regard to diabetes by medical assistants and using text messages technologies to promote health care.

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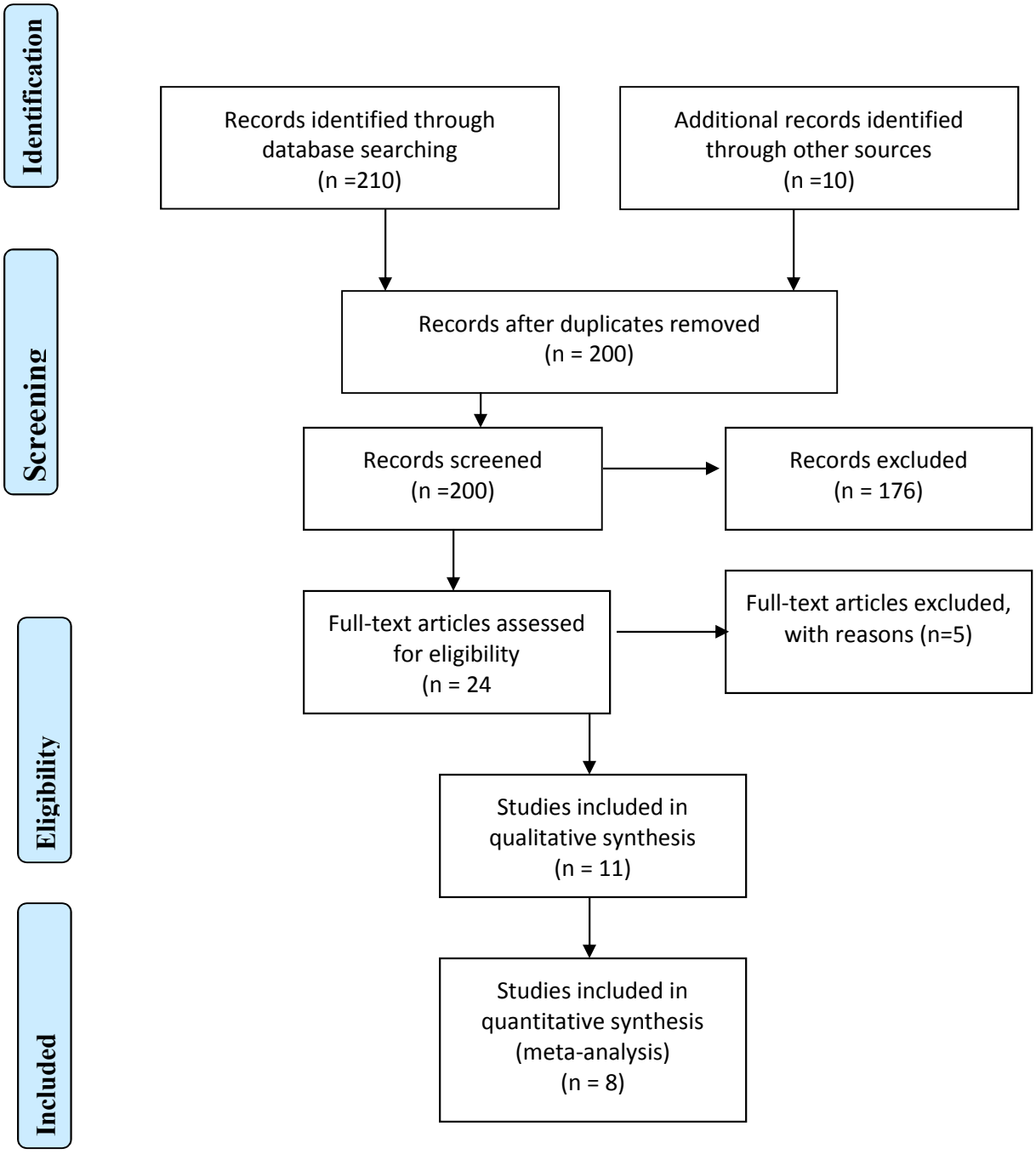
Appendix A: PRISMA flow chart



