

ABSTRACT

Introduction: A balanced diet, regular physical activity, and weight loss are recommended by the American Diabetes Association (ADA) to improve glycemic control. Low-income individuals often lack healthful food resources, access to recreational space, and food knowledge and skills to meet the ADA's recommendations. Therefore, the Fresh Start program combines a produce prescription (PRx), group classes, and health coaching to ensure access to fresh produce, improve food literacy, and bolster behavior changes to address diabetes related disparities with uninsured patients.

Methods: This prospective cohort study included rural, low-income patients with type-2 diabetes recruited from safety-net clinics in Eastern North Carolina and was implemented from January-May 2022. Class materials (e.g., handouts, recipes) and educational approach were tailored for low-literacy, under-resourced patients. Validated surveys including socio-demographics, diet quality, and food knowledge/skills were conducted pre and post program. Surveys examining satisfaction and experience were conducted after each group class as well as for the overall program.

Results: Participants (n=56) were primarily female (74.5%), did not receive SNAP benefits (65.5%), and employed (51.9%). The majority enrolled in all three services: PRx, group classes, and health coaching (62.5%). At baseline, most were very willing to make changes to their dietary habits to become healthier (68.6%). Satisfaction for classes has been high with participants reporting either very satisfied (82.8%) or satisfied (15.1%) and cooking, taste testing, physical activity demonstrations, and PRx were reported as most valuable to patients.

Discussion: Preliminary results revealed high satisfaction and desire for increased culinary and physical activity support in future program implementation.

INTRODUCTION

- **1 in 10** Americans have diabetes and it is the 7th leading cause of death in the United States.¹
- Dietary and lifestyle changes are critical to diabetes self-management but not all individuals have adequate resources to abide by evidence-based guidelines.^{2,3}
- Individuals with lower income lack access to adequate food resources, diabetes self-management education and support as well as specialty nutrition care.^{3,4}
- **Therefore, the objective of this study was to identify how a multi-layered lifestyle management intervention for rural uninsured patients with type-2 diabetes impacted their glycemic control (Hemoglobin A1c (HbA1c)).**
- Secondary objectives included examination of diet quality and food literacy.

MATERIALS & METHODS

Study Design

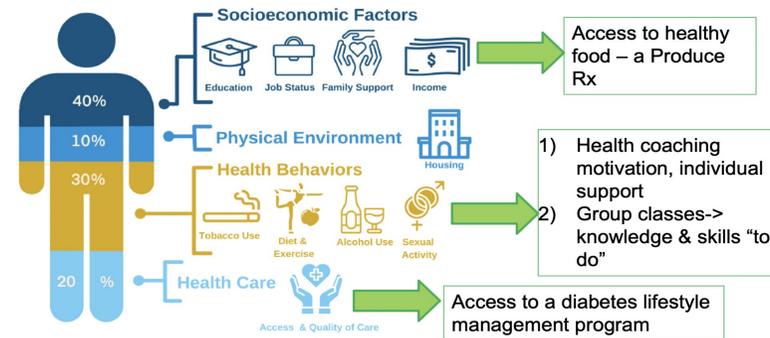
This prospective cohort study was implemented between January-May 2022 and rural, uninsured patients were recruited from two safety-net clinics in Eastern North Carolina. Eligibility criteria for the study were: Current patient at one of the clinics, adult (aged 18-65), and diagnosis of type-2 diabetes. The intervention including culinary medicine/nutrition education/physical activity classes, a produce prescription, and 1 on 1 health coaching via telephone. Class materials (e.g., handouts, recipes) and educational approach were tailored for low-literacy, under-resourced patients.

Data Collection

Validated surveys included sociodemographics, food insecurity status, diet quality, and food literacy. HbA1c were collected utilized retrospective chart review. All data were collected and managed with Research Electronic Data Capture (REDCap) a HIPAA secure, web-based application designed to support data capture for research studies.⁵

Data Analysis

Data were analyzed using IBM SPSS version 28.0. Descriptive statistics were conducted for sociodemographic characteristics. Paired sample t-tests were conducted for changes in food insecurity status, food literacy, HbA1c, and diet quality.



RESULTS

- Patients (n=56) were primarily female (74.5%), did not receive SNAP benefits (65.5%), employed (51.9%), and Hispanic/Latin-x (48.2%).
- The majority enrolled in all three services: PRx, group classes, and health coaching (62.5%).
- At baseline, most were very willing to make changes to their dietary habits to become healthier (68.6%).
- Satisfaction for classes has been high with participants reporting either very satisfied (82.8%) or satisfied (15.1%) and cooking, taste testing, physical activity demonstrations, and PRx were reported as most valuable to patients.
- Patients (n=27) had pre- and post-intervention HbA1c measurements taken and (n=19) completed pre- and post-intervention surveys.
- **Food literacy scores increased from 85.53 (SD=25.42) pre-intervention to 98.63 (SD=19.60) (p=0.038).**
- **There was an average decrease in patients HbA1c of 1.21% (p=0.019) and those who attended at least 4 group classes (n=23) had an average decrease of 1.87% (p< 0.001)**



DISCUSSION

- The Fresh Start program was able to significantly improve glycemic control as well as food literacy within a rural uninsured patient population.
- Intensive lifestyle interventions with under-resourced patient populations often do not provide food access as well, which may further facilitate behavior change.
- Produce prescription and other food access programs should layer additional behavioral support with varied educational approaches in order to address food literacy gaps.
- Limitations of our study include a smaller sample size and the lack of a control group.
- Future studies should examine the impact of each individual service separately to identify the minimum threshold of contacts (e.g., health coaching, produce prescription, and group classes) to optimize chronic disease management.
- Lastly, it is important that similar programming is developed and evaluated for other chronic conditions (e.g., cardiovascular disease, hypertension, obesity, etc.) as there many similarities in the nutrition and physical activity guidelines for these conditions.

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