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Exploring the Integration of Nutrition Education in a Mobile App-Based Produce Prescription Program: A Mixed-Methods Study

Background

Diabetes is a global and local health crisis. In Iowa:

- Over 10% of adults have diabetes.[1]
- 34.1% are diagnosed with prediabetes.[1]
- The annual direct medical cost of diabetes is $3 billion.[1]

Nutrition is a key treatment for diabetes, yet only 6.7% of Iowans meet the recommended daily intake of fruits and vegetables, and this rate further drops when looking at low-income populations.[2] This demonstrates the need for more proactive approaches for improving Iowan's nutrition and overall health. The Iowa Produce Prescription Program (I-PPP) addresses this by providing monthly produce vouchers and nutrition education for low-income patients with prediabetes and diabetes. While similar programs have shown dietary and clinical improvements, I-PPP offers a unique approach to providing nutrition education using a mobile app.[3]

Methods

Nutrition Education was delivered to participants using SNAP-Ed Spend Smart Eat Smart videos from Iowa State University Extension and Outreach. The content covered topics like shopping for fresh fruits and vegetables, safely storing and preparing fruits and vegetables, reading nutrition fact labels, budgeting for healthier eating, and recipe videos. Participants watched 1-2 videos (~10-15 minutes) each month in the mobile app to receive their prescription benefits, which was $30/month per person in the household. Benefits were automatically loaded into the mobile app for redemption at participating retailers for the purchase of fresh fruits and vegetables. Fruit and vegetable intake was collected using the Dietary Screener Questionnaire at baseline and following the six-month intervention. The post-survey assessed program acceptability, nutrition education utilization, and suggestions for program improvement. A midpoint survey (3 months) collected program satisfaction and self-reported fruit and vegetable intake. Descriptive data and matched paired t-test were used to assess the extent of change in pre-post self-reported survey responses.

Results

Twenty-seven participants completed the baseline and post survey and twenty completed the midpoint survey. From baseline to post-intervention, there was a significant increase in fruit intake, vegetable intake, and fruit and vegetable intake together (Table 1). Over half of participants reported using the information from nutrition education videos >2-3 per week (HIGH) compared to LOW users, who reported using the information less than once per month. Increase in fruit and vegetables intake was not significantly different between the HIGH group compared to the LOW group (Table 2). Post survey data showed most participants had positive or very positive experiences, and midpoint survey results found that participants were satisfied or strongly satisfied with the mobile app (88%) and nutrition education modules (90%)(Figure 1). Qualitative feedback on the nutrition education indicated that participants wanted more recipe videos with ingredient substitutions, preferred shorter videos, and wanted continuous access to the content.

Change in Fruit & Vegetable (F/V) Intake in Cups (n=27)

	Baseline	Post-IPPP	p-value	Mean Difference
F/V	2.27	2.89	<.0001	0.6193
Fruit alone	0.86	1.16	0.0037	0.30253
Vegetables alone	1.45	1.73	0.0014	0.27606

Table 1. *Total fruit, vegetable, and F/V intake increased after participating in IPPP*

Change in Fruit & Vegetable Intake between high and low nutrition education users (n=27)

	HIGH	LOW	p-value
Use of nutrition education (n)	15	12	
Change in F/V Intake (c)	0.65 (± 0.68)	0.58 (± 0.74)	0.8035

Table 2. *Change in F/V intake was not significantly different between HIGH nutrition education users (>2-3 times/week) and LOW (< once per month)*

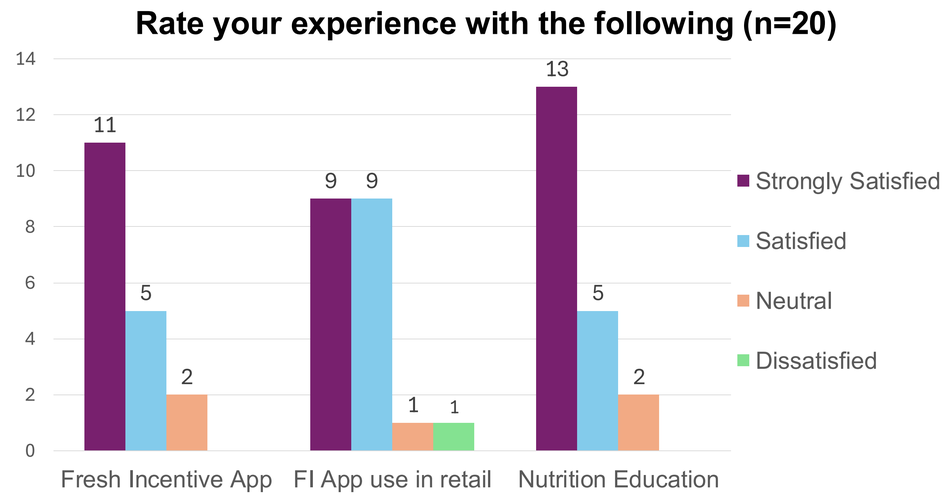

Figure 1. *Midpoint survey results show that 88% of participants were satisfied or strongly satisfied with the app, and 90% were satisfied or strongly satisfied with the nutrition education.*

Implications

Using these findings, we developed an updated nutrition education curriculum for our second cohort. The revised intervention is grounded in Self-Determination Theory and features culturally tailored content, additional recipes and ingredient content, and shorter modules accessible both in-app and online (Figure 2). While the core content remains similar, the updated curriculum incorporates integrative elements such as goal-setting opportunities and a social support Facebook page. The I-PPP and supplemental education demonstrate potential as a scalable, low-cost intervention to improve nutrition and utilization of nutrition education through a mobile app.

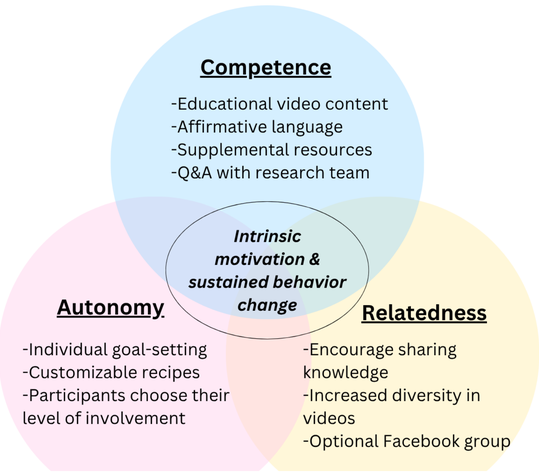

Figure 2. *Components of the updated nutrition education curriculum mapped out into Self Determination Theory domains.*

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