Appendix B: Evidence Matrix/Table

Evidence Matrix/Table

Article	Author & Date	Evidence Type	Design	Sample, Sample Size, and Setting	Study findings that help answer the EBP question	Limitations	Evidence Level & Quality
Factors influencing diabetes self-management among Omani patients with Type-2 diabetes: Patients' perspectives.	Alrahbi, H. H., & Alghenaim, S. A. (2017).	Qualitative study	A qualitative, descriptive design using semi-structured individual interviews.	A purposive sample of 21 Omani patients with type-2 diabetes.	To improve compliance, a collaborative approach that considers the factors influencing diabetes self-management is recommended.	Conducted in Oman, which has different culture than U.S. A small sample was small, purposive, and represents few numbers of regions of Oman. The findings of this study may have not capture the perspectives of patients in other regions.	Level VI evidence

Factors influencing self-management in patients with Type 2 diabetes: A quantitative systematic review protocol	Bagnasco, A., Di Giacomo, P., Mora, R. R. D., Catania, G., Turci, C., Rocco, G., & Sasso, L. (2013).	Systematic review of mix study design	A quantitativ, systematic review.	The protocol for the systematic review was conducted based to the guidelines of the Centre for Reviews and Dissemination, York (UK).	Identifies factors influencing self-management in persons with Type II diabetes. Identifies the personal characteristics appropriate for self-management.	Conducted based on conducted based to the guidelines of the Centre for Reviews and Dissemination, York (UK).	Level II evidence
Diabetes self-management education improves quality of care and clinical outcomes determined by a diabetes bundle measure.	Brunisholz, K. D., Briot, P., Hamilton, S., Joy, E. A., Lomax, M., Barton, N. … Cannon, W. (2014).	Case control Study	A retrospective, case-control study.	IH's Enterprise Data Warehouse (EDW) queried for all adult type II diabetes mellitus patients (18–75 years of age) between 2011 and 2012 who received DSME from one of five American Diabetes Association (ADA)-certified diabetes education centers.	Standardized DSME is strongly linked with a considerable improvement in patients meeting all five elements of a diabetes bundle as well as a decline in HbA_1.	The study population was limited to patients attended by primary care physician employed by the medical group.	Level IV evidence and good quality of evidence (B).
Effectiveness of text message based, diabetes self management	Dobson, R., Whittaker, R., Jiang, Y., Shepherd, M.,	Randomized controlled trial	**A** randomized controlled trial.	A sample of 1000 participants (500 per arm).	Text message-based diabetes self-management is s acceptable as well as	The study's findings are only limited to New Zealand.	Level II evidence, and good quality of

support program (SMS4BG): two arm, parallel randomized controlled trial	Maddison, R., Carter, K., … Murphy, R. (2018).				perceived as useful by people diagnosed with diabetes in New Zealand.		evidence (A).
Automatic messaging for improving patients' engagement in diabetes management: An exploratory study.	Fioravanti, A., Fico, G., Salvi, D., García-Betances, R., Arredondo, M., García-Betances, R. I., & Arredondo, M. T. (2015).).	Randomized controlled trial	A randomized controlled exploratory pilot study.	51 out of 54 patients, who were enrolled, completed the trials. Participants were recruited from four different clinical centers in Europe	The findings indicated that the automatic messaging could be feasible and can increase adherence to diabetes self-management.	A more extensive research is needed to corroborate the outcomes and to find benefits of the proposed intervention.	Level II
Adherence to therapies in patients with Type 2 diabetes.	García-Pérez, L.-E., Álvarez, M., Dilla, T., Gil-Guillén, V., & Orozco-Beltrán, D. (2013).).	Literature review	Narative review.	A review of publications regarding clinical trials, and epidemiology and evidence reviews,	The factors that impact adherence to various therapies for type II diabetes include poor adherence, communication issues, and high costs.	The literature was on used a small number of studies, which affects generalizability of the findings.	Level VII
A systematic literature review of diabetes self-management education features	Gucciardi, E., Chan, V. W., Manuel, L., & Sidani, S. (2013)	A systematic review of randomized controlled trials studies	A systematic literature review	A total sample of 13 studies, 10 randomized controlled trials studies and	Different DSME intervention features influence self-management outcomes for women	Only a handful of studies (n = 13) fit the inclusion criteria and this	Level 1

