DM Education on Lifestyle Modification to Improve DM Knowledge Retention and Self-Care Confidence

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DM education on lifestyle modification to improve DM knowledge retention and self-care confidence

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**Background and Significance**

Diabetes occurs when the pancreas does not produce enough insulin or the body becomes resistant to insulin. Insulin is an important hormone that regulates blood glucose. Among different types of diabetes, Type 2 diabetes takes up to 90-95%, affecting approximately 37 million people in America (C.D.C., 2023). Type 2 diabetes also has increased rapidly worldwide due to the sedentary lifestyle and obesity (Garcia-Molina et al., 2019). Uncontrolled diabetes can cause long-term complications such as cardiovascular disease, kidney insufficiency and amputation. These consequences would decrease life expectancy and burden people with diabetes financially, physically and mentally. According to the American Diabetes Association (A.D.A.) new research shows that $327 billion was spent on diagnosed diabetes in 2018 compared to $245 billion in 2012. That is a 26% increase in five years (A.D.A., 2023). Another recent study demonstrated that people with diabetes were hospitalized three times more than the general population (Dhatariya & Umpierrez, 2023).

Diabetes education focuses on self-management, including diet and exercise and emphasizes diabetes knowledge and skills (Lambrinou, 2019). This education would also improve your self-confidence in managing diabetes as you gain confidence in your clinical practice. Engaging the affected personnel to participate in the process increases health literacy and self-care as their participation improves their critical thinking and decision in controlling diabetes (Lambrinou, 2019). Modified lifestyle management and improved self-confidence will decrease long-term complications, morbidity, and mortality.

Nurses can play an important role in providing diabetes education. In the U.S.A., most diabetes education is provided by nurses in community and acute-care hospital settings. The
results of nurses' education shows that patients are involved in their care by developing their critical thinking, improving their diabetes skills, and gaining self-confidence (Celik et al., 2022).

**Purpose/Aims**

The purpose of this evidence-based practice project provide diabetes education to improve diabetes knowledge and self-care confidence for patients with type 2 diabetes admitted to a tertiary hospital in San Diego. First, this study assessed patient’s DM knowledge and self-confidence before the education was provided. Second, based on the initial assessment and the education on lifestyle modification, 3 months of follow up was assessed to see if the education had been effective. Third, the study determined if the education also improved the self-confidence in managing diabetes on their own. At the end of the study, by gaining the diabetes knowledge and increased self-confidence, we hoped that the patients would reduce hospital readmission, complication and improve their quality of life.

**Evidence-Based Practice Model**

This project was based on the 5A Model: Assess, Advise, Agree, Assist and Arrange. The five A model is a behavior change counseling model that promotes a healthier lifestyle. This model assesses the patients' behavior, advising specific and personalized treatment options. The Agree step will involve the patients’ willingness and motivation and the assist step will provide education teaching. Finally, the last arranged step will be follow-up calls to ensure the behavioral changes have been made and continued.

**Literature Review/Evidence for the Problem**

Nazar et al. (2016) stated that diabetes education plays a vital role in managing diabetes, making people with diabetes more aware of fighting against diabetes.
Camargo-plazas et al. (2023) included 44 articles to see how diabetes education affects knowledge and behavior changes in populations over 65 in Western countries with type 1 and type 2 diabetes. Eighteen out of forty-four studies showed that diabetes knowledge was improved, and 2 of 4 reported improved self-efficacy scores. This review also demonstrated the improved A1c level after diabetes knowledge on dietary and physical activity from 9.2 to 7.2, which is significant. Another study in this review also suggested that people who receive diabetes education show increased self-care behavior, which shows self-management skills. The review strongly supports diabetes education to enhance knowledge and improve self-efficacy and quality of life.

Another study conducted by Ernawati et al. (2021) using a systematic literature review supports diabetes education to improve self-management and confidence. The study conducted 15 studies, and six out of 15 studies show good effects of education on type 2 diabetes patients. One of the studies performed in Ethiopia had 220 participants for diabetes education, exercise, and glucose monitoring. The study showed that people had significant improvements in knowledge and lifestyle changes. Several other studies proved improvement in quality of life from diabetes education. The study concluded that diabetes education has a positive effect on improving knowledge, self-efficacy, and clinical conditions.

Sun et al. (2017) demonstrated in the study that diabetes education is an effective way of managing diabetes. The researchers collected 69 studies that included 22,009 participants with diabetes. Sixty-four studies showed that the intervention groups lost weight of 1.17 kg - 2.07 kg compared to the control group (95% CI 0.50, 1.52; p < 0.001), which is a considerable risk factor for diabetes. In addition, the lifestyle interventions successfully reduced 2h blood glucose and HbA1c (95% CI 0:0.01 to 0.14, p=0.078) after 12 months of intervention. However, the study
found that the dietitian-delivered intervention was more effective than the non-dietitian-delivered intervention but still showed improvement in diabetes management when the non-dietitian provided the education. This study concludes that the findings suggest that diabetes prevention programs, including nutrition, are an effective way to improve diabetes.

Garcia-Molina et al. (2020) also collected a systematic review and meta-analysis to demonstrate the effectiveness of lifestyle intervention by implementing diabetes education. This article included 28 studies, and the maximum sample size was 1004 participants. The post-intervention hemoglobin A1c level improved when the follow-up was 2-3 months after providing the education. The study also found evidence that the effectiveness of lifestyle interventions was more successful when teaching was provided compared to the standard diabetes care in glycemic control. When there was a lifestyle intervention, including physical activity and nutrition, hemoglobin A1c level was reduced, and the impact was much stronger. However, when the education included self-management skills, patients had higher improvement in hemoglobin A1c than when it included diet and physical activities only (95% CI -0.24, P=0.036).

Adam et al. (2018) conducted research on diabetes self-management education methods on knowledge, attitudes, and behaviors. This study proved that the Canadian conversation maps (CMs) had significant knowledge retention at 3 months compared to the traditional education (TE). CMs are a method of using images and symptoms and engaging with people with diabetes rather than providing PowerPoint lectures by Registered Nurses. The CMs group decreased by 1.29% of Ac1 compared to the TE (0.76%) (p<0.05). Also, the attitude scale showed significant improvement in CM groups when the TE group did not show any improvement (p=0.59). This study supports diabetes self-management and education to reduce health complications from poorly controlled diabetes.
Design

We developed two surveys. The first survey consisted of fifteen questions about general diabetes knowledge. This pre-test survey was assessed the patient’s knowledge retention before and after the education has been provided. The post-test survey was provided at the time of discharge, two weeks, six weeks and 12 weeks after discharge. The second survey measured self-confidence level before and after the education.

Ethical Considerations

This study was approved by the Institutional Review Board of the University of San Diego, Hanh’s School of Nursing and the Aligning and Coordinating Quality Improvement, Research, and Evaluation (ACQUIRE) committee of the hospital.

Evaluation of Current Practice

Based on the literature view, the doctor of nursing practice (DNP) student assessed how diabetes education was provided on a medical-surgical/telemetry floor in a tertiary care hospital in San Diego. The hospital provides a diabetes education video using a program called Emmi. However, after providing the video, a few patients received follow-up visits at beside by the diabetes nurses only if they were recently diagnosed with diabetes. Even with the visit, there is no assessment on how much the patients learn or are confident in managing their diabetes after the video education. The patients and the diabetes nurses do not discuss the videos they watched. There is no measurement if the patient understands the material nor there is no follow up after the video. In addition, the nursing staffs on the floor were not providing diabetes education to the patients even though the diabetes pamphlets were available on the unit due to high acuity and census. The floor staffs do not have time to spend on diabetic educations. Therefore, the DNP
student decided to implement diabetes education to the patients admitted to the floor using the hospital pamphlets.

**Project Development, implementation, and Measurement Period**

This project was to evaluate diabetes knowledge retention assessment and confidence level provided to the patients admitted to a medical-surgical/telemetry unit from July 2023 to November 2023.

The DNP student developed the idea and plan with the mentor from the university nurse practitioner program and diabetic educator at the tertiary hospital in San Diego. Afterward, the DNP student made an initial stakeholder presentation to the unit manager and other nurses at the 20-bed medsurge/telemetry floor of a tertiary hospital. This project was submitted to the Human Subject Review Board (HSRB) of the University of San Diego and the Aligning and Coordinating Quality Improvement, Research, and Evaluation (ACQUIRE) committee of the hospital for review. Both the HSRB and ACQUIRE committee approved the project that does not have human subject research. The project received approval from both organizations to start a project in July 2023.

The DNP student and another diabetes champion nurse from the floor created 15 questionnaires based on the pamphlets and confidence level chart. The 1:1 education was created to provide 30 minutes to an hour of education on diabetes.

The study had inclusion criteria as follows: Alert and oriented English-speaking patients with a medical history of diabetes, willing to improve their diabetes condition, ages over 18 years old, without any cognitive impairment. The exclusion criteria were patients who will not be
able to have a phone follow-up since the DNP student would not be able to collect follow-up calls for their knowledge retention and confidence level measurement.

Eligible patients were screened by the DNP student upon their admission. The patients were informed of the purpose of the study and received their willingness to participate and learn about their condition. The DNP student provided a pre-test of the diabetes knowledge and confidence level before the 1:1 education. Upon discharge, the patient receives the second assessment as a post-test. After the discharge, the patient had phone follow-ups at two, six, and twelve weeks to see any changes in the knowledge retention and confidence level.

**Results and Discussion**

Before the start of the project, we collected the data between January 1st, 2023 and April 22nd, 2023, 161 people with a past medical history of Type 2 diabetes were admitted to the floor. Some patients received diabetes education through the video education material tool called EMMI. Still, there was no assessment to measure if the education helped the patient to improve their DM knowledge or assess their self-care improvement with any follow-up. The DNP student made diabetes questionnaires based on the hospital DM education materials and used the confidence level evaluation tool created by Grundy to assess the patient’s confidence level in managing DM.

The screening for patients with diabetes was performed from July 22, 2023, to November 30, 2023. Only five people were able to fully participate the project due to the lost phone follow-up and unwilling to participate in the middle of the project.
The patients were asked the same 15 questionnaires before and after the education and at each follow-up. The mean of the pretest of the five patients was 7.8 out of 15. As the follow-up call continued, the patients remembered the answers to the questions. The mean of the knowledge retention increased each time they were assessed from 7.8 to 11.4, 12, 12.4, and 13.

The confidence level also showed improvement as the follow-up continued. Each time the DNP student calls and asks about their knowledge retention, knowing their knowledge has increased, they feel more confident about Diabetes management. Also, three out of five patients realized their glucose levels had improved after the education had been provided. The average of the pretest of confidence level was 3 out of 5 but upon the completion of the test, the mean of the test of confidence level was 3.75 out of 5.
The objective of this project was to provide Diabetes education to patients with diabetes to increase their diabetes knowledge retention and improve their confidence level in managing diabetes on their own. The result of the project showed improved retention and self-care confidence levels by 1.6 times and 1.25 times respectively. Besides, all patients felt that their blood sugars were better controlled by modifying their diet and increasing physical activities.

**Study limitations**

This project had several limitations. A significant issue was the small sample size. The unit had more than 150 patients with diabetes during the time of the data collection. However, more than half the patients with DM were Spanish-speaking, which was an exclusive criterion. Secondly, patients refused or did not care to improve their diabetic condition, though they had complications from the diabetes, such as limb amputation and chronic ulcers in their legs. The
huge population of the unit is mainly IV drug users or homeless and many patients were not interested in the study or unwillingness to improve their diabetes condition. Also, due to the acuity and census, the nurses did not have enough time to screen and educate the patients when the patients were available.

**Conclusion and Recommendations**

This evidence-based project proved that providing diabetes education improves knowledge retention and confidence level in managing diabetes. Incorporation of inpatient diabetes education and outpatient follow up will strengthen the diabetes knowledge and confidence level, which will allow the patient to manage their diabetes on their own. This will reduce admission to the hospital, shorten hospital stay, and complication caused by diabetes. Future project should focus on extending the follow up to see if their diabetes knowledge retention and confidence level improve or remain high in a long term after 3 months of follow up. Also inpatient diabetes education should be encouraged and the in-patient nurses or diabetes educators should be encouraged to spend more time in patients education.
References


