

# **Tracking Carbohydrate Intake with a Mobile App and the Effect on Type 2 Diabetes Mellitus**

Chantell Corkern, DNP, RN

## **Structured Abstract**

### **LOCAL PROBLEM**

Diabetes Mellitus (DM) is a chronic metabolic disorder that is a fast-growing global issue with huge health and economic consequences. This ever-growing disease can lead to a multitude of comorbidities including heart disease and stroke. The estimated cost of DM is \$245 billion in the United States and \$827 billion worldwide. For a person diagnosed with DM, their medical expenditures attributable to diabetes are approximately \$8,000 per year. Patients with diabetes spend an average of 2.3 times more money on healthcare than the average patient without diabetes. Statistics from 2016 indicate that the rate of type 2 DM in Arkansas adults was over 12%, placing Arkansas in the top 10 for states with the highest rates of DM. That averages out to approximately 300,000 adults in Arkansas with a known diagnosis of DM. In Yell County Arkansas, an estimated 11.7% of residents have been diagnosed with DM.

### **PROJECT PURPOSE**

The purpose of this project was to evaluate if the utilization of a mobile health app to track daily carbohydrate intake improves clinical outcomes in patients with type 2 DM as evidenced by improved glycemic control, reduction in weight, and improved perception of self-management of DM.

### **METHODOLOGY**

Ida Jean Orlando's "Theory of the Nursing Process Discipline" was used as a guide to implement this project. This theory lays out the importance of the nursing process in improving patient outcomes and promotes patient-centered care. The selected clinical site of implementation is a privately-owned clinic that serves a rural community in Dardanelle, Arkansas. The project included a convenience sample of 10 participants who met the evidence-based inclusion criteria. Participants were given a pre-implementation questionnaire with seven questions regarding their diabetes on a Likert Type Scale from one to four with one being the least and four being the most. Their most recent HbA1c, weight, and BMI were documented at this time. Participants were asked to monitor their blood glucose daily. After downloading the app and inputting personal data (i.e. weight, activity level, goals), participants documented their daily food intake into the mobile app, Carb Manager, for four weeks. After this time, participants were re-administered the questionnaire, and their final weight and average blood glucose levels were documented.

## **RESULTS**

After completion of the 4 weeks, each participant presented with improvement in all areas that were evaluated. Cumulatively, the participants demonstrated an average weight loss of 4%, BMI decrease of 4.24%, and an average blood glucose decrease of 26%. The pre- and post-implementation questionnaire displayed improvement in participants' comfort in self-managing their DM.

## **IMPLICATIONS FOR PRACTICE**

All primary care providers (PCPs) should integrate an organized approach to supporting patients' behavior modification efforts, including nutrition management and healthy lifestyle choices. The utilization of a mobile smart phone or tablet device app to monitor daily carbohydrate intake, such as "Carb Manager", could help PCPs promote patient self-management and improve diabetes outcomes in a way that is easily adaptable, of low cost, and readily available to most patients. Utilization of an app into diabetic management could offer patients increased autonomy in managing their DM, improve clinical outcomes associated with DM, promote the patient-provider dynamic relationship, and improve patient, family, and provider satisfaction.

*Keywords:* diabetes mellitus, mobile application, carbohydrate, self-management

Team Leader: Dr. Jane Holston