Diabetic Education for Licensed Vocational Nurses (LVN) to Improve Glycemic Control in Patients with Type 2 Diabetes Mellitus in Ambulatory Care Setting

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This project is in partial fulfillment of the degree requirements for the Doctor of Nursing Practice at Touro University Nevada

Overview

Project Aim

- To address the issue of limited time available for healthcare providers to provide diabetes education.

What was Achieved

- Improve glycemic control among T2DM patients
- LVNs improved their diabetic knowledge and understanding.
- The organization adopted the project.

Key Clinical-Leadership Implications

- DNP-prepared nurses are significant in using evidence to improve health outcomes for T2DM patients.
- Promote continuous diabetes education.

Problem and Background

Problem

- Healthcare clinic providers often struggle to provide comprehensive diabetic education to T2DM patients due to limited visit time.
- Requiring LVNs with insufficient diabetic knowledge bridges the gap in educating patients

Background

- Inadequate provider time for patients' education often requires LVNs to step into educational roles that providers cannot offer due to time constraints.

Literature Review: Themes

Theme 1: Importance of Glycemic Control

- T2DM patients must understand poor glycemic controls' precise dynamics and impacts.
- Controlling blood sugar reduces T2DM risk factors and complications
- Reduce diabetic-related complications (Afroz et al., 2019).

Literature Review: Themes

Theme 2: Nurse Education

- Empowering nurses is essential for promoting effective diabetic self-care management.
- Nurse education boosts motivation and confidence.
- The Diabetes Self-Management Education and Support (DSMES) improves quality care (Tamiru et al. 2023).

Literature Review: Themes

Theme 3: Lifestyle Behavioral Changes

- Incorporating a nutritious diet and regular exercise
- Adopting a healthy lifestyle can help reduce sedentary behavior.
- Better outcomes include weight loss, improved blood pressure, and lipid control.

National Guideline

- The project used the Diabetes Self-Management Education and Support (DSMES) national guideline
- It was developed by the Association of Diabetes Care and Education Specialists (ADCES)
- It is crucial to achieving educative measures among nurses (Ryan et al., 2020)
- DSMES allows the patients to develop behaviors crucial to coping with and managing T2DM (Macido, 2019)
- The ADCES recommends that health organizations apply DSMES in nurses training to help improve quality measures (Powers et al., 2020)

Project Aims Presented

Aim

- Due to inadequate provider time, the project aimed to standardize and improve the level of diabetes education among LVNs and to ensure consistency in their understanding as they play a crucial role in educating T2DM patients.

- **Objectives**

1. To improve and standardize diabetes knowledge among LVNs at the project site.

2. To improve diabetic education and self-care habits for diabetic patients seen at the project site.

3. To enhance glycemic control by improving the delivery of diabetic self-care behaviors.

Framework for the Quality Improvement

Plan-Do-Study-Act (PDSA)

Plan

- Collecting baseline data and piloting ideas were done at this stage

Do

- Involved using PowerPoint and charts to educate the LVNs.
- Data was collected from the LVNs through interviews (Chen et al., 2021)

Study

- Evaluate the results of the interventions
- Recording insights from stakeholder interviews (Chen et al., 2021)

Act

- Identification and adoption of the most appropriate changes
- Evaluating the plan and determine outcomes (Knudsen et al., 2019)

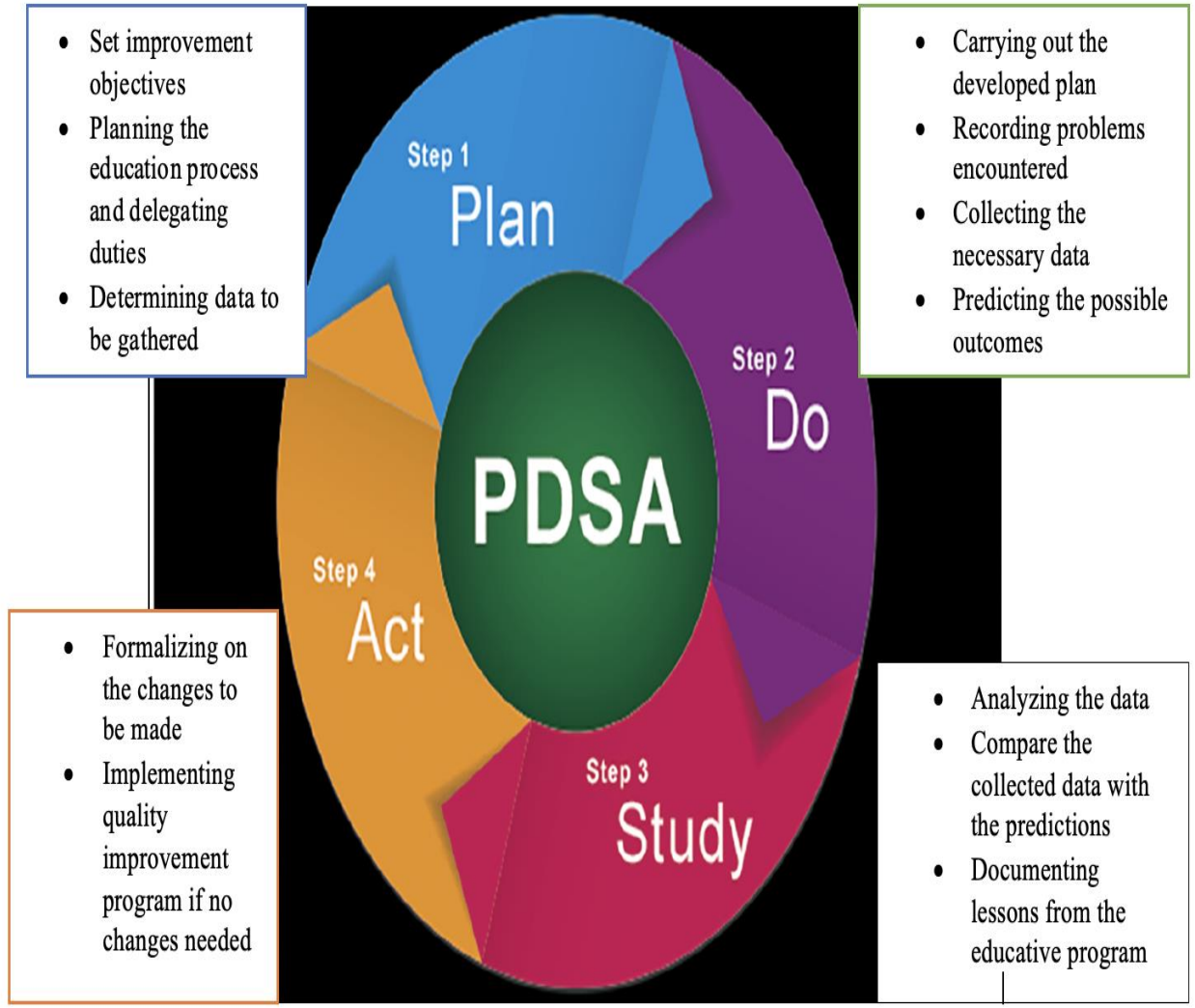


Figure 1: The Plan, Do, Study, Act (PDSA) framework

Methodology

Contextual Information

- Observations from the project site indicate that healthcare providers have limited time to educate T2DM patients, and LVN bridges the gaps in educating patients.

Population

- **Direct:** The Licensed Vocational Nurses (LVNs)
- **Indirect:** T2DM patients
- **Stakeholders:** Clinic manager, medical practitioners, director of clinical quality and compliance, and educational committee members

Methodology

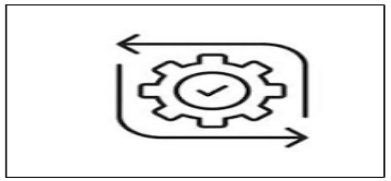
Setting

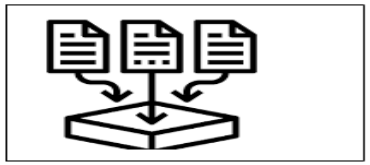
- The project site was a Federally Qualified Health Center (FQHC) in Los Angeles.
- Provides comprehensive services to improve community health.

