

MEASURING HEALTH OUTCOMES VIA AN MHEALTH TEXT MESSAGE-BASED INTERVENTION IN
LOW-INCOME, SPANISH SPEAKING AND ENGLISH SPEAKING PARTICIPANTS IN RURAL
APPALACHIA

A Thesis
by
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Abstract

MEASURING HEALTH OUTCOMES VIA AN MHEALTH TEXT MESSAGE-BASED INTERVENTION IN LOW-INCOME, SPANISH SPEAKING AND ENGLISH SPEAKING PARTICIPANTS IN RURAL APPALACHIA

Candace Campbell Abstract
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Rural dwelling, low-income individuals see increased risk of chronic disease due to limited access to healthcare. Hispanic/Latino adults are affected disproportionately by these barriers. High Country Community Health (HCCH) and Appalachian State University (ASU) developed a bilingual (English and Spanish), 24-week, mHealth-based program called *My Quest in the High Country (MQHC)* to support these individuals.

HCCH patients were recruited by the HCCH Registered Dietitian (RD) using a standardized recruitment script. Participants received materials based on native language (English speaking or Spanish speaking). Participants received a scale and FitBit. ASU implemented the 24 week intervention. From weeks 1-12, participants received text messages (n=1-2/ day), self-monitoring prompt texts (n=1-2/wk), eNewsletters (n=1/wk) and weekly physical activity feedback. At mid-point, participants returned the Fitbit. Participants continued to receive texts and eNewsletters from weeks 13-24. Biometric data were collected and participants completed a survey at pre-, mid- and post-assessment. Analyses included

McNemar, Wilcoxon Signed Rank, paired t-test, and descriptives. Significance was set at $p < .05$.

Participants [n=19; English speaking (n=13), Spanish speaking (n=6) were female (95%), income less than \$25,000/year (63%) and a mean age of 42.9 (11.9) years. *My Quest in the High Country* (MQHC) resulted in significant weight loss and reduction in diastolic blood pressure in the whole group (n=18) and in the English speaking group (n=13). No changes were observed in the Spanish speaking group (n=6).

Feedback showed participants found the text messages *extremely helpful* (58%) and eNewsletters *extremely helpful* (50%). This, with biometric results, suggests mHealth interventions can be impactful in rural, low-income populations. Focus groups could determine how to meet the needs of the Hispanic/Latino population in the rural Appalachia area.

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Foreword

Chapter 2 of this Thesis will be submitted to the *Journal of Rural Health*. It has been formatted according to the style guide of that journal.

Chapter 1: Introduction

Background

Low-income, rural-dwelling individuals are at higher risk of obesity and chronic disease due to health education barriers and isolation to proper health care.¹ Ethnic minorities, especially Latino adults, are affected disproportionately by these barriers and see increased rates of obesity and chronic disease.¹ Residents of rural areas have limited access to nutrient-dense foods, which leads to nutritional inadequacies as well as favoring quantity over quality.¹ Many families living in rural areas choose highly-processed foods due to perceived benefits including affordability and shelf-stability.¹ A recent study found that 31.6% of the US population is obese and the prevalence of obesity was higher among rural than urban adults.¹

There is significant research in the correlation of limited nutrition knowledge in rural Appalachia and the positive association to chronic disease.^{1,2} However, there is not a significant amount of research on how implementing nutrition education programs may impact these rural populations. Appalachian communities are often isolated from larger towns with adequate nutrition education options to support a healthy diet, indicating that mHealth initiatives could be a promising intervention for this population. Furthermore, there is research that shows ethnic minorities are disproportionately affected by food insecurity³ which is associated with increased health risks and morbidities.³ mHealth interventions (text messages and eNewsletters) could then be a promising tool for ethnic minority populations as it can deliver education and health promotion at a limited added cost to this at-risk

population.³ Implementing nutrition education in conjunction with using technologies that are accessible to most individuals (cell phones, fitness trackers, email), as well as making interventions available in Spanish, is likely to increase access to programs that may improve health-related behaviors and food choices, resulting in weight loss and positive health outcomes within Appalachian populations.³

Literature Review

Statistics and Health Disparities in rural Appalachia

In 2019, the median household income in Watauga County, NC was \$41,541/year and in Avery County, NC it was \$37,109/year. Both counties' median income was significantly below the state median of \$50,320/year.⁴ In addition to Appalachian incomes, poverty rates, unemployment rates, and postsecondary education levels also lag behind performance at the national level.⁴

In recent reports, Watauga and Avery counties in North Carolina stated top health concerns included: diet/nutrition, chronic illness, health behaviors/lifestyles and access to healthcare.⁵ Healthcare providers in these counties are working to provide health literacy and nutrition related programs to address health concerns as well as address concerns regarding access to care.⁵ Feeding America found that in 2019, 13.3% of all people in rural areas lived below the poverty line and rural communities make up 87% of US counties with the highest rates of overall food insecurity.⁵ Counties located in the Appalachian Mountain region, like Watauga and Avery counties, make up part of this demographic struggling with food insecurity in the US. These rural communities lack many of the resources that more urban areas may have such as public transit, larger grocery store chains, and thus, access to healthier food options.⁵

Obesity and Chronic Disease Prevalence

Previous studies have reported a higher prevalence of obesity among rural Americans.¹ This can be attributed to limited opportunities for physical activity as well as lack of access to healthy food and quality healthcare.¹ Additionally, fewer health and personal resources among this population contribute to higher rates of chronic disease and multiple morbidities.² Rural areas, specifically Appalachia, are susceptible to limited access to healthy food. A study examined differences in obesity-related behaviors across rural-urban adult populations in the United States. This study obtained data from National Health and Nutrition Examination Survey (NHANES) to assess body mass index (BMI), physical activity levels and a dietary recall from participants using the census tract level to identify rural-urban commuting area codes.¹ In comparison to urban residents, rural residents had lower self-perceived health status, household income and educational attainment, and were more likely to report no physical activity at all.¹ In terms of diet, rural residents were also more likely to consume more sugar sweetened beverages and have lower intakes of fruit and total daily fiber.¹ Additionally, the study found that 31.6% of the population was obese and the prevalence of obesity was higher among rural compared to urban adults. Lower levels of physical activity, lower fruit consumption, higher meat intake, and skipped breakfast patterns were associated with increased obesity risk in adults in rural populations.¹

In addition to rural populations, racial/ethnic minorities are also disproportionately affected by overweight and obesity.³ Recent research has sought to improve health behavior outcomes specifically in minority women living in rural areas. Minority women participants in a rural North Carolina study were shown to increase health-related behavior change when

introduced to a health information education intervention as compared to a control group with no intervention.³ Increasing health education is a key component in behavior change and ultimately positive health behavior outcomes.³

Health Disparities in the Spanish-Speaking (Hispanic/Latino) Population

Hispanic/Latino adults in the US demonstrate the lowest health literacy,⁴ adding to the disproportionate effect of nutritional inadequacies seen in this population. Additionally, cultural assimilation of the Hispanic/Latino population in the US, combined with low food literacy, has resulted in higher intakes of fast food and convenience snacks, and decreased intake of fruit and vegetables.⁴ These lifestyle behaviors increase added sugar, saturated fat, sodium and overall calorie intake and have increased health disparities and chronic disease incidence in the Hispanic/Latino population within the US.⁴ According to the Centers for Disease Control and Prevention (CDC), 12.5% of the Hispanic/Latino population in the United States are diagnosed with diabetes compared to 9.4% of non-Hispanic adults.⁵ Approximately 80% of Hispanic/Latino adults are overweight or obese compared to 69.8% of non-Hispanic adults in the United States.⁸

Hispanic/Latino health is often shaped by factors such as language, limited access to preventive care, and the lack of health insurance. The CDC has cited some of the leading causes of illness and death among Hispanics, which include heart disease, cancer, and diabetes.⁸ These conditions can be prevented or managed with nutrition education.

Recent research has shown that minority populations, including those that classify themselves as Hispanic, are using mobile phones to access health information via the internet

more frequently than their white counterparts.⁹ This consecrates the need for health interventions within this population and the opportunity mHealth can create.

Social Cognitive Theory

Social Cognitive Theory (SCT) is a behavioral theory often used in health promotion and disease prevention. SCT states human behavior is a result of a triad of interactions between environmental, personal and behavioral factors.¹⁰ Environmental factors can include physical surroundings, living conditions, access to resources and a person's social network. Personal factors include a person's thoughts and feelings. Behavioral factors include constructs such as skill sets surrounding nutrition knowledge. Creating behavior change in individuals using SCT requires invoking all three of these aspects.

Self-efficacy is an essential pillar of SCT.¹⁰ Defined as an individual's confidence in their capability to engage in a specific action or to overcome barriers to engage in a specific behavior. Self-efficacy is the most central and pervasive factor for health behavior change.¹⁰ Also of importance in motivating individuals is the construct of outcome expectations or the perceived benefits of engaging in the behavior. Understanding the benefits of a particular behavior can lead to an incentive for learning.¹⁰ Combining self-efficacy and outcome expectations leads to goal-setting which leads individuals' to take control of their environments to create positive health behavior change.¹⁰

mHealth Initiatives

Mobile health, or mHealth, interventions use portable electronic devices, such as cellphones, to allow healthcare professionals to provide care to patients remotely.¹² Recent data shows that 96% of all Americans, 96% of the Hispanic Americans, and 81% of rural Americans own a smart phone.¹¹ Previous research provides evidence that using common technologies,

i.e. text messaging, is an effective way to reach patients and convey health information to increase positive health outcomes.^{12, 13}

Literature shows that self-reporting body weight alone via an mHealth initiative (mobile phone app) can self-regulate health behavior and result in weight loss.¹⁴ In addition, multiple studies have shown that nutrition education, text-message based interventions can also result in weight loss and positive health outcomes.¹⁵⁻¹⁷

Dulce Digital, a randomized clinical trial recruited individuals with Type 2 Diabetes. Participants receiving the Dulce Digital intervention received up to 3 motivational or educational text messages per day over 6 months.¹⁵ The results showed that participants in the Dulce Digital group had a lower HbA1C and a lower fasting blood glucose than control.¹⁵ Dulce Digital provided evidence that the use of a low-cost text messaging program was highly acceptable within the Hispanic population and resulted in greater glycemic control when compared to a control group.¹⁵ This study is pivotal in showing that mHealth interventions can be successful in Hispanic/Latino communities within the United States.

A randomized-control trial completed in 2008 by Patrick et al., showed promising evidence that text messages may prove to be an efficient way to promote health behaviors to encourage weight loss.¹² This study included a control group receiving monthly printed materials about weight control and an intervention group that received personalized text messages 2-5 times daily. At the end of 16 weeks the intervention group lost more weight than the comparison group, concluding that text messages can be a productive channel of communication for health education and weight loss.¹²

Text4Diet, a 2012 study that built on Patrick et al., also showed that using a text-message based intervention for weight loss behaviors could improve weight-related behaviors.¹³ Study adherence, including reduced attrition and increased participant engagement, was associated with improvement in weight-related behaviors. Participants with greater adherence lost more weight at 6 and 12 month benchmark check-ins than those who were less adherent concluding that text messages can be a successful adjunct in weight loss management interventions.¹³

My Quest, a 2015 study conducted in 55 predominantly rural Alabama counties, showed that mHealth initiatives in the form of a low-cost text messaging program could promote weight loss and improve health behaviors in limited-resource, predominantly rural dwelling women.^{16, 17} This study based its' methodology on previous mHealth studies^{12,13} with participants receiving 2-3 nutrition education texts per day for 12 weeks. Participants received a bath scale and a pedometer to self-monitor weekly body weight and daily step counts. Additionally, *My Quest* included a weekly newsletter with a variety of nutrition topics.^{16, 17}

Finally, a study focusing on racial/ethnic minority women, predominately black, showed similar outcomes to previous studies with adherence to the text message-based program being a key factor in weight loss as well as a conclusion that texting was an easy and helpful way to increase health behaviors.¹⁸ This study followed 50 obese women from Raleigh, NC through a text messaging-based weight loss program using constructs of SCT to engage participants. Each participant received up to 5 texts per day and were monitored for 6 months, addressing behavior change goals throughout the intervention.¹⁸ This study further

supported that combining mHealth initiatives and SCT nutrition education and disease management can be an impactful weight loss intervention.

Methodology

Study Design

The current study, *My Quest in the High Country (MQHC)*, modified Griffin et al.'s content with: 1) expanded content to include (Healthy Picnics, Potassium, Rate of Perceived Exertion, Vitamin C, Iron, Added Sugars, Calcium and Vitamin D, Antioxidants, Sodium, Fat, Protein, Carbohydrates), 2) daily step monitoring and weekly physical activity minute monitoring via Fitbits, 3) creation of 223 non-repetitive SMS and MMS, 4) access to a registered dietitian for nutrition counseling (standard care) in conjunction with *MQHC*,¹⁵ 5) biometric assessment including researcher gathered body weight, height, blood pressure, and blood work, and 6) weekly physical activity feedback, to fit the needs of the rural central Appalachian region. All materials used in *MQHC* were available in English or Spanish. Participants received identical texts, eNewsletters and surveys depending on which language was preferred. *MQHC* was a collaborative effort between High Country Community Health (HCCH)- a Federally Qualified Health Center- and Appalachian State University (ASU) to deliver a tailored mHealth-based prevention and health risk reduction program to adults ages 18-69 in the Appalachia High Country. *MQHC* was a 24-week, theory-driven intervention with annual follow-up for 60 months to augment clinical standard care through a mHealth community-based support protocol. This one group, pre- post-test, adult weight loss/management and health behavior intervention was delivered through text messaging and eNewsletter to a limited-resource, rural population residing in Watauga and Avery counties, North Carolina. Participants were also given a bath scale (model: Etekcity EB4410B) and

FitBit (model: Inspire HR) to monitor weekly body weight and daily physical activity. The goal of *MQHC* was to aid limited-resource adults in weight loss/management, and dietary and physical activity behavior change using an easily accessible format for intervention delivery.

Participants

Participants in *MQHC* were current patients of HCCH, recruited from November 2020 to January 2021.