to improve diabetes education in women of Black African/Caribbean and Hispanic/Latin American ethnicity.				3 cohort studies including both an intervention group and a comparison group	of African/Caribbean and Hispanic/Latin ethnicity.	limited the ability to stratify the analysis by cultural group.	
Adherence to self-care behaviours and associated barriers in Type 2 diabetes patients of low-and middle-income countries: A systematic review protocol	Mogre, V., Johnson, N. A., Tzelepis, F., Shaw, J., & Paul, C. (2017).	A Systematic review	A systematic review composed of cross-sectional studies, observational cohort studies, baseline data of randomized controlled trials, and qualitative studies.	A narrative review base on the guidelines of the Preferred Reporting Items for Systematic review and Meta-Analysis Protocols (PRISMA-P).	Provides evidence on adherence to self-care behaviors by type 2 diabetes patients.	The number of articles to be reviewed not included.	Level I evidence and good quality of evidence (A).
Assessment of barriers to improve diabetes management in older adults: A randomized controlled study.	Munshi, M. N., Segal, A. R., Suhl, E., Ryan, C., Sternthal, A., Giusti, J., … Weinger, K. (2013).	Randomized controlled trial	A randomized controlled study.	A sample of randomized 100 subjects aged ≥69 years with poorly controlled diabetes (A1C >8%), divided into two groups.	The common barrier was inadequate medications by older patients. Both intervention and control groups showed improvement in levels of glycemic	A small sample use and relatively short study period limited the ability to generalize the study's finding.	Level II evidence and good quality of evidence (A).

					control after contacting with educators.		
Factors influencing diabetes self-management among medically underserved patients with Type ii diabetes.	Reyes, J., Tripp-Reimer, T., Parker, E., Muller, B., & Laroche, H. (2017).	Descriptive qualitative study	A descriptive qualitative study.	A sample of 44 patients who participated in eight focus groups with control status (HbA1c of > 9 [uncontrolled] or < 7 [controlled]).	Hindrances to compliance were fear about being unable to control their diabetes, difficulty managing their diabetes while caring for family members, and confusion about self-management.	Limited to Spanish-speaking Latino participants.	Level V I evidence and good quality of evidence (B).
Text-messaging to support diabetes self-management in a rural health clinic: A quality improvement project.	Russell, N., Vess, J., Durham, C. & Johnson, E. (2017).	Quality improvement study	Quality improvement study.	participants included 49 patients with diabetes managed at the clinic that chose to participate in the text message program.	Mobile phone technology is not only feasible, but also sustainable means to enhance current diabetes management with text-messaging interventions that promote DSME.	The project limitation is that both diabetes management and control and is appropriately measured by HbA1c level. Limited to a small sample.	Level V (JHNEBP)
Barriers and facilitators for Type-2 diabetes management in South Asians: A systematic review	Sohal T, Sohal P, King-Shier KM, Khan NA (2015).	Systematic review of qualitative studies and mixed method studies	A Systematic review	20 studies were included (19 qualitative including mixed methods studies, 1 questionnaire).	Language and communication discordance with the healthcare provider remains the primary barrier compliance to	Inability to stratify the results into respective subgroups. Lack of	Level V evidence

					self-management for diabetes. Limited knowledge, lack of awareness, and culture hindered compliance to diabetes self-management.	information on facilitators for compliance, medication and lack of comparisons between various ethnic groups.	
Factors affecting compliance to management of diabetes in urban health center of a tertiary care teaching hospital of South India.	Santhanakrishnan, I., Lakshminarayanan, S., & Kar, S. S. (2014).	A single descriptive study	A descriptive study.	A sample of diagnosed diabetics (*n* = 135) attending the chronic disease clinic of Urban Health Center, Jawaharlal Institute of Postgraduate Medical Education and Research (JIUHC).	Noncompliance to diabetic management increases the complications and the cost of health-care. It also decreases productivity of the affected individual.	The limitation of the study is that compliance was tested based on the self-report (recall bias).	Level VI evidence
The effect of text message support on diabetes self-management in developing countries–A randomised trial.	Van Olmen, J., Kegels, G., Korachais, C., de Man, J., Van Acker, K., Kalobu, J. C., ... & Malombo, B. (2017)	Randomized controlled trial	A two-arm randomized controlled trial.	The sample consisted of a total of 480 adults with diabetes who participated in an existing DSME program.	Test messages are effective is supporting diabetes management adherence.	The study is limited to study in the democratic Republic of Congo, Cambodia and the Philippines.	Level II evidence

						There was a limitation associated with the design.	
Interventions to improve patients' compliance with therapies aimed at lowering glycated hemoglobin (HbA1c) in Type 1 diabetes: Systematic review and meta-analyses of randomized controlled clinical trials of psychological, telecare, and educational interventions	Viana, L. V., Gomes, M. B., Zajdenverg, L., Pavin, E. J., Azevedo, M. J., & On Behalf of the Brazilian Type 1 Diabetes Study Group (BrazDiab1SG). (2016).	Systematic review and meta-analysis of randomized controlled clinical trials	A systematic review and meta-analyses of randomized controlled clinical trials (RCTs).	Only19 articles met the inclusion criteria providing data from 1782 patients (49.4 % males, age 18 years). Systematic review and meta-analyses RCTs performed using Medline, Embase, Cochrane and Scopus databases up to April 2015.	Psychological approaches can improve adherence to diabetes care treatment modestly by reducing HbA1c in patients with type-1 diabetes. Both telecare and education interventions can be used to enhance self-management of diabetes.	Limited number of studies included in the systematic review and meta-analysis.	Level I evidence and good quality of evidence (B).
Discovering successful strategies for diabetic self-management: A qualitative comparative	Weller, S. C., Baer, R., Nash, A., & Perez, N. (2017).	A qualitative study	A qualitative comparative study.	Conducted among 56 adult patients with diabetes. Data collected using semi structured interviews.	Nutritional education can improve knowledge required to enhance diabetes self-management among adult patients.	The study failed to systematically explore and test the effectiveness of these	Level VI evidence

study.						strategies used to enhance diabetes self-management.	
Factors influencing the ability to self-manage diabetes for adults living with Type 1 or 2 diabetes.	Wilkinson, A., Whitehead, L., & Ritchie, L. (2015).	A systematic review of qualitative studies	A systematic review of qualitative research studies using the Joanna Briggs Institute (JBI) approach.	An electronic search of Health Sciences databases for qualitative studies. Search conducted April 2011. Review of 37 qualitative studies.	Issues associated to communication with healthcare providers hinder self-management. An education program that allowed for knowledge gain and learning of culturally sensitive care can improve day-to-day management of the disease.	The electronic search of Health Sciences databases was conducted April 2011.	Level V evidence
Health coaching by medical assistants to improve control of diabetes, hypertension, and hyperlipidemia in low-income patients: a randomized controlled trial.	Willard-Grace, R., Chen, E. H., Hessler, D., DeVore, D., Prado, C., Bodenheimer, T., & Thom, D. H. (2015).	Randomized controlled trial	A randomized controlled trial.	A 12-month randomized controlled trial composed of a sample of 441 patients at 2 safety net primary care clinics in San Francisco, California.	Health coaching can improve compliance to self-management and control diabetes and hypertension.	The study is limited in terms of generalization of the findings.	Level II evidence
Improving	Zullig, L. L.,	Systematic	Systematic	A sample of 7	The study identifies	The study	Level I

diabetes medication adherence: Successful, scalable interventions.	Gellad, W. F., Moaddeb, J., Crowley, M. J., Shrank, W., Granger, B. B., … Bosworth, H. B. (2015).	review of randomized controlled trial studies	literature reviews.	randomized controlled trial studies in full-text articles.	successful, scalable interventions for improving diabetes medication adherence.	search was limited to studies indexed in PubMed and no other databases were included. The review used a small sample of 7 full-text articles and this may affect reliability.	evidence