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Staff Education on Type 2 Diabetes Management

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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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Executive Summary: Staff Education Project

Staff Education on Type 2 Diabetes Management

by

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Summary

The Doctor of Nursing Practice (DNP) project involved a staff education program resulting from an identified practice gap. The nursing staff lacked the knowledge and skills necessary about Type 2 diabetes to teach their patients self-care management of their condition. The setting was an outpatient family practice clinic in Houston, Texas. The facility director reported that the clinic patients were experiencing unstable and high blood sugar due to their lack of knowledge about diabetes self-care management. The nurses were not knowledgeable enough about diabetes care to teach the patients. The practice-focused question was whether staff education could increase nurses' knowledge of Type 2 diabetes care. The project enabled the clinic nurses to obtain the vital knowledge and skills to teach patients about diabetes self-management. The PowerPoint teaching presentation was an hour long and provided for seven staff nurses who volunteered to participate in the educational intervention. The content included evidence-based information related to diabetes and self-care management. The nurses completed a pretest and posttest multiple-choice survey questions to determine improvement in knowledge due to education. Data were entered into IBM SPSS (Version 29) and compared at pretest and posttest with a paired samples *t*-test. The result showed a statistically significant improvement in the mean knowledge score from the pretest mean of 5.29 to the posttest mean of 9.71. The *p*-value was less than .05, indicating that the increase in mean knowledge scores was statistically significant. The findings can potentially effect positive social change by increasing nurses' knowledge, equipping patients with skills for self-care management, and reducing complications from diabetes, thereby improving individual and population health.

Background

Diabetes can be challenging for patients to control and requires ongoing self-management capability to prevent the long-term effects of the condition. The clinic director reported that patients with Type 2 diabetes who attend the clinic were experiencing consistently elevated blood glucose levels due to their lack of knowledge about diabetes self-care, and the nurses taking care of them do not include diabetes education during their clinic visits because they lack knowledge related to diabetes management. In other words, the nurses were not well prepared to teach their patients about diabetes self-care. A lack of knowledge about self-care management of the patient's diabetes could adversely affect their quality of life. The need for practice change is relevant because uncontrolled blood glucose levels or diabetes can cause severe life-threatening complications and multiple organ failure. This project attempted to answer the practice question, "Does education of staff on diabetes mellitus increase knowledge?"The project aimed to create a staff education program to increase nurses' knowledge about Type 2 diabetes for patients' self-care management. I conducted a literature search on Walden Library for sources that support the practice problem and the need for change. I selected peer-reviewed articles; four were Level I, and three were Level II evidence quality, based on the Johns Hopkins Evidence Appraisal Tool.

Diabetes is a chronic condition represented by high blood glucose levels that may lead to severe complications and multiple organ and system failures (Albagawi et al., 2023). According to the Albagawi et al. (2023), education fosters how individuals assume control of their diabetes and improve their quality of life. If nurses acquire appropriate knowledge about diabetes, they can significantly be effective in educating diabetic patients with the information they need to manage and care for their condition. In support of the practice change, Albagawi et al. stated that people with diabetes grapple with compliance issues, and knowledge deficits among nurses caring for diabetic patients can have profound clinical implications. Nikitara et al. (2019) suggested that through better nursing education and adequate resources, nurses can perform diabetes care and patient education accurately. Landu and Crowley (2023) opined that nurses require knowledge of diabetes and confidence to perform diabetes self-management and support, which they educate patients on and give them skills to enhance their health and well-being. One in ten Americans have diabetes, and most have Type 2, representing more than 38 million people, where 90%–95% have Type 2 diabetes mellitus (Centers for Disease Control and Prevention [CDC], 2024). The CDC (2024) reported that the total direct and indirect estimated costs of diagnosed diabetes in the United States in 2022 were $413 billion. Diabetes was the eighth leading cause of death in the United States in 2021 (CDC, 2024).

These statistics and sources from the literature highlight the importance of educating the nursing staff and caregivers on diabetes self-care management to teach and support patients in self-care to prevent complications. The prevalence of diabetes places a significant burden on society and healthcare systems, with one in every 4 to 5 patients in hospital with diabetes (Piya et al., 2022). Piya et al. (2022) noted that people with diabetes are associated with higher hospital readmissions, higher mortality rates, and complications, and the resulting increased length of hospital stay has both financial and hospital capacity implications. Therefore, improving the nursing staff's knowledge about diabetes care will help to reduce diabetes complications and the high costs associated with extended hospitalization, medications, tests, surgeries, rehabilitation, and medical devices. Self-care management activities and behaviors include weight reduction and exercise, self-glucose monitoring, smoking cessation, diet planning, portion control, avoiding high-fat and cholesterol foods, and stress management. The clinic nurses will utilize the diabetes self-management plan to teach their patients about diabetes care, including identifying signs and symptoms of hypoglycemia and hyperglycemia and what to do. Liao et al. (2021) stated that patients' knowledge of diabetes self-care is influenced by the health education they receive, which nurses mainly provide.

Staff Education Project Development

Seven nurses participated in the educational program, and they are the ones who provide care to adult clinic patients with Type 2 diabetes. The project was developed to present an educational program for nurses to teach patients about diabetes self-care management. The program included learning objectives, course content, PowerPoint presentations, and a pretest and posttest consisting of 10 multiple-choice questions.

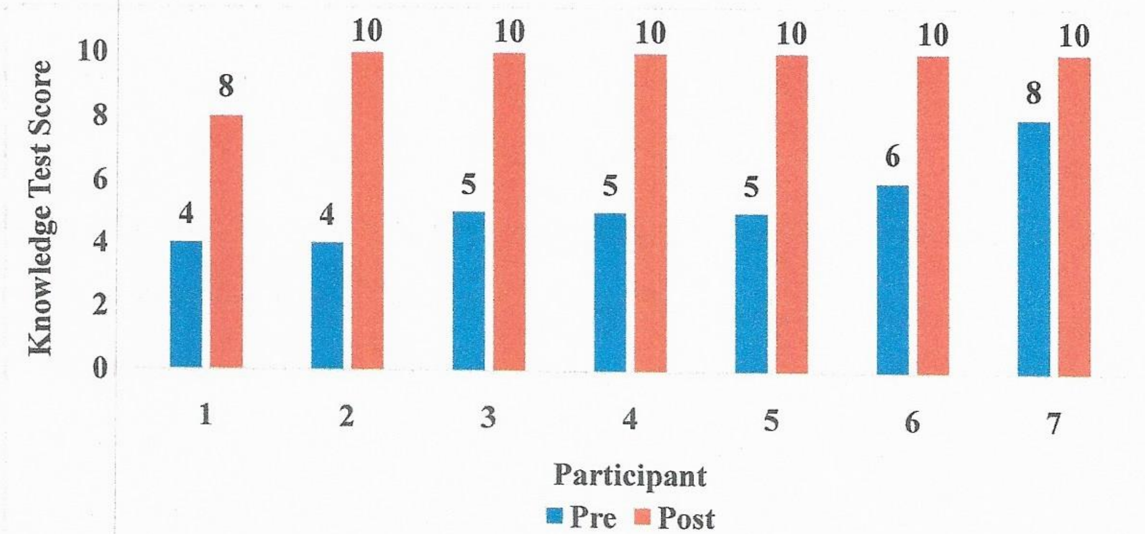
After obtaining the ethics approval, the seven participants completed the pretests before receiving the education to determine their understanding of diabetes care. I presented the teaching in the clinic's conference room using PowerPoint presentations. It was an interactive 1-hour session covering the diabetes disease process, the statistical analysis, classification, evidence-based standards of care in diabetes, medication management, preventative measures, and complications. After the teaching, I encouraged the participants to ask questions. They completed the posttest survey after the educational program. I considered each nurse's correct answers to the 10 multiple-choice questions on the pretest and posttest (see Figure 1). I used the IBM SPSS descriptive statistics to analyze the pretest and post-test data for the mean and *t*-test (see Figure 2).

Results

Seven participants completed the pre- and post-knowledge tests. Each test consisted of 10 items, with one point for each item. The possible knowledge scores range from 0 to 10, with 10 being a perfect score on the knowledge test. Figure 1 displays each participant's pretest and posttest scores on the knowledge test. As shown, the pretest had scores ranging from 4 to 8, and the posttest had scores ranging from 8 to 10.

Figure 1

Knowledge Test Scores at Pre- and Post-Implementation for Participants

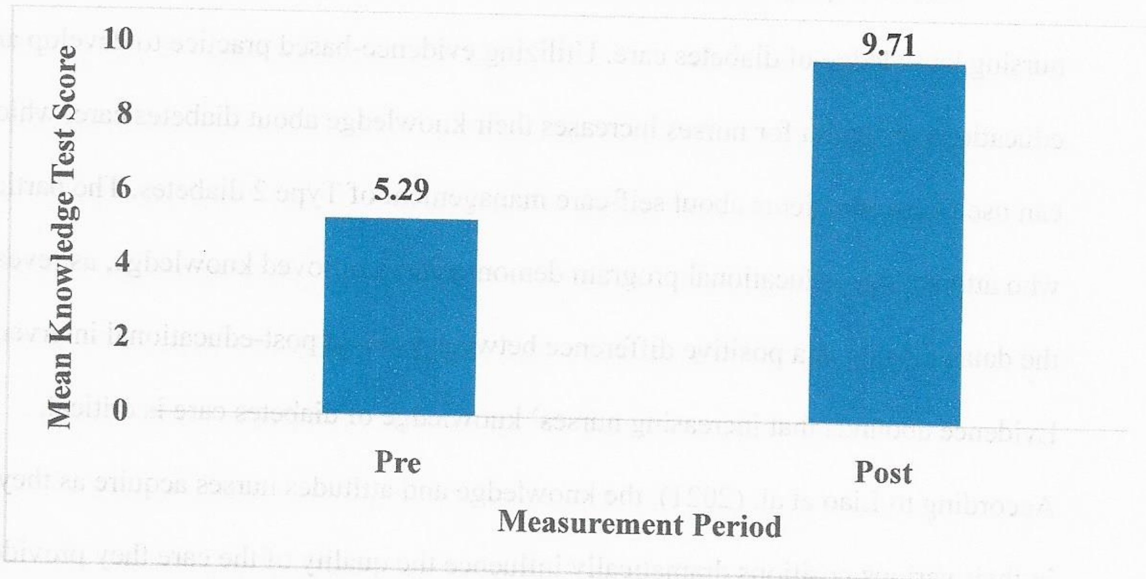


Data were entered into IBM SPSS (Version 29) to determine whether the improvement in knowledge was statistically significant, and pretests and posttests were compared using a paired samples *t*-test. The paired samples *t*-test was used because the data are at the interval/ratio level, and the scores matched for each participant at pre- and post-implementation. The level of significance was set at 0.05. The results showed a statistically significant improvement in the mean knowledge score from pretest ($M =$

5.29, $SD = 1.38$) to posttest ($M = 9.71$, $SD = .76$), $t(6) = -9.21$, $p = .001$ (see Figure 2). The p-value is less than .05, proving that the increase in mean knowledge scores was statistically significant. The clinical significance is evident in the 83.6% improvement in mean scores, from 5.29 at pre- to 9.71 at post-implementation.

Figure 2

Knowledge Mean Scores at Pre- and Post-Implementation



The post-implementation results demonstrated that the DNP project increased the staff nurses' knowledge of evidence-based self-care strategies for managing Type 2 diabetes patients. The gap in practice found in the organization was that nurses lacked knowledge and were inadequately prepared to teach their diabetic patients about diabetes self-care management. This DNP project enabled the clinic nurses to acquire the necessary knowledge and skills to help them teach patients how to perform self-care management of their condition for improved health outcomes. Liao et al. (2021) suggested that nurses can provide extensive care that directly impacts the quality of care only when they have accurate knowledge and capabilities. The educational program is essential beyond the local site because knowledge of Type 2 diabetes care is crucial in stabilizing blood sugar levels, thereby preventing the deterioration or complications of the patient's condition (Veras et al., 2019).

Conclusions

This DNP project is deemed valuable for the organization as it has improved nursing knowledge of diabetes care. Utilizing evidence-based practice to develop an educational program for nurses increases their knowledge about diabetes care, which they can use to teach patients about self-care management of Type 2 diabetes. The participants who attended the educational program demonstrated improved knowledge, as revealed by the data analysis of a positive difference between pre-and post-educational intervention. Evidence abounds that increasing nurses' knowledge of diabetes care is critical. According to Liao et al. (2021), the knowledge and attitudes nurses acquire as they work in their various positions dramatically influence the quality of the care they provide, thus positively impacting the organization they work for.

The result derived from this project can provide a scientific basis for providing educational programs for new hires and annually for all nurses at the clinic. I will further recommend the clinic provide educational materials on self-care management strategies for patients discharged from clinic visits.

The practice implication is that nursing and patient education are crucial approaches to enhancing glycemic control. Also, this project has the potential to effect positive social change as it improves the knowledge of diabetic patients, consequently decreasing healthcare costs derived from complications, thus improving the quality of life of individuals and population health.

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Appendix A

Individual Pretest and Posttest Results

Participant	Pretest score	Posttest score
1	4	8
2	4	10
3	5	10
4	5	10
5	5	10
6	6	10
7	8	10

Appendix B

Pretest and Posttest Questionnaire

Thank you for agreeing to participate in this educational intervention program. You will create a 4-digit unique identification number (ID) only known to you. Please do not share this ID with anyone. It will be used to match your pretest with your post-test knowledge. All information collected will be confidential and used to analyze the scores and determine the effectiveness of the educational intervention.

My Unique ID: -------------

1. Which should not be used to treat low blood glucose?
   a. Three hard candies
   b. Half a cup of orange juice
   c. 1 cup diet soft drink
   d. 1 cup skim milk
2. Signs of ketoacidosis (DKA) include:
   a. Shakiness
   b. Sweating
   c. Vomiting
   d. Low blood glucose
3. Which of the following is a free food for people with diabetes?
   a. Any unsweetened food
   b. Any food that has "free fat" on the label
   c. Any food or drink with less than 20 calories or less than 5 grams of carbohydrate per serving.

d. Any food that is "sugar-free" on the label

4. AIC is a measure of your average blood glucose level for the past:

   a. Day

   b. Week

   c. 3 months

   d. 6 months

5. Which is the best method for home glucose testing?

   a. Urine testing

   b. Blood testing

   c. Both are equally good.

6. The best way to take care of your feet is to:

   a. To look and wash them each day.

   b. Massage them with alcohol each day.

   c. Soak them for one hour each day.

   d. Buy shoes larger than usual.

7. If you have taken rapid-acting insulin, you are most likely to have a low blood glucose reaction in:

   a. Less than 2 hours

   b. 3-5 hours

   c. 6-12 hours

   d. More than 13 hours

8. Just before lunch, you forgot to take your insulin at breakfast. What should you do now?

a. Skip lunch to lower your blood glucose.

b. Take the insulin that you usually take at breakfast.

c. Take twice as much insulin as you usually take at breakfast.

d. Check your blood glucose level to decide how much insulin to take.

9. Which of the following is usually not associated with diabetes:

a. Vision problems

b. Kidney problems

c. Nerve problems

d. Lung problems

10. A low blood glucose reaction may be caused by:

a. Infection

b. Heavy exercise

c. Overeating

d. Not taking our insulin