Eligibility criteria included:

- 1) must be between age 18-69 years
- 2) must be an active patient of HCCH (defined as someone who has been seen by HCCH within the past 6 months)
- 3) must have a cell phone with text messaging
- 4) must have an active email address
- 5) must be at low risk for medical complications as determined by the Physical Activity Readiness Questionnaire (PAR-Q) or provide signed medical clearance from primary care provider
- 6) have not previously participated in *My Quest in the High Country*

Exclusion criteria included participants who were pregnant, planning to become pregnant, currently breastfeeding, or high risk per PAR-Q without medical clearance.

Procedures

Recruitment and pre-assessment

Flyers were posted in English and Spanish at the Watauga County and Avery County HCCH locations. Prospective participants contacted the HCCH Registered Dietitian (RD), Ariel Danek, MS, RD, LDN, to determine eligibility. They were then scheduled for an in-person appointment with the HCCH RD prior to the study start date to complete the initial assessment. During this initial assessment participants completed the informed consent process. Participants completed the Physical Activity Readiness-Questionnaire (PAR-Q). Participants were provided with an iPad to take the Qualtrics-based online pre-assessment survey during their clinic visit. During this survey, participants signed an electronic Informed Consent and Authorization to Collect Personal Health Information. The pre-assessment assessed current dietary patterns, in addition to self-efficacy and goal setting intentions as it related to behavior change. Participants then opted-in to the text message program by texting the pre-decided keyword (i.e., MQHCG5 for English-speaking participants, MQHCG3 for Spanish-speaking participants) to a short code. Participants signed a FitBit User Agreement stating they were responsible for the FitBit with a date of return on the agreement, then they received a Fitbit to wear during the first 12 weeks of MQHC. Participants downloaded the FitBit App on their phone and logged in with a predetermined FitBit log-in set by the researchers. The HCCH RD worked with the participant to ensure they understood how to wear the FitBit to track physical activity as well as how to sync the FitBit daily to their phone for weekly data collection by the researchers. The HCCH RD provided participants with an introduction to the physical activity recommendations set by the Dietary Guidelines for Americans¹⁹ and received basic nutrition education using MyPlate²⁰ materials. The

participants were given the opportunity to ask any nutrition related questions and were able to have one on one instruction with the HCCH RD. Participant height, weight and blood pressure was also collected during the pre-assessment visit using standardized procedures and entered into a Health Information Portability and Accountability Act (HIPAA) compliant, coded spreadsheet for data analysis. MQHC began January 10, 2021. A total of 19 participants were recruited (n=13 English Speaking group, n=6 Spanish speaking group).

Intervention

Text message Education

Participants enrolled in MQHC received daily texts (n=1-2/day) in addition to self-monitoring prompt texts (n=1-2/week), and a self-reported body weight prompt (n=1/week). Texts covered a variety of topics related to the weekly nutrition education theme, including topics such as portion size, added sugars, sugar sweetened beverages, importance of protein at mealtimes, food journaling and how to read a nutrition facts label. Texts also included bitly links, or hyperlinks, to recipes modified for weight loss/management, short cooking demonstrations for healthy food preparation, or low-impact workout videos to encourage physical activity. Participants received the nutrition education text message intervention for 24 weeks. MQHC was split into two phases. Phase 1 consisted of weeks 1-12. Phase 2 included weeks 13-24. At the end of the first 12 weeks, participants scheduled a mid-point assessment appointment with the HCCH RD to return the Fitbit. During this visit, height, weight and blood pressure were taken and recorded. The HCCH RD also assessed participant progress and addressed any additional questions they may have in regard to the study. From weeks 13-24, participants continued to self-monitor and report body weight weekly, received all text message education (n=1-2/d) and eNewsletters (n=1/wk).

eNewsletter

Participants received a weekly eNewsletter every Sunday for weeks 1-24 via email that encompassed the topic of the week (Appendix #D). Each eNewsletter included tips, reminders, and a low-cost healthy recipe.

FitBit

Physical activity data were collected weekly for weeks 1-12 by logging into the FitBit dashboard. Weekly total step counts and physical activity minutes as well as average resting heart rate were recorded into a coded, de-identified spreadsheet. Participants received self-reporting prompt texts through the week (i.e., “#MQHC: Remember to weigh yourself this morning. Respond with your current weight”, “#MQHC: Recuerde pesarse esta mañana. Responda con su peso actual. (Ej .: 145 #)” and “#MQHC: How many servings of fruits and vegetables did you have yesterday? Reply with a number.”, “#MQHC: ¿Cuántas porciones de frutas y verduras comiste ayer? Responde con un número.”). Responses were recorded in a de-identified spreadsheet.

Post-assessment

After the 24 week intervention, participants scheduled a post-assessment visit with the HCCH RD. During this visit, height, weight and blood pressure were taken. Participants were provided with an iPad to complete the same Qualtrics-based survey, also given during the pre-assessment appointment. Participants that completed both the pre and post assessment surveys were eligible for a \$50 Walmart gift card drawing. Participants were then moved into the maintenance phase. They continue to receive text messages (n=2-3/week) and will complete an annual follow-up survey at 60 months.

Statistical Analysis

Descriptive statistics were used for demographic and physical characteristics at pre-assessment. Data for within-group primary outcomes were analyzed from pre- to post-assessment using Wilcoxon Ranked Sign Test (ordinal data), McNemar's test (dichotomous data, i.e. gender and primary language), or paired *t*-test or Repeated Measure ANOVA (continuous data, i.e., repeated body weight measures, blood pressure measures at pre-, mid- and post- assessment, weekly monitored physical activity steps and minutes). Data for between-group (English-speaking group vs. Spanish-speaking group) primary outcomes was analyzed from pre- to post-assessment using Mann Whitney-U (ordinal data), Fisher Exact Test/Person χ^2 (dichotomous data, i.e. gender and primary language), or mixed-design Analysis of Variance (ANOVA-continuous data, i.e. repeated body weight measures, blood pressure measures at pre-, mid- and post- assessment, weekly monitored physical activity steps and minutes). Statistical analyses were performed with SPSS software (version 27, IBM Corp, Armonk, NY, 2020). Statistical significance was set to $P < 0.05$. Data will be presented at the North Carolina Academy of Nutrition and Dietetics Regional meeting and prepared for publication in *The Journal of Rural Health*, as well as submitted for presentation at state or national conferences.

This study was approved under Appalachian State University IRB 19-0304.

Research Purpose and Questions:

Low-income, rural-dwelling individuals are at higher risk of obesity and chronic disease due to health education barriers and isolation to proper health care.¹ Ethnic minorities, especially Hispanic/Latino adults, are affected disproportionately by these barriers and see increased rates of obesity and chronic disease. Residents of rural areas have limited access to nutrient-

dense foods, which leads to nutritional inadequacies as well as favoring quantity over quality. Many families living in rural areas choose highly-processed foods due to perceived benefits including affordability and shelf-stability. A recent study found that 31.6% of the US population is obese and the prevalence of obesity was higher among rural than urban adults.¹

Research Questions:

1. Will a 24-week mHealth text message and eNewsletter-based health and nutrition education intervention result in significant weight loss and positive changes in blood pressure biometric markers in low-income Spanish speaking and English speaking participants in rural Appalachia from pre- to post-assessment?
2. Will a 24-week mHealth text message and eNewsletter-based health and nutrition education intervention result in significant improvements in 12 predictors of behavior change for weight loss/weight management in low-income Spanish speaking and English speaking participants in rural Appalachian from pre- to post-assessment?

Hypotheses:

Hypothesis 1: MQHC will produce significant weight loss and improvements in biometric measures from pre- to post-assessment.

Hypothesis 2: MQHC will significantly improve 12 predictors of behavior change for weight loss/weight management from pre- to post-assessment.

Study Objectives:

Primary Goal: Weight loss of 5% from baseline body weight; clinically significant reduction in A1C (0.5%), systolic (5mmHg), diastolic blood pressure (5 mmHg), LDL cholesterol (10 mg/dL), or triglycerides (40 mg/dL), and increase in HDL cholesterol (5 mg/dL) from pre- to post-assessment.

Secondary Goals: Increased self-monitoring of body weight and physical activity, water intake, fruit and vegetable intake, healthy snacking, meal planning, daily steps, physical activity, knowledge and adherence to personal calorie requirement, food and exercise journaling, and reduce sugar-sweetened beverage intake and screen time.

Significance of Study

This study is significant because it observes the impact of a low-cost and highly accessible health promotion intervention in a rural community. This study also provides a culturally adapted MQHC program to better serve the rural Appalachia area. Using personal cell phones to interact with participants during *My Quest in the High Country* may further reveal the strength of mobile health programs in promoting health behaviors within rural communities.

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Chapter 2: Article

Abstract

Rural dwelling, low-income individuals see increased risk of chronic disease due to limited access to healthcare. Hispanic/Latino adults are affected disproportionately by these barriers. High Country Community Health (HCCH) and Appalachian State University (ASU) developed a bilingual (English and Spanish), 24-week, mHealth-based program called *My Quest in the High Country (MQHC)* to support these individuals.

HCCH patients were recruited by the HCCH Registered Dietitian (RD) using a standardized recruitment script. Participants received materials based on native language (English speaking or Spanish speaking). Participants received a scale and FitBit. ASU implemented the 24 week intervention. From weeks 1-12, participants received text messages (n=1-2/ day), self-monitoring prompt texts (n=1-2/wk), eNewsletters (n=1/wk) and weekly physical activity feedback. At mid-point, participants returned the Fitbit. Participants continued to receive texts and eNewsletters from weeks 13-24. Biometric data were collected and participants completed a survey at pre-, mid- and post-assessment. Analyses included McNemar, Wilcoxon Signed Rank, paired t-test, and descriptives. Significance was set at $p<.05$.

Participants [n=19; English speaking (n=13), Spanish speaking (n=6) were female (95%), income less than \$25,000/year (63%) and a mean age of 42.9 (11.9) years. *My Quest in the High Country (MQHC)* resulted in significant weight loss and reduction in diastolic

blood pressure in the whole group (n=18) and in the English speaking group (n=13). No changes were observed in the Spanish speaking group (n=6).

Feedback showed participants found the text messages *extremely helpful* (58%) and eNewsletters *extremely helpful* (50%). This, with biometric results, suggests mHealth interventions can be impactful in rural, low-income populations. Focus groups could determine how to meet the needs of the Hispanic/Latino population in the rural Appalachia area.

Introduction

Low-income, rural-dwelling individuals are at higher risk of obesity and chronic disease due to health education barriers and isolation to proper health care.¹ Racial/Ethnic minorities, especially Hispanic/Latino adults, are affected disproportionately by these barriers and see increased rates of obesity and chronic disease. Residents of rural areas have limited access to nutrient-dense foods, which can lead to nutritional inadequacies, as well as favoring quantity over quality. Many families living in rural areas choose highly-processed foods due to perceived benefits including affordability and shelf-stability. A recent study found that 31.6% of the US population is obese and the prevalence of obesity was higher among rural than urban adults.¹

Hispanic/Latino adults in the US demonstrate the lowest health literacy,⁴ adding to the disproportionate effect of nutritional inadequacies seen in this population. Additionally, cultural assimilation of the Hispanic/Latino population in the US, combined with low food literacy, has resulted in higher intakes of fast food, convenience snacks and decreased intake of fruit and vegetables.⁴ These lifestyle behaviors increase added sugar, saturated fat, sodium and overall calorie intake and have increased health disparities and chronic disease incidence

in the Hispanic/Latino population within the US.⁴ According to the Centers for Disease Control and Prevention (CDC), 12.5% of the Latino population in the United States are diagnosed with diabetes compared to 9.4% of non-Hispanic adults.⁵ Approximately 80% of Latino adults are overweight or obese compared to 69.8% of non-Hispanic adults in the United States.⁶

Latino health is often shaped by factors such as language, limited access to preventive care, and the lack of health insurance. The CDC has cited some of the leading causes of illness and death among Hispanics, which include heart disease, cancer, and diabetes.⁶ These conditions can be prevented or managed with nutrition education.

There is significant research in the correlation of limited nutrition knowledge in rural Appalachia and the positive association to chronic disease.^{1,2} However, there is not a significant amount of research on how implementing nutrition education programs may impact these rural populations. Many Appalachian communities are isolated from larger towns with adequate food options to support a healthy diet, indicating that mHealth initiatives could be a promising intervention for this population. Furthermore, there is research that shows ethnic minorities are disproportionately affected by food insecurity.⁴ However, there is minimal research to provide solutions to alleviate this chronic issue.⁴ mHealth interventions could also be a promising tool for ethnic minority populations as it can deliver education and health promotion without added cost. Implementing nutrition education in conjunction with using technologies that are accessible to most individuals (cell phones, fitness trackers, email), as well as making interventions culturally appropriate, is likely to improve health-related behaviors and food choices, resulting in weight loss and positive health outcomes within Appalachian populations.

Mobile health, or mHealth, interventions use portable electronic devices, such as cellphones, to allow healthcare professionals to provide care to patients remotely. Recent data shows that 96% of all Americans, 96% of the Hispanic Americans, and 81% of rural Americans own a smart phone.⁹ Previous research provides evidence that using common technologies, i.e. text messaging, is an effective way to reach patients and convey health information to increase positive health outcomes.^{10, 11}

Implementing nutrition education in conjunction with using technologies that are accessible to most individuals (cell phones, fitness trackers, email), as well as making interventions available in Spanish, is likely to increase accessibility of the program, improve health-related behaviors and food choices, resulting in weight loss and positive health outcomes within Appalachian populations. Objectives of this study align with these ideas in that implementing a low-cost, easily accessible (mHealth) intervention, participants will obtain healthier lifestyle habits, such as increase physical activity, increase fruit and vegetable intake, and increase water intake. Assessing overall acceptability of this program provides insight for further mHealth based research studies.

