

SELF-BLOOD GLUCOSE MONITORING IN NON-INSULIN TYPE 2DIABETES

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PRACTICE PROBLEM

According to the Centers for Disease Control and Prevention (CDC; 2015), approximately 1.7 million new cases of diabetes are diagnosed among adults each year in the United States. In 2013, diabetes was the country's seventh leading cause of death and 29 million people, or 9.3% of the U.S. population, were estimated to have diagnosed or undiagnosed diabetes (CDC, 2015).

The CDC (2015) estimates that by 2050, one out of every three adults in the United States could have diabetes. Diabetes is also very costly to treat. In 2013, the cost of diabetes treatment in the United States reached an estimated \$245 billion.

For this evidence-based project, a problem-focused trigger was identified, which was the increase in adult patients with noninsulin type 2 diabetes with HbA1c values greater than 7.0 mg/dl over the prior 3 years. Leaders at the clinic supported the development of an intervention to address the problem, and a multidisciplinary team was formed to develop an evidence-based practice intervention. The research team identified SBGM as an appropriate intervention based on the existing literature. An intervention protocol was developed and tested with a small group of patients.

CLINICAL QUESTION

In type 2 diabetes patients between 20-70 y/o, how does setting a guideline in practice for monitoring of blood sugars with glucometers, compared to not using glucometers influence their hemoglobin A1C over a 3-month period?

PROJECT DESCRIPTION

The project followed a one group, pretest-posttest design. The research setting was a small, primary care group practice located in rural California. The intervention consisted of a structured SBGM protocol combined with regular care for noninsulin type 2 diabetic patients. This intervention was developed based on studies that have established the use of structured monitoring of SBGM in noninsulin type 2 diabetic patients (Parsons et al., 2017; Polonsky et al., 2011; Zhu et al., 2016).

The convenience sample consisted of noninsulin type 2 diabetic patients between the ages of 20–70 years old. Inclusion criteria included patients with a diagnosis of type 2 diabetes who were not currently taking insulin, were willing and able to provide informed consent, had access to daily use of a telephone, and were able to conduct SBGM testing. Patients who are diagnosed with type 2 diabetes have a HbA1c value greater than 6.5%, or a fasting plasma glucose greater than 126 mg/dl (ADA, 2017)

Participants were recruited and screened by members of the multidisciplinary health care team. The multidisciplinary team consisted of a family physician, a family nurse practitioner, a registered dietitian, and clinic staff members. All team members were trained about the daily SBGM intervention and how to monitor compliance.

All eligible participants were given information about the project and consented. Once enrolled, participants' HbA1c values were recorded and each participant was given a blood sugar log and instructed to log the values daily.

Clinical staff were educated about daily SBGM and how to monitor participant compliance. Clinic staff performed weekly phone calls to the participants and updated the multidisciplinary team weekly about participants' progress.

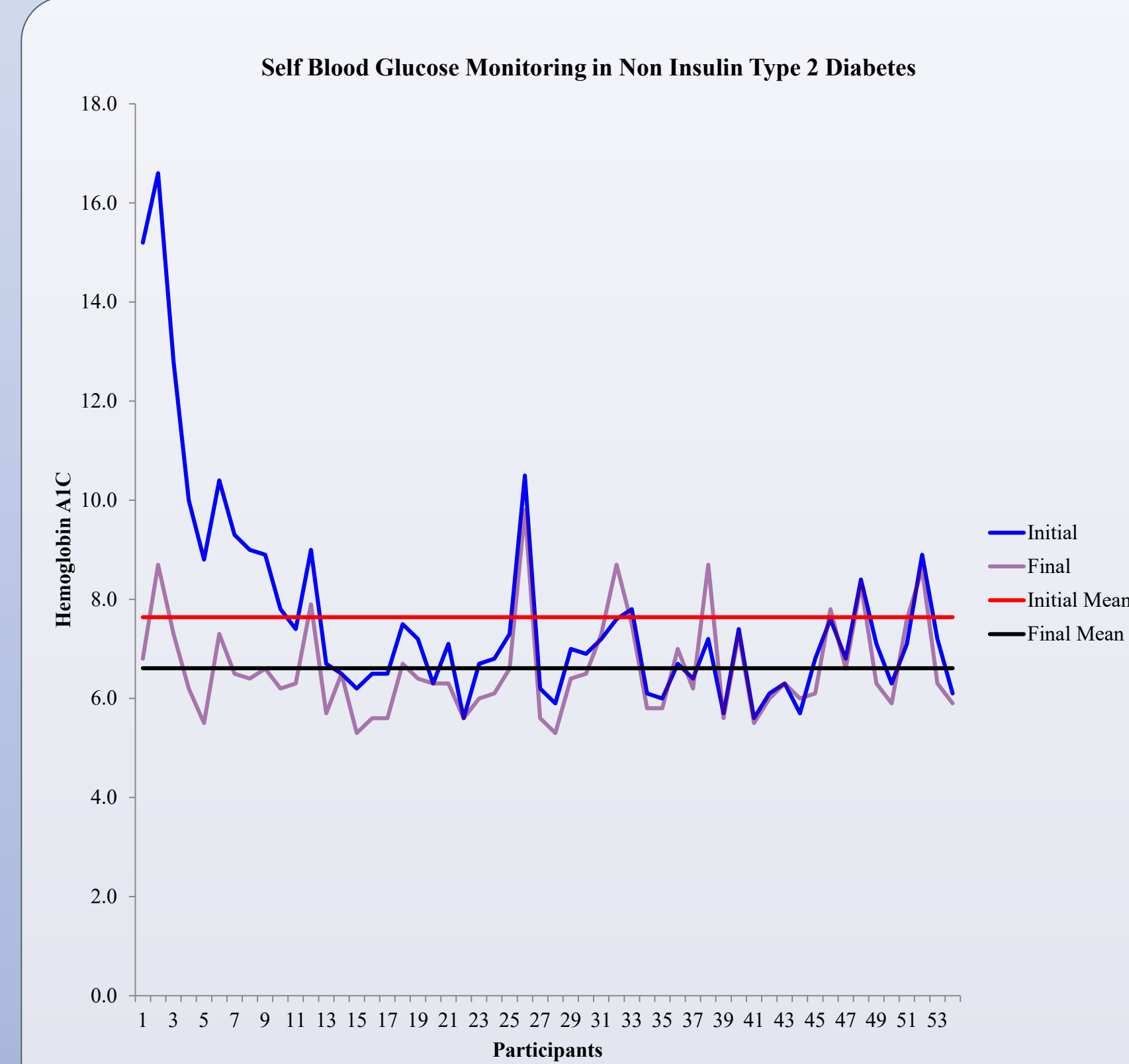
Clinic staff also provided the blood sugar log to the provider for evaluation and therapeutic adjustment when needed. Participants returned to the clinic once a month to review their blood glucose log with clinic staff.

Clinic staff clarified any patient questions or concerns and delivered the log to the health care provider for review. The health care providers evaluated the data in the blood sugar log and adjusted noninsulin medication as needed every month. This process was repeated for each participant for three months, and the results were documented accordingly.

DATE	TIME	BLOOD SUGAR VALUE	NOTES

PROJECT EVALUATION

Sixty patients enrolled in the project. Four participants were lost to follow up, and two participants were discontinued due to the required use of oral medications that disqualified them. Therefore, data were analyzed on 54 participants (Mean age = 52, range 20–70). Overall, there was a decrease in the mean HbA1c value from 7.6 mg/dl preintervention to 6.6 mg/dl postintervention, with a mean difference of 1.0 mg/dl. A majority of participants (77%; $n = 43$) experienced a decrease in their HbA1c values; 7% ($n = 4$) demonstrated no change, and 13% ($n = 7$) demonstrated an increase in their HbA1c values. Results agreed with existing SBGM research. No hypoglycemic events occurred during the project.



CONCLUSIONS

The findings of this evidence-based intervention confirm those of prior research on daily SBGM with noninsulin type 2 diabetic patients and can be generalized to other primary care clinics. Therefore, it is recommended that health care providers working in similar settings consider implementing a daily SBGM protocol with noninsulin type 2 diabetic patients. However, this project did not collect demographic information or control for potential confounding variables; therefore, it cannot be said with certainty that these findings can be duplicated in other settings or generalized to other contexts.

Future research in this area should use a larger sample size and consider the use of a control group to compare results of the intervention group. In addition, it would be beneficial to collect demographic data and evaluate differences in measures based on age, race, ethnicity, and co-existing chronic conditions.

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