Qualitative Study: User Experiences with Plańano, a Dietary Self-Monitoring App for Underserved Patients with Type 2 Diabetes

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Background

- 39 million Americans have type 2 diabetes6
- Americans from low socioeconomic and racial/ethnic minority groups have higher diabetes prevalence and fewer management resources7
- Diet and blood glucose monitoring are linked to better diabetes management8
- Sustained engagement with self-monitoring is challenging, especially among underserved populations9
- This may exacerbate health disparities via “intervention-generated inequalities”10
- In focus groups, we found that mHealth tools for diabetes self-monitoring tailored Self-Determination Theory’s extrinsic—intrinsic motivation continuum may improve engagement and dietary management of type 2 diabetes

Methods

The ongoing Personal Informatics Technology for Engagement in Community Health (PI-TECH) study includes a pilot sequential multiple assignment randomized trial (SMART) of the Plańano dietary self-monitoring app for type 2 diabetes.

- Study design: Thematic analysis of Plańano user experience
- Setting: Washington Heights/Inwood, New York City
- Sample: N=9, age range=28-61, 88% female, 89% non-white, 88% household income<$20,000
- Data collection: Face-to-face, in-depth interviews after using Plańano for 6 weeks during SMART
- Interviews recorded and transcribed verbatim
- Analysis: Data coded for emergent themes related to participants’ user experience using Thematic Analysis
- Software: NVivo 12

Results

Plańano User Experience Themes and Supporting Quotes

Food insecurity

"To meet the goals at least two different types of fruit, but sometimes when you cook the meal — suppose you don’t have any more money. So, sometimes you bought your groceries for the month and you don’t have any more money to buy any fruit, so that’s for the day." (P1, F)

Awareness of diet and influencers

“So, I am finding the suggestions the app itself it helps me understand that I am — I am being more conscious of what I am eating or what I — I shouldn’t eat.” (P3, M)

Plańano as a tool for self discovery

"I said right say I just ate stay I want some Doritos or something potato chips or Pringles is my favorite. see that the sugar will go down it won’t go as high as a coke or a cookie or a piece of pie." (P5, F)

Dietary behavior change from Plańano

“So, I’m looking at my pictures I’m saying you know I could do better, so then I had greens. I had a vegetable plate, I had greens then I had cabbage. I said hey, I had two greens and I didn’t have rice, I had a sweet potato.” (P1, F)

Motivation (internal, outcome expectation)

“Well, for me what helped me was like even prior to joining the program it was just me wanting to really change my diabetes, because I didn’t want to be injecting myself with medicines. I was at the point where I was taking insulin, not even in Metformin, so as far as me that’s what motivated me, not having because I personally don’t take insulin even throughout the whole program, I haven’t taken any insulin." (P5, F)

Feeling irresponsible

“It’s rare, I have to be starving to eat out. The other day I had some Chinese food because I was reckless. And then I took my reading and it was pretty high.” (P1, F)

Plańano users...

1. Log meal
2. Log blood glucose
3. Receive feedback tailored based on extrinsic—intrinsic motivation continuum

Plańano

A self-determination theory-based mHealth diet and blood glucose self-monitoring app developed with user-centered design.

Self-determination theory applied to findings from focus groups with participants from population of interest

-extrinsic motivation
-internal motivation

regulatory styles
-external
-proximal
-cognitive
-pride, self-esteem, guilt avoidance

regulatory processes
-compliance, reward/punishment

self-monitoring behaviors
-data collection, goal setting and tracking

behavior change strategies
-money, points, material reward, feedback from social network or clinician

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Conclusion

- The thematic analysis suggests that a diabetes-self management app specifically designed for a disadvantaged population is well received and viewed as a supporting tool among underserved urban adults with type 2 diabetes.
- Participants valued Plańano as a tool for self-discovery and accountability. To participants, using Plańano resulted in dietary changes, weight loss, and potential for improved patient-provider communication.
- External circumstances, individual characteristics, and in-the-moment barriers influenced app usage and diet goal adherence. For example, limited household income<$20,000 prevented participants from making healthier dietary choices.
- Our findings reinforce the need for more comprehensive solutions to reduce barriers in engaging in dietary behavior change to improve diabetes outcomes.

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