Intervention

- Educating licensed vocational nurses (LVNs) will be the primary intervention.

Project Implementation Timeline





Week 1

11/1/23-11/7/23

Introduction of the project: the topic, purpose, and implementation.

Initial data collection of blood glucose levels from the electronic health record (EHR) from twenty different charts.

Recording blood glucose levels in a chart audit tool as pre-intervention data.

Assessing the Licensed Vocational Nurses (LVNs) diabetic knowledge base using questionnaires.

Distributing Diabetic education Questionnaires to the LVN for pre-test knowledge assessment

Week 2

11/8/23-11/14/23

PowerPoint presentations on diabetic education

Answering all questions and concerns regarding diabetic education

Providing Blood glucose logs

LVNs will provide comprehensive diabetic education to patients during their appointments.

Extracting Blood glucose levels from twenty charts in the electronic health record and entered in the chart audit tool for tracking

Week 3

11/15/23-11/21/23

Intervention implementation continuation

Week 4

11/22/23-11/28/23

Final data collection and analysis

Week 5

11/29/23-12/5/23

Result evaluation, presentation, and dissemination

- ❑ The project was scheduled to last five weeks
- ❑ There was no alteration to the timeline

Data Collection

- A diabetic education questionnaire was created using pre and post-test questions on T2DM to evaluate LVNs' knowledge base.

- A blood glucose chart audit that aids in tracking changes in blood glucose levels.

- PowerPoint presentation was adapted from the (DSMES) framework to develop the project's educational toolkit.
- A blood glucose log will be provided for the LVNs

- The baseline blood glucose levels were collected from HER
- Chart audits were reviewed twice weekly
- EHR was used to store data.

Evaluation

- Statistical package for social sciences (SPSS) was used to conduct the analysis.
- A chi-square test was used to examine pre-test and post-test interventions.
- The tests were conducted at an alpha value of 0.05.
- Descriptive statistics was used to examine the population.

Human Subjects Protection and IRB Standards

- ❑ The project was registered with Touro University (IRB).
- ❑The quality improvement project did not involve direct patient care
- ❑The IRB determined that a full review was unnecessary
- ❑Patients' details were coded
- ❑All data will be securely stored and destroyed after two years

Results/Findings

- 80 patients with diabetes, 36 were male and 44 were female participated
- Patients with T2DM experienced a significant improvement in their blood glucose levels
- the mean age of the respondents was 49.88, with a minimum age of 25 and a maximum age of 74
- The change represents a reduction in blood glucose level by 42.12%

Table 1

Gender of the Respondents

	N	%
FEMALE	44	55.0%
MALE	36	45.0%

Number of LVN Participants

Table 2

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Age of the Respondents	80	25	74	49.88	13.282
Valid N (listwise)	80				

Mean age of Respondents

Results/Findings

Mean Comparison of Pre-intervention (EHR) and Post-Intervention Blood Glucose Levels

Table 3

	Mean	Std. Deviation	N
Blood Glucose Level From the EHR	220.31	62.813	80
Blood Glucose Level at Post-intervention	127.51	21.297	80

Table 4

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Pre-intervention Blood Glucose Level	Male	36	227.67	73.064	12.177
	Female	44	214.30	53.114	8.007
Blood Glucose Level at Post-intervention	Male	36	127.36	22.414	3.736
	Female	44	127.64	20.599	3.105

- Males and females had an initial mean blood glucose level of 227.67 and 214.3 mg/dl
- The average blood glucose level reduced from 220.31 to 127.51 mg/dl after the educational intervention.
- Post-test scores showed that male and female levels changed to 127.36 and 127.64 mg/dl, respectively
- The males reduced their blood sugar levels by 44.06% compared to their female peers, who reduced by 40.44%.

