Research Article

My Quest, an Intervention Using Text Messaging to Improve Dietary and Physical Activity Behaviors and Promote Weight Loss in Low-Income Women

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ABSTRACT

Objective: To evaluate changes in dietary and physical activity behaviors and weight after implementation of a 12-week text messaging initiative (*My Quest*).

Design: The researchers conducted a 1-group, pre- to posttest study design to determine changes after implementation of a text messaging initiative developed using the tenets of the Social Cognitive Theory.

Setting: A total of 55 Alabama counties (84% rural) with high rates of poverty, overweight/obesity, and chronic diseases.

Participants: Convenience sample of low-income, primarily overweight/obese women (n = 104).

Intervention: Short texts (n = 2–3/d) provided health tips, reminders, and goal-setting prompts. Weekly electronic newsletters provided tips and recipes. Participant self-monitored body weight weekly.

Main Outcome Measure: Outcomes included goal setting, self-efficacy, behavioral and environmental factors, self-monitoring, and body weight; data collection occurred through text message response and online surveys.

Analysis: Analyses were conducted using McNemar test (dichotomous data), Wilcoxon signed rank test (ordinal data), or paired *t* test (continuous data).

Results: Participants significantly ($P < .05$) improved dietary and physical activity behaviors and food environment; increased dietary and physical activity goal setting; and reduced body weight.

Conclusions and Implications: A low-cost, text messaging initiative particularly targeting women residing in rural communities with high rates of poverty and obesity can promote weight loss and improve dietary and physical activity behaviors. Future studies may include a control group and social support component such as group text messaging.

Key Words: text messaging, weight loss, mHealth, socioeconomic status, women (*J Nutr Educ Behav*. 2018;50:11–18.)

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INTRODUCTION

Overweight, obesity, and associated comorbidities affect almost 70% of American adults.[1] The highest rates of obesity occur among low-income, minority women.[1,2] Interventions promoting weight loss/management in high-risk populations present many challenges.[2] Meeting low-income women where they are by using delivery methods already ingrained in their culture is a crucial first step in weight loss and management efforts.

Cell phone ownership is highly integrated into American society, even among individuals with limited resources. In 2015, cell phone ownership was substantial among lower-income households, rural communities, American adult women, and the African American and Hispanic populations.[3] Most cell phone owners use phones to text and send or receive e-mails.[3,4] Texting is the dominant way of communicating for Americans aged <50 years.[4] Therefore, 1 possible intervention delivery method is mobile health (mHealth). mHealth includes the use of cell phones to deliver health

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information, implement behavior change programs, and collect data.

Short messaging service (SMS) or text messaging initiatives have shown promise as a medium for weight loss interventions. These programs are cost-effective and convenient, have high adherence rates, and promote behavior change and moderate weight loss.[5-9] Messages are short and targeted, increasing the likelihood that recipients read and use the information.

Public health initiatives aim to promote health and reduce chronic disease risk through healthy lifestyle behaviors and body weight management.[10] Healthy lifestyle behaviors that support these initiatives include increasing fruit and vegetable (FV) consumption and physical activity and reducing sugar intake and sedentary behavior.[10]

Because the majority of low-income and rural individuals own cell phones, using a text messaging initiative is a feasible way to overcome challenges to reach a population that is female, overweight or obese, and living in rural areas, and that has limited financial resources, transportation, or the ability to access community centers for on-site weight loss intervention programs. Building on the premise that most Americans own cell phones and that using a mHealth text messaging initiative may influence health promotion programs successfully and positively, *My Quest* was developed to overcome barriers and reach a targeted at-risk population.

The objective of *My Quest,* a 12-week 1-group, pre- to posttest study, was to evaluate changes in dietary and physical activity behaviors and weight in low-income women residing primarily in rural areas using an easily accessible text messaging initiative based on Social Cognitive Theory (SCT) constructs.[11] The SCT constructs emphasized goal setting, self-efficacy, behavioral and environmental factors, and self-monitoring. Goal setting and self-efficacy included dietary factors and physical activity. Behavioral and environmental factors included participation in physical activity, intake and availability of FV and sugar-sweetened beverages (SSB), and sedentary behavior.

METHODS

Participants

Using a standardized recruitment script, extension agent assistants in 55 Alabama counties (84% rural) recruited a convenience sample of women (n = 159) at the following locations: the *Supplemental Nutrition Assistance Program* (SNAP) office, the Department of Housing and Urban Development, and the Alabama Food Bank. The Auburn University Institutional Review Board approved this study. At the recruitment location, participants completed an eligibility checklist and Physical Activity Readiness Questionnaire (PAR-Q)[12]; and if they were eligible, they provided signed written consent, opted in to the text message program, and weighed themselves. The eligibility checklist indicated that women met study criteria if they were eligible for SNAP, were aged 19–49 years, had a cell phone with text message capability, and had an active e-mail account. In addition, participants had to be at low risk for medical complications, as determined by PAR-Q. If participants were eligible and willing to participate in *My Quest*, they signed a written consent form. Participants (n = 143) were also prompted to opt in to the text messaging initiative. Finally, they removed shoes and outer garments to weigh themselves on a provided scale ($20 value) and immediately texted their initial body weight to researchers. During recruitment, 4 women were not interested in participating in *My Quest* and 12 did not meet study criteria. No formal *a priori* sample size calculation was conducted.

Intervention

Using averaged, self-obtained baseline data for body weight, height, and age (Table 1), the MyPlate Checklist Calculator[13] determined a mean calorie intake level for 2 physical activity levels for the total sample. According to the calculator for sedentary and moderate physical activity, a daily intake of 1,800 or 2,000 cal, respectively was needed. To create a small calorie deficit to elicit slow and steady weight loss, a registered dietitian prescribed a 1,600-kcal MyPlate meal plan for all participants. This community-based calorie level ensured that (1) a variety of foods was included in the diet, (2) there was a balanced food intake from all major food groups, and (3) an attainable and sustainable calorie intake was achieved for lifelong eating habits, unlike low-calorie meal plans. The prescribed calorie level was used while developing text messages and electronic newsletters (eNewsletters).

The researchers conducted *My Quest* for 12 weeks. The intervention was based on SCT: specifically, goal setting, self-efficacy, dietary and physical activity behaviors, and environmental factors related to weight loss or management and self-monitoring. In addition to participants monitoring body weight (using a scale) and physical activity (using a pedometer), they all received 2–3 short, daily, identical SMS text messages. The text messages included tips on diet and exercise, Web links, goal-setting prompts, and reminders or questions about exercise or healthy eating that required a response. They also received a weekly eNewsletter that provided tips, reminders, and a low-cost healthy recipe. Each Sunday morning, a self-monitoring text prompt requested a response for current body weight that participants could obtain at home using the provided scale.

Text Messaging Initiative

A database of 350 SMS text messages was developed; each message targeted 1 of 12 weekly themes (Table 2). Weekly goals and objectives were met through the text message education component. Text messages were scheduled for daily delivery in the morning (between 7 and 8 AM), at lunch (between 11 AM and noon), and at 8:30 PM. Delivery time of the morning and lunch text messages was randomized daily to reduce the likelihood that participants would begin to ignore text messages. The cost of the *My Quest* text messaging software was $159.00/mo to send a maximum of 50,000 messages.

Data Collection

Pre- and post-assessment data were collected through an online survey. The survey tool was developed using adapted