Title of Project: The Impact of Healthy Eating Among Patients With Type II Diabetes

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Introduction and Problem

Introduction

- The World Health Organization (WHO, 2021) acknowledged diabetes is a chronic life threatening disease that is increasing in prevalence.
- The Centers for Disease Control and Prevention (CDC, 2021) identified diabetes to be the 7th leading cause of death in the United States
- The increasing prevalence of diabetes is a national and global economic burden (Berbudi et al., 2020; Dao et al., 2019)
- The serious complications that can result from poorly controlled diabetes are leg amputations, blindness, renal disease, cardiovascular disease, and untimely death (WHO, 2021).
- Effective strategies are needed to manage the disease, such as diabetes self-care education which can be by healthcare providers to help type II diabetic patients manage and control the complications associated with their disease (WHO, 2021).
- The New York State Department of Health (2020) data showed that there were two million individuals diagnosed with type II diabetes in 2019 within the State of New York.
- The New York State Department of Health (2020) identified the need for evidence-based interventions to be implemented in practice to help enhance population outcomes, care systems, and quality improvement through promoting self-management education for patients diagnosed with diabetes.
- The provision of diabetes self-management education have proven achieve clinical and behavioral outcomes among patients with type II diabetes (Dao et al., 2019).

The Problem

- The population affected were type II diabetic patients who were adults aged 65 and over
- The nursing staff at the project site (nursing rehabilitation center) provides care to older type II diabetic patients.
- There was no diabetes educator or diabetes education program to assist patients to understand the disease and adopt healthy behaviors for glycemic control.
- The Director of Nurses asserted that most of the diabetic patients refused to eat the meals offered at the nursing rehabilitation center and instead ate food brought in by family members
- The management of diabetes was based on routine blood glucose assessment and coverage with insulin sliding based on the results.
- The project site sought to implement an evidence based education program for the management of type II diabetes management among the older adults

Purpose of the Project

- The purpose of this quantitative quasi-experimental quality improvement project was to determine if or to what degree the implementation of the American Association of Diabetes Educators seventh edition (AADE7) healthy eating program would impact the pre-prandial blood glucose levels when compared to current practice among type II diabetic patients in a skilled nursing rehabilitation center in an urban area in New York.
- The healthcare providers who implemented the AADE7 education program were 14 registered nurses and 5 charge nurses (the 5 charge nurses were also registered nurses) who (according to the Director of Nurses) were employed for over one year at the time of the project, worked the day and night shifts, and had access to documenting using EPIC software.
- The skilled nursing rehabilitation center is located in a densely populated urban area in New York. (Neighborhood Scout, 2019).
- Approximately 65% of this county's population were older adults over 65 years (Neighborhood Scout, 2019). Over 34% of the people were Blacks, 18.9% were Latinos, and 12.7% were of Asian descent (Neighborhood Scout, 2019)
- The diabetes education supported the patients in making healthy lifestyle adjustments, participating in health-seeking behaviors to promote healthy living, and taking the necessary steps to prevent complications and improve their health outcomes

Clinical Question(s)

QI: If or to what degree the implementation of the American Association of Diabetes Educators seventh edition (AADE7) healthy eating program would impact the pre-prandial blood glucose levels when compared to current practice among type II diabetic patients in a skilled nursing rehabilitation center in an urban area in New York?

Variables

- The independent variable was the AADE7 diabetes education program that was used for the weekly structured educational sessions.
- The dependent variable was the patients' pre-prandial blood glucose levels that were measured as numerical values in milligrams per deciliters. The pre-prandial blood glucose levels of the patients were checked by the nurses using the Nova Stat Strip glucose monitor.

Data Analysis

- The baseline and post-implementation data for the pre-prandial blood glucose levels were extracted from the Epic electronic system by the project site's Director of Nurses and given to the primary investigator in a de-identified Word report.
- The patients' outcome data on blood glucose levels were entered into an Excel spreadsheet using a unique study identifier to match each patient's baseline and post-implementation blood glucose levels. After all data entry was completed, data were exported to IBM SPSS version 27 for statistical analysis.
- Data were checked for outliers and normality using skewness analysis and a Shapiro-Wilk test (Polit & Beck, 2017). No outliers or severe skewness were identified.
- The data were evaluated to determine if the assumptions of the inferential paired samples *t*-test.
- A paired *t*-test procedure was used to determine whether the mean difference between two sets of observations was significantly different from zero (Mishra et al., 2019).
- The significance level was set to .05 to indicate that a *p*-value of less than .05 would be considered statistically significant (Hernandez-Boussard et al., 2019).

Descriptive Data

- The total sample was *n* = 32 patients from whom the baseline and post-implementation data on the pre-prandial blood glucose levels were collected.
- The descriptive data for the demographics of the sample population (*n*=32) were the age, sex, highest level of education and marital status
- The demographic, baseline, and post-implementation data (pre-prandial blood glucose levels) were analyzed by calculating the means and percentages
- The compiled descriptive data included the gender, age, the highest level of education, and marital status of the 32 type II diabetic patients

Results

- **Table 1** shows descriptive data (*n, %)* are displayed in Table 1.
- The sample population, there were 14 males (43.8%) and 18 females (56.3%). Of the 32 patients, 17 (53.1%) were 65 years of age, and 15 (46.9%) were older than 65 years old.
- The highest level of education among the 32 patients included in the project showed 7 (21.9%) had completed junior high school, 15 (46.9%) had completed high school, and 10 (31.3%) had received a college education.
- The marital status showed 11 (34.4%) of the patients were single, eight patients were divorced (25.0%), and 13 patients were married (40.6%)

Table 1

Demographics of Sample Population N=32

Variable	*n*	%
Gender		
Male	14	43.8
Female	18	56.3
Age		
65	17	53.1
> 65	15	46.9
Highest Level of Education		
Junior High School	7	21.9
High School	15	46.9
College	10	31.3
Marital Status		
Single	11	34.4
Divorced	8	25.0
Married	13	40.6

Results (cont.)