Methods

Flyers were posted in English and Spanish at the Watauga County and Avery County HCCH locations for recruitment. Prospective participants scheduled an in-person appointment prior to the study start date with the HCCH Registered Dietitian to complete the initial assessment. During the initial assessment, the participants were introduced to the physical activity recommendations set by the Dietary Guidelines for Americans and received basic nutrition education using MyPlate materials. During the initial assessment participants completed the recruitment and consent process. Participants used a provided iPad to

complete a Physical Activity Readiness-Questionnaire (PAR-Q) and a Qualtrics-based online pre-assessment survey. During the survey, participants signed an electronic Informed Consent and Authorization to Collect Personal Health Information. The survey assessed current dietary patterns, in addition to self-efficacy and goal setting intentions as it relates to behavior change. Participants opted-in to the text message program by texting a pre-decided keyword (i.e. MQHCG5 for English-speaking participants, MQHCG3 for Spanish-speaking participants) to a short code to enroll them in the text messaging program. Participants signed a FitBit User Agreement stating they are responsible for the FitBit with a date of return on the agreement and received a Fitbit to wear during the first 12 weeks of MQHC. Participants downloaded the FitBit App on their phone and logged in with a predetermined FitBit log-in set by the researchers. Participant height, weight and blood pressure was collected during the pre-assessment visit using standardized procedures. MQHC began January 10, 2021. At 12 weeks participants scheduled an appointment at HCCH to return the FitBit and complete a Qualtrics online-based midpoint survey to assess progress. Participants continued receiving the text message and eNewsletter intervention from weeks 13-24. At the end of the 24 weeks participants scheduled an appointment at HCCH to complete the post-assessment Qualtrics survey.

Participants

Participants in *MQHC* were current and active (having had an appointment within 6 months) patients of HCCH. Inclusion criteria stated participants were between the ages of 18-69 years old, had a cell phone with text messaging, had an active email address, were at low risk for medical complications as evidenced by PAR-Q and had not previously participated in MQHC or another weight loss study. Participants who were pregnant, planned to become

pregnant or were breastfeeding were excluded. A total of 19 participants were recruited (n=13 English speaking; n=6 Spanish speaking).

Intervention

MQHC was a 24 week, bilingual, mHealth based intervention offered in English and Spanish. Participants received text messages, eNewsletters and individualized feedback from their weekly FitBit data. Health behaviors were assessed at pre-, mid- and post- assessment using a Qualtrics survey. Biometric data was collected at pre-, mid- and post assessment to measure participant success.

Text Message Education and eNewsletters

Participants received daily texts (n=1-2/day) in addition to self-monitoring prompt texts (n=1-2/week), and a self-reported body weight prompt (n=1/week). Texts covered topics such as portion size, added sugars, sugar sweetened beverages, importance of protein at mealtimes, food journaling and how to read a nutrition facts label. Texts also included bitly links, or hyperlinks, to recipes modified for weight loss/management, short cooking demonstrations for healthy food preparation, or low-impact workout videos to encourage physical activity.

Participants also received a weekly eNewsletter (n=24) that focused on nutrition and physical activity behavioral goals. The eNewsletters were developed based on one of twelve predictors of behavior change of Social Cognitive Theory (Food Journaling, Know your Calories, Portion Control, Exercise Journaling, Increasing Steps, Increasing Water Intake, Reducing Intake of Sugar Sweetened Beverages, Meal Planning, Increasing Fruit and Vegetable Intake, Smart Snacking, Increased Physical Activity and Reducing Screen Time). eNewsletters provided tips, reminders and a low-cost healthy recipe.

MQHC was split into two phases. Phase 1 consisted of weeks 1-12. Phase 2 included weeks 13-24. At the end of the first 12 weeks, participants returned the Fitbit. From weeks 13-24, participants continued to self-monitor and report body weight, received all text message education (n=1-2/d) and received weekly eNewsletters (n=1/wk).

FitBit

Physical activity data was collected weekly for weeks 1-12 by logging in to the participant's FitBit account and recording weekly total step counts, weekly total physical activity minutes, as well as average resting heart rate into a coded, de-identified spreadsheet. Participants received self-reporting prompt texts through the week (i.e. body weight, how many servings of fruits and vegetables they had that day, current step counts, etc). The researcher recorded any participant responses to self-reporting texts that were sent out that week.

Data Analysis

Descriptive statistics were used for demographic and physical characteristics at pre-assessment. Data for within-group primary outcomes was analyzed from pre- to post-assessment using Wilcoxon Ranked Sign Test (ordinal data), McNemar's test (dichotomous data, i.e. gender and primary language), or paired *t*-test or Repeated Measure ANOVA (continuous data, i.e. repeated body weight measures, blood pressure measures at pre-, mid- and post- assessment, weekly monitored physical activity steps and minutes). Data for between-group primary outcomes was analyzed from pre- to post-assessment using Mann Whitney-U (ordinal data), Fisher Exact Test/Person χ^2 (dichotomous data, i.e. gender and primary language), or mixed-design Analysis of Variance (ANOVA-continuous data, i.e. repeated body weight measures, blood pressure measures at pre-, mid- and post- assessment,

weekly monitored physical activity steps and minutes). Statistical analyses were performed with SPSS software (version 27, IBM Corp, Armonk, NY, 2020). Statistical significance was set to $P < 0.05$.

Results

Participant Demographics

Participants [(n=19; English speaking (n=13), Spanish speaking (n=6)] were female (95%), Hispanic (32%), married (62%), with 2 year degree/some college or more (58%), income less than \$25,000/year (63%) and had a mean age of 42.9 (+/- 11.9) years. At post-assessment, six participants voluntarily opted-out of MQHC and 13 participants (English speaking (n=10) , Spanish speaking (n=3)) completed the 24-week MQHC intervention (68% retention rate). Demographics of participants that opted out of the program did not vary significantly from the overall demographics of the participants that remained in the program.

Table 1. Demographic Characteristics of *My Quest in the High Country* Participants

Characteristic	All Participants (n=19)	English Speaking Participants (n=13)	Spanish Speaking Participants (n=6)
Age [y (SD)]	41.2 (11.2)	44.4 (12.5)	38 (9.8)
Gender [n (%)]			
Female	18 (95)	12 (92)	6 (100)
Male	1 (5)	1 (8)	0 (0)
Race [n (%)]			
White	15 (79)	13 (100)	2 (33)
Black or African American	1 (5)	-	1 (17)
Other	-	-	-
Hispanic or Latino [n(%)]			
Education [n (%)]	3 (13)	-	3 (50)
Less than High School			
High School or GED	5 (26)	1 (8)	4 (67)
2 year/Some College	3 (16)	3 (23)	0 (0)
4 year degree or more	7 (54)	5 (38)	2 (33)
Marital Status [n (%)]	4 (21)	4 (31)	0 (0)
Single			
Married	7 (37)	7 (54)	0 (0)
Income [n (%)]	12 (63)	6 (46)	6 (100)
<\$15,000/year			
\$15,001-\$25,000/year	4 (21)	2 (15)	2 (33)
>\$25,001/year	8 (42)	5 (38)	3 (50)
	7 (37)	6 (46)	1 (17)

Health-Related Behavior Change

From the pre- and post- assessment health related behaviors were assessed. Overall, English speaking participants showed increased confidence in preparing and cooking food ($p=0.008$). Among English speaking participants, a statistically significant increase in strenuous activity was also found from pre to post assessment ($p=0.024$). No statistically significant associations were found pre- to post- for health behaviors in the Spanish speaking group (see Table 2).

Table 2. English-speaking Participant Behavioral Factors and Social Cognitive Theory Construct Scores Before and After *My Quest in the High Country*

	English Speaking Pre Mean (SD)	English Speaking Post Mean (SD)	Spanish Speaking Pre Mean (SD)	Spanish Speaking Post Mean (SD)	P-value English Speaking, Spanish Speaking
Food Security					
Do you ever worry that you do not have enough money to buy food? ^{1,a}	1.54 (0.49)	1.67 (0.5)	1.4 (0.489)	1.3 (0.58)	1.0, 1.0
I do not know how to prepare or cook food. ^{1,a}	1.08 (0.29)	2.0 (0)	1.6 (0.54)	2.0 (0)	0.008**, 1.0
Behavioral Factors					
Physical Activity					
Yesterday, I exercised 30 minutes. ^{1,a}	0.08 (0.28)	0.22 (0.44)	0.33 (0.516)	1.0 (0)	0.5, 0.5
Sedentary Behaviors					
Think about the time you spend at home, work or travelling. In a typical day, how many hours do you spend sitting? ^{2,b}	7.0 (1.21)	7.06 (0.87)	5.25 (1.722)	2.25 (0.71)	0.33, 0.18
Think about the time you spend at home, work or travelling. How often do you perform strenuous exercise (heart beats rapidly) ex. biking fast, hiking, running, jogging, swimming laps, etc.? ^{2,d}	1.69 (0.63)	2.67 (0.87)	1.83 (0.753)	3.67 (0.58)	0.024*, 0.11
Environmental Factors					
Sugar-Sweetened Beverages					
Replacing one sugar-sweetened beverage (such as sweet tea, soft drinks, fruit drinks or sports drinks) a day with water will help me lose weight. ^{2,e}	4.23 (0.83)	4.0 (1.12)	3.33 (1.86)	3.67 (1.53)	0.18, 0.32

¹McNemar Test; ²Wilcoxon Signed Rank test; ³Paired t-test

⁴Response scale: 0=No, 1=Yes; ⁵Response scale: 1=Never, 7=Daily; ⁶Response: Open-ended question; ⁷Response scale: 1=None, 7=9 or more hours per day; ⁸Response scale: 1=Strongly Disagree, 5=Strongly agree

⁹Standard deviation not produced in SPSS outputs

*p<.05, **p<.01, ***p<.001

Biometric and Anthropometric Data

Significant changes in body weight (p=0.007), diastolic blood pressure (p=0.022) (English group only). No significant changes were seen in biometric or anthropometric data in the Spanish group.

Feedback

Upon completion of the study, feedback showed all participants (English and Spanish groups) found the text messages *extremely helpful* (58%) or *a little helpful* (42%) and eNewsletters *extremely helpful* (50%) or *a little helpful* (42%). Participants also stated the amount of text messages per day (n=1-2) was *about right* (73%) and overall rated the program *extremely helpful* in creating healthier habits (73%). Some qualitative feedback from the English group included messages like “I wore the FitBit every day and challenged myself to get 10,000 steps a day...” and “I printed out the newsletters as reminders, the program really worked for me.” Positive qualitative feedback was also received from the Spanish

group with one participant commenting “I never took it off (the FitBit), I loved having it and bought my own after turning it in.”

Table 3. Anthropometric and Physical Activity Characteristics of *My Quest in the High Country* Participants at Pre-assessment and Post-assessment

Characteristic	Pre-assessment (English Speaking)	Post-assessment (English Speaking)	Pre-assessment (Spanish Speaking)	Post-assessment (Spanish Speaking)	p-value (English, Spanish)
<i>Anthropometric^a</i>					
Height [ft (SD)]	65.5 (2.6)	65.5 (2.6)	62.3 (1.9)	62.3 (1.9)	-
Weight [lb (SD)]	247.9 (49.7)	234.9 (47.3)	171.8 (20.3)	170.5 (13.3)	.05* ^c , .11
Systolic Blood Pressure [mmHg (SD)]	128.6 (11.4)	125.3 (15.6)	120.0 (10.4)	117.0 (10.1)	.53, .64
Diastolic Blood Pressure [mmHg (SD)]	85.8 (5.5)	75.3 (8.7)	76.3 (8.2)	75.0 (8.7)	.01* ^{ac} , .73

^a Data collected from Electronic Medical Record

^b Data collected from Fitbit Dashboard

^c paired *t*-test (pre- post data from 10 participants who completed MQHC)

p*<.05; *p*<.01; ****p*<.001

Discussion

MQHC assessed health outcomes in Spanish and English speaking low-income, rural-dwelling adults by providing a 24 week mHealth based intervention. This low-cost intervention intended to provide basic nutrition education and support to individuals that otherwise may not have been accessible. This study parallels earlier research with mHealth initiatives and finds similar results.^{13,14}

However, this study aimed to better serve the Hispanic/Latino population in rural Appalachia with translated materials. While only 5.3% of the population in Watauga County

and 5.4% of the population in Avery County identify as Hispanic/Latino,¹⁷ this population is underserved and at higher risk of diabetes and heart disease;⁴ conditions that can be prevented with nutrition education and encouragement of healthier lifestyle behaviors. This adaptation was completed by utilizing the same resources for the intervention (text messages, eNewsletters, FitBit data, etc) and providing them in the Spanish language.

Significant findings for health-based behaviors and biometric data were reported in the English speaking group only. English speaking participants observed a significant change in weight loss of an average of 12.91 pounds ($p=0.007$) and an average decrease in diastolic blood pressure of 10.5 mmHg ($p=0.012$). This group also observed significant changes in health-based behaviors, including increased confidence in preparing and cooking food ($p=0.008$) and increased strenuous activity ($p=0.024$). No significant findings were reported for the Spanish speaking group.

MQHC provided Spanish materials to increase access to nutrition education, however, no significant findings were reported. Small sample size ($n=3$) and lower risk for weight-related morbidities at the beginning of the study (BMI at pre-assessment for Spanish speaking group was 31.4 compared to BMI at pre-assessment for English speaking group was 40.6) are limitations to consider. Previous mHealth studies have found significant results with Spanish speaking populations in regard to weight loss and health behaviors.¹² This indicates that mHealth initiatives can be successful and impactful in the Hispanic/Latino population. Further studies should be conducted to better meet the needs of Hispanic/Latino population in rural Appalachia.

Other limitations to the study include suboptimal participant engagement. Text message responses to weekly body weight prompts was 45% during the 24 week

intervention. Self-reporting prompt texts had a 26% response rate for weeks 1-12 and a 27% response rate for weeks 13-24, lower than previous studies with a self-reported body weight.^{13,14}

Limitations

This study was not without limitations. The small sample size limits generalizability to other populations. Absence of clinically or statistically significant findings in the Spanish speaking group indicates the study may need expanded cultural adaptation instead of only translating materials and providing the same intervention to different racial/ethnic groups.

Suboptimal participant engagement was also a limitation. This indicates participants may not have been reading the text messages closely or did not feel it was important to respond. Suboptimal participant engagement could provide insight to participants' overall behavior change; however, further analysis would need to be conducted.

Implications

While the results of MQHC did not show significant changes in health behaviors or biometric measures in the Spanish speaking group, it did find significant weight loss and change in diastolic blood pressure in the English-speaking group. Smaller sample size and lower overall BMI in the Spanish speaking group could have had an impact on results, in addition to the need for cultural adaptation of the program.

Additionally, there was a significant change in participant feedback from both groups that showed it to have a positive impact on creating healthy lifestyle habits. This suggests that mHealth initiatives are impactful in rural populations.

Retention for the current study was near that of previous mHealth studies to promote weight loss and behavior change (68.4% compared to 68%-96%).^{13,14} Participants were

provided a FitBit (fitness tracker) and a bath scale to self-monitor their physical activity and body weight. The ability to provide this equipment to individual participants enabled researchers to individualize feedback throughout the study to promote participant engagement and retention. Minimal cost was incurred by both researchers and participants due to the nature of the remote delivery of the program. This also allowed the program to continue even with the COVID-19 pandemic because the majority of interactions throughout the study were conducted via text message or email.

Conclusion

My Quest in the High Country resulted in statistically and clinically (5% weight loss from baseline)²⁰ significant weight loss and reduction in diastolic blood pressure only in the English speaking group. This suggests that mHealth interventions can be impactful in rural, low-income English speaking populations. Clinically significant weight loss can improve health and health risks.²⁰ This includes mitigated risk for diabetes, stroke and coronary heart disease, as well as all-cause mortality.²⁰ This change in risk factors for participants outweighs the costs incurred by the researchers, including time participants spent with the HCCH RD and use of the text-messaging technology (Textedly).

Positive results also consecrate the idea that mHealth initiatives can be impactful during COVID-19. Focus groups may be helpful to determine how to better meet the needs of the Hispanic/Latino population in the rural Appalachia area.

Further studies should more closely research the impact that a text-message based nutrition education intervention has on anthropometric and health behavior outcomes in rural populations.

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Chapter 3: Summary of Findings and Limitations

Results

Participants [(n=19; English speaking (n=13), Spanish speaking (n=6)] were female (95%), Hispanic (32%), married (62%), with 2 year degree/some college or more (58%), income less than \$25,000/year (63%) and had a mean age of 42.9 (+/- 11.9) years. At post-assessment, six participants voluntarily opted-out of MQHC and 13 participants completed the 24-week MQHC intervention (68% retention rate). The participants that opted-out of MQHC did not significantly differ demographically from the participants that remained in the study.

Health-Related Behavior Change

From the pre- and post- assessment health related behaviors were assessed. Overall, English speaking participants found increased confidence in preparing and cooking food ($p=0.008$). English speaking participants also found statistical significance in increased strenuous activity from pre to post assessment ($p=0.024$). No statistical significance was found in pre- to post- qualtrics survey questions for health-based behaviors in the Spanish speaking group.

Biometric and Anthropometric Data

Significant changes in body weight ($p=0.007$), diastolic blood pressure ($p=0.022$) and health-based behaviors ($p<.05$) were observed (English group only). No significant changes were seen in biometric or anthropometric data in the Spanish group.

Feedback

Upon completion of the study, feedback showed all participants in both English and Spanish groups found the text messages *extremely helpful* (58%) or *a little helpful* (42%) and eNewsletters *extremely helpful* (50%) or *a little helpful* (42%). Participants also stated the amount of text messages per day (n=1-2) was *about right* (73%) and overall rated the program *extremely helpful* in creating healthier habits (73%). Some qualitative feedback from the English group included messages like “I wore the FitBit every day and challenged myself to get 10,000 steps a day...” and “I printed out the newsletters as reminders, the program really worked for me.” Positive qualitative feedback from the Spanish group included a comment that “I never took it off (the fitbit), I loved having it and bought my own after turning it in”.

Research Purpose and Questions

Study Objectives

Primary Goal: Weight loss of 5% from baseline body weight; clinically significant reduction in A1C (0.5%), systolic (5mmHg), diastolic blood pressure (5 mmHg), LDL cholesterol (10 mg/dL), or triglycerides (40 mg/dL), and increase in HDL cholesterol (5 mg/dL) from pre- to post-assessment.

Secondary Goals: Increased self-monitoring of body weight and physical activity, water intake, fruit and vegetable intake, healthy snacking, meal planning, daily steps, physical activity, knowledge and adherence to personal calorie requirement, food and exercise journaling, and reduce sugar-sweetened beverage intake and screen time.

Research Questions

1. Will a 24-week mHealth text message and eNewsletter-based health and nutrition education intervention result in significant weight loss and positive changes in blood pressure in low-income Spanish speaking and English speaking participants in rural Appalachia from pre- to post-assessment?

Significant findings for weight loss and diastolic blood pressure were found within the English speaking group. No significant findings were found in the Spanish speaking group.

2. Will a 24-week mHealth text message and eNewsletter-based health and nutrition education intervention result in significant improvements in 12 predictors of behavior change for weight loss/weight management in low-income Spanish speaking and English speaking participants in rural Appalachian from pre- to post-assessment?

Significant findings for health-based behaviors were observed in the English speaking group for increased confidence in preparing and cooking food and increased strenuous activity. No significant findings were found in the Spanish speaking group. Feedback showed all participants found the text messages extremely helpful (58%) or a little helpful (42%) and eNewsletters extremely helpful (50%) or a little helpful (42%).

Limitations

This study was not without limitations. The small sample size limits generalizability to other populations. Absence of clinically or statistically significant findings in the Spanish speaking group indicates the study could benefit from cultural adaptation, instead of only

making materials available in Spanish. Focus groups could identify ways in which to better serve the Hispanic/Latino population in the rural Appalachia area.

Suboptimal participant engagement was also a limitation. Text message responses to weekly body weight prompts was 45% during the 24 week intervention. Self-reporting prompt texts had a 26% response rate for weeks 1-12 and a 27% response rate for weeks 13-24, lower than previous studies with a self-reported body weight.^{13,14}

Implications

While the results of MQHC did not show significant changes in health behaviors or biometric measures in the Spanish speaking group, it did find significant weight loss and change in diastolic blood pressure in the English-speaking group. Additionally, there was participant feedback from both groups that showed it to have a positive impact in creating healthy lifestyle habits.

Retention for the current study was near that of previous mHealth studies to promote weight loss and behavior change (68.4% compared to 68%-96%).^{13,14} Participants were provided a FitBit (fitness tracker) and a bath scale to self-monitor their physical activity and body weight. The ability to provide this equipment to individual participants enabled researchers to individualize feedback throughout the study to promote participant engagement and retention. Minimal cost was incurred by the participants due to the nature of the remote delivery of the program. This also allowed the program to continue even with the COVID-19 pandemic because the majority of interactions throughout the study were conducted via text message or email. Cost to the researchers include time spent with participants at pre-, mid- and post-assessment, purchasing the Fitbit (Inspire HR) and text

messaging software (Textedly) and time of the translators at HCCH spent translating text messages, eNewsletters and questionnaires.

Conclusions

My Quest in the High Country resulted in significant weight loss and reduction in diastolic blood pressure only in the English speaking group. This suggests that mHealth interventions can be impactful in rural, low-income English speaking populations. Positive results also consecrate the idea that mHealth initiatives can be impactful during COVID-19. Focus groups may be helpful to determine how to better meet the needs of the Hispanic/Latino population in the rural Appalachia area.

Further studies should more closely research the impact that a text-message based nutrition education intervention has on anthropometric and health behavior outcomes in rural populations.

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Appendices

Appendix A: Recruitment and Informed Consent Documents

“My Quest in the High Country: Augmenting nutrition standard care with a text message-based health behavior intervention to improve clinical biometric markers and health behaviors in Appalachia.”

Are you trying to lose weight? Do you want support losing weight? Do you like getting text messages? If so, we invite you to participate in a research study that will determine if text messaging is a good way to help men and women trying to lose weight. For this study, we are looking for female, Spanish-speaking patients aged 18-69 years who are trying or want to lose weight.

To be in this study you must be:

- A patient of High Country Community Health
- Age 18-69
- Have a cell phone with text messaging
- Have an active email address
- Have a low risk for medical complications as determined by the Physical Activity Readiness Questionnaire (PAR-Q) or provide signed medical clearance for your primary care provider
- Not pregnant or planning to become pregnant during the study
- Have not lost weight or tried to lose weight within the last three months

Being in this study is completely voluntary. If you decide to be in this study you will be asked to read and sign an Informed Consent form and complete a Physical Activity Readiness Questionnaire (PAR-Q) to determine if you can safely complete this program. When you sign the Informed Consent form you will receive an email to complete an online survey and a short code to opt-in to the text message program.

You will be asked to take three online surveys. These will be sent to the email address you write down on your Informed Consent form. Each survey should take no longer than 15 minutes to finish. Everything will be kept private and confidential.

You will need a cell phone that can receive and send text messages. You will get 2-3 short text messages each week with tips, reminders or questions about exercise and healthy eating, or your body weight.

You will get a weekly eNewsletter that contains tips and recipes. Each newsletter will have links to web pages. Click on the **blue web links** for helpful websites to visit.

Participating in the study is completely voluntary. Even if you decide to participate now, you can change your mind and stop at any time. Participating in this study will not make a difference in how you are treated by the High Country Community Health medical staff, Jamie Griffin and researchers at Appalachian State University, or Appalachian State University.

Reasons not to participate: there is a slight risk of mild discomfort in the beginning of this study as you start being more physically active. This discomfort usually gets better as physical endurance and lung capacity improve.

If you have questions or want to sign up to participate in this study, contact Ariel Danek, HCCH Registered Dietitian, at 828-262-3886 ext 125 or arieldanek@hcchmail.org, or Dr. Jamie Griffin, Assistant Professor at Appalachian State University, at 828-262-8534 or griffinjb@appstate.edu.

Physical Activity Readiness Questionnaire (PAR-Q) and You

Regular physical activity is fun and healthy, and increasingly more people are starting to become more active every day. Being more active is very safe for most people. However, some people should check with their doctor before they start becoming much more physically active.

If you are planning to become much more physically active than you are now, start by answering the seven questions in the box below. If you are between the ages of 15 and 69, the PAR-Q will tell you if you should check with your doctor before you start. If you are over 69 years of age, and you are not used to being very active, check with your doctor.

Common sense is your best guide when you answer these questions. Please read the questions carefully and answer each one honestly:

YES	NO	
<input type="checkbox"/>	<input type="checkbox"/>	1. Has your doctor ever said that you have a heart condition <u>and</u> that you should only do physical activity recommended by a doctor?
<input type="checkbox"/>	<input type="checkbox"/>	2. Do you feel pain in your chest when you do physical activity?
<input type="checkbox"/>	<input type="checkbox"/>	3. In the past month, have you had chest pain when you were not doing physical activity?
<input type="checkbox"/>	<input type="checkbox"/>	4. Do you lose your balance because of dizziness or do you ever lose consciousness?
<input type="checkbox"/>	<input type="checkbox"/>	5. Do you have a bone or joint problem that could be made worse by a change in your physical activity?
<input type="checkbox"/>	<input type="checkbox"/>	6. Is your doctor currently prescribing drugs (for example, water pills) for your blood pressure or heart condition?
<input type="checkbox"/>	<input type="checkbox"/>	7. Do you know of <u>any other reason</u> why you should not do physical activity?

If you answered:	YES to one or more questions
	<p>Talk to your doctor by phone or in person BEFORE you start becoming much more physically active or BEFORE you have a fitness appraisal. Tell your doctor about the PAR-Q and which questions you answered YES.</p> <ul style="list-style-type: none"> You may be able to do any activity you want – as long as you start slowly and build up gradually. Or, you may need to restrict your activities to those which are safe for you. Talk with your doctor about the kinds of activities you wish to participate in and follow his/her advice. Find out which community programs are safe and helpful for you.
	NO to all questions
	<p>If you answered NO honestly to <u>all</u> PAR-Q questions, you can be reasonably sure that you can:</p> <ul style="list-style-type: none"> Start becoming much more physically active – begin slowly and build up gradually. This is the safest and easiest way to go. Take part in a fitness appraisal – this is an excellent way to determine your basic fitness so that you can plan the best way for you to live actively.
	<p>Delay becoming much more active:</p> <ul style="list-style-type: none"> If you are not feeling well because of a temporary illness such as a cold or a fever – wait until you feel better; or If you are or may be pregnant – talk to your doctor before you start becoming more active.
	<p>Please note: If your health changes so that you then answer YES to any of the above questions, tell your fitness or health professional. Ask whether you should change your physical activity plan.</p>

Informed use of the PAR-Q: Reprinted from ACSM's Health/Fitness Facility Standards and Guidelines, 1997 by American College of Sports Medicine

Fit Bit User Agreement

Thank you for participating in the *My Quest in the High Country (MQHC)* study. Today you will receive a Fit Bit to use during the study and this agreement outlines your responsibilities for the care and return of the Fit Bit you are issued as a part of this study.

In consideration of being permitted to participate in this study and receive a Fit Bit for use, I agree to the following:

- The Fit Bit shall remain the property of Appalachian State University.
- I will wear the Fit Bit at all times, except when I am sleeping, swimming, or bathing.
- I will not permit anyone else to have access to and/or wear the Fit Bit.
- I will return the Fit Bit in working order, without damage; normal wear and tear is expected, by April 12, 2021.
- I understand and agree that if I fail to return the Fit Bit or if it is damaged, lost or stolen while in my possession, I will be responsible for paying the full cost of the Fit Bit to Appalachian State University. The replacement cost for the Fit Bit by type are as follows: Charge HR - \$80; Inspire HR - \$100.

I understand if I have any problems with the Fit Bit, I am to immediately contact Jamie Griffin at 828-262-8534 or griffinjb@appstate.edu.

Fit Bit Style assigned: Fit Bit Charge HR or Fit Bit Inspire HR

Fit Bit ID #: _____

I acknowledge I have read this agreement and agree to abide by the terms outlined.

Printed Name

Signature

Date

Witness

Date

Appendix B: Pre and Post Survey Tool-English

Informed Consent for a Research Study called: "My Quest in the High Country"

You are invited to participate in a 24-week research study that will determine if text messaging is a good education and support tool to help patients trying to lose weight. This study is being done by Jamie Griffin, PhD, RDN, LDN, a nutrition professor and researcher at Appalachian State University, Candace Campbell, a graduate dietetics student at Appalachian State University, and Ariel Danek, the Registered Dietitian (RD) at High Country Community Health (HCCH). If you agree to participate, you will work one-on-one with Ariel. You will be scheduled a one-hour visit with Ariel and a follow up visit with her after 4-6 weeks. You will also receive text messages and newsletters from Candace to help you stay on track to meet your weight loss goals and improve health measures.

Your personal health information from your medical record, including your age, height, weight, blood pressure, fasting blood sugar, A1C, HDL cholesterol, LDL cholesterol and triglycerides will be collected by HCCH and monitored during the study. You will sign a HIPPA Authorization to Release Personal Health Information so that High Country Community Health can share this information with Jamie and Candace. They will use this information to determine if receiving text messages and emails will improve these health measures when compared to standard nutrition care given at High Country Community Health. Taking part in this study will not cost you anything extra. You will not be asked to make any additional doctor's appointments during the study. Please continue to show up to your regularly scheduled appointments.

To be eligible you must be:

- Age 18-69
- An active patient of High Country Community Health (someone who has been seen by HCCH with in the past 6 months)
- Have a cell phone with text messaging
- Have an active email address
- Be at low risk for medical complications as determined by the Physical Activity Readiness Questionnaire (PAR-Q) or provide signed medical clearance from your primary care provider.
- *Have not previously participated in My Quest in the High Country*

You must meet all these requirements to be eligible to participate in this study.

During the 24-week study you will receive 1-2 text messages each day. Text messages will contain web links to videos, tips, reminders and questions about exercise or healthy eating, or your body weight. You will be given a bath scale to weigh yourself each week. You will weigh yourself and text your current weight back to Candace. You will get a weekly e-newsletter that contains tips and recipes. You will be given a Fit Bit to wear every day during the first 12 weeks. You are expected to wear the Fit Bit at all times unless you are bathing or sleeping. Each week, Candace will download your physical activity and send you a text message with feedback on how you are doing meeting your physical activity goal.

During this study you will complete 3 online surveys. Please complete the survey and sign into the text message program. The survey should only take about 15 minutes to complete. Survey 2 and 3 will be sent to you at the email address you type at the bottom of this screen.

You will complete the first survey and opt into the text messaging program when you sign up with Ariel Danek. Once you complete the first survey and opt into the text message program Ariel will assign you a Fit Bit. The second survey will arrive in your email box on June 27, 2021. Once you complete the second survey, your name will be entered into a drawing for a \$50 Walmart gift card. The third survey will arrive in your email box on January 10, 2021.

On January 10, 2020 you will begin receiving 1-2 text messages per day. You will also receive a weekly eNewsletter to your email on Sundays. You will get a Fit Bit to wear during the study. You will return the Fit Bit to Ariel at High Country Community Health after April 4th, 2021. You will continue to receive 2-3 text

Your personal health information will be monitored each February from January 2021 to January 2026 to see if the text message program helps you continue to stay on track to meet your weight loss goals and improve health measures.

The benefits of this research study may include improved body weight, A1c, fasting blood glucose, blood pressure, and blood lipids (HDL, LDL and triglycerides).

Reasons not to participate: There is a slight risk of mild discomfort in the beginning of this study as you start being more physically active. This discomfort usually gets better as physical endurance and lung capacity improve.

Confidentiality: Everything will be kept confidential. Your personal identifying information will be kept in a HCCH HIPPA compliant, password protected spreadsheet. Identifiers will be removed from the identifiable private information and after such removal it will be used for the research study. The information will not be used or distributed for future research studies without additional informed consent. Even though strict measures are in place to protect confidentiality, there is a slight risk for loss of confidentiality.

Participating in the study is completely voluntary. Even if you decide to participate now, you can change your mind and stop at any time by responding "STOP" to any text message. Participating in this study will not make a difference in how you are treated by the High Country Community Health medical staff, Jamie Griffin and researchers, or Appalachian State University.

If you choose to opt-out of the text message program, you are choosing to opt-out of the entire study. The Fit Bit will need to be returned to Ariel at HCCH within seven days of opting-out of the program.

We will use information from the surveys and text message responses for the study. Your answers are important. There are no right or wrong answers. Everything will be kept confidential. The survey should take about 15 minutes to complete.

If you have any questions, contact Dr. Jamie Griffin (griffinjb@appstate.edu; 828-262-8534) or Candace Campbell (campbellcd3@appstate.edu). If you feel you have been harmed by this research, or if you have questions regarding the protection of human subjects, contact the IRB administrator, Research Protections, Appalachian State University, Boone, NC 28607, (828)262-2692, irb@appstate.edu. Refer to IRB Study #19-0304.

Q125 Capture

A

Q123 **Informed Consent for a Research Study called: "My Quest in the High Country"**

A

Q124 Please type your full name below to acknowledge you have read the informed consent.

A



Q122



Authorization to Disclose Protected Health Information

I authorize High Country Community Health to release protected health information to the following individual/organization.

Jamie B. Griffin, PhD, RDN, LDN, Assistant Professor and Primary Investigator, Appalachian State University, Boone, North Carolina 28607.

I understand that I am authorizing the following information from my medical record to be released by High Country Community Health.

- Age
- Height
- Weight
- Blood pressure
- Fasting blood glucose
- A1C
- Triglycerides
- HDL Cholesterol/LDL Cholesterol

I understand that authorizing the disclosure of this information is voluntary. I can refuse to sign this authorization. I have the right to cancel this authorization at any time. I understand that it is my responsibility to notify High Country Community Health if I wish to cancel this authorization. I further understand that High Country Community Health is not responsible for disclosures made based on this authorization prior to date of cancellation. This authorization will expire July 1, 2025.

Q110





Q112



By continuing to the survey questions, you acknowledge that you:

- Are between the ages 18-69
- Are an active patient of High Country Community Health (someone who has been seen by HCCH within the past 6 months)
- Have a cell phone with text messaging
- Have an active email address
- Are at low risk for medical complications as determined by the Physical Activity Readiness Questionnaire (PAR-Q) or provide signed medical clearance from your primary care provider.
- **Have not previously participated in My Quest in the High Country**
- Have read all of the above information
- Have agreed to participate in the survey and study.

Remember, there are no right or wrong answers.
Let's get started!

Q5

For these questions, think about your feelings towards exercise. How much do you agree with the following statements?

A

Q4

Exercise lets me have contact with friends and people I enjoy.



(Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree)

Q3

Exercise makes me feel better physically.



(Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree)

Q2

Walking an extra 500 steps each day will help me lose weight.



(Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree)

Q6 For these questions, think about your feelings towards exercise. How much do you agree with the following statements?

A

Q7 It costs too much to exercise.

• —
• —

(Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree)

Q8 Exercise is an activity I enjoy doing.

• —
• —

(Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree)

Q9 Exercise improves my ability to perform daily activities (such as cooking, shopping or light cleaning).

• —
• —

(Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree)

Q10 For these questions, think about your feelings towards exercise. How much do you agree with the following statements?

A

Q11 I want to exercise 30 minutes or more each day.

• —
• —

(Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree)

Q12 I can exercise 30 minutes or more each day when I'm tired, upset or stressed.

• —
• —

(Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree)

Q13 I want to walk 10,000 steps each day.

• —
• —

(Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree)

Q14 Now, think about the foods you eat. How much do you agree with the following statements?

A

Q15 I have control over what foods are served in my home.

•—
•—

(Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree)

Q16 Writing down the foods I eat will help me lose weight.

•—
•—

(Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree)

Q18 My family members think I should offer fruits and vegetables more often.

•—
•—

(Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree)

Q19 I want to eat more fruits and vegetables each day.

•—
•—

(Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree)

Q20 It is mostly up to me what to make for meals.

•—
•—

(Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree)

Q21 Eating fruits and vegetables is enjoyable.

•—
•—

(Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree)

Q22 Now, think about the foods you eat. How much do you agree with the following statements?

A

Q23 I want to write down my foods each day to know how many calories I am eating.

•—
•—

(Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree)

Q24 I can eat fruits and vegetables each day when I am nervous, upset or stressed.
• —
• —
• — (Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree)

Q25 Replacing one sugar-sweetened beverage (such as sweet tea, soft drinks, fruit drinks or sports drinks) a day with water will help me lose weight.
• —
• —
• — (Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree)

Q26 Eating fruits and vegetables is needed for good health.
• —
• —
• — (Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree)

Q27 For the next few questions, think about how sure you are of the following statements.

A

Q28 I know how to set goals to increase my physical activity.
• —
• —
• — (Not sure at all, Not sure, Neither not sure nor sure, Sure, Extremely sure)

Q29 I can have fruits and vegetables when I am in a rush.
• —
• —
• — (Not sure at all, Not sure, Neither not sure nor Sure, Sure, Extremely sure)

Q30 I can eat 5 servings of fruits and vegetables most days.
• —
• —
• — (Not sure at all, Not sure, Neither not sure nor Sure, Sure, Extremely sure)

Q31 I can eat high fiber foods.
• —
• —
• — (Not sure at all, Not sure, Neither not sure nor Sure, Sure, Extremely sure)

Q32 I know how many calories I should eat each day to manage my weight.
• —
• —
• — (Not sure at all, Not sure, Neither not sure nor Sure, Sure, Extremely sure)

Q33 I can select foods from all food groups that are rich in nutrients and lower in calories (such as fruits and vegetables, whole grains, lean meats, low-fat dairy).
• —
• —
• — (Not sure at all, Not sure, Neither not sure nor Sure, Sure, Extremely sure)

Q33 I can select foods from all food groups that are rich in nutrients and lower in calories (such as fruits and vegetables, whole grains, lean meats, low-fat dairy).

• —
• —
• —

(Not sure at all, Not sure, Neither not sure nor Sure, Sure, Extremely sure)

Q34 For the next few questions, think about how sure you are of the following statements.

A

Q35 I can control my food portions to control my weight.

• —
• —
• —

(Not sure at all, Not sure, Neither not sure nor Sure, Sure, Extremely sure)

Q36 I know what a single serving is for my favorite food.

• —
• —
• —

(Not sure at all, Not sure, Neither not sure nor Sure, Sure, Extremely sure)

Q37 I know how to read food labels to pick foods lower in calories.

• —
• —
• —

(Not sure at all, Not sure, Neither not sure nor Sure, Sure, Extremely sure)

Q38 I know I can make small changes in my eating to make my health better.

• —
• —
• —

(Not sure at all, Not sure, Neither not sure nor Sure, Sure, Extremely sure)

Q40 How often do you do the following?

A

Q41 Make a grocery shopping list?

• —
• —
• —

(Never, Less than once a month, Once a month, 2-3 times a month, Once a week, 2-3 times a week, Daily)

Q43 Plan your meals ahead?

• —
• —
• —

(Never, Less than once a month, Once a month, 2-3 times a month, Once a week, 2-3 times a week, Daily)

Q47 Have fruits and vegetables ready to eat as a snack?
• —
• —
• — (Never, Less than once a month, Once a month, 2-3 times a month, Once a week, 2-3 times a week, Daily)

Q46 How often do you do the following?

A

Q45 Have sugar-sweetened beverages (such as sweet tea, soft drinks, fruit drinks or sports drinks) in your home?
• —
• —
• — (Never, Less than once a month, Once a month, 2-3 times a month, Once a week, 2-3 times a week, Daily)

Q48 Eat fruits and vegetables as a snack?
• —
• —
• — (Never, Less than once a month, Once a month, 2-3 times a month, Once a week, 2-3 times a week, Daily)

Q49 Drink water instead of sugar-sweetened beverages (such as sweet tea, soft drinks, fruit drinks or sports drinks)?
• —
• —
• — (Never, Less than once a month, Once a month, 2-3 times a month, Once a week, 2-3 times a week, Daily)

Q39 Respond "Yes" or "No" to the following questions.

A

Q42 Yesterday, I exercised for 30 or more minutes.
• —
• — (Yes, No)

Q50 Next week, I will exercise 30 minutes or more each day.
• —
• — (Yes, No)

Q51 Respond "Yes" or "No" to the following questions.

A

Q52 I know the number of steps I walked yesterday.

Yes
 No
(Yes, No)

Q53 Next week, I will walk 500 more steps each day.

Yes
 No
(Yes, No)

Q54 Next week, I will write down my steps each day.

Yes
 No
(Yes, No)

Q55 Respond "Yes" or "No" to the following questions.

A

Q56 Yesterday, I wrote down what I ate and drank.

Yes
 No
(Yes, No)

Q57 Next week, I will write down what I eat and drink each day.

Yes
 No
(Yes, No)

Q60 Now, think about the foods you usually eat and drink.

A

Q61 How many servings of fruits do you eat each day? A serving of fruit is an apple or banana, a small bowl of grapes, or 3 tablespoons of canned fruit

Q59 How many servings of vegetables do you eat each day? A serving of vegetables is 3 heaped tablespoons of green or root vegetables like peas, baked beans, or sweet corn; or a medium bowl of salad (lettuce, tomatoes, etc.)

A

Q62 Vegetable serving

A

Q96 Now, think about the foods you usually eat. How often do you eat the following?

A

Q97 Canned vegetables (with salt)

• —
• —
• —

(Never, Less than once a month, Once a month, 2-3 times a month, Once a week, 2-3 times a week, Daily)

Q98 Canned vegetables (with low sodium or no salt added)

• —
• —
• —

(Never, Less than once a month, Once a month, 2-3 times a month, Once a week, 2-3 times a week, Daily)

Q99 Frozen vegetables (with salt or sauce added)

• —
• —
• —

(Never, Less than once a month, Once a month, 2-3 times a month, Once a week, 2-3 times a week, Daily)

Q100 Frozen vegetables (with no salt or sauce added)

• —
• —
• —

(Never, Less than once a month, Once a month, 2-3 times a month, Once a week, 2-3 times a week, Daily)

Q101 Fresh vegetables

• —
• —
• —

(Never, Less than once a month, Once a month, 2-3 times a month, Once a week, 2-3 times a week, Daily)

Q63 Now, think about the foods you usually eat and drink.

A

Q64 How many sugar-sweetened beverages (such as sweet tea, soft drinks, fruit drinks or sports drinks) do you drink each day?

• —
• —

Q67 Think about the foods you usually eat and drink.

A

Q66 How often do you eat high-fat meats (such as hot dogs, bologna, bacon, sausage, pepperoni, BBQ or fried chicken)?

• —
• —
• —

(None, 1-2 times per week, 3-4 times per week, 5-6 times per week, 1 or more each day)

Q68 How often do you eat refined grains (such as white bread, white rice or pasta)?

• —
• —
• —

(None, 1-2 times per week, 3-4 times per week, 5-6 times per week, 1 or more each day)

Q65 Think about the time you spend sitting (such as at work, home or traveling).

A

Q69 In a typical day, how much time do you usually spend sitting (in hours)?

A

Q70 Think about the time you spend sitting (such as at work, home or traveling).

A

Q71 How much time do you usually spend sitting watching television, playing video games or searching the internet (computer, tablet or cell phone)?

• —
• —
• —

(None, Less than 1 hour per day, 1-2 hours per day, 3-4 hours per day, 5-6 hours per day, 7-8 hour...)

Q72 In the next week, how many hours do you plan to do the following?

A

Q73 Strenuous exercise (heart beats rapidly)Ex: biking fast, hiking, running, jogging, swimming laps, etc.

• —
• —
• —

(None, Less than 1 hour per week, 1-2 hours per week, 3-4 hours per week, 5-6 hours per week, 7-8 ...)

Q74 Moderate exercise (not exhausting)Ex: walking quickly, dancing, team sports, weight lifting, etc.
• —
• —
• — (None, Less than 1 hour per week, 1-2 hours per week, 3-4 hours per week, 5-6 hours per week, 7-8 ...)

Q75 Mild exercise (little effort)Ex:walking slowly, gardening, cleaning house, vacuuming, golf, fishing, yoga, etc.
• —
• —
• — (None, Less than 1 hour per week, 1-2 hours per week, 3-4 hours per week, 5-6 hours per week, 7-8 ...)

Q114 Do you ever worry that you do not have enough money to buy the foods you wish to buy?
• —
• — (Yes, No)

Q121 Respond "Yes" or "No" to the following questions:
A

Q115 In the past month, did you ever cut the size of your meals or skip meals because there wasn't enough money for food?
• —
• —
• — (Yes, No)

Q116 In the past month did you ever eat less than you felt you should because there wasn't enough money for food?
• —
• —
• — (Yes, No)

Q117 Respond "Yes" or "No" to the following questions:
A

Q118 I do not have enough money to buy food.
• —
• — (Yes, No)

Q119 I do not know how to purchase food.
• —
• — (Yes, No)

Q120 I do not know how to prepare or cook food.

Yes
 No
(Yes, No)

Q76 You are almost finished. This is the last set of questions. Make sure to complete the survey.

A

Q77 What is your age?

Q78 What is your height? (in inches)Example: If you are 5 feet and 6 inches, you will enter 66"

Q79 What is your weight? (in pounds)

Q80 Are you?

Male
 Female
(Male, Female)

Q81 Are you?

Married
 Widowed
 Divorced
 Separated
 Never married
(Married, Widowed, Divorced, Separated, Never married)

Q82 Are you Hispanic or Latino?

Yes
 No
(Yes, No)

Q83 What is your race? (Check all that apply)

White/Caucasian, Black/African American, Native American/Alaska Native, Native Hawaiian or Other ...
(Yes, No)

Q84 Including yourself, how many adults (over 18 years old) live with you?

Q85 How many children (17 years or younger) live with you?

Q86 How much education do you have?

Less than High School, High School Graduate/GED, 2 Year Degree/Some college, 4 Year Degree or More

Q87 For work, are you employed?

Full-time, Part-time, Unemployed, Retired

Q88 What is your income?

-
-
-

(Less than \$15,000 per year, \$15,001 to \$25,000 per year, \$25,001 to \$50,000 per year, \$50,001 to ...)

Q102 Have you tried to lose weight within the past three months?

-
-

(Yes, No)

Q104 Have you been in a weight loss program such as Weight Watchers, NutriSystem, etc. in the past three months?

-
-

(Yes, No)

Q103 Have you lost weight within the past three months?

-
-

(Yes, No)

Q91 Have you had an initial consult visit with Ariel Danek, Registered Dietitian at High Country Community Health?

-
-
-

(Yes, No, No, but I have an appointment scheduled)

Q92 If you answered yes, how many appointment visits have you had with Ariel Danek, Registered Dietitian at High Country Community Health clinic?

-
-
-

(1 appointment visit, 2 appointment visits, 3 appointment visits, 4 or more appointment visits)

Q89 What is your cell phone number?Ex: 828-262-8534Please note: Your phone number will not be shared with anyone. This information will be used to ensure you have successfully opted-in to the text message program.



Q90


Thank you for your time. You will get another email in December with a link to a new survey. Be sure to complete the second survey. You must complete both surveys to be entered into a drawing for a \$50 Walmart gift card. The next survey will be much shorter than the one you just finished.



If you have any questions, please contact Dr. Jamie Griffin, researcher, at 828-262-8534 or griffinjb@appstate.edu.



Appendix C: Pre and Post Survey Tool-Spanish

<input checked="" type="checkbox"/> Q123 	<p>Consentimiento Informativo para una Investigación Nombrada: "Mi Misión en el High Country"</p> <p>Está invitada a participar en un estudio científico de 24 semanas que determinará si mensajes de texto son una buena herramienta de educación y apoyo para pacientes que intentan perder peso. Este estudio está siendo hecho por Jamie Griffin PhD, RDN, LDN, profesora de nutrición e investigadora en Appalachian State University. Si está de acuerdo en participar, se le programará una preevaluación de una hora con Ariel Danek en High Country Community Health y una visita de rutina al terminar el programa de 24 semanas. Ambas citas al igual que cualquier tipo de comunicación se llevará a cabo en High Country Community Health por Ariel Danek e Interpretes de la Clínica. Se le asignará un fitbit que usará durante la investigación durante las primeras 12 semanas. Tendrá que regresar el FitBit a High Country Community Health antes de 03/08/2021 y continuará recibiendo educación sobre nutrición después de las 12 semanas. Esto incluye mensajes de texto y un boletín informativo electrónico para ayudarle a seguir el camino a cumplir sus metas de pérdida de peso y mejorar medidas de salud.</p> <p>Su información de salud personal, incluyendo su edad, altura, peso y presión sanguínea será colectada durante su visita de preevaluación. Esta información será monitoreada durante la investigación. Tomar parte en esta investigación no le dará un costo adicional. Usarán esta información para determinar si recibir mensajes de texto y correos electrónicos mejorará estas medidas de salud.</p> <p><u>Para ser elegible necesita tener:</u> <u>Mujer</u> <u>Edad de 18-69</u> <u>Hablar el Español como su lengua principal</u> <u>Tener un celular con mensajes de texto</u> <u>Una dirección de correo electrónico activo</u> <u>Ser de bajo riesgo de alguna complicación médica determinada por el Cuestionario de Disposición a Actividad física (PAR-Q en inglés) o proveer una autorización firmada por su proveedor médico.</u> <u>No haber participado previamente en <i>Mi Búsqueda</i> en el High Country.</u> <u>Debe cumplir con todos los requisitos para ser elegible a participar en esta investigación.</u> <u>Durante la investigación de 24 semanas recibirá 1-2 mensajes de texto cada día. Los mensajes de texto van a contener links a videos, consejos, recordatorios y preguntas sobre el ejercicio o el comer saludable, o sobre su peso corporal. Usted se pesará y regresará un mensaje con su peso actual. Recibirá un boletín cada semana conteniendo consejos y recetas. Se le otorgará un Fit Bit que tendrá puesto todos los días durante las 24 semanas. Se requiere que use el Fit Bit todo el tiempo al menos que se esté bañando o durmiendo. Cada semana, su actividad física será descargada cada Sábado Recibirá un mensaje de texto con criticas de como va en su camino a cumplir su meta de actividad física.</u></p> <p><u>Durante esta investigación completé 7 encuestas en línea. La encuesta será enviada al correo que proporciona. La encuesta debería tomar alrededor de 15 minutos para completar. Debe completar la primera encuesta y optar por el programa de mensajes de texto hoy. Ya que complete la primera encuesta y opte por el programa de mensajes de texto se le asignará un Fit Bi. La segunda encuesta llegará a su correo electrónico el 16 de Mayo del 2021. Al completar la segunda encuesta, su nombre será metido a una rifa para una tarjeta de regalo de \$50 a Walmart. La tercera encuesta le llegará el 1 de Marzo del 2021. Las demás encuestas le llegarán a su correo electrónico anualmente cada Marzo. La última encuesta llegará a su correo electrónico el 1 de marzo del 2025.</u></p>
--	--

El 29 de Noviembre del 2020 comenzará a recibir 1-2 mensajes de texto por día. También recibirá un boletín electrónico cada semana. También recibirá un Fit Bit para llevarlo puesto durante la investigación. Regresará el Fit Bit a Jamie Griffin después del 08 de Marzo del 2021.

Continuará recibiendo 2-3 mensajes de texto cada semana para ayudarla a mantenerla en buen camino.

Su información de salud personal será monitorizada cada Marzo del 2021 -2025 para ver si el programa de mensajes de texto le ayudan a continuar el camino a cumplir su meta de pérdida de peso y mejorar sus medidas de salud.

Confidencialidad: Todo será confidencial. Su información personal de identidad estará en un documento protegido por una contraseña. Los identificadores serán removidos de la información privada que es identificable y después de ser removida solo se usará para estudios de investigación. La información no será usada o distribuida para estudios de investigación en el futuro sin algún consentimiento adicional. Aunque medidas estrictas están puestas en lugar para proteger la confidencialidad, existe la posibilidad de una pérdida de confidencialidad.

Participar en esta investigación es completamente voluntario. Aunque decida participar ahora, puede cambiar de opinión y contestar 'STOP' a cualquier mensaje de texto. El participar en esta investigación no hará alguna diferencia en el trato por Jamie Griffin e investigadores o Appalachian State University.

Si decide optar fuera del programa de mensajes de texto, está eligiendo optar fuera de la investigación por completo. El Fit Bit necesitaría ser regresado a Jamie Griffin en ASU dentro de siete días después de optar fuera del programa.

Razones para no participar: existe un riesgo de incomodidad leve al empezar a ser más activo al principio de este programa. La incomodidad usualmente disminuye al mismo tiempo que su resistencia física y capacidad pulmonar mejoran.

Usaremos esta información obtenida de las encuestas y respuestas de mensajes de texto para esta investigación. No hay respuestas correctas o incorrectas. Todo se mantendrá privado y confidencial. La información colectada por parte de esta investigación, incluyendo si los identificadores son removidos, no se usarán o serán distribuidos para investigaciones en el futuro.

Si tiene cualquier pregunta, contacte a Dr. Jamie Griffin (griffinjb@appstate.edu; 828-262-8534) o Candace Campbell (campbellcd3@appstate.edu). Si siente que fue lastimada durante esta investigación contacte a Dr. Jamie Griffin (griffinjb@appstate.edu; 828-262-8534). Preguntas sobre la protección de sujetos humanos pueden ser digeridas a el administrador del IRB, Research Protections, Appalachian State University, Boone, NC 28607 (828)262-4060; irb@appstate.edu.

-

Q123 **Consentimiento Informativo para una Investigación Nombrada: "**


A

Q124 Por favor ingrese su nombre abajo para aceptar que ha leído el c...

A

Page

Q122



Authorization to Disclose Protected Health Information

I authorize High Country Community Health to release protected health information to the following individual/organization.

Jamie B. Griffin, PhD, RDN, LDN, Assistant Professor and Primary Investigator, Appalachian State University, Boone, North Carolina 28607.

I understand that I am authorizing the following information from my medical record to be released by High Country Community Health.

- Age
- Height
- Weight
- Blood pressure
- Fasting blood glucose
- A1C
- Triglycerides
- HDL Cholesterol/LDL Cholesterol

I understand that authorizing the disclosure of this information is voluntary. I can refuse to sign this authorization. I have the right to cancel this authorization at any time. I understand that it is my responsibility to notify High Country Community Health if I wish to cancel this authorization. I further understand that High Country Community Health is not responsible for disclosures made based on this authorization prior to date of cancellation. This authorization will expire July 1, 2025.

Q112



El continuar a las preguntas de encuesta, acepta que:

Tiene la edad de 18-69 años
Tiene un celular con mensajes de texto
Tiene una dirección de correo electrónico activa
Ser de bajo riesgo a alguna complicación médica determinada por el Cuestionario de Disposición a Actividad Física (PAR-Q) o proveer una autorización firmada por su proveedor médico.
No haber participado previamente en Mi Búsqueda en High Country
Haber leído toda la información de arriba
Haber aceptado participar en las encuestas e investigación.

Recuerde no hay respuestas correctas e incorrectas.
Ahora, Comencemos!

-

Q5



Para estas preguntas, piense sobre sus sentimientos hacia el ejercicio. Que tan de acuerdo está con las siguientes declaraciones?

Q4 El ejercicio me deja tener contacto con amigos y gente que disfru...



(Completamente Desacuerdo, Desacuerdo, Ni de acuerdo o Desacuerdo, Acuerdo, Completamente Acuerdo)

Q3 El ejercicio me hace sentir mejor físicamente



(Completamente Desacuerdo, Desacuerdo, Ni de acuerdo o Desacuerdo, Acuerdo, Completamente Acuerdo)

Q2 El caminar 500 pasos extra me ayudara a perder peso.



(Completamente Desacuerdo, Desacuerdo, Ni de acuerdo o Desacuerdo, Acuerdo, Completamente Acuerdo)

Page Br

Q6 Para estas preguntas, piense sobre sus sentimientos hacia el ...

A

Q7 Cuesta demasiado hacer ejercicio



(Completamente Desacuerdo, Desacuerdo, Ni de acuerdo o Desacuerdo, Acuerdo, Completamente Acuerdo)

Q8 El ejercicio es una actividad que me gusta



(Completamente Desacuerdo, Desacuerdo, Ni de acuerdo o Desacuerdo, Acuerdo, Completamente Acuerdo)

Q9 El ejercicio mejora mi habilidad para realizar actividades di...
•—
•—
•— (Completamente Desacuerdo, Desacuerdo, Ni de acuerdo o Desacuerdo, Acuerdo, Completamente acuerdo)

----- Page Break

Q10 Para estas preguntas piense sobre sus sentimientos hacia el e...

A

Q11 Quiero hacer ejercicio por más de 30 minutos cada día...
•—
•—
•— (Completamente Desacuerdo, Desacuerdo, Ni de acuerdo o Desacuerdo, Acuerdo, Completamente Acuerdo)

Q12 Puedo hacer ejercicio 30 minutos o mas cada día cuando estoy ...
•—
•—
•— (Completamente Desacuerdo, Desacuerdo, Ni de acuerdo o Desacuerdo, Acuerdo, Completamente Acuerdo)

Q13 Quisiera caminar 10,000 pasos cada día.
•—
•—
•— (Completamente Desacuerdo, Desacuerdo, Ni de acuerdo o Desacuerdo, Acuerdo, Completamente Acuerdo)

----- Page Break

Q14 Ahora, piense sobre las comidas que consume. Que tan de acuerdo con las siguientes declaraciones?

A

Q15 Tengo control sobre las comidas que se sirven en mi hogar.
•—
•—
•— (Completamente Desacuerdo, Desacuerdo, Ni de acuerdo o Desacuerdo, Acuerdo, Completamene Acuerdo)

Q16 Anotando las comidas que consume me ayudara a perder peso.
• —
• —
• — (Completamente Desacuerdo, Desacuerdo, Ni de acuerdo o Desacuerdo, Acuerdo, Completamente Acuerdo)

Q18 Los miembros de mi familia piensan que debería ofrecer más...
• —
• —
• — (Completamente Desacuerdo, Desacuerdo, Ni de acuerdo o Desacuerdo, Acuerdo, Completamente Acuerdo)

Q19 Quiero comer más frutas y verduras cada día.
• —
• —
• — (Completamente Desacuerdo, Desacuerdo, Ni de acuerdo o Desacuerdo, Acuerdo, Completamente Acuerdo)

Q20 La mayoría de las veces, yo decido que hacer de comer...
• —
• —
• — (Completamente desacuerdo, Desacuerdo, Ni de acuerdo o Desacuerdo, Acuerdo, Completamente Acuerdo)

Q21 Comer frutas y verduras es agradable
• —
• —
• — (Completamente Desacuerdo, Desacuerdo, Ni de acuerdo o Desacuerdo, Acuerdo, Completamente Acuerdo)

----- Page Bre

Q22 Ahora piense sobre las comidas que consume. Que tan de acu...

A

Q23 Quiero anotar mis comidas cada día para saber cuantas caloria...
• —
• —
• — (Completamente Desacuerdo, Desacuerdo, Ni de acuerdo o Desacuerdo, Acuerdo, Completamente Acuerdo)

Q24 Puedo comer frutas y verduras cada día cuando estoy nerviosa,...
• —
• —
• — (Completamente Desacuerdo, Desacuerdo, Ni de acuerdo o Desacuerdo, Acuerdo, Completamente Acuerdo)

Q25 Reemplazando una bebida endulzada con azúcar(como el té dulce...
• —
• —
• — (Completamente Desacuerdo, Desacuerdo, Ni de acuerdo o Desacuerdo, Acuerdo, Completamente Acuerdo)

Q26 Comiendo frutas y verduras es necesitado para buena salud...
• —
• —
• — (Completamente Desacuerdo, Desacuerdo, Ni de acuerdo o Desacuerdo, Acuerdo, Completamente Acuerdo)

----- Pag

Q27 Para las siguientes preguntas, piense qué tan segura está de ...

A

Q28 Se como establecer metas para incrementar mi actividad fis...
• —
• —
• — (De nada segura, No segura, Ni nada segura o segura, Segura, Extremadamente Segura)

Q29 Puedo obtener frutas y verduras cuando estoy de prisa...
• —
• —
• — (De nada segura, No segura, Ni nada segura o segura, Segura, Extremadamente Segura)

Q30 Puedo comer 5 porciones de frutas y verduras la mayoría de lo...
• —
• —
• — (De nada segura, No segura, Ni nada segura o segura, Segura, Extremadamente Segura)

Q31 Puedo comer comidas altas en fibra
• —
• —
• — (De nada segura, No segura, Ni nada segura o segura, Segura, Extremadamente Segura)

Q32 Se cuántas calorías debo comer cada día para manejar mi peso<...
• —
• —
• — (De nada segura, No segura, Ni nada segura o segura, Segura, Extremadamente Segura)

Q33 Puedo seleccionar comidas de todos los grupos alimenticios qu...



(De nada segura, No segura, Ni nada segura o segura, Segura, Extremadamente segura)

Q34 Para las siguientes preguntas, piense que tan segura esta de las siguientes declaraciones.

A

Q35 Puedo controlar mis porciones de comida para controlar mi peso...



(De nada segura, No Segura, Ni nada segura o segura, Segura, Extremadamente segura)

Q36 Se cuanto es una sola porción de mi comida favorita



(De nada segura, No segura, Ni nada segura o segura, Segura, Extremadamente segura)

Q37 Se como leer etiquetas de comida para elegir comidas bajo en c...



(De nada segura, No segura, Ni nada segura o segura, Segura, Extremadamente segura)

Q38 Se que puedo hacer pequeños cambios en mi comida para mejor...



(De nada segura, No segura, Ni nada segura o segura , Segura, Extremadamente segura)

Q40 Con qué frecuencia haces lo siguiente?

A

Q41 Hace una lista para comprar comida?



(Nunca, Menos de un vez cada mes, Una vez por mes, 2-3 veces por mes, Una vez por semana, 2-3 vece...)

Q43 Planifique sus comidas con anticipación?



(Nunca, Menos de un vez cada mes, Una vez por mes, 2-3 veces por semana, Una vez por semana, 2-3 v...)

Q47 Tener frutas y verduras listas para comer como bocadillo?



(Nunca, Menos de un vez cada mes, Una vez por mes, 2-3 veces por mes, Una vez por semana, 2-3 vece...)

Page Bre

Q46 Que tan seguido hace lo siguiente?

A

Q45 Tenga bebidas azucaradas en su hogar? (té dulce, refrescos, bebidas deportivas)



(Nunca, Menos de un vez cada mes, Una vez por mes, 2-3 veces por mes, Una vez por semana, 2-3 vece...)

Q48 Comer fruta y verdura como botana?



(Nunca, Menos de un vez cada mes, Una vez por mes, 2-3 veces por mes, Una vez por semana, 2-3 vece...)

Q49 Tomar agua en vez de bebidas endulzadas con azúcar(como el t...



(Nunca, Menos de un vez cada mes, Una vez por mes, 2-3 veces por mes, Una vez por semana, 2-3 vece...)

Q39 Responde "si" o "no" a las siguientes preguntas

A

Q42 Ayer, Hice ejercicio por 30 minutos o más.

Sí
 No

(Si, No)

Q50 La proxima semana, hare ejercicio por 30 minutos o más<...

Sí
 No

(Si, No)

Q51 Responde "si" o "no" a las siguientes preguntas

A

Q52 Yo se el número de pasos que camine ayer.

Sí
 No

(Si, No)

Q53 La proxima semana, caminare 500 pasos ...

Sí
 No

(Si, No)

Q54 La siguiente semana, anotare mis pasos cada dia.

Sí
 No

(Si, No)

Q55 Responde "si" o "no" a las siguientes preguntas

A

Q56 Ayer anote todo lo que comi y bebi

Si
 No
(Si, No)

Q57 La siguiente semana voy a anotar lo que comi y bebi todos los d...

Si
 No
(Si, No)

Q60 Ahora, piense sobre lo que come y bebe usualmente

A

Q61 Cuantas porciones de fruta come cada día? Una porción de fruit...

A



Q58



Fruit

Aim for 2-3 servings/day

1 serving of fruit =

- 1/2 cup raw fruit (strawberries, blueberries, raspberries...)
- 4 large strawberries
- 1 small banana, orange
- 1/2 large banana, orange, grapefruit
- 16 grapes
- 1 large plum



2 servings of fruit =

- 1 small apple
- 1 large banana
- 1 medium grapefruit
- 1 large orange
- 1 medium pear
- 3 medium plums or 2 large
- 8 large strawberries



Remember...



1 baseball = 1 cup



1 small computer mouse = 1/2 cup

NATURAL GROCERS
www.NaturalGrocers.com

Q59

Cuántas porciones de verduras consume cada día? una porción de ve...

A|



Q62





Q96



Ahora, piense sobre las comidas que usualmente consume. Que tan seguido come lo siguiente?

Q97 Verduras en lata (con sal)



(Nunca, Menos de un vez cada mes, Una vez cada mes, 2-3 veces por mes, Una vez por semana, 2-3 vec...)

Q98 Verduras en lata(bajo en sodio o sin sal agregada)



(Nunca, Menos de un vez cada mes, Una vez por mes, 2-3 veces por mes, Una vez por semana, 2-3 vece...)

Q99 Verdura congelada(con sal o salsa agregada)



(Nunca, Menos de un vez cada mes, Una vez por mes, 2-3 veces por mes, Una vez por semana, 2-3 vece...)

Q100 Verdura congelada(sin sal o salsa agregada)



(Nunca, Menos de un vez cada mes, Una vez por mes, 2-3 veces pormes, Una vez por semana, 2-3 veces...)

Q101 Verduras frescas



(Nunca, Menos de un vez por mes, Una vez por mes, 2-3 veces por mes, Una vez por semana, 2-3 veces...)

Q63 Ahora, piense sobre lo que usualmente come y bebe.

A

Q64 Cuántas bebidas endulzadas con azúcar(como el té dulce, soda...

• —
• —
• —

(Ninguna, Menos de 1 por día, 1-2 por día, 3-4 por día, 5 o mas por dia)

Q67 Piense sobre lo que usualmente come y bebe.

A

Q66 Qué tan seguido come carne alta en grasa(como perros calient...

• —
• —
• —

(Ninguna, 1-2 veces por semana, 3-4 veces por semana, 5-6 veces por semana, 1 o mas por dia)

Q68 Qué tan seguido come granos refinados(como pan blanco, arroz...

• —
• —
• —

(Ninguna, 1-2 veces por semana, 3-4 veces por semana, 5-6 veces por semana, 1 o mas por dia)

Q65 Piense sobre el tiempo que pasa sentado(como en el trabajo, ...

A

Q69 En un día normal, cuánto tiempo está sentado(en horas)?

A



Q70



Piense cuánto tiempo que pasa sentado(como en el trabajo, en casa o viajando).

Q71 Cuanto tiempo normalmente pasa sentad...



(Ninguna, Menos de una hora por día, 1-2 horas por día, 3-4 horas por día, 5-6 horas por día, 7-8 ...)

Pa

Q72 Durante la próxima semana, cuántas horas piensa hacer lo sigu...



Q73 Ejercicio extenuante (corazon late fuerte) ej: en biciclet...



(Ninguna, Menos de una hora por semana, 1-2 horas por semana, 3-4 horas por semana, 5-6 horas por ...)

Q74 Ejercicio moderado(no exhausto) ej: caminando rápido, bailar...



(Ninguna, Menos de una hora por semana, 1-2 horas por semana, 3-4 horas por semana, 5-6 horas por ...)

Q75 Ejercicio leve(poco esfuerzo) Ej.: caminando despacio, jardi...



(Ninguna, Menos de una hora por semana, 1-2 horas por semana, 3-4 horas por semana, 5-6 horas por ...)



Q121



Responda "si" o "No" a las siguientes preguntas:

Q114 Se preocupa que no tiene suficiente dinero para comprar las c...



(Si, No)

Q115 En el mes pasado, tuvo que cortar las porciones de comidas, o...



(Si, No)

Q116 En el mes pasado, comió menos de lo que quería por que no ...



(Si, No)

Q117 Responda "si" o "No" a las siguientes preguntas:

A

Q118 No tengo suficiente dinero para compr...



(Si, No)

Q117 Responda "si" o "No" a las siguientes preguntas:

A

Q118 No tengo suficiente dinero para compr...

—
 — (Si, No)

Q119 No se como comprar comida

—
 — (Si, No)

Q120 No se como preparar o cocinar comida

—
 — (Si, No)



Casi terminas. Estas son las últimas preguntas, asegúrese de completar la encuesta.

Q76



Q77 Que edad tiene?

Q78 Cual es su altura?(en pulgadas) Ejemplo: si usted mide 5 pies...

Q79 Cual es su peso? (en libras)

Q80 Usted es?



(Hombre, Mujer)

Q81 Usted es?



(Casada, Viuda, Divorciada, Separada, Nunca antes casada)

Q82 Usted Hispano o Latino?

Sí
 No (Yes, No)

Q83 Cual es su raza?(elija todo lo que aplique)

Blanco/Caucasico, Negro/Afroamericano, Nativo Americano/Nativo de Alaska, Nativo de Hawaii or Oro...)
(Yes, No)

Q84 Incluyendo a usted cuántos...

Q85 Cuantos niños(17 años o menores) viven con usted?

Q86 Cuánta educación obtuvo?

Menos de Escuela superior, High graduado de Escuela Superior/GED, Carrera de 2 años, Carrera de ...)

Q87 Para trabajo, está actualmente empleada?

Sí
 No (Tiempo Completo, Tiempo Parcial, Desempleada, Jubilada)

Q88 Cual es su ingreso?



(Menos de \$15,000 por ano, \$15,001 to \$25,000 por ano, \$25,001 to \$50,000 por ano, \$50,001 to \$75,...)

Q102



(Si, No)

Q104 Ha estado en un programa para pérdida de peso como Weight ...



(Si, No)

Q103 Ha perdido peso durante los últimos 3 meses?



(Si, No)

Q91 Ha tenido una consulta inicial con Ariel Danek, dietista registrado en High County Community Health?



(Si, No, No, pero tengo una cita programada)

Q92 Si respondió que sí, ¿cuántas consultas ha tenido con Ariel Danek, dietista registrado en la clínica High Country Community Health?



(1 cita, 2 citas, 3 citas, 4 citas)

Q89 Cual es su numero de celular?Ej:828-262-8534 Por Favor ten...

A



Q90



Gracias por su tiempo. Usted recibirá un mensaje de texto con un enlace a la nueva encuesta. Asegure de completar la segunda encuesta. Usted debe completar ambas encuestas para ser sometidas a la rifa para una tarjeta de regalo de \$50 a Walmart.

Si tiene algunas preguntas, por favor contacte a Dr, Jamie Griffin, Investigadora a 828-262-8534 or griffinjb@appstate.edu

Week 11

My Quest

March 21, 2021

Choosing the Right Kinds of Fat

Quote of the Week: “The individual who says it is not possible should move out of the way of those doing it.” -Tricia Cunningham

Your body needs fat to maintain certain processes. This includes providing the body with energy and helping your body absorb vitamins. It is also important for proper growth and development. There are two types of fat: saturated and unsaturated. Saturated fats are the biggest dietary cause of high cholesterol (LDL) levels. Saturated fats are usually in solid form, such as butter or coconut oil. These fats are found in animal products such as cheese, whole milk, ice cream, and fatty meats. Limiting saturated fat is beneficial for your overall health. The other kind of fat, unsaturated fat, is usually liquid at room temperature, and is beneficial in your diet. Examples include olive oil, canola oil, fish, sunflower oil, and soybean oil. Unsaturated fats can help lower blood cholesterol. They are typically classified as “heart healthy.” Another type of fat, trans fats, are liquid oils that turn into solid fats during food processing. These fats are harmful to your health. They lower your “good” cholesterol (HDL) and raise your “bad” cholesterol (LDL). Avoid products that include “partially

hydrogenated oils” or “shortening” in their nutrition facts. These are typically signs that there is trans fat in that product.

Tip of the Week: If you're starving when you get home from work, prepare a salad, eat it, and then cook the rest of your meal. The fiber in the salad will help fill you up leading to smaller portion sizes for your dinner meal!

Recipe of the Week: Cheddar Broccoli Egg Muffins

4 eggs

1 cup steamed broccoli

½ cup sharp cheddar, shredded

Sea salt and pepper to taste (about ½ tsp each)

Preheat the oven to 375 degrees. Coat a 6 hole muffin tin with oil.

Chop broccoli and place it in a bowl with the eggs, salt, and pepper. Whisk together.

Pour egg mixture into muffin tins and divide cheese evenly among them.

Bake for 12-15 minutes, or until the eggs are set.



Semana 11

Mi búsqueda

21 de Marzo de 2021

Eligiendo los tipos correctos de grasa

Cita de la semana: "La persona que dice que no es posible debería apartarse del camino de quienes lo están haciendo". -Tricia



Cunningham

Tu cuerpo necesita grasa para mantener ciertos procesos. Esto incluye proporcionar energía al cuerpo y ayudarlo a absorber las vitaminas. También es importante para un crecimiento y desarrollo adecuado. Hay dos tipos de grasas: saturadas y no saturadas. Las grasas saturadas son la causa principal de niveles altos de colesterol (LDL). Las grasas saturadas generalmente están en forma sólida, como la mantequilla o el aceite de coco. Estas grasas se encuentran en productos de origen animal como queso, leche entera, helados y carnes

grasosas. Limitar las grasas saturadas es beneficioso para su salud en general. El otro tipo de grasa, la grasa no saturada, generalmente es líquida a temperatura ambiente y es beneficiosa en su dieta. Los ejemplos incluyen aceite de oliva, aceite de canola, pescado, aceite de girasol y aceite de soja. Las grasas no saturadas pueden ayudar a reducir el colesterol en la sangre. Por lo general, se clasifican como "saludables para el corazón". Otro tipo de grasa, las grasas trans, son los aceites líquidos que se convierten en grasas sólidas durante el procesamiento de alimentos. Estas grasas son perjudiciales para su salud. Bajan el colesterol "bueno" (HDL) y aumentan el colesterol "malo" (LDL). Evite los productos que incluyen "aceites parcialmente hidrogenados" o "mantecas" en los datos nutricionales. Estos son típicamente signos de que hay grasas trans en ese producto.

Consejo de la semana: si 'mueres' de hambre cuando llegas a casa del trabajo, prepara una ensalada, cómetela y luego cocina el resto de tu comida. ¡La fibra en la ensalada te ayudará a satisfacerte, llevándote a porciones más pequeñas para la cena!

Receta de la semana: Panque de queso cheddar , brócoli y huevo

4 huevos

1 taza de brócoli al vapor

½ taza de queso cheddar , rallado

sal marina y pimienta al gusto (aproximadamente ½ cucharadita cada una)

Precaliente el horno a 375 grados. Cubra un molde para 6 panecillos con aceite.

Pique el brócoli y colóquelo en un tazón con los huevos, la sal y la pimienta. Batir juntos.

Vierta la mezcla de huevo en moldes para panecillos y divida el queso en partes iguales.

Hornee por 12-15 minutos, o hasta que los huevos estén listos.

Appendix F: Week-by-week Goals and Objectives

Week 1- Food Journaling

Goal: Educate participants on the value of food journaling and why it may be used for weight loss

- Objective: Participants will keep a food journal at least one full day during this study
- Objective: Participants will identify food habits that encourage weight gain/inhibit weight loss

Week 2- Portion Control

Goal: Educate participants on plate method and how to portion home cooked meals when serving to their family

- Objective: Participants will know an approximate serving size of each macronutrient
- Objective: Participants will be able to construct a balanced plate

Week 3- Carbohydrates

Goal: Educate participants on carbohydrate use and function in the body as energy.

- Objective: Participants will be able to identify carbohydrate sources in their diet
- Objective: Participants will know when to eat carbohydrate sources for energy

Week 4- Nutrition Facts Label

Goal: Educate participants on how to read a nutrition facts label, specifically, what serving size and %dv numbers mean on an English food label

- Objective: Participants will be able to identify serving size on a nutrition facts label
- Objective: Participants will be able to identify saturated fat, trans fat and sodium on a nutrition facts label and know goal amounts for items

Week 5- SMART Goals

Goal: Educate participants on the five pillars of goal setting, Specific, Measurable, Attainable, Relevant, Time sensitive

- Objective: Participants will be able to identify and set goals that adhere to the SMART acronym

Week 6- Fitness Tracker

Goal: Educate participants on the Physical Activity Guidelines for Americans for promotion of weight loss (30 minutes per day/5 days per week)

- Objective: Participants will meet 80% of the set Physical Activity Guidelines by week 12
- Objective: Participants will be able to use alternative forms of physical activity to ensure movement throughout the week (dance, hiking, swimming, cleaning the house, etc).

Week 7- Protein

Goal: Educate participants on the importance of protein in the diet for growth and satiety at meal times.

- Objective: Participants will be able to identify protein sources within their diet
- Objective: Participants will include a protein source at breakfast every day

Week 8- Sugar Sweetened Beverages

Goal: Educate participants on SSB, their calorie content, and the effects it can have on weight loss and health

- Objective: Participants will reduce SSB consumption by 50% by week 12
- Objective: Participants will identify sources of SSB in their diet

Week 9- Fats

Goal: Educate participants on fat as a macronutrient and its role in our health

- Objective: Participants will be able to identify saturated and unsaturated fat sources within their diet
- Objective: Participants will limit saturated fat sources to 7% of their daily caloric intake by week 12

Week 10- Sodium

Goal: Educate participants on the risk of a high sodium diet

- Objective: Participants will be able to identify high sodium foods (including but not limited to, processed meats, instant rice, pre-packaged foods, frozen meals, sauces, dressings, etc)
- Objective: Participants will see a positive change in blood pressure over the 12 week research period

Week 11- Rate of Perceived Exertion

Goal: Educate participants on RPE and the Talk Test as it relates to physical activity

Objective: RPE score will improve as participants increase regular physical activity

Week 12- Added Sugars

Goal: Educate participants on what added sugars are and how they negatively affect our health and weight

- Objective: Participants will be able to identify sources of added sugars in their current diet
- Objective: Participants will limit amount of added sugars in their diet to less than 10% of total caloric intake

Week 13- Fruits and Vegetables

Goal: Educate participants on CDC guidelines for 5 servings of fruit and vegetables per day, even during fall and winter, and the role they play in health and weight loss

- Objective: Participants will increase fruit and vegetable intake to five servings per day
- Objective: Participants will be able to identify fruits and vegetables in season for fall/winter

Week 14- Holiday/BBQ

Goal: Educate participants on how to choose healthy, nutrient-dense options during holiday mealtimes. Educate participants on food safety during summer BBQs.

- Objective: Participants will be able to implement the plate method during summer picnics/BBQs for consistent weight management

Week 15-Fiber

Goal: Educate participants on the benefits of including fiber in their diet

- Objective: Participants will be able to identify sources of soluble and insoluble fiber.
- Objective: Participants will increase fiber intake in their daily diet

Week 16- Rethink Your Drink

Goal: Educate participants on benefits of water and its effect on health status

- Objective: Participants will increase water intake compared to previous weeks in intervention
- Objective: Participants will be able to identify sources of water within their diet (i.e. fruits, vegetables)

Week 17- Pedometers

Goal: Educate participants on the health benefits of walking

- Objective: Participants will increase step counts weekly
- Objective: Participants will be able to identify 3 health benefits of walking (i.e. decrease risk for cardiovascular disease)

Week 18- Antioxidants

Goal: Educate participants on benefits of antioxidants and sources within their diet

- Objective: Participants will be able to identify different sources of food high in antioxidants

Week 19- Calcium and Vitamin D

Goal: Educate participants on the importance of Calcium and Vitamin D intake and its importance on bone health

- Objective: Participants will be able to identify sources of vitamin D and calcium within their diet

Week 20- Iron

Goal: Educate participants on iron's role within the body

- Objective: Participants will be able to identify heme and non-heme sources of iron within their diet

Week 21- Healthy Snacking

Goal: Educate participants on how to create a healthy snack

- Objective: Participants will be able to identify healthy snack choices that combine macronutrients to increase satiety

Week 22- Vitamin C

Goal: Educate participants on the role Vitamin C plays in health status

- Objective: Participants will be able to identify multiple sources of Vitamin C within their diet

Week 23- Potassium

Goal: Educate participants on the role of potassium in the body and its importance in nerve and muscle function.

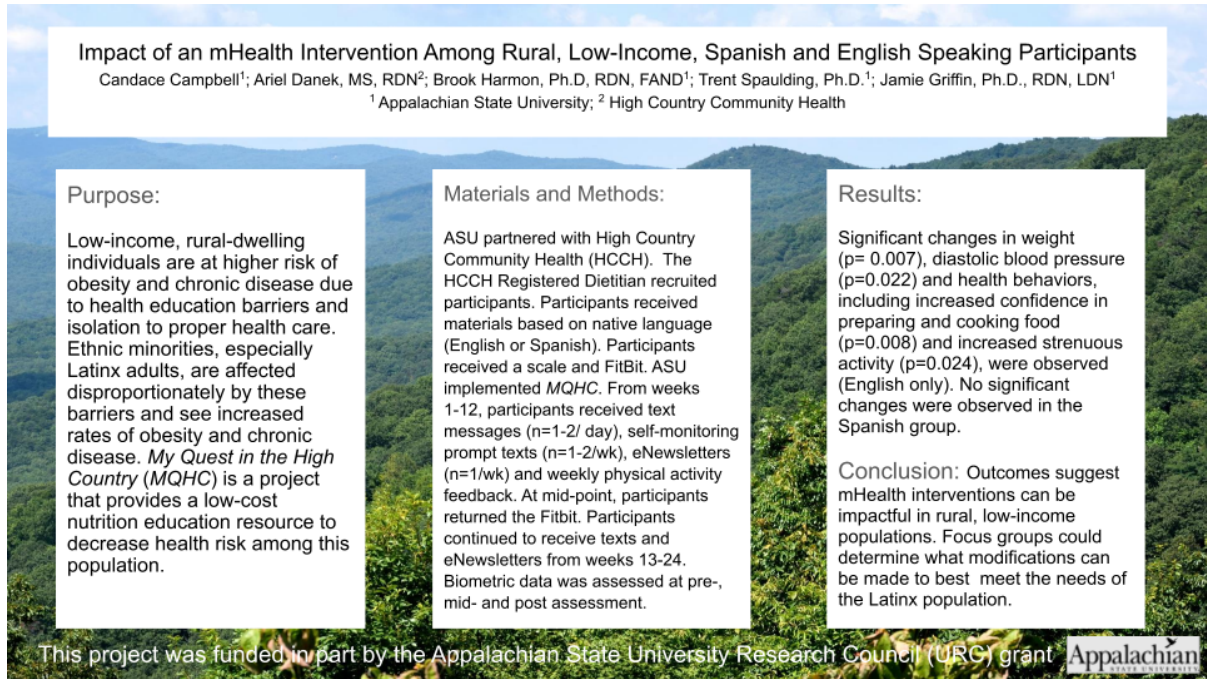
- Objective: Participants will be able to identify dietary sources of potassium

Week 24- Screen Time

Goal: Educate participants on the adverse effects of excessive screen time

- Objective: Participants will stand/move each hour

Appendix G: NCAND Lightning Slide




Impact of an mHealth Intervention Among Rural, Low-Income, Spanish and English Speaking Participants
Candace Campbell¹; Ariel Danek, MS, RDN²; Brook Harmon, Ph.D, RDN, FAND¹; Trent Spaulding, Ph.D.¹; Jamie Griffin, Ph.D., RDN, LDN¹
¹ Appalachian State University; ² High Country Community Health

Purpose:
Low-income, rural-dwelling individuals are at higher risk of obesity and chronic disease due to health education barriers and isolation to proper health care. Ethnic minorities, especially Latinx adults, are affected disproportionately by these barriers and see increased rates of obesity and chronic disease. *My Quest in the High Country (MQHC)* is a project that provides a low-cost nutrition education resource to decrease health risk among this population.

Materials and Methods:
ASU partnered with High Country Community Health (HCCH). The HCCH Registered Dietitian recruited participants. Participants received materials based on native language (English or Spanish). Participants received a scale and FitBit. ASU implemented *MQHC*. From weeks 1-12, participants received text messages (n=1-2/ day), self-monitoring prompt texts (n=1-2/wk), eNewsletters (n=1/wk) and weekly physical activity feedback. At mid-point, participants returned the Fitbit. Participants continued to receive texts and eNewsletters from weeks 13-24. Biometric data was assessed at pre-, mid- and post assessment.

Results:
Significant changes in weight (p= 0.007), diastolic blood pressure (p=0.022) and health behaviors, including increased confidence in preparing and cooking food (p=0.008) and increased strenuous activity (p=0.024), were observed (English only). No significant changes were observed in the Spanish group.

Conclusion: Outcomes suggest mHealth interventions can be impactful in rural, low-income populations. Focus groups could determine what modifications can be made to best meet the needs of the Latinx population.

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Vita

Candace Campbell is a native of Lakeview, North Carolina. She is the daughter of Danny and Martha Campbell. She graduated Union Pines High School in 2008 and continued her education at University of North Carolina Wilmington where she received a Bachelors of Science in Biology and Bachelors of Arts in Spanish. In 2018 she returned to academia at Appalachian State University and received a Bachelors of Science in Nutrition and Dietetics. Candace received a Masters of Science in Nutrition and Dietetics in May 2022. She will pursue a career as a Registered Dietitian Nutritionist.