An Innovative Physical Activity Intervention in Overweight and Obese Adults Using Continuous Glucose Monitor

Yue Liao1, Christopher J. Miller2, Diana L. Urbauer3, Therese B. Bevers3, Ernest Hawk3, Karen M. Basen-Engquist4, Susan M. Schembre4

1Department of Behavioral Science, MD Anderson Cancer Center, Houston, TX; 2Department of Biostatistics, MD Anderson Cancer Center, Houston, TX; 3Department of Clinical Cancer Prevention, MD Anderson Cancer Center, Houston, TX; 4Department of Family & Community Medicine, University of Arizona, Tucson, AZ

Background

Two in three overweight and obese adults are not sufficiently active, putting them at high risk for various types of obesity-related cancers, such as endometrial, breast, and colorectal cancers.

Research Objectives

Advancement in wearable sensor technology has made access to biological data more readily available, providing an opportunity for a more timely and personalized intervention. The current pilot study was designed to utilize the continuous glucose monitor (CGM) to demonstrate the immediate, physiological benefits of physical activity. The goals of the current study are to determine the feasibility of wearing CGM in a sample of insufficiently active overweight or obese adults and to get feedback about the physical activity education module that features CGM and glucose data.

Participants

Eligible individuals were between 18-65 years old, engaged in less than 150 minutes/week physical activity, had a body mass index (BMI) ≥25 kg/m², able to speak, read, and write in English, and had a smartphone with daily internet access. Individuals were excluded if they were pregnant women, had diabetes, kidney, thyroid or cardiovascular disease, failing blood glucose > 125 mg/dL, not able to perform unsupervised exercise, or were unable/unwilling to have the CGM sensor inserted.

Currently, 15 participants completed the study with a recruitment goal of 20.

Methods

Figure 4 outlines the flow of the pilot study. All in-person visits were conducted at the MD Anderson Cancer Center. Figure 5 outlines the components of the physical activity education session.

Results

Overall, participants highly rated each component of the education session (Fig. 7).

- Participants also reported a very positive experience wearing the CGM and Fitbit® (Fig. 8).

- On average, participants scanned their CGM sensor 6 times (SD=2.4) times each day and 77.7% (SD=13) of the glucose data was captured.

- All participants had 10 valid Fitbit® wear days.

- There was also a trend in improving motivation in engaging in physical activity between the two visits (Fig. 5 & 10).

Conclusion and Implications

The preliminary results from this study suggest that using a CGM to motivate physical activity among overweight and obese adults is feasible and acceptable.

Future directions:

1. Develop personalized feedback messages that incorporate data from CGM and Fitbit® to motivate daily physical activity.

2. Incorporate another behavior change technique (e.g., self-efficacy, social support) to optimize the effect on increasing daily physical activity.

3. Explore the impact of sedentary behavior on daily glucose patterns.

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