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The Use of Telehealth to Improve Patient Outcomes Among Prediabetes and Diabetic Patients in
a Rural Women's Health Clinic: An Evidence-Based Practice Project

UNIVERSITY OF SAN DIEGO
Hahn School of Nursing and Health Science
Byster Institute of Nursing

DOCTOR OF NURSING PRACTICE

by

Alejandra Villegas

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Abstract

The Use of Telehealth to Improve Patient Outcomes Among Prediabetic and Diabetic Patients in a Rural Women's Health Clinic

Abstract

Background: Type 2 diabetes mellitus (T2DM) is a global problem. Lack of healthcare access affects the low-income population and telehealth can aid the problem. For newly-diagnosed T2DM patients, customary practice is a 3-month follow-up after they are diagnosed. Patients only have education on diet and medication given by the healthcare provider at the time of appointment. Patients can be overwhelmed and confused to grasp the information. Telehealth has become mainstream due to the current COVID-19 pandemic and that is why it is the right time to use it to help T2DM patients further. **Purpose of Project:** The project's goal is to help patients with prediabetes and T2DM decrease the hemoglobin A1C and, by doing this, decrease the disease's complications with an early understanding treatment and by having a provider answer their questions in a telemedicine appointment 2 weeks following diagnosis. **EBP Model/Frameworks:** The patients were newly diagnosed as prediabetic or were new patients coming to the clinic diagnosed with T2DM to start treatment. It is a retrospective and prospective project. The model selected for this project is the Advancing Research and Clinical Practice Through Close Collaboration (ARCC) model. **Evidenced-Based Interventions:** The evidence shows patients have higher satisfaction when they have access to a provider, including remote access. Newly diagnosed T2DM patients need repeated and reinforced education. Early teaching and medication adherence improves Ha1C levels and prevents T2DM complications. **Evaluation/Results:** A total of 20 patients' post intervention; the intervention showed an average - 0.1 to +1 point in Ha1c when comparing initial level versus 3 months follow-up. The reduction was higher in patients who had a new diagnosis and less in patients diagnosed in the past and had not been taking any treatment. **Implications for Practice:** Early intervention with patients diagnosed with T2DM can help lower their HgA1c numbers from early in the disease. Healthcare needs to adapt to patients' needs with a lack of access and resources to provide better care. The successful implementation of this project will prevent disease complications and hospitalizations. **Conclusions:** Telemedicine is an option that can help the patient have access to a provider. Many patients find a diabetes diagnosis shocking and scary. Having open communication with a healthcare provider can help them conquer the fear and start being proactive in their own care. T2DM is a prevalent topic and it is imperative to find the best evidence-based practice to help decrease the number of patients with complications from this disease.

KEYWORDS: A1C, diabetes mellitus, prediabetes, telehealth

The Use of Telehealth to Improve Patient Outcomes Among Prediabetic and Diabetic Patients in a Rural Women's Health Clinic

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The Use of Telehealth to Improve Patient Outcomes Among Prediabetic and Diabetic Patients in a Rural Women's Health Clinic

Type 2 diabetes mellitus (T2DM) is a global problem. According to Zheng (2020), the number of cases worldwide has quadrupled in the past 30 years. T2DM may represent a more dangerous and prominent mortality factor in the United States than previously believed. T2DM affects males and females equally and the incidence peaks at approximately 55 years of age. There is a lack of access to healthcare that affects the low-income population and telehealth is believed to aid with the problem. According to the Imperial County Health Status Report (2016), "15.9% of Imperial County adults reported being diagnosed with diabetes compared to 8.9% statewide and Imperial County's age-adjusted death rate due to diabetes on average in 2012-2014 (27.6 deaths per 100,000 population) is higher than the statewide rate (20.4)" (p.65).

Newly diagnosed or uncontrolled T2DM patients are typically scheduled to be seen every 3 months to re-evaluate the glycated hemoglobin (HbA1c) until glycemic control is achieved. They only have an education on diet and medication given by the healthcare provider at the time of appointment; this may lead to lack of understanding, anxiety, confusion, and unintentional noncompliance.

According to Faruque et al., (2017), telehealth follows-ups at short intervals can help improve medication compliance, reduce anxiety, and decrease HbA1c. One strategy that can potentially help ease the T2DM problem is implementing open communication with healthcare providers via telehealth. Telehealth has become mainstream due to the current COVID-19 pandemic and it can help T2DM diagnosed patients with limited access to healthcare.

Telemedicine can help decrease the gap of access and give patients and providers a way of

communication to explore treatment further before the next HbA1c is evaluated in the office; an opportunity to start seeing progress in their care.

So and Chung (2018) evaluated the effectiveness of telehealth on diabetes control in primary healthcare settings and their results were positive. However, it was a small study and does state that further studies are needed to evaluate telehealth and T2DM control. In their research, Sarathi et al. (2017) had 32 patients with newly diagnosed T2DM. They implement intense lifestyle modification (e.g., diet, exercise) and medication according to the T2DM treatment guidelines. The study was done over 2 years and the results indicated high reversibility of T2DM. These studies are promising to apply in rural communities with a lack of healthcare access and a problem with T2DM.

The number of people affected by T2DM is expected to grow in all regions of the world, affecting mostly the areas with lower income. There is an urgent need for public health and clinical preventive measures to decrease the number of people affected by T2DM (Khan et al., 2020).

Clinical Guidelines

The American Diabetes Association established guidelines for primary care providers. These guidelines aimed to help the provider achieve early diagnosis and prevention of complications. At 35 years of age, everyone should be screened for diabetes unless they have other health problems (e.g., obesity, hypertension, history of cardiovascular disease, women with polycystic ovary) or are from a high-risk race/ethnicity. By screening patients in time for early intervention, the provider can ensure evidence-based practice (EBP) is followed. The screening is done with different approaches, it can be by HgA1c, fasting blood glucose, 2-hour glucose tolerance test, or random plasma glucose readings. In their 2022 guidelines, the American

Diabetes Association stated telehealth could be a tool used to increase access to medical care and decrease diabetes complications. The first line of treatment for prediabetic patients is lifestyle modification and weight loss; if a patient has an increased risk for complications, then metformin can be started.

The Rationale for Model and Theory for EBP Project Question

According to Milner et al. (2018), EBP is a problem-solving approach to clinical decision-making that uses the best evidence with clinical expertise, patient preferences, and values to improve outcomes. EBP is an essential skill and ethical obligation for all practicing health professionals because it is strongly associated with improved health outcomes.

The model selected for this project is the Advancing Research and Clinical Practice Through Close Collaboration (ARCC) model. This model aims to build resources and train mentors who play a vital role in facilitating and sustaining EBP at the point-of-care and healthcare organization (Wyant, 2017). According to the ARCC model, many barriers exist in healthcare organizations that prevent clinicians from applying EBP. Some of these barriers are inadequate EBP knowledge, a lack of administrative support, disbelief that EBP can be effective in the patient's health, and nurse leader resistance (Melnik & Fineout-Overhold, 2019).

As with many other healthcare areas, the first step for ARCC model implementation is to assess the organization for readiness to change and implement the EBP project. The second step is to identify potential and actual barriers to facilitators of the EBP project. The third step is to identify EBP "champions" (i.e., the people most knowledgeable on the EBP project) to work with direct care nurses or specific areas of care. The fourth step is to implement the evidence into practice. The fifth and last step is to evaluate EBP outcomes. The ARCC model uses cognitive-behavioral theory to guide behavioral change in individual clinicians toward EBP.

Implementation of the ARCC Model in healthcare systems can enhance clinicians' beliefs, implement evidence-based care, improve patient outcomes, and move organizational culture toward EBP (Melnyk & Fineout-Overhold, 2019).

The ARCC model fits the EBP project because of the use of mentors or champions to enhance the organization's knowledge on the topic. T2DM is a prevalent topic and it is imperative to find the best EBP to help decrease the number of patients with complications from this disease. In the setting where the project will be implemented, there may be a continuous change in healthcare providers and new hires; therefore, having a mentor with the expertise can help the organization sustain the culture of EBP.

Methods

Study Design

The project is a retrospective and prospective chart review (i.e., 12 months prior, 3 months post-intervention). Participants were either newly diagnosed T2DM patients or new T2DM-patients to the clinic who were started on oral antidiabetics and advised in lifestyle modifications. The exclusion was patients who were started on insulin as it represented a different treatment regimen. Patients who had been using insulin long term could be included.

Study Setting

A retrospective and prospective standardized chart review was performed for 12 months prior and 3 months post intervention in order to achieve an adequate sample. Inclusion criteria were patients with the following ICD-10 codes: T2DM without complication, T2DM with hyperglycemia, T2DM without use of insulin. Exclusion criteria were pediatric patients under the age of 18-years-old, patients without the specific ICD-10 codes, diabetes type 1, and insulin-dependent diabetic patients.

Study Protocol

The project was feasible as it only involved retrospective and prospective data collection. The student was responsible for collecting the data promptly. One risk of this study was the loss of a laptop computer with sensitive patient health record information; however, the computer was encrypted and password-protected to prevent a breach of health record confidentiality.

Results

Figure 1

Pre and Post Intervention HgA1c Levels

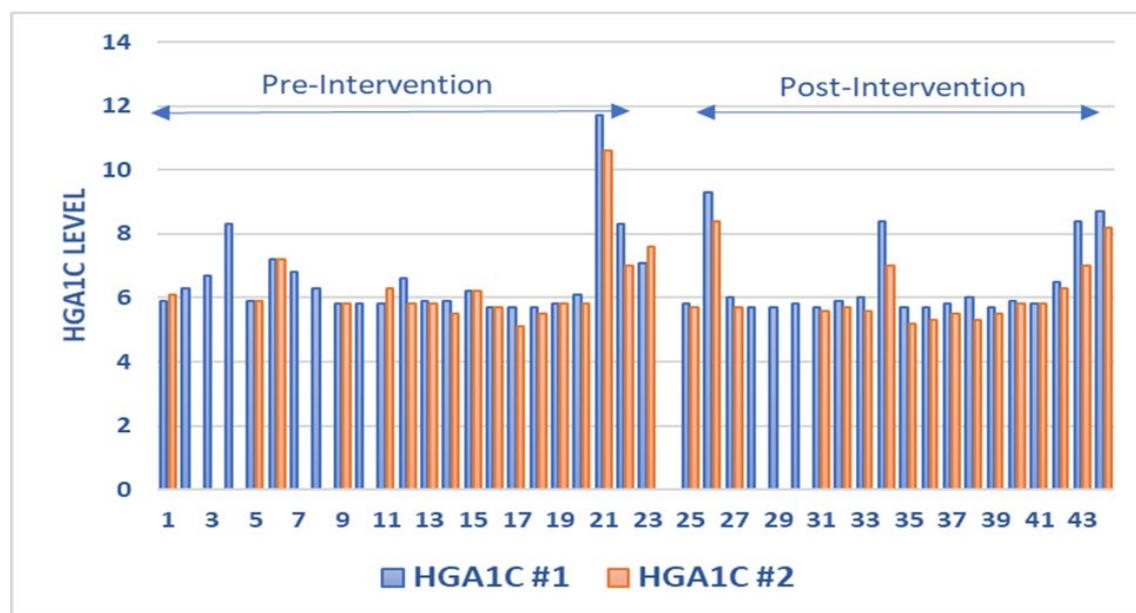


Figure 1 displays the HgA1c levels pre-intervention (blue) and the HgA1c levels post-intervention (orange). There were 23 patients' pre-intervention, but 3 patients did not follow up, resulting in 20 patients for the post-intervention data. The HgA1c was lowered in 16 patients' post-intervention. All patients had a telehealth follow-up and treatment adjustments were made when necessary. There was a decrease of at least 0.5 to 1 point in the HgA1c levels for postintervention patients.

Limitations

The limitations found for this project were the lack of follow-up by patients. Patients were called four or more times in order to encourage follow up with the provider. The increased work for the medical assistants was an issue for the flow of the office hours. Another limitation found in the project was patients not having access to a phone due to them living in Mexicali, a problem with a phone line, or no internet access.

Potential Cost Benefit Analysis

The average annual medical cost for a patient with diabetes is \$16,752 per year. There is no added equipment cost for telehealth services because the clinic already has a system in place. There is no added cost to implement intervention and provider education as the person executing the project was a volunteer DNP student. With the implementation of the project, there was an increase in patient outreach and patient volume without overwhelming the office. An increase in revenue was estimated to be between \$3,840 and \$9,600 a year.

Conclusion

This project has the possibility of helping a patient with T2DM decrease the complications of the disease by an early understanding of treatment and by having a provider answer their questions utilizing telehealth at short intervals following diagnosis. Diabetes is a global problem and early intervention with patients diagnosed with T2DM can help lower their HbA1c numbers early in their disease. Healthcare services should be adapted to patients who do not have access and resources to provide better care. Telehealth is an option that can help the patient have access to a provider. Many patients find a diabetes diagnosis shocking and upsetting; having open communication with a healthcare provider can help them conquer their

fear and become proactive in their care. Knowledge is power and healthcare providers can help patients achieve this power.

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