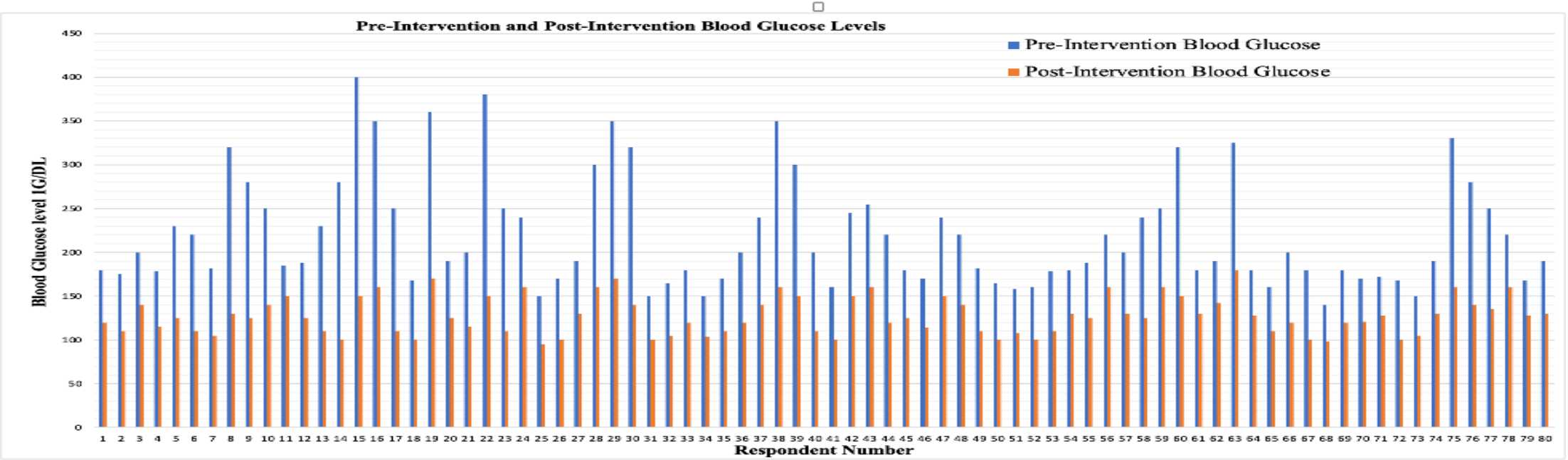
Results/Findings

Table 5

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	715.455[a]	600	.001
Likelihood Ratio	281.957	600	1.000
Linear-by-Linear Association	40.933	1	.000
N of Valid Cases	80		

- The Chi-square test value was given by $X^2(600) = 715.455$, $p = .001$
- The pre and post-test analysis returned a *p*-value of $p < .001$
- The data provided a statistically significant result
- The significance emphasizes the importance of LVN education to improve glycemic control



Graph 1

- All patients reduced their blood sugar levels after the intervention

Significance To the Project Site/Nursing Profession

Significance To the Project Site

- The project site will revamp its strategies to standardize LVN education
- Impact the organization's financial strength: Hiring more DNP–prepared nurses.
- Improved quality care delivery

Significance to the Nursing Profession

- Improved leadership systems
- Development of policies to combat T2DM prevalence
- Increased interprofessional collaboration

Limitations/Solutions

Limitations

- ❑ The project was limited to one clinic site
- ❑ The sample size of 80 was small
- ❑ The implementation period was short
- ❑ The data was self-reported

Solution to the Limitations

- ❑ Random sampling to reduce biases and selecting populations with general population traits
- ❑ Educating patient on fasting blood glucose levels recording

Project Sustainability/Future Dissemination

Project Sustainability

- ❑ The organization approved its adoption in all the clinic sites
- ❑ The management is in the process of forming a diabetic education committee.
- ❑ Quarterly staff education on T2DM.

Future Dissemination

- ❑ Will be shared in the DNP project repository
- ❑ Will be shared in the nursing organizations in California

Conclusion

- The project mitigated the lack of provider education due to time constraints
- The project improved diabetic education, self-care habits, and proper glycemic control among patients
- Proper policies are required to increase diabetes self-care management awareness

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