- **Table 2** shows 6 patients (18.6%) had pre-prandial blood glucose levels < 180 mg/dl at baseline and post-implementation.
- 8 males (25% of the sample) were older than 65 with pre-prandial blood glucose levels greater than 180mg/dl at baseline.
- 5 patients (15.6%) with pre-prandial blood glucose levels greater than 180 mg/dl at post-implementation.
- Among females 65-year-old, 11 patients (34.4%) had pre-prandial blood glucose <180 mg/dl at baseline.
- 9 patients (28.1%) had pre-prandial blood glucose levels less than 180mg/dl post implementation.
- Among the females older than 65, seven patients (21.9%) had pre-prandial blood glucose levels greater than 180 mg/dl before implementing the project.
- 4 patients (12.5%) had pre-prandial blood glucose levels greater than 180mg/dl

Table 2

Comparison of Pre-Prandial Blood Glucose Results at Baseline and Post-Implementation

Variable	Baseline		Post	
	n	%	*n*	%
Males 65 < 180 mg/dl	6	18.6	6	18.6
Males >65 >180 mg/dl	8	25.0	5	15.6
Females 65 <180 mg/dl	11	34.4	9	28.1
Females > 65 >180 mg/dl	7	21.9	4	12.5

Inferential Statistics

- The baseline and post-implementation pre-prandial blood glucose levels of the patients were analyzed using a paired t-test analysis
- Table 3 displayed the results to compare the means of the baseline and post-implementation results of the pre-prandial blood glucose levels.
- The results showed a decrease in the mean pre-prandial blood glucose levels of the patients from baseline (M = 169.59, SD = 34.71) to post-implementation (M = 160.96, SD = 32.08), t (31) = 2.52, p = .017.
- The *p*-value is less than .05, which indicating a decrease in blood glucose level was statistically significant.

Table 3

Comparison of Pre-Prandial Blood Glucose Results at Baseline and Post-Implementation

Variable	Baseline		Post-Implementation		*t*	*df*	*p*-value
	M	*SD*	*M*	*SD*			
Pre- Prandial Blood Glucose Level	169.59	34.71	160.96	32.08	2.52	31	.017

Discussion

- The results showed a reduction in the mean pre-prandial blood glucose level of the patients from baseline of 169.59 to 160.96 post implementation of the AADE healthy eating program.
- The standard deviation (SD) for the baseline pre- prandial blood glucose level was 34.71, compared to the standard deviation of 32.08 for the post implementation pre-prandial blood glucose levels.
- The *p*-value was .017 which is an indication that statistical significance was achieved in the decrease of the blood glucose level when the baseline and post implementation groups were compared (Polit & Beck, 2017).
- The clinical significance of the project is that the patients' blood glucose levels decreased after the implementation of the AADE healthy eating program.

Project Limitations

- The limited sample from the population, which only included participants 65 years and older.
- The characteristics of the sample used can potentially restricted the application of the project's findings to similar environments and populaces.
- The second weakness was the inability of the primary investigator to collect demographic data on the characteristics of the nurses. Collecting the demographic data on the nurses would have provided an insight into the highest level of education and years of practicing as nurses.
- The primary investigator would have been able to use descriptive statistics (by calculating percentages) to analyze the nurses' demographic data and determine the highest level of education among the nurses.
- This project did not collect pretest-posttest data on the nurses' knowledge to determine the impact of the educational intervention on their knowledge or an evaluation of their prior knowledge of diabetes management with education on healthy eating.
- Even though the results showed improvement in the pre-prandial blood glucose levels among the participants, the findings may not be generalizable because the project was limited to one nursing rehabilitation center.
- It cannot be proven or determine that the AADE program actually led to the decrease in the patients' blood glucose levels.

Recommendations for Future Projects and Practice

1. Future projects and research should evaluate nurses' knowledge of diabetes care before and after implementing educational interventions. This approach will allow clinicians to collect data that will help determine how prepared nurses are in the provision of self-care education for the management of diabetes.
2. Future projects should be conducted over a more extended period to provide long-term follow-up (at least six months) to determine the impact of a healthy eating program on the patients' blood glucose levels and health outcomes. This project was cost-effective and feasible, but the time allowed for implementing, collecting, and analyzing the data collected was limited. As a result, the limited time-restricted collecting data for a prolonged period (Siminerio et al. (2018)
3. Use a combined approach of the interventions from the AADE7 self-care behaviors, such as eating healthy and exercising to lower blood glucose levels (CDC, 2021).
4. Select participants for projects from a diverse age range. For instance, future projects should include middle-aged adults (30-65) diagnosed with type II diabetes to evaluate the impact of education on diabetes care (Siminero et al., 2018).
5. Recruit participants for a larger sample size. The sample size for this direct practice improvement project was 32 patients with type II diabetes (Siminerio et al., 2018).

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