



Published in final edited form as:

*J Transcult Nurs.* 2017 May ; 28(3): 236–242. doi:10.1177/1043659616644959.

## Development of Participant-Informed Text Messages to Promote Physical Activity Among African American Women Attending College: A Qualitative Mixed-Methods Inquiry

Jasmine M. Reese, MD, MPH<sup>1</sup>, Rodney P. Joseph, PhD<sup>2</sup>, Andrea Cherrington, MD, MPH<sup>3</sup>, Jeroan Allison, MD<sup>3</sup>, Young-il Kim, PhD<sup>3</sup>, Bonnie Spear, PhD, RD<sup>3</sup>, Gwendolyn Childs, PhD, RN<sup>3</sup>, Tina Simpson, MD, MPH<sup>3</sup>, and Nefertiti H. Durant, MD, MPH<sup>3</sup>

<sup>1</sup>Physicians' Primary Care, Fort Myers, FL, USA

<sup>2</sup>Arizona State University, Phoenix, AZ, