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A Staff Education Program to Improve Nurses' Knowledge of Managing Type 2 Diabetes

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
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Walden University
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Abstract

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MSN, Walden University, 2015

BSN, Coppin State University, 2009

Project Submitted in Partial Fulfillment

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Abstract

Older adults residing in long-term care facilities (LTCFs) have high prevalence rates of Type 2 diabetes (T2D). However, registered nurses practicing in these settings often lack the essential knowledge to manage the condition. The staff development activity developed for this project was to improve LTCF registered nurses' knowledge of understanding of the American Diabetes Association (ADA) position statement on the management of diabetes in LTCFs. The project was grounded in Knowles's adult learning theory. Lynn's content validity model was used to evaluate the staff development activity. The project's practice-focused questions concerned whether the educational sessions met Lynn's evaluation criteria and whether the participating staff met the learning objectives. A pre and post-test questionnaire was used to assess the attendees' knowledge of the ADA position statement. The registered nurses who participated improved their knowledge of the ADA position statement, the analysis found 11.75 and 18.31 mean points for the pretest and post-test results, respectively, depicting a 6.56-point increase in the mean points in the post-test results. Therefore, the staff development activity supported a 56 percent (6.56 points) mean gain in the percentage of correct scores. . A recommendation is a staff development activity regarding the ADA-approved strategies for managing T2D among older adult patients. The project's implications for positive social change include equipping nurses with the essential knowledge and competencies for improved T2D management among patients in LTCF. In addition, the project contributed to evidence-based practices for a better quality of care in LTCFs.

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Dedication

I dedicate this DNP project to my family. Without their support, inspiration, love, understanding, and patience, it would have been impossible to complete this undertaking.

Acknowledgments

I take this opportunity to thank my project advisor for the wise counsel, support, and encouragement throughout the journey. I am grateful for your believing in me. Without your selflessness and devotion, I would certainly not have realized this academic dream.

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Section 1: Nature of the Project

Introduction

The increasing occurrence and burden of Type 2 diabetes (T2D) is a global health concern (Khan et al., 2019). Globally, diabetes had a prevalence of 9.3% in 2019, with more than 463 million individuals worldwide diagnosed with gestational diabetes mellitus, T2D, and Type 1 diabetes (Saeedi et al., 2019). Saeedi et al. (2019) posited that T2D accounted for 90% of the aggregate global diabetes prevalence. Besides the high prevalence rate, T2D has also been a leading cause of reduced life expectancy and mortality. T2D caused more than one million deaths in 2017 alone, making it the ninth-ranked global death cause (Khan, YEAR). From the perspective of human suffering and disability-years life years view, T2D is the tenth leading disease contributing to a global burden (Xu et al., 2020). Due to its high prevalence rates, mortality rates, and global burden, T2D is one of the most common serious chronic endocrine disorders (Al Mansour, 2020).

T2D is a multifactorial condition (Al Mansour, 2020). Severe hypoglycemia, ketoacidosis, or decompensated metabolism can occur. These conditions can result in severe hyperglycemic hyperosmolar coma. There are also potential long-term critical complications of the nervous system. In addition, damage to small and large arterial blood vessels is possible. There is also lifelong quality of life challenges because of diverse psychosocial problems (Standl et al., 2019). Chronic hyperglycemia related to T2D results in the failure and damage of numerous organs, especially the kidney, eyes,

blood vessels, and heart(Standl et al., 2019). From a cardiovascular risk perspective, cardiovascular disease and T2D are similar, with a sizable proportion of individuals with cardiovascular disease dying from T2D and vice versa (Harding et al., 2019). An unhealthy modern lifestyle impacts the disease (Harding et al., 2019).

Although it is life-threatening to all persons, T2D has a higher mortality rate among the older adult population. In developing and developed nations, T2D comorbidities and complications are more common among older adults with diabetes than young people (Chentli et al., 2016). Older adults have a similar risk for macro-and microvascular complications as the rest of the population with the condition. Still, they have a much higher absolute cardiovascular disease risk than their younger counterparts.

Furthermore, older adults with T2D have much higher mortality and morbidity than older adults. Older adults with T2D are at increased risk for functional and physical disabilities, rheumatic pain, and comorbidities. These comorbidities are associated with increased risk for a variety of conditions. Common comorbidities are iatrogenic problems, neuropsychiatric diseases, urinary complications, visual issues, arteriopathies, cerebral and heart ischemia, and orthopedic and neurological disorders (Chentli et al., 2016). As a result of these comorbidities, the older adult population with T2D has a higher mortality rate than their peers without the condition (Chentli et al., 2016). These complications illustrate the need for comprehensive and effective T2D management practices and programs targeting this population.

The current project size of the older adult population further reinforces the need for these practices and programs. Bigelow and Freeland (2017) reported that in the world, 50% of adults aged over 65 have prediabetes, placing them at a greater risk of developing the condition in the future. In contrast, one in every four had been diagnosed with T2D. The high prevalence of diabetes is associated with age-related physiological adjustments, such as chronic low-grade inflammation, increased abdominal fat, and sarcopenia, resulting in compromised pancreatic islet function and the increment of peripheral tissues' insulin resistance (American Diabetes Association [ADA], 2021).

Additionally, T2D has a high prevalence ranging from 25 to 34% in patients living in long-term care facilities (LTCFs; Munshi et al., 2016). However, despite the high T2D prevalence within these facilities, few researchers have studied T2D among older adults living in LTCFs (Osman et al., 2019). Existing research has shown a lack of knowledge and competencies among those providing diabetes care within these settings (Lega et al., 2020). There is a need to improve diabetes care providers' knowledge and competencies in managing older adult patients with T2D living in LTCFs. In this doctoral project, I developed a staff educational intervention using the ADA (2021) position statement regarding diabetes management in long-term and skilled nursing facilities (Munshi et al., 2016).

The project's objective was to educate registered nurses employed in LTCFs on the ADA (2021) position paper's specific guidelines for managing diabetes in LTCF. The primary focus was on the goals and strategies recommendations outlined in the position

paper. These include hypoglycemia risks, simplified treatment plans, avoidance of only the sliding scale insulin (SSI) protocols, liberal diets and beverages, and physical activities and exercise. The project may promote positive social change by improving registered nurses' knowledge of the management of T2D among older within LTCF (see Munshi et al., 2016).

Problem Statement

Older adults living in LTCFs have high T2D prevalence rates. Registered nurses practicing in these settings often lack the essential knowledge to manage the condition (Lega et al., 2020).

Local Nursing Practice Problem

Munshi et al. (2017) established that the United States is being affected by the epidemic progression of T2D, with the prevalence rates of the condition six times higher in the older adult population than that in younger people. Similarly, the study indicates that many older adult patients in LTCF either have diagnosed or undiagnosed T2D. Diabetes raises the risks of microvascular and cardiovascular problems. Urinary incontinence, persistent pain, polypharmacy, falls, depression and cognitive impairment can also occur (Lu et al., 2019).

The heterogeneity of functional impairments and comorbid illnesses significantly excludes older adult populations from randomized scientific trials (Lu et al., 2019). The exclusion of older adults from randomized clinical trials has resulted in a lack of adequate data, which further complicates realizing standardized intervention strategies for T2D

management within this population (Lu et al., 2019). The lack of intervention strategies impacts registered nurses' knowledge of the best practices for managing T2D among older adults.

Inadequate knowledge and competencies among LTCFs' registered nurses regarding the management of T2D among the older population may compromise patient safety. Nikitara et al. (2019) associated the lack of sufficient education on the best practices for T2D management with the lack of a standard approach for registered nurses' practice in caring for diabetic patients. In most instances, registered nurses are authorized to work autonomously to ensure safe, competent, and ethical care for long-term care residents.

The lack of a common approach to educating registered nurses on the best practices for managing T2D further complicates their ability to care for older individuals in LTCFs. Brandburg (2017) suggested that registered nurses have the most versatile nursing role within any LTCF. Their roles comprise assistant directors of nursing, directors of nursing, quality improvement and compliance coordinators, risk managers, and infection control officers. These roles may be combined into single or multiple positions or separate positions based on the LTCF's size. The lack of universal T2D education programs on managing conditions in older adults in LTCF is concerning.

The Local Relevance of Addressing the Problem

At the selected local LTCF, registered nurses primarily use glycemic management and SSI regimen practices and strategies to manage multiple comorbidities in older T2D

patients. The glycemic management approach comprises a comprehensive geriatric assessment as a therapeutic strategy to realize the lowest drug-induced hypoglycemia risk (Brandburg 2017). However, the ADA (2021) position statement states that this approach has proven ineffective in managing T2D management in the elderly population. Nevertheless, knowledge of the information can bring about tight glycemic control among older adult patients (Gómez-Huelgas et al., 2018).

The use of the SSI regimen is also commonplace in the selected LTCF. According to an article by Coggins, more than half of the older adult patients admitted within these facilities are started on an SSI regimen. In contrast, a considerable proportion of the patients who are not started on an SSI regimen are introduced to this regimen later. However, this management approach does not accommodate alteration in the patient's insulin needs. The regimen also fails to control hyperglycemia and increases blood sugar levels in some instances (Coggins, 2012).

The glycemic management and SSI regimen practices signify the providers' flaws in prescribing practices and registered nurses' knowledge gap in managing T2D among older adult long-term care patients by failing to advocate for and implementing ADA-approved practices. Therefore, there is a need to address registered nurses' knowledge gap problem to improve the quality of care that older adult patients receive. In this doctoral project, I addressed the gap in practice by developing a staff development activity to improve registered nurses' knowledge of the ADA (2021) position statement on the management of diabetes in skilled nursing facilities and LTCFs.

Significance to Nursing Practice

The significance of this project to nursing practice stems from the resulting staff education program. I created the program to educate LTCFs' registered nurses on the essential skills and knowledge for managing older adult populations on the best practices for T2D management. In addition, I sought to offer registered nurses a standard approach for managing T2D in residents and long-term facilities using the ADA management guidelines.

Purpose

The primary aim of this staff development activity was to improve LTCF registered nurses' knowledge of the ADA (2021) position statement on the management of diabetes in long-term care and skilled nursing facilities (see also Munshi et al., 2016). There is a significant gap in practice in registered nurses' provision of quality care to older diabetic patients due to a lack of comprehensive understanding of effective management for T2D (Munshi et al., 2016). Additionally, the registered nurses practicing in LTCFs also lack the essential knowledge regarding the best practices' management of residents with T2D. Therefore, I sought to answer the following practice-focused questions:

1. Will the developed educational sessions meet the evaluation criteria in the Lynn (1986) model?
2. Will the evaluation of the staff development activity using Lynn's model meet the evaluation criteria?

3. After attending the staff development activity, will the staff meet the learning objectives?

The project can potentially address the existing gap in practice by offering registered nurses working in LTCFs the essential knowledge and skills to manage T2D among the elderly population. I drew relevant information on the subject matter from existing studies and the ADA's (2021) position statement on the management of diabetes LTCFs.

Nature of the Doctoral Project

Sources of Evidence

Publications and journal articles from the nursing and academic fields served as the main data sources for the project. I obtained the literature from several databases comprising EBSCOhost (Health Source: Nursing), Google Scholar, Health Source, MEDLINE, and CINAHL. In addition, I used the following keyword phrases in my searches: *registered nurses and long-term care facilities*, *registered nurses and diabetes management, registered nurses' knowledge of T2D management*, and *registered nurses' T2D education*. The use of keywords enabled the researcher to obtain information aligned with the study's central objective, improving registered nurses' knowledge of the prevention and management of T2D.

I used only articles published within the last five years for improved project integrity. In addition, I used peer-reviewed journal articles to enhance the articles' reliability. Search criteria emphasized relevant information related to effective staff

education program(s) on the management of T2D among older adult populations in LTCFs. The inclusion criterion included peer-reviewed publications written in English and published within the last five years. Another significant inclusion criterion was the selection of studies with T2D participants. From this perspective, the exclusion criteria consisted of articles published before 2015 and journal articles that were not peer-reviewed or published in English. I used the information I obtained from the literature review to develop a staff education program in an LTCF in Maryland to improve registered nurses' knowledge of T2D management and prevention among the older adult population.

I used pre-and post-test results from a survey I administered to program attendees to fulfill the DNP project's purpose. The pretest was administered to registered nurses from the selected LTCF in Maryland to determine their knowledge of ADA-approved T2D management practices in treating older adult long-term care patients before participating in the staff education program. The posttest was administered after the staff education program. I analyzed the pretest and posttest results to examine the differences in scores from T1 (pretest) and T2 (post-test). The differences in pretest and posttest scores were used to determine if attendees' knowledge had improved.

Approach

I drew from Lynn's (1986) content validity model to develop the staff education program. This model endorses two phases in a program's development and content validity. The first stage (growth) leads to the generation of the program's items. The

second stage (judgment and quantification) involves assessing the program's performance.

Regarding the first stage, I developed the staff education program based on the T2D management evidence-based practices obtained from the evaluated data from existing studies and the ADA (2021) position statement. The survey of T2D management evidence-based practices determined the ideal practices for enhancing registered nurses' knowledge of T2D management among the older adult population. In addition, I analyzed the ADA position statement to support individualized care for older T2D adult patients. The judgment and quantification phase comprised two evaluations. The first evaluation was performed by an expert panel consisting of five experts. Those selected included a facility's nurse educator, the assistant director of nursing, the director of nursing, and two of the facility's unit supervisors. These five experts used Lynn's (1986) model to validate the staff education plan. Using Lynn's model, I utilized the content validity index of program items with three or four ratings from the expert panel. After validation, I performed the second evaluation to examine the differences in T1 (pretest) scores and T2 (post-test). The pretest addressed the learning objectives of the staff development teaching plan. After the education sessions, the registered nurses completed the posttest—the analysis centered on the differences in T1 (pretest) and T2 (post-test) scores. Primarily, I performed a descriptive analysis comparing the obtained descriptive data from the pretest and the posttest to determine any changes in the participants' scores.

The study's anticipated findings were that the registered nurses who participated in the education program would have gained knowledge, as evidenced by improved scores between the pre and post-test assessments. In theory, the new knowledge should translate to enhanced quality of care, enhanced patient life quality, and reduced financial burden for older adult residents with T2D living at the LTCF. However, it is important to note that I did not assess these potential impacts in this project.

Significance

The project has significance to several stakeholders, from registered nurses working in long-term care and LTCF residents with T2D to the entire nursing practice and related practice areas. It equips nurses with the essential knowledge and competencies for improved T2D management among older adult patients. In addition, LTCF residents with T2D may benefit from the pa project by understanding T2D management to reduce related comorbidities. Further, the project contributes to the development of T2D management evidence-based practices for a better quality of care in LTCFs, leading to the improvement of the nursing profession. Furthermore, the information from the project may also be transferrable to other areas of T2D care.

Potential Contribution to Stakeholders

Registered nurses working in LTCF are the primary beneficiaries of this project. The project provides evidence-based practice recommendations to registered nurses employed at the targeted long-term facility on managing T2D in the older adult population. In this context, the project educates registered nurses on the significance of

understanding T2D and the nutritional modifications required to manage the condition. Residents with T2D at LTCFs are also stakeholders benefiting from the staff development activity. (Osman et al., 2019)

Potential Contribution to Nursing Practice and Allied Healthcare

In addition to benefiting individual registered nurses in LTCFs, the project may also provide insight that helps nursing leaders in their efforts to improve the nursing practice. It benefits the nursing practice by enhancing registered nurses' knowledge regarding implementing evidence-based practices for T2D management among the older adult population. The realized information from the project may also be transferrable to other areas of T2D care. Particularly, the project may benefit dieticians and nutritionists working with individuals with T2D by helping them understand the best nutritional modifications for managing the condition and educating their clients on ways of self-managing the condition. Further, it may benefit registered nurses working in other healthcare settings, apart from long-term care environments.

Potential Implications for Positive Social Change

The project may affect positive social change by enhancing care quality in LTCFs for T2D residents. Enhanced care quality would, furthermore, improve residents' quality of life. Similarly, the project may also help nursing staff minimize the incidences of related comorbidities and disease burden on diabetic individuals' families, friends, and society. The project could contribute to efforts to decrease the social inequalities arising from the disproportionate prevalence and impacts of T2D on the elderly population.

Summary

In Section 1, I discussed the key issues that have surfaced because of the increased prevalence of T2D globally. The section the older adult population is one of the groups most at risk of being diagnosed with T2D and suffering from the diverse comorbidities associated with the condition. The section highlighted a gap in practice for registered nurses who lack the prerequisite knowledge regarding the proper management of the disease of the condition among the older adult patients in LTCFs. Section 2 offers a more theoretical perspective of the identified practice problem by focusing on background and contextual information.

Section 2: Background and Context

Introduction

In this project, I addressed the significant gap in practice in registered nurses' provision of quality care to older diabetic patients. Registered nurses practicing in LTCFs often lack essential knowledge regarding the management of diabetes in patients in skilled nursing facilities and LTCFs (Hu et al., 2019). The ADA (2021) position statement offers strategies for improving nurses' understanding. The practice-focused questions for the project included

1. Will the developed educational sessions meet the evaluation criteria in Lynn's (1986) model?
2. Will the evaluation of the staff development activity using Lynn's model meet the evaluation criteria?
3. After attending the staff development activity, will the staff meet the learning objectives?

The staff development activity aimed to improve long-term care registered nurses' knowledge of the ADA's (2021) approved goals and strategies for the management of diabetes in skilled nursing facilities and LTCFs (see also Munshi, YEAR). The goals and strategy recommendations are

- The risk of Hypoglycemia is the most significant factor in defining glycemic goals because of its catastrophic ramifications for this population.
- Simplified treatment procedures are better tolerated and most preferred.

- The utilization of SSI only must be avoided.
- Exercise and physical activity are vital for all patients. However, they should be subject to the patient's current level of functional abilities.
- Liberal diet strategies have been linked with the improved beverage and food intake within this population. It helps the patient avoids unexpected weight loss and dehydration. Restraining therapeutic diets and regimens should be reduced.

In Section 2, I address five major topics. In the Concepts, Models, and Theories subsection, I describe Knowles's (YEAR) adult learning theory and its application in this doctoral project. In the Relevance to Nursing Practice subsection, I offer a brief history of registered nurses' involvement in patient education, identify a gap in practice, and consider the existing standard practices. Also discussed are strategies used in addressing the gap in practice. The Local Background and Context subsection explains the selected Maryland health center's institutional experience. The section also includes a discussion of my role as a DNP student in the doctoral project. The final subsection, Role of the Project Team, provides information on how the expert panel members validated the staff education program.

Concepts, Models, and Theories

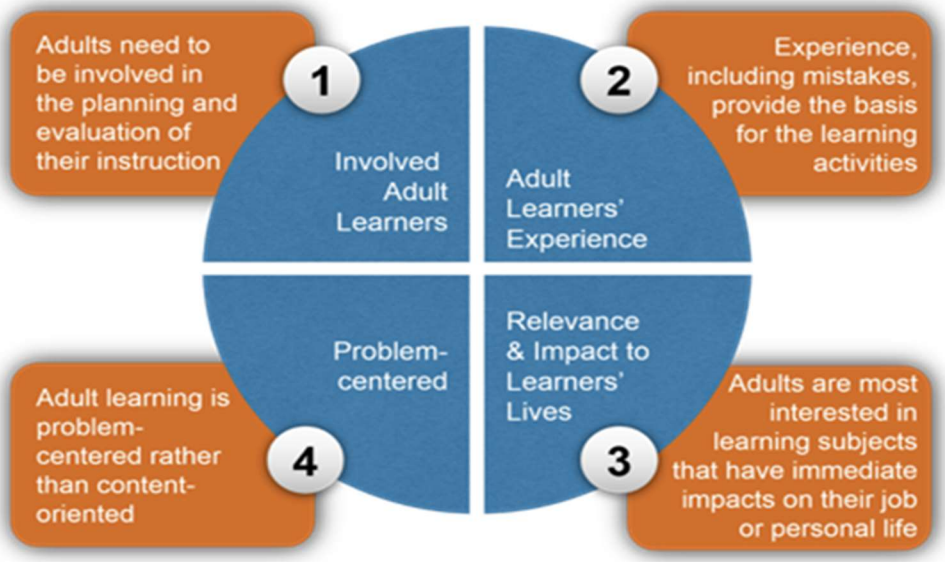
Knowles's adult learning theory was the primary theory that informed this doctoral project. The theory's premise is that adults are expected to make decisions responsibly, self-directed (Knowles, 1975). Adult learning activities and programs must

accommodate these vital aspects. Knowles's theory is grounded in the concept of andragogy. In practicality, the concept means that adult education should focus on the process rather than the instructions (Knowles, 1984). The most convenient of these modalities encompass role-playing case studies, self-evaluation, and simulations. The instructors of adult students should adopt the facilitator role.

Adult learning theory has six assumptions that differentiate andragogy from pedagogy (children's learners). These assumptions are that adults are (a) collaborative, (b) practical, (c) focused on relevant information that reinforces their existing goals, (d) goal-focused and reliant on existing life experiences and knowledge base, and (e) self-directed learners (Knowles, 1980). Andragogy integrates principles that promote learning success (Knowles et al., 2011). These principles include problem-centeredness, work relevance, experiential, and engagement. The principle of work relevance suggests that adults are mostly fascinated by learning that is impactful and relevant to their personal lives or jobs. The experiential principle encompasses the learning culture and the opportunity to assess, succeed, and make mistakes. The engagement principle requires learners to be involved in the evaluation and planning of their instruction. Problem-centeredness involves substituting conventional content-oriented instruction delivery with individualized teaching (Knowles, 2011). Figure 1 shows a model of the theory.

Figure 1

Knowles's Adult Learning Model



Note. The model depicts the four principles, problem-centeredness, work relevance, experiential, and engagement, which form the foundation for andragogy.

Knowles's (1980) theory is premised on adults' attributes that favor learning. The theory's focus on adult learning made it credible to form the foundation for developing a staff development activity targeting LTCFs' registered nurses managing older adult T2D patients. The participants were registered nurses with experience providing care to T2D patients in LTCFs. The instructor-facilitated learning, while the content was related to the participants' practice setting. The goals were to translate the ADA (2021) recommendations' goals and strategies into the nurses' daily practice.

Relevance to Nursing Practice

Existing Scholarship Relating to This Project

There are many strategies and goals for managing T2D among older adults living in LTCFs. The availability of varied is key in matching patients to caregivers and health care facilities. They include hypoglycemia risk, simplified treatment regimens, avoiding the sole use of SSI, liberal diet plans, and using the patient's functional abilities to determine the proper exercise and physical activity regimens (ADA, 2021; Munshi et al., 2016).

The hypoglycemia risk is considered the essential factor in determining goals for older patients in LTCFs. Hypoglycemia risk assessment is necessary because it manifests differently in older patients than in younger ones (Lega et al., 2020). In older patients, hypoglycemia may manifest as dizziness, delirium, or confusion (ADA, 2020). In addition, it often presents as tremors, sweating, and palpitations (ADA, 2020). In the older T2D patients, even less severe hypoglycemia can be disastrous, especial in those taking other medications, those with an unsteady gait and neuropathy, and poor vision (ADA, 2020). Hypoglycemia is preventable using the ADA prevention protocols (ADA, 2020).

Persistent SSI practice contributes to hypoglycemia among older adult patients in LTCFs (AMDA–The Society for Post-Acute and Long-Term Care Medicine, 2017). SSI results in extensive variations in blood glucose levels among these patients, thus increasing hypoglycemia risks without improving hyperglycemia (AMDA–The Society

for Post-Acute and Long-Term Care Medicine, 2017). SSI is also not effective in T2D management among elderly long-term care patients. It is reactive, reacting solely to blood glucose excursions without addressing basal needs (AMDA–The Society for Post-Acute and Long-Term Care Medicine, 2017). The ADA recommends that registered nurses avoid using SSI as the sole approach to glucose control.

Munshi recommends the substitution of SSI with simpler treatment regimens in managing T2D among long-term care elderly patients. The recommendation of simplified treatment regimens and the avoidance of sliding-scale regimens is because these regimens focus on the patients' blood glucose levels without considering physical activity or food (Pandya et al., 2013). Some of the alternatives recommended comprise switching to non-insulin therapy, correcting for high blood glucose, and changing insulin therapy delivery timing (ADA, 2021). In non-insulin treatment, ADA recommends the use of non-insulin agents. In correcting for high blood glucose, SSI, scheduled basal insulin, and scheduled mealtime insulin are recommended. In addition, the ADA recommends that registered nurses consider giving basal insulin in changing the delivery time. Insulin given in the morning reduces early-morning hypoglycemia risk. However, it also impacts postprandial hyperglycemia (Munshi).

ADA also recommends liberal diet plans and using the patient's functional abilities to determine the proper exercise and physical activity regimens to avoid hypoglycemia (Munshi). A liberal diet helps prevent dehydration and weight loss among the elderly long-term care patients caused by restrictive therapeutic diets. The

recommendation of exercise and physical activity based on the patient's functional abilities is that elderly long-term care patients present different comorbidities and frailty levels (Leung, Wongrakpanich & Munshi, 2019).

Besides, T2D in this patient population is attributed to accelerated muscle mass loss, poor muscle quality, and reduced muscle strength, resulting in sarcopenia. Some exercises, like aerobic exercise, provide a partial solution to sarcopenia (Sampaio et a,l, 2020). Inadequate nutritional intake, especially protein intake, can elevate frailty and sarcopenia risk among elderly long-term care patients. Liberalized diets with adequate protein intake combined with an exercise program incorporating resistance and aerobic training can improve frailty management (Oliveira et al., 2020).

The Current State of Nursing Practice

The current nursing practice acknowledges the importance of hypoglycemia risk as the primary determinant of glycemic goals in older T2D patients (Longo et al., 2020). Avoidance of hypoglycemia has become a common consideration in selecting therapeutic agents (Longo et al., 2020). Used with caution in long-term care patients with T2D are certain insulin, such as meglitinides and sulfonylurea (Leung et al., 2019). The neurologic disease may be diagnosed instead of neuroglycopenic hypoglycemia. The symptoms may also not be recognized. The result could be the under-reporting of hypoglycemic episodes (Leung et al., 2019). Therefore, the registered nurses need to improve their knowledge of ADA's recommendation regarding neuroglycopenic manifestations of hypoglycemia instead of adrenergic exhibitions in managing T2D in elderly patients.

The current nursing practice in LTCFs is characterized by multiple changing treatment approaches (Quattrocchi et al., 2020). This challenge is because of a lack of standard practice in managing T2D among elderly patients (Quattrocchi). Therefore, registered nurses working within these facilities can benefit immensely from learning the simplified treatment regimens recommended by ADA in managing T2D in elderly long-term care patients.

The use of the SSI regimen is commonplace in LTCFs. More than half of the patients admitted to these facilities are on an SSI regimen (Woods & Nadelson, 2018). A third of the LTCFs patients not on an SSI regimen are later introduced to this regimen (Woods). However, this management approach does not accommodate alteration in the patient's insulin needs. Through this project, registered nurses working in LTCFs learned about avoiding the sole use of SSI among elderly patients. Additional recommendations discussed are using non-insulin therapy, correcting for blood glucose, and alternating insulin administration time (ADA, 2021).

Physical activity or exercise is a first-line therapy in treating elderly T2D patients in the nursing practice (Williams et al., 2020). The current exercise recommendation is 150 minutes of moderate-intensity aerobic activity per week (Williams et al., 2020). However, the frailty and comorbidities in elderly T2D patients impede them from participating in intensive physical activities. The patients' current functional abilities determine their exercise and physical activities.

Healthy eating is the cornerstone of T2D management in elderly patients in the current nursing practice (Wexley, Nathan & Mulder, 2020). Some Long-Term Care (LTC) facilities have switched from therapeutic diets to providing dining options concerning the type of meals and time, addressing personal food preferences, and offering a wide variety of food choices (Leung et al., 2019). However, these patients have lifetime habits that may be resistant to change before all these challenges (Bigelow & Freeland, 2017). Elderly patients are also at significant risk for poor fluid and nutritional intake and irregular meal intakes that LTCFs fail to acknowledge (Bigelow & Freeland, 2017). Understanding the ADA's liberal diet plans helps registered nurses participate in the project to prevent unintentional weight loss and dehydration in their elderly patients.

Gap in Practice

There is a significant gap in practice in registered nurses' provision of quality care to older diabetic patients due to a lack of in-depth understanding of T2D effective management. There is a lack of a standard approach to managing T2D among elderly patients (Quattrocchi). An overreliance on the SSI regimen does not accommodate alteration in the patient's insulin needs (Woods). The current exercise recommendation is impractical for frail elderly patients with different comorbidities (Williams et al., 2020). The current nursing practice also fails to acknowledge that elderly patients are at significant risk for poor fluid and nutritional intake (Bigelow & Freeland, 2017).

In addressing the gap in practice, existing studies have utilized various educational methods in improving the registered nurses' knowledge of T2D management

and patient education for successful diabetes management. Several educational initiatives have been developed to resolve the knowledge gap. These initiatives comprise the National Institute of Diabetes and Digestive and Kidney Diseases National Diabetes Education Program (NDEP) (NIDDK, 2019); the U.S. Department of Defense/ U.S. Department of Veterans Affairs T2D Management Clinical Practice Guideline (Conlin et al., 2017); and the American Association of Clinical Endocrinology's Clinical Practice Guidelines (Handelsman, 2015). However, these educational initiatives focus on general diabetes management without T2D management among elderly patients in LTCFs. The doctoral project closes the gaps in registered nurses' knowledge of the ADA position statement on the management of diabetes.

Local Background and Context

Local Evidence on Relevance to the Problem

Diabetes prevalence in the United States is progressing at an epidemic rate. Approximately 30 million Americans have diabetes and incur the condition's adverse outcomes (ADA, 2020). Similarly, in Maryland, 12.6 percent of the adult population, comprising 623,041 individuals, have diabetes (ADA).

The estimated annual costs of T2D in Maryland are $4.9 billion (ADA). The condition has become the sixth leading cause of death in Maryland. T2D is also considered a primary risk factor for other principal causes of death in Maryland and the United States. For instance, older people with T2D are at an increased risk of severe illness or death from COVID-19 than individuals without the condition (CDC, 2020).

Maryland also incurs a $2 billion loss in economic productivity because of T2D (ADA). The high burden of T2D in Maryland justifies implementing a staff development activity within this area.

The facility's registered nurses' knowledge gap in managing T2D among elderly long-term care patients also justifies the need for a staff development activity for bridging the existing knowledge gap. The DNP student interviewed the selected facility's director of nursing to find the facility's knowledge gap in managing T2D among elderly long-term care patients. The director of nursing stated that registered nurses at her facility have a knowledge gap in their practice related to T2D. She indicated that the nurses depend on a glycemic management approach (S. Barrera, personal communication, April 28, 2021). However, ADA considers the sole focus on a glycemic management approach inadequate in managing T2D in elderly long-term care patients (ADA). Thus, there is a need to address registered nurses' knowledge gap problem to improve the quality of care that elderly patients receive within the selected facility.

Institutional and Local Context

The staff development activity took place in an LTCF located in Maryland. The project site is a 150-bed facility. The facility's long-term care for the elderly involves various services designed to meet a person's health or personal care needs. These services help elderly patients live independently and safely when they can no longer perform everyday activities independently.

The facility's mission is to help reduce global disease and provide leading long-term care services and solutions while helping people through some of the most challenging times. The mission aligns well with the staff development program's aim of improving LTCFs' registered nurses' knowledge of the ADA position statement on T2D. Besides, the project site offers sub-acute rehabilitation and long-term care for numerous complex medical conditions. This healthcare center's provision of LTCFs services makes it ideal for implementing this staff development activity targeting the elderly population in LTCFs.

Clarification of Terms

Basal-bolus insulin plan: using short-acting insulin to prevent a rise in blood glucose after eating meals and longer-acting insulin to keep blood glucose steady during periods of fasting (ADA).

Exercise: Engaging in physical activity depends on the patient's functional abilities (ADA).

Hyperglycemia: **is** the technical term for high blood glucose (blood sugar), which happens when the body cannot use insulin properly or has too little insulin (ADA).

Hypoglycemia: when the blood sugar level is less than 70 mg/dL, and there is a need to take action to bring it back to the target range (ADA).

Liberal diet: A diet offering a wider variety of food choices allowing for personal preferences (ADA).

Long-term care facility (*LTCF):* A facility that provides rehabilitative, restorative, and ongoing skilled nursing care to patients or residents in need of assistance with activities of daily living (ADA).

Sliding scale insulin (SSI): finger-stick blood glucose testing to assess the need for insulin administration based on current blood glucose levels (ADA).

Type 2 diabetes (T2D): type 2 diabetes occurs when the body develops insulin resistance or does not produce enough insulin to regulate blood glucose (ADA).

State and Federal Context

The state of Maryland has implemented the Maryland Diabetes Action Plan. This plan describes action steps that healthcare centers can implement for diabetes management (Maryland Department of Health, 2020). The plan's vision is to collaborate with all Maryland partners to identify areas where they can align their funds, resources, and efforts to decrease the state's disease burden.

This plan endorses evidence-based diabetes self-management services, training, and education for T2D patients. The plan's support for T2D management education is advantageous in implementing the staff development activity. Additionally, the development activity complied with the Maryland Diabetes Action Plan. It promotes long-term care registered nurses' T2D management education, which improves their teaching skills.

Role of the DNP Student

My Professional Context and Relationship to the Doctoral Project

I have a Bachelor of Science in Nursing (BSN) and a Master of Science in Nursing (MSN). These certifications provide me with the essential knowledge for completing this doctoral project. 70 to 80 percent of the patients I care for are either prediabetic or diabetic in my practice. My primary function is to monitor patients with diabetes and manage their condition. As a diabetes management nurse, my responsibilities include nutrition therapy, patient education, and ensuring that they adhere to medication administration prescribed. My involvement in this field gives me a clear perspective of the challenges registered nurses face in T2D management. In addition, as a diabetes management nurse, my role allows me to utilize my diabetes management knowledge and skills to provide individualized care.

My Role in the Project

I am the project manager and responsible for ensuring the effective formulation and completion of the doctoral project. My primary role entailed ensuring that the staff development activity was grounded in Lynn's (1986) model and met the evaluation criteria. I was also responsible for developing the staff education program. The offering targeted registered nurses working in LTCFs. Implementation occurred in one specified LTCF.

Further, I completed the assessment of learners' knowledge of the learning objectives. As a DNP nurse, I collaborated with other registered nurses working in the

local LTCF. My professional relationship with the participants ensured the successful implementation of the staff education program within the selected LTCF.

My Motivations and Perspectives About This Project

The belief that all patients deserve quality care is my primary motivation for this project. In addition, I am motivated by the need to provide quality care to the elderly population in LTCFs and ensure that they enjoy the benefits of improved quality of life. The continual prevalence rates of T2D among the older adults in LTCFs and the related adverse outcomes also motivate me to solve this problem. As a nurse, I am committed to the nursing profession. Therefore, I perceive finding a solution to a primary problem affecting registered nurses in LTCFs as an ideal manner of promoting the growth of the nursing practice.

I also highly value personal and professional development. Developing and then teaching a staff development activity helps enhance registered nurses' knowledge and competencies in T2D management. Registered nurses' understanding of the ADA goals and strategies for managing T2D may lead to better T2D management and decreased burden of the condition in residents of Maryland.

Potential Biases

Several potential biases may be present in the DNP project. The DNP student may not fully understand the participants' comprehensive knowledge of T2D management among elderly patients. While the DNP student anticipated that the registered nurses wanted to learn about the ADA standards, some may not have been interested in learning.

The DNP student addressed the potential research bias by encouraging participation in the staff development activity through a supportive learning environment.

Role of the Project Team

A project team comprising five expert panel members determined the relevance and validity of the staff education learning objectives. The five experts included a diabetes educator, a physician, a pharmacist, and two nurse practitioners who are diabetes specialists. Their expertise in type 2 diabetes management and formulating and conducting diabetes-related educational sessions make the selected team members ideal expert panel members. The expert panel provided background information regarding the project, Lynn's (1986) model, and the staff development program through online meetings. Discussions with the experts were through Zoom. Panel members received invitations for participation and project information before the initial meeting. These invitations were sent through e-mail.

The project information was shared with the team through online meetings. The presentation sought to inform the team of the existing gap in practice and how the project bridges this gap in nursing practice. The team was also informed of their responsibilities to implement the staff education plan to assist the researcher successfully.

The project team comprised experts with vital knowledge of formulating and conducting educational sessions, project management, and the selected facility's registered nurses' educational needs. This expertise gives them the proper competencies and knowledge to offer practical insights to ensure the success of the staff development

program. Combined wisdom, my own, and their insights helped formulate and implement the staff development program promptly.

Summary

Section 2 introduced Knowles learning theory that informs this doctoral project. The ADA standard practices in managing T2D in elderly long-term care patients were also presented. The current state of nursing practice was also evaluated regarding the ADA recommendations. Gaps in practice were identified from this evaluation, confirming the need for a staff development program in LTCFs. The need for such a program was also verified by assessing diabetes care in the selected institution. Also discussed was my role in the doctoral project and the team members. Section 3 presents the sources of evidence used to develop and implement this project, including participants, procedures, protections, and project analysis and synthesis.

Section 3: Collection and Analysis of Evidence

Introduction

Older adults residing in LTCFs have high T2D prevalence rates. However, the registered nurses in these settings often lack the essential knowledge to manage the condition (Lega et al., 2020). Therefore, the staff development activity aimed to improve LTCF registered nurses' understanding of the ADA (2021) position statement on the management of diabetes in long-term care and skilled nursing facilities (see also Munshi et al., 2016).

The United States has been experiencing a progressing prevalence of diabetes at an epidemic rate. T2D accounts for 90% of the total global diabetes prevalence (Saeedi et al., 2019). T2D has a high prevalence ranging from 25 to 34% in patients residing in LTCFs (Munshi et al., 2016). Additionally, in Maryland, 12.6% of the adult population, comprising 623,041 individuals, have diabetes (ADA, 2021). The high prevalence rates of T2D in Maryland, especially among older adults living in LTCFs, served as the primary reason for selecting a facility in Maryland as the area of study and registered nurses collaborating with older adult patients in LTCFs as the project's participants.

Section 3 has three major components. The first component discusses the practice-focused questions. It also offers an overview of the local problem and gaps in practice. The second section, the sources of evidence section, discusses sources used in the data collection exercise. These sources include a literature review on current

evidence-based practices for T2D management among older adults in long-term care and the use of a pretest and posttest design for evaluation.

Additionally, I discuss the methods I used in collecting relevant articles. Also discussed are the types of databases, key search terms, and the search criteria used. For the primary data collection exercise, I explain the procedures used to select the project participants and ensure their ethical protection during the project. The final sub, Analysis and Synthesis, offers comprehensive information regarding the data analysis process, including statistical tools and descriptive statistics used to organize, analyze, and present the obtained data.

Practice-Focused Questions

The staff development activity took place in an LTCF located in Maryland. The estimated annual costs of T2D in Maryland are $4.9 billion (ADA, 2021). Maryland also incurs a $2 billion annual loss in economic productivity because of T2D (ADA, 2021). The high burden of T2D in Maryland justifies implementing a staff development activity within this area. The healthcare center's provision of LTCFs services makes it ideal for implementing the staff development activity targeting the registered nurses working in LTCFs.

The gaps in practice identified in the Introduction section further reinforce the need for the staff development activity. There is a lack of a standard approach to managing T2D among older adult patients (Nikitara et al., 2019; Quattrocchi et al., 2020). Also, an overreliance on the SSI regimen that does not alter the patient's insulin needs

appears prevalent (Woods, 2018). The current exercise recommendations are impractical for frail elderly patients with different comorbidities (Williams et al., 2020). The current nursing practice also failed to acknowledge that elderly patients are at significant risk for poor fluid and nutritional intake (Bigelow & Freeland, 2017). In creating this doctoral project, I sought to address the gaps in practice through a staff development activity. The activity aimed to improve LTCF registered nurses' knowledge of effective T2D management strategies in older adult patients. I sought to answer the following practice-focused questions; -

1. Will the developed educational sessions meet the evaluation criteria in Lynn's (1986) model?
2. Will the evaluation of the staff development activity using Lynn's model meet the evaluation criteria?
3. After attending the staff development activity, will the staff meet the learning objectives?

These practice-focused questions aligned with the project's purpose. The staff development activity aimed to improve LTCF registered nurses' knowledge of the ADA (2021) position statement on the management of diabetes in long-term care and skilled nursing facilities (see also Munshi et al., 2016). The staff development activity aligned with the ADA recommended T2D management among older adult patients in LTCFs. The evaluation of the staff development activity ensured that it aligned with the ADA position statement. Similarly, the staff development activity's learning outcomes also

matched the ADA goals and recommendations for T2D management. These recommendations include hypoglycemia risk, simplified treatment regimens, SSI usage, liberal diet plans, and physical activity and exercise.

Operational Definition of Terms

Basal-bolus insulin plan: Using short-acting insulin to prevent a rise in blood glucose after eating meals and longer-acting insulin to keep blood glucose steady during periods of fasting (ADA, 2021).

Exercise: Engagement in physical activity depends on the patient's current functional abilities level (ADA, 2021).

Hyperglycemia: The technical term for high blood glucose (blood sugar) is when the body cannot use insulin properly or has too little insulin (ADA, 2021).

Hypoglycemia: A state that occurs when the blood sugar level is less than 70 mg/dL, and there is a need to take action to bring it back to the target range (ADA, 2021).

Liberal diet: A diet offering a wider variety of food choices allowing for personal preferences (ADA, 2021).

Long-term care facility (*LTCF)*: A facility that provides rehabilitative, restorative, and ongoing skilled nursing care to patients or residents in need of assistance with activities of daily living (ADA, 2021).

Sliding scale insulin (*SSI*): Finger-stick blood glucose testing to assess insulin administration needs based on current blood glucose levels (ADA, 2021).

Type 2 diabetes (*T2D*): A condition that occurs when the body develops insulin resistance or does not produce enough insulin to regulate blood glucose (ADA, 2021).

Sources of Evidence

This doctoral project relied on two sources of evidence to address the practice-focused questions. The first was a literature review on current evidence-based practices for T2D management among elderly long-term care patients that align with the recommendations in the ADA position statement. The second was the pretest and post-test results, particularly the differences in T1 (pretest) scores and T2 (post-test).

The pretest and post-test questions measured the registered nurses' knowledge of T2D management among elderly long-term care patients. The tailoring of the questions reflected the ADA position statement. These questions determine whether the registered nurses understand the importance of hypoglycemia risk in defining glycemic goals and simplified treatment regimens. Also sought was the registered nurses' knowledge of avoiding the sole use of SSI, liberal diet plans, and basing the patients' exercise and physical activity on the current level of their functional abilities. In the project, I used Lynn's (1986) model to determine the validity of the lesson plan. The next subsection focuses on the project's second source of evidence, the literature review. The evidence obtained from the literature review was employed in this DNP project proposal in helping identify the gaps in practice and offer up-to-date results for the staff education program development.

Published Outcomes and Research

The literature review included journal articles from the nursing and academic fields related to T2D management among elderly patients within LTCFs. The student examined the EBSCOhost, Google Scholar, Health Source, MEDLINE, and CINAHL databases to collect relevant studies and articles. Also utilized were the Walden Library databases for scholarly works and online journals focusing on T2D management among elderly long-term care patients.

The DNP student utilized keywords in collecting relevant articles for the review. The keywords comprised *type 2 diabetes, type 2 diabetes education, long-term care facilities, registered nurses, and older diabetic patients*. Additionally, a combination of the keywords containing registered nurses and long-term care facilities," "registered nurses and diabetes management," "registered nurses' knowledge of T2D management," and "registered nurses' T2D education" were also used. The keyword usage helped collect information that fits the project's primary objective of improving the registered nurses' knowledge of the prevention and management of T2D.

The DNP student utilized selection criteria to ensure the project's integrity and a comprehensive and exhaustive review. The inclusion criterion included peer-reviewed publications written in English and published within the last five years. For increased reliability of the doctoral project, the student only considered peer-reviewed journal articles for review. The exclusion criteria consisted of articles published before 2016 and those not peer-reviewed or written in English.

Evidence Generated for the Doctoral Project

Participants

Participants in the staff development activity included registered nurses from the selected LTCF in Maryland. The DNP project targeted 30 registered nurses working in the chosen LTCF. Purposive sampling was employed to ensure the selection of registered nurses because of their routine work with the elderly long-term care patients with T2D, making them the ideal participants in answering the practice-focused questions. However, the registered nurses' participation in the staff development activity was optional. The DNP student informed the participants of the staff development activities and learning objectives.

Procedures

The DNP student utilized the component Content Validity Index (CVI) and the Content Validity (CV) model to evaluate the staff development activity plan. The CV model and the CVI utilize Lynn's (1986) model (see Table 1) in assessing the staff development activity plan. The CV score helped determine content revisions (if any) within the staff development activity plan. The student chose the validity based on the number of experts who agree that the staff development activity plan's content items are relevant to the learning objectives (Yussof, 2019). For instance, if four out of five experts agree that the items are applicable, the CV is 0.80 based on Lynn's (1986) model (see Table 1).

On the other hand, the CVI rates and computes each scenario component individually. For example, the individual staff development plan identifies training objectives, topical content outline, materials, and PowerPoint slides. The DNP student determined the CVI by dividing the number of experts rating an individual component by a 3 or 4. For instance, if three out of five experts rate the training objectives with a 4, the CVI was 0.60 (see table 1). Finally, the analysis and synthesis section provides additional information on the evaluation and collection methods.

Table 1

Lynn's (1986) Model

	Number of experts endorsing item or instrument as content valid						
Number of experts	2	3	4	5	6	7	8
2	1.00						
3	0.67	1.00					
4	0.50	0.75	1.00				
5	0.40	0.60	0.80	1.00			
6	0.33	0.50	0.67	0.83	1.00	1.00	
7	0.29	0.43	0.57	0.71	0.86	0.88	1.00
8	0.25	0.38	0.50	0.63	0.75	0.78	0.89

Protections

The doctoral project ensured the ethical protection of the participants. Before the participants' involvement in the project, the DNP student sought permission to conduct the study from Walden University's Institutional Review Board (IRB). The DNP student also sought the selected facility's permission.

The DNP student then contacted the expert panel members through e-mail. Before their involvement in the project, the DNP student obtained their consent using the Walden anonymous questionnaires' educational manual guide (Walden University, 2020). Using the guide was ethical and ensured the expert panel members' privacy protection.

Besides seeking approval, the DNP student also took some measures to ensure the participants' ethical protection. Firstly, the student acquired the participants' consent before their involvement in the project. Secondly, the DNP student also notified the participants that they should feel free to withdraw from the task at any given point. Participating in the evaluation process, staff education activity, and the pretest and post-test were voluntary. Thirdly, the staff was informed that their responses were only to be used for academic purposes and were to be maintained confidential a

The DNP student warned the participants to refrain from including personal information in the pretest and post-tests for enhanced confidentiality and privacy safeguarding. Besides, the participants' responses and the consequent results were reported in aggregate to safeguard the participants' anonymity. Finally, Walden

University's Institutional Review Board (IRB) played a critical role in ensuring the DNP project's ethical integrity by providing the proper protection of the participants.

Analysis and Synthesis

Data Collection

After the IRB approval, the DNP held an online meeting with the expert team to educate them on the evaluation procedure and complete the experts' initial evaluation. The evaluation of the staff development activity plan requires the expert panel to review the program items and rate their content. The DNP student developed a five-question, four-point ordinal rating scale evaluation questionnaire to collect the staff development program's expert panels' opinions (Appendix B). The rating scale's scoring comprised (1= not relevant, 2= unable to assess relevance without item revision, 3= relevant but needs minor alterations, and 4=very relevant and succinct). The evaluation questionnaire also had an entry for comments and suggestions. Lynn's (1986) model analyzed the Likert-style questions' responses with a summary of the comments' information and suggestions entry.

The DNP student collected the expert panels' scores for the program items and each scenario component from the initial validation meeting. Lynn's (1986) model was utilized in calculating each component's content validity index (CVI) and content validity (CV). A CVI and CV of 0.80 was the minimum acceptable for each program item and a scenario component. Therefore, the DNP student revised any program item or scenario component with a CV or CVI score below 0.80. Besides, a CVI and CV of 0.80

demonstrated the developed staff activity capacity to address long-term care registered nurses' T2D management education needs.

Once the staff development activity was validated and revised, the DNP student administered the pre-and post-test. Administration of the pretest occurred before the project participants participated in the staff development activity. Once the participants partook in the staff development activity, the DNP student administered a post-test. Sixteen questions focusing on the recommended strategies in managing T2D among elderly patients within LTCFs formed the post-test (Appendix D) and pretest (Appendix C). The questions were closed-ended to ensure the collection of quantitative data. The DNP student then examined the differences between T1 (pretest) scores and T2 (post-test).

The final procedure entailed the evaluation of the staff development activity. The DNP student used the American Nurses Credentialing Centre's (ANCC's) abridged version of the standard evaluation tool as an evaluation questionnaire (Appendix E). The tool consisting of a four-point Likert scale captured the registered nurses' perceptions and views concerning participating in the program's staff development activity. This evaluation helped answer the practice-focused questions by determining the relevance of the staff development activity in improving the registered nurses' knowledge of the management of T2D in long-term care and skilled nursing facilities.

Data Analysis

After conducting the staff development activity and administering the pretest and post-test, data was collected, coded, and organized to facilitate data analysis. The initial phase of the data analysis procedure entailed the data cleaning process. The DNP student then evaluated the obtained data for completeness and to ensure its relevance to the project. Afterward, the data was manipulated through filtering and sorting processes and codes assigned to minimize data entry and processing errors that do not occur.

The statistical analysis appropriate for the DNP project was descriptive, including the number of participants, percentage of correct scores on the pretest (T1) and post-test (T2) questionnaires, and the mean gain in the percentage of correct scores. In addition, the DNP student analyzed the difference between T1 and T2 scores to determine whether there were changes in the percentage of correct answers after the registered nurses participated in the staff development activity. I employed the Statistical Package for Social Sciences (SPSS) Version 26 for the descriptive analysis process. The anticipated findings were that the registered nurses who participated in the education would have gained knowledge, as evidenced by improved scores between the pre and post-test assessments.

Summary

This section established an LTCF in Maryland as this project's study area. The DNP student selected registered nurses working within the facility as the participants in the staff development activity. Lynn's (1986) model is the primary tool for evaluating the

staff development activity validity. The project further identified post-test and pretest as the main sources of preliminary data for the project. I used SPSS Version 26 for the data analysis procedure. The obtained data from this section was discussed and interpreted in section four. Section four offered a comprehensive discussion of the project's findings, implications, and recommendations.

Section 4: Findings and Recommendations

Introduction

The current DNP project established a knowledge gap among the registered nurses in the selected LTCF. The selected LTCF's registered nurses lacked adequate knowledge of ADA-approved practices for managing T2D among older adult long-term care patients. Thus, I found a significant gap in practice in registered nurses' provision of quality care to older diabetic patients due to a lack of in-depth understanding of T2D effective management. Additionally, the registered nurses practicing in LTCFs also lacked the essential knowledge regarding the best practices' management of residents with T2D.

In addressing the local problem and the gap in practice, I sought to answer the following practice-focused question: What is the level of knowledge regarding the use of the ADA position statement on managing type 2 diabetes among elderly patients in long-term care skills nursing facilities? I also sought to address the gap in practice by developing a staff development activity to improve registered nurses' knowledge of the ADA (2021) position statement on the management of diabetes in long-term care and skilled nursing facilities. The staff development activities to improve LTCF registered nurses' knowledge of the ADA position statement on the management of diabetes in long-term care and skilled nursing facilities (see also Munshi et al., 2016).

In developing the project, I relied on two sources of evidence. The first comprised a literature review on current evidence-based practices for T2D management among older

adult long-term care patients that align with the ADA (2021) position statement recommendations. The second consisted of pretest and posttest results, primarily the differences in scores from T1 (pretest) and T2 (post-test). I obtained the evidence by analyzing the difference between T1 and T2 scores to determine whether there were changes in the correct answers after the registered nurses participated in the staff development activity. I employed SPSS Version 26 for the descriptive analysis process.

Findings and Implications

The five expert panel members used Lynn's (1986) model to evaluate the relevance and validity of the staff development activity. The expert panel comprised a diabetes educator, a physician, a pharmacist, and two nurse practitioners who are diabetes specialists. They used a 4-point ordinal rating scale evaluation questionnaire (Appendix B) in reviewing the program items and rating content. The rating scale comprised 1 = *not relevant*, 2 = *unable to assess relevance without item revision*, 3 = *relevant but need minor alterations*, and 4 = *very relevant and succinct*. All five experts responded within a week.

A general overview of the expert panel's responses indicated that the reactions were overall positive. My evaluation of the responses' Content Validity Index (CVI) and content validity (CV) scores further supported the finding on the general positivity of the answers. I found a CVI and CV score of at least 0.80 for each program item; more than four experts endorsed each item and rated each item with a 3 or 4. Therefore, the staff development activity items did not need to be revised. In addition, the scores met the set

minimum acceptable CVI and CV of 0.80 for each program item and a scenario component. These findings inferred the relevance of the staff development activity plan's content items to the learning objectives. Table 2 depicts a summary of the expert panels' responses.

Table 2

Expert Panels' Responses

Expert	Question				
	How relevant is the improvement of registered nurses' knowledge of ADA type 2 diabetes management recommendations among elderly long-term care patients?	How relevant are the staff development activity's objectives for improving registered nurses' knowledge of ADA type 2 diabetes management among elderly long-term care patients?	How relevant is the ADA's position statement for improving registered nurses' knowledge of ADA type 2 diabetes management among elderly long-term care patients?	How relevant is the information presented in the staff development activity to improving registered nurses' knowledge of ADA type 2 diabetes management among elderly long-term care patients?	How relevant is the information presented in the staff development activity to improving registered nurses' patient teaching skills regarding type 2 diabetes management among elderly long-term care patients?
A	4	4	4	3	4
B	4	4	4	3	4
C	3	4	4	4	4
D	4	3	4	3	3
E	3	4	3	4	3

Note. 1= *not relevant*, 2 = *unable to assess relevance without item revision*, 3 = *relevant but need minor*, 4 = *very relevant and succinct*.

The evaluation questionnaire also had an entry for comments and suggestions. The final question, “What recommendations would you offer to improve the staff development activity?” provided the expert panel members with an opportunity to offer open-ended suggestions. Table 3 provides a summary of the expert panel's recommendations.

Table 3

Summary of Expert Recommendations

Expert	Quotations
A	No comments
B	None
C	None
D	“Consider other evidence-based T2D management practices for a comprehensive education program.”
E	None

Of the five expert panel members, only one offered a recommendation requiring broadening the staff development activity’s objectives and content. The member recommended incorporating other evidence-based T2D management practices into the staff development activity. However, I did not integrate the recommendation into the staff development activity. The program was limited to using the ADA (2021) position statement to manage T2D diabetes among older adult patients in long-term care and skills nursing facilities.

After the validation process, 30 registered nurses from the selected LTCF participated in the staff development activity. Of the 30 participants, only 21 registered nurses attended all the staff development activity sessions and completed the pretest and post-tests. Participation in the staff development activity was optional. The student administered the pretest before the beginning of the staff development activity. The pretest comprised sixteen questions focusing on the recommended strategies for managing T2D among elderly patients within LTCFs (Appendix C). Similarly, the post-test also consisted of sixteen questions (Appendix D).

Pretest and Posttest Results

Pre-Test Results

Table 4

Pretest Results

Pre-Test Results		
Question	**Correct Answers**	**Correct Answers (%)**
1	9	43%
2	17	81%
3	15	71%
4	12	57%
5	10	48%
6	8	38%
7	15	71%
8	6	29%
9	11	52%
10	8	38%
11	16	76%
12	17	81%
13	10	48%
14	7	33%
15	8	38%
16	19	90%

Based on the pre-test results, only 43 percent of the participants correctly answered question 1. This finding indicated that most of the participants (57%) lacked knowledge of the prevalence of T2D among patients residing in long-term care facilities. On the other hand, most participants (80%) correctly answered question 2, understanding T2D-related comorbidities. Similarly, a substantial number of participants (71%)

correctly answered the third question depicting a considerable knowledge of the T2D disease burden. Finally, regarding question 4, half of the participants (57%) correctly answered the question indicating that half of the registered nurse participants knew the causes of the gap in practice.

In question 5, only 10 out of 21 participants, representing 48 percent of the participants, correctly answered the question. This finding revealed that approximately 52 percent of the registered nurses participating in the staff development activity could not identify neuroglycopenic symptoms, including dizziness, delirium, and confusion, as the primary presenting symptoms of hypoglycemia in older type 2 diabetes patients.

The sixth question focused on hyperglycemia symptoms. Only 38% of the participants correctly identified signs associated with hyperglycemia. The seventh question required the participants to answer what primarily constitutes the glycemic goals for older diabetic patients in LTCFs. Again, 15 of the 21 participants correctly responded to the question. The eighth question required the participants to accurately identify the false statement about glucose-lowering medications in T2D management in older long-term care patients. Only six registered nurses, representing 29 percent of the participants, correctly identified the correct information.

Eleven participants (52%) correctly answered the question concerning the ninth question. The question evaluated the registered nurses' knowledge of why they should avoid the sole use of SSI in controlling the older patients' blood glucose levels based on ADA recommendations. Complementarily, the tenth question focused on assessing the

registered nurses' knowledge of using SSI in addition to scheduled mealtime insulin and basal insulin as an SSI replacement strategy. Only 38 percent of the participants accurately answered the question. The eleventh question required the registered nurses to prescribe the right diet to older diabetes adults in the long-term care setting. Seventy-six percent of the participants accurately acknowledged a liberal diet as fitting for elderly long-term care patients. Additionally, 81 percent of the participants correctly answered that the patients' nutrition preferences should guide nutritional goals in LTCFs in question 12.

In question 13, only 48 percent of the participants correctly identified all the benefits of physical activity in elderly T2D long-term care patients. In question 14, only 33 percent of the participants accurately pinpointed the factors that should guide the type of activity recommended for older T2D patients within LTCFs. Similarly, the fifteenth question addressed the physical activity subject matter. Only 38 percent of the participants correctly answered the barriers to physical activity in the older long-term care population. Finally, the sixteenth question had the highest number of correct answers. Ninety percent of the participants correctly answered the question. The high number of correct answers indicated that most registered nurses participating in the staff development activity understood the meaning of hyperglycemia.

After the registered nurses participated in the staff development activity, correct answers increased for every question. Table 4 below indicates an aggregate of the staff development activity participants’ correct answers to the sixteen post-test questions.

Posttest results

Table 5

Posttest Results

Post-Test Results			
Question	**Correct Answers**	**Correct Answers (%)**	**% Change in Correct Answers**
1	17	81%	38%
2	20	95%	14%
3	19	90%	19%
4	18	86%	29%
5	15	71%	24%
6	18	86%	48%
7	20	95%	24%
8	16	76%	48%
9	17	81%	29%
10	18	86%	48%
11	19	90%	14%
12	21	100%	19%
13	20	95%	48%
14	16	76%	43%
15	18	86%	48%
16	21	100%	10%

An analysis of the post-test results revealed a positive change in the number and percentage of correct answers for the sixteen questions. The number of correct answers for the first question increased from 43 percent in the pretest to 81 percent in the post-test, indicating a 38 percent increase incorrect answers. In the second question, 95 percent of the participants correctly answered the question, showing a 14 percent increase in the percentage of correct answers between the pre-and post-test. The number of correct answers increased by 19 percent to 90 percent in the post-test results regarding the third

question. A 29 percent increment of incorrect answers occurred after 86 percent of the participants correctly answered the question for the fourth question. In the fifth question, 71 percent of the participants correctly responded, resulting in a 24 percent increase in correct answers between the pretest and post-test.

The sixth question showed a 48 percent increase in correct answers, for 86 percent of the participants correctly answered the post-test question. In question 7, approximately 95 percent (24% increase in the correct post-test answers) of the participants provided an accurate answer. For questions 8, 9, and 10, the analysis found a 48%, 29%, and 48% increase in the percentage of correct answers, respectively, between the pre-and post-test results. Similarly, the analysis also discovered an increase in the correct answers between the pre-and post-test results for the last five questions. The increases comprised 14 percent (90% correct answers), 19 percent (100% correct answers), 48 percent (95% correct answers), 43 percent (76% correct answers), 48 percent (86% correct answers), and 10 percent (100% correct answers) for questions 11, 12,13, 14, and 15, respectively.

Finally, concerning the mean gain in the percentage of correct scores, the student analyzed the mean of the pretest and post-test results. The analysis found 11.75 and 18.31 mean points for the pretest and post-test results, respectively, depicting a 6.56-point increase in the mean points in the post-test results. Therefore, the staff development activity supported a 56 percent (6.56 points) mean gain in the percentage of correct scores. The registered nurses gained new knowledge regarding T2D management among elderly long-term care patients. One of the project's objectives was to orient hospital staff

to the ADA position statement on its use in diabetes management. All the 21 participants (N=21) were asked to rate their knowledge of ADA guidelines in the management of T2D among the elderly on a scale of 1-5 before and after the program (See Appendix E). The results yielded a pretest and post-test mean of 2.33 and 3.33, respectively, with a pretest and post-test mode of 2 and 4. Another objective was to improve registered nurses' knowledge of ADA application in type 2 diabetes management among the elderly in LTCFs. In the question on their understanding of the use of ADA guidelines in managing T2D among the elderly, the mean score improved by 1.33 points from a low of 2.19 before the project to a .57 after the project, with a median also improving from 2 to 4. The question on how well the participants understood the management of T2D among the elder concerning hypoglycemia risks, simplified treatment plans, avoidance of only using SSI protocols, diets and beverages, and physical activities and exercise also yielded similar scores in both means (2.19 pretest and 3.57 post-test) and median (2 pretests and 4 post-test) Further, despite the reluctance by registered nurses to follow the ADA guidelines in the management of type 2 diabetes among the elderly long-term care patients, the recommendations remained relevant to them, with the question producing a pretest and post-test mean scores of 2.71 3.48, respectively. Concerning the participants' skill in implementing the ADA guidelines in managing T2D elderly patients, the mean score improved from 2.57 pretest to 3.76 post-test, with a median of improving from 2 to 4 pretest and post-test, respectively. However, the biggest improvement is the participants' level of knowledge in identifying T2D and formulating a personalized

patient care plan using the ADA guidelines, with a mean score improvement of 1.48 from 2.52 to 4. Overall the mode for all the five questions on this objective improved from 2 to 4 before and after the program. For more detailed descriptive pre-and post-test statistics, See Appendix E.

Program Evaluation Results

Table 6

Program Evaluation Results

Program Evaluation Results				
Question	**1 (SD)**	**2(D)**	**3(A)**	**4(SA)**
1. The staff development activity improved my knowledge of ADA type 2 diabetes management recommendations among elderly long-term care patients.	1	1	8	11
2. The content was consistent with the objectives.	2	2	7	10
3. The objectives of the staff development activity were consistent with the program's purpose.	1	1	6	13
4. The information presented in the staff development activity can be put into practice in managing type 2 diabetes among elderly long-term care patients.	0	4	3	14
5. The presentation was clear and to the point.	1	2	6	12
6. The instructional material was well organized.	1	3	5	12
7. The teaching strategies were appropriate for the activity.	2	3	9	7

Note: *4 = strongly agree (SA), 3 = agree (A), 2 = disagree (D), and 1 = strongly disagree (SD)*

The DNP student requested the project participants to assist in the staff development activity evaluation. The program evaluation comprised a four-point Likert scale focusing on the registered nurses' perceptions and views concerning participating in the program's staff development activity (Appendix E). Table 5 below summarizes the staff development activity participants' responses to the program evaluation statements.

A general analysis of the program evaluation results shows that most participants offered positive responses to participating in the program's staff development activity. These findings indicate that the participants believed that the staff development improved their knowledge of ADA-recommended T2D management practices for elderly long-term care patients. The results also infer the participant's perception of the staff development activity's objectives, content, instructional materials, and teaching strategies as fitting for the activity.

Unanticipated Limitations and Outcomes

The project only suffered one unanticipated limitation. The DNP student initially expected to recruit 30 registered nurses from the selected facility and improve their knowledge of the ADA position statement on the management of diabetes in long-term care and skilled nursing facilities. However, only 21 of the 30 selected registered nurses participated in the staff development activity and completed the pre-and post-tests. This unanticipated outcome decreased the sample size by 30 percent, an aspect that limited the project's results. The eventual impact of such a limitation could be a reduction in the project results' generalizability to the nursing practice.

Implications of the Findings

The current doctoral project established a gap in the registered nurses' knowledge of managing T2D among elderly patients in the selected LTCF. The doctoral project filled the gap in practice by developing a staff development activity to improve registered nurses' knowledge of the ADA position statement on the management of diabetes in long-term care and skilled nursing facilities. As a result, there was an increase in the percentage of correct answers in the post-test results. These scores indicated an improvement in knowledge of management of diabetes in patients residing in long-term care and skilled nursing facilities.

These findings imply translating the new knowledge to improve care quality, enhance the quality of life, and improve patient skills for the selected facility's registered nurses. Consequently, the increase in the designated facility's registered nurses' knowledge of the ADA position statement could also benefit the nursing practice by enhancing the registered nurses' knowledge and implementing evidence-based practices on T2D management among the elderly population leading to a better quality of care in LTCFs and an improvement of the nursing profession.

Moreover, the realized information from the project may also be transferrable to other areas of T2D care. Particularly, the project may benefit dieticians and nutritionists collaborating with individuals with T2D by helping them understand the best nutritional modifications for managing the condition and educating their clients on ways of self-

managing the condition. The project may also benefit registered nurses working in other healthcare settings, apart from long-term care environments.

Potential Implications for Positive Social Change

The project findings may influence positive social change by improving the quality of care in LTCFs for T2D residents. The improvement would, in return, enhance the elderly population's quality of life. The project may also minimize the incidences of T2D-related comorbidities and disease burden on diabetic individuals' families, friends, and society. Finally, the project could also help decrease the social inequalities arising from the disproportionate prevalence and impacts of T2D on the elderly by providing LTCFs with adequate knowledge to manage the condition properly.

Recommendations

The current DNP project relied on 21 registered nurses from LTCF to realize the project's purpose. Using a larger sample size from numerous LTCFs may have generated more accurate results. Therefore, future scholars should consider extending the number of target participants and LTCFs for more accurate, reliable, and generalizable results. In addition, the project's findings indicated that LTCFs could benefit from implementing education programs targeting registered nurses working with older T2D patients. The staff development activity's success in improving the registered nurses' knowledge of the ADA position statement on the management of diabetes in long-term care and skilled nursing facilities infers the importance of education programs in the nursing practice. Therefore, LTCFs should consider implementing education programs for their healthcare

providers for improved management of T2D among elderly long-term care patients and other at-risk groups.

For the success of the education programs, the DNP project recommends that each LTCF formulate its staff development activity based on registered nurses' needs. In addition, they could also benefit from using ADA-approved strategies for managing T2D among elderly patients in LTCFs as the grounds for developing their education programs. Besides, the LTCFs can also benefit from implementing policies requiring all healthcare providers working with elderly T2D patients to participate in education programs focusing on improving their knowledge of evidence-based practices for T2D management.

Moreover, LTCFs should also consider integrating evidence-based practices into their T2D management guidelines from education sessions. Incorporating these practices into practice guidelines would mean the availability of a standard approach for managing T2D among elderly patients in LTCFs. Eventually, the development and implementation of evidence-based education programs, policies, and practices would bridge the existing gap in practice by offering the registered nurses practicing in LTCFs the essential knowledge regarding the best practices in managing T2D among the elderly residents with T2D.

Contribution of the Doctoral Project Team

The DNP student worked with a project team comprising five expert panel members. The five experts included a diabetes educator, a physician, a pharmacist, and

two nurse practitioners who are diabetes specialists. Their responsibilities were to determine the relevance and validity of the staff education learning objectives and content. Besides, their insights, combined with my own, helped promptly formulate and implement the staff development program. Nonetheless, despite the successful implementation of the staff development activity in the selected LTCF, currently, there are no plans to extend the project beyond the DNP doctoral project.

Strengths and Limitations of the Project

The current DNP project had several limitations and strengths. The first strength entailed using an expert panel with proficient knowledge of formulating and conducting educational sessions, project management, and the selected facility's registered nurses' educational needs in evaluating the staff development activity before its implementation. The panel's knowledge enabled them to offer practical insights to ensure the success of the staff development program—the second strength comprised of registered nurses as the project's participants. The registered nurses work directly with the elderly T2D patients. The project also ascertained that registered nurses lack adequate knowledge of managing T2D among elderly long-term care patients. Therefore, their participation in the staff development activity meant the program realized a significant impact in improving the quality of care for older T2D patients. The third strength was its focus on registered nurses. Very few existing projects target registered nurses working with elderly T2D patients. Therefore, the project addresses the literature by tackling the unexplored study area.

On the other hand, the project also had a limitation. The collection of results from only 21 staff development activity participants constrained the findings to a small sample bringing about a generalizability issue. Also, limiting the findings to a single LTCF impacts the generalizability of the project's results to all LTCFs in the United States. Therefore, future DNP projects should consider using larger sample sizes and extending their target areas of study to multiple LTCFs.

Section 5: Dissemination Plan

Introduction

The DNP project established the existence of knowledge gaps among registered nurses in the selected LTCF in Maryland. As revealed by this DNP project, the selected registered nurses lacked sufficient knowledge of ADA-approved practices for managing T2D among older adult long-term care patients. However, the registered nurses learned about T2D management among older adult long-term care patients after participating in the education sessions. Therefore, the dissemination of these research findings is critical. Dissemination is considered an essential part of evidence-based practice in nursing because it helps translate knowledge into clinical practice (Curtis et al., 2017).

The primary objective of disseminating the project findings is to improve registered nurses' knowledge of the ADA-approved practices for managing T2D among older adult patients in long-term facilities. The broader aim is to enhance their understanding of the best practices in managing such clients. The dissemination is through posters at strategic points such as staff notice boards, oral presentations, and online engagements, especially with the facility's T2D registered nurses.

Audiences and Appropriate Venues for Dissemination

The DNP project was a staff education program to improve nurses' knowledge of managing T2D diabetes patients. The findings showed a knowledge gap among registered nurses who treat these patients. The audiences for this DNP project findings include registered nurses and other care providers, nursing organizations, nursing students,

hospitals leadership, policymakers, and researchers. The results are particularly useful to each audience because they are a key part of the nursing practice. In addition, the project's results are critical in helping the audiences improve their knowledge of ADA-approved practices for managing T2D and enhancing their understanding of the best practice in managing individuals with T2D.

The venues appropriate for the dissemination include publishing the results in program or policy briefs, presentations at professional associations meetings and national conferences, and creating and distributing the project's materials, including guides, pamphlets, and flyers. Other appropriate dissemination venues for the project findings would be nursing organizational websites, national journals, and statewide publications. Various social media platforms may also be suitable for sharing project findings.

Analysis of Self

Practitioner

As a practitioner whose primary function is to monitor patients with diabetes and manage their condition, 70 to 80% of my practice involves encounters with prediabetic or diabetic clients. These engagements have provided me with a clear perspective of registered nurses' challenges in managing T2D. I drew from my expertise as a practitioner managing diabetic patients. In addition, the knowledge gained throughout this DNP project to formulate a staff development activity to promote individualized care for T2D patients contributed to my understanding. My long-term professional goal as a diabetes management nurse is to see improved knowledge of ADA-approved practices

for managing T2D among registered nurses. Gaining knowledge may lead to reduced burden and enhanced health outcomes among T2D, particularly older adults, who are particularly vulnerable (ADA, 2021). Further, as a nurse committed to the nursing profession, finding a solution to a primary problem affecting registered nurses in LTCFs is an ideal way of promoting the growth of the nursing practice.

Scholar

The motivation for undertaking this DNP project was my belief that all patients deserve quality care and improved quality of life. The experience I gained has prepared me well for the challenges within the nursing profession, even as theT2D prevalence among older adults continues to increase. In addition, the knowledge and experience that I acquired from the project will inform the next leadership role that I assume within the nursing profession, particularly in the care of patients with diabetes.

Project Manager

The project manager role that I undertook in this DNP project was critical because I was responsible for ensuring the effective formulation and completion of the doctoral project. Furthermore, it provided me with an opportunity to provide leadership while collaborating closely with the other professionals and stakeholders to ensure a successful implementation. The experience gained in successfully implementing this DNP project provides me with useful knowledge that I can draw on in my future professional assignments.

Challenges, Solutions, and Insights Gained in Completing the Project

Although this DNP project was conducted thanks successfully to the supportive team I worked with throughout the project, the educational journey was not without challenges. The first challenge was assembling the research team. The main challenge was determining the appropriate number of experts and their expertise. However, this challenge was overcome through consultations. Finally, I settled on a team of five experts, who included a diabetes educator, a physician, a pharmacist, and two nurse practitioners who are diabetes specialists. The second challenge was maintaining the optimum number of participants in the DNP project. Of the project's 30 participants who were validated to participate, only 21 registered nurses attended all the staff development activity sessions and completed the pre-and post-tests.

Given that participation was voluntary, this challenge was beyond my control. Still, thankfully the number of registered nurses who participated was more than two-thirds, and, therefore, there was no significant impact on the results. The final challenge encountered during this project was the potential for participant bias. I ensured that participants were provided with relevant information to participate in the DNP project to overcome this.

This DNP project provided me with evidence-based insights on the level of knowledge among registered nurses on ADA-approved practices for managing T2D patients. With the participating nurses displaying a mutual understanding of ADA-approved practices for managing T2D clients and applying best practices in managing

these patients, participation in the DNP project's educational sessions improved their knowledge as per the post-test scores. This information was important to me. My goal is to see registered nurses enhance their knowledge of managing T2D patients, particularly older adults.

Summary

The increasing prevalence, burden, and mortality rates of T2D make it one of the most common diseases while becoming a global health concern (Khan et al., 2020). In this DNP project, I sought to improve the level of knowledge among registered nurses on the ADA (2021) position statement on the management of diabetes in long-term care and skilled nursing facilities. The selected registered nurses lacked sufficient knowledge of approved practices for managing T2D among older adult long-term care patients and the essential knowledge regarding the best practice in managing such clients. However, the registered nurses learned about T2D management among older adult long-term care patients after participating in the education sessions. The project has implications for delivering quality care to patients with T2D, especially older adults, who are the most vulnerable. The project’s most important outcome may be providing a tool that nursing leaders can use to improve the health outcomes of T2D patients.

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Appendix A: Staff Development Activity Plan

Problem: The elderly residing in LTCFs have high T2D prevalence rates. The registered nurses practicing in these settings often lack the essential knowledge to manage the condition (Lega et al., 2020).

Purpose: The staff development activity aimed to improve LTCF registered nurses' knowledge of the ADA position statement on the management of diabetes in LTCFs.

Goal: The anticipated findings were that the registered nurses who participate in the education program would have gained new knowledge regarding T2D management among elderly long-term care patients. The new understanding should translate to improved quality of care, enhance the quality of life, and better patient skills for the elderly residents with T2D living at the LTCFs.

Time frame	**Training objectives**	**Topical content Outline**	**References**	**Teaching method/participant engagement and evaluation method**
Week 1	At the end of the session, the participants should be able to: -describe the prevalence of T2D in LTCFs -identify the disease	Pre-test completion Introduction-T2D prevalence Disease burden and complications related to T2D in elderly	ADA. (2020). Standards of Medical Care in Diabetes—2020 Abridged for Primary Care Providers. *Clinical Diabetes*, *38*(1), 10-38 Munshi, N. et al. (2016). Management of	Zoom training Q&A (Zoom) Pre-test

	burden and complications related to T2D among elderly long-term care patients.	long-term care patients.	Diabetes in Long-term Care and Skilled Nursing Facilities: A Position Statement of the ADA *Diabetes Care,* 39, 308–318.	
Week 2	-to identify current practices in T2D management among elderly long-term care patients. -to compare current practices to ADA-recommended strategies and goals for managing T2D in elderly long-term care patients. - To identify gaps in practice in registered nurses' provision of quality care to older diabetic	The current nursing practices in T2D management among elderly long-term care patients. Gaps-in-practice in registered nurses' provision of quality care to older diabetic patients in LTCFs	Leung, L., Wongrakpanich & Munshi, M.N. (2019). Diabetes Management in the Elderly. *Diabetes Spectrum*, 31(3), 245-253. Longo, M., Bellastella, G., Maiorino, M.I., Meier, J.J., Esposito, K. & Giugliano, D. (2020). Diabetes and Aging: From Treatment Goals to Pharmacologic Therapy. *Frontiers in Endocrinology*, 10(45). Quattrocchi, E., Goldberg, T. & Marzella, N. (2020). Management of type 2 diabetes:	Zoom training Q&A (Zoom)

	patients in LTCFs		consensus of diabetes organizations. *Drugs in Context*, 9, 1-8. Osman, O., Sherifali, D., Stolee, P. & Heckman, G. (2019). Diabetes Management in Long-Term Care: An Exploratory Study of the Current Practices and Processes to Managing Frail Elderly Persons with Type 2 Diabetes. *Canadian Journal of Diabetes*, 40(1), 17-30.	
Week 3	-To identify the hypoglycemia and hyperglycemia risks to elderly T2D patients. -To determine ADA-approved glycemic goals for elderly T2D patients.	Hypoglycemia and hyperglycemia risks. ADA-approved glycemic goals for older T2D patients.	Munshi, N. et al. (2016). Management of Diabetes in Long-term Care and Skilled Nursing Facilities: A Position Statement of the ADA *Diabetes Care,* 39, 308–318.	Zoom training Q&A (Zoom)
Week 4	-To identify the glucose-	Glucose-lowering	Munshi, N. et al. (2016).	Zoom training

	lowering medications used in T2D management among elderly LTC patients. -To determine the advantages, disadvantages, and caveats in using the identified medications in the LTC patients.	medications for older individuals in LTC. The advantages, disadvantages, and caveats in using common glucose-lowering agents in the LTC population.	Management of Diabetes in Long-term Care and Skilled Nursing Facilities: A Position Statement of the ADA *Diabetes Care,* 39, 308–318.	Q&A (Zoom)
Week 5	-To clarify why the sole use of SSI should be avoided in LTC facilities. -To discuss the ADA-approved SSI replacement strategies in LTC facilities.	Sliding-scale insulin ADA-approved strategies for replacing SSI in LTC.	Munshi, N. et al. (2016). Management of Diabetes in Long-term Care and Skilled Nursing Facilities: A Position Statement of the ADA *Diabetes Care,* 39, 308–318.	Zoom training Q&A (Zoom)
Week 6	-To appraise the effects of therapeutic "diabetic" diets on older LTC populations. -To clarify why the ADA	Impact of therapeutic "diabetic" diets on older LTC populations. ADA-approved liberal diets for the elderly	Munshi, N. et al. (2016). Management of Diabetes in Long-term Care and Skilled Nursing Facilities: A Position Statement of the ADA *Diabetes*	Zoom training Q&A (Zoom)

	recommends liberal diets for the elderly T2D LTC patients.	T2D LTC patients.	*Care,* 39, 308–318.	
Week 7	-To identify barriers to physical activity for patients in the LTC facility. -To explain the importance of physical activity for elderly T2D LTC patients. -To pinpoint the ADA-recommended physical activity and exercise for the elderly T2D LTC patients.	Barriers to regular physical activity for patients in the LTC facility. Importance of physical activity for the elderly T2D LTC patients. ADA-recommended physical activity and exercise.	Munshi, N. et al. (2016). Management of Diabetes in Long-term Care and Skilled Nursing Facilities: A Position Statement of the ADA *Diabetes Care,* 39, 308–318.	Zoom training Q&A (Zoom)
Week 8	-To inform the registered nurses of their role in educating patients regarding T2D management. -To impart essential	The role of registered nurses in educating patients. Essential patient-teaching skills.	Powers, M., Bardsley, J., Cypress, M., Duker, P., Funnell, M., Fischl, A., & Maryniuk, M. (2015). Diabetes Self-Management	Zoom training Q&A (Zoom) Post-test

	patient-teaching skills. -To improve the registered nurses' knowledge of the management of T2D among elderly LTC facilities' patients.	Summary of the program items. Post-test completion	Education and Support in Type 2 Diabetes: A Joint Position Statement of the ADA, Educators, and the Academy of Nutrition and Dietetics. *Diabetes Care*, 38(7), 1372-1382.	

Appendix B: Expert Panel Content Evaluation

This brief survey allows you to determine the staff development activity's validity in improving registered nurses' knowledge of the ADA position statement on the management of diabetes in LTCFs. Please review the staff development tool, application scenario, and proposed violence risk assessment policy and provide evaluations and recommendations.

Please check next to the box 1= not relevant, 2= unable to assess relevance without item revision, 3= relevant but need minor alterations, and 4=very relevant and succinct.

How relevant is the improvement of registered nurses' knowledge of ADA type 2 diabetes management recommendations among elderly long-term care patients?

☐ 1 = not relevant

☐ 2 = unable to assess relevance without item revision

☐ 3 = relevant but needs minor alterations

☐ 4 = very relevant and succinct

How relevant are the staff development activity's objectives for improving registered nurses' knowledge of ADA type 2 diabetes management among elderly long-term care patients?

☐ 1 = not relevant

☐ 2 = unable to assess relevance without item revision

☐ 3 = relevant but needs minor alterations

☐ 4 = very relevant and succinct

How relevant is the ADA's position statement for improving registered nurses' knowledge of ADA type 2 diabetes management among elderly long-term care patients?

☐ 1 = not relevant

☐ 2 = unable to assess relevance without item revision

☐ 3 = relevant but needs minor alterations

☐ 4 = very relevant and succinct

How relevant is the information presented in the staff development activity to improving registered nurses' knowledge of ADA type 2 diabetes management among elderly long-term care patients?

☐ 1 = not relevant

☐ 2 = unable to assess relevance without item revision

☐ 3 = relevant but needs minor alterations

☐ 4 = very relevant and succinct

How relevant is the information presented in the staff development activity to improving registered nurses' patient teaching skills regarding type 2 diabetes management among elderly long-term care patients?

☐ 1 = not relevant

☐ 2 = unable to assess relevance without item revision

☐ 3 = relevant but needs minor alterations

☐ 4 = very relevant and succinct

What recommendations would you offer to improve the staff development activity?

Comment:

Thank you for your feedback.

Appendix C: Pretest

1. What is the prevalence of type 2 diabetes among patients residing in LTCFs?
    a) 50-65%
    b) 25-34%
    c) 19-28%
    d) 41-49%
2. Miss W, a registered nurse in an LTCF, is assigned an elderly type 2 diabetes patient. Having worked with the older population, Miss W should expect the following geriatric comorbidities, except one, to impact the patient's quality of life and self-management abilities. Kindly identify the complication that Miss W should least expect as a type 2 diabetes-related comorbidity in the older patient.
    a) Persistent pain
    b) Urinary incontinence
    c) Depression
    d) Prostate cancer
    e) Injurious falls
    f) Cognitive impairment
    g) Polypharmacy
3. Which statement about type 2 diabetes disease burden is **false**?
    a) The estimated annual costs of type 2 diabetes in Maryland are $14.9 billion.
    b) Type 2 diabetes is the sixth leading cause of death in Maryland.

c) Maryland incurs a $2 billion loss in economic productivity because of type 2 diabetes.

4. There is a significant gap in practice in registered nurses' provision of quality care to older diabetic patients in LTCFs. The gap-in-practice is caused by the following **except**:

   a) A lack of a standard approach to managing type 2 diabetes among elderly patients.

   b) There is an overreliance on the SSI regimen that does not accommodate alteration in the patient's insulin needs.

   c) The poor diagnosis of type 2 diabetes among elderly long-term care patients.

   d) The impracticality of the current exercise recommendation for frail elderly patients with different comorbidities.

   e) The current nursing practice's failure to acknowledge that elderly patients are at significant risk for poor fluid and nutritional intake.

5. The presenting symptoms of hypoglycemia in older type 2 diabetes patients are primarily:

   a) Adrenergic (tremors, sweating, and palpitation).

   b) Neuroglycopenic (dizziness, delirium, and confusion).

6. Which of the following symptoms is not a symptom of hyperglycemia?

   a) Confusion

   b) Nausea and vomiting

c) Increased thirst

d) Frequent urination

e) Loss of appetite

7. The glycemic goals for older diabetic patients in LTCFs are primarily dependent on:

a) The patient's risk of cognitive dysfunction.

b) The patient's risk of hyperglycemia.

c) The patient's risk of hypoglycemia.

d) The patient's comorbidities.

8. Which statement about glucose-lowering medications in T2D management in older long-term care patients is **false**?

a) Biguanides can be used until the estimated glomerular filtration rate is <30 mL/min/1.73 m^2.

b) Sulfonylureas can be used if the patient is on a substantial insulin dose (e.g., >40 units/day).

c) DPP-4 inhibitors can be combined with basal insulin for a low complexity regimen.

d) Hypoglycemia is the most common side effect of meglitinides.

9. Mr. T, a fellow registered nurse, requests your consult regarding the best blood glucose regulator for a 72-year-old long-term care patient. Why would you advise him to avoid

the sole use of sliding-scale insulin (SSI) in controlling the older patient's blood glucose levels based on ADA recommendations? Select all that apply.

a) Sliding-scale regimens focus on the patients' blood glucose levels without considering physical activity.
b) Sliding-scale regimens do not consider the patient's food intake.
c) SSI is reactive, reacting solely to blood glucose excursions without addressing basal needs.
d) SSI results in extensive variations in blood glucose levels among these patients, thus increasing hypoglycemia risks without improving hyperglycemia.
e) Persistent SSI practice contributes to hypoglycemia among elderly patients in LTCFs.
f) The sole use of SSI causes loss of appetite in older long-term care patients.

10. As a registered nurse working in LTCFs using SSI in addition to scheduled mealtime insulin and basal insulin as an SSI replacement strategy, you notice that one of the older type 2 diabetic patients requires a correction dose. For example, suppose the patients' glucose values are consistently elevated before dinner or lunch, requiring 3-unit corrections. In that case, the scheduled breakfast or lunch should be:

a) Decreased by three units.
b) Increased by three units.

c) Decreased by 1.5 units.

d) Increased by 1.5 units.

e) Decreased by six units.

f) Increased by six units.

11. Which type of diet would you prescribe to older diabetes adults in the long-term care setting?

a) The Mediterranean diet

b) The paleo diets

c) Liberal diets

d) A vegetarian diet

e) Therapeutic diets

12. Should the patients' nutrition preferences guide nutritional goals in LTCFs?

a) Yes

b) No

13. Suppose one of Mrs. Z's elderly long-term care patients asked her to explain the importance of physical activity for older type 2 diabetes patients. Which benefits would Mrs. Z identify? Select all that apply.

a) Quality of life improvement.

b) Severe hyperglycemia minimization.

c) Electrolyte imbalance prevention.

d) Functionality improvement.

e) Urinary incontinence prevention.

f) Independence improvement.

14. Which factors should guide the type of activity recommended for older T2D patients within LTCFs?

    a) The patient's preferences.

    b) The patient's blood glucose level.

    c) The intensity of the activity.

    d) The patient's current level of ability and activity.

15. As a registered nurse working with older long-term care patients, one should expect some regular physical activity barriers for the patients. Therefore, select all the barriers to physical activity in the older long-term care population.

    a) Lack of incentives.

    b) Cognitive dysfunction.

    c) Repeated infections.

    d) Inadequate staff supervision.

    e) Risk of dehydration.

    f) Fear of falls.

    g) Frailty.

16. When teaching an elderly long-term care patient about type 2 diabetes management, which of the following would indicate correct understanding if the patient states?

    a) Hyperglycemia means high blood glucose.

b) Hyperglycemia means low blood glucose.

c) Hyperglycemia means high blood pressure.

d) Hyperglycemia means low blood pressure.

Appendix D: Posttest

1. What is the prevalence of type 2 diabetes among patients residing in LTCFs?

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    b) 25-34%

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b) Sliding-scale regimens do not consider the patient's food intake.

c) SSI is reactive, reacting solely to blood glucose excursions without addressing basal needs.

d) SSI results in extensive variations in blood glucose levels among these patients, thus increasing hypoglycemia risks without improving hyperglycemia.

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Appendix E: Descriptive Statistics for Pre- and Posttest

Question	Pre-test Mean	Posttest Mean	Pretest Median	Posttest Median	Pretest Mode	Posttest Mode	Pretest STDEV	Posttest STDEV
Objective: To orient hospital staff on the ADA position statement on diabetes management. On a scale of 1-5, rate your knowledge of ADA guidelines in managing T2D among the elderly.	2.33	3.33	2	3	2	4	1.08379	0.99203
Objective: To Improve registered nurses' knowledge of the application of ADA in type 2 diabetes management among the elderly in LTCFs. On a scale of 1-5, rate what is your knowledge of the use of ADA guidelines in the management of T2D among the elderly.	2.19	3.52	2	4	2	4	1.09627	0.82086

On a scale of 1-5, how relevant is the ADA position statement as a framework for improving your knowledge of ADA type 2 diabetes management among elderly long-term care patients?	2.71	3.48	3	4	2	4	1.16057	0.82026
On a scale of 1-5, how do you rate your skill in implementing the ADA guidelines in managing T2D elderly patients?	2.57	3.76	2	4	2	4	1.04978	0.86766
On a scale of 1-5, how well do you understand the management of T2D among the elderly regarding hypoglycemia risks, simplified treatment plans, avoidance of only using sliding scale insulin protocols,	2.19	3.52	2	4	2	4	1.09627	0.82086

liberal diets and beverages, and physical activities and exercise?								
On a scale of 1-5, kindly rate your level of knowledge in identifying T2D and formulating a personalized patient care plan.	2.52	4	2	4	2	4	1.13888	0.92582

Appendix F: Program Evaluation

As a participant in the staff development activity, please assist in the program's evaluation. Kindly tick the statement that best reflects the extent of your agreement. Use the Likert scale [4 = strongly agree (SA), 3 = agree (A), 2 = disagree (D), and 1 = strongly disagree (SD)].

	1 (SD)	2(D)	3(A)	4(SA)
1. The staff development activity improved my knowledge of ADA type 2 diabetes management recommendations among elderly long-term care patients.				
2. The content was consistent with the objectives.				
3. The objectives of the staff development activity were consistent with the program's purpose.				
4. The information presented in the staff development activity can be used to manage type 2 diabetes among elderly long-term care patients.				
5. The presentation was clear and to the point.				
6. The instructional material was well organized.				
7. The teaching strategies were appropriate for the activity.				

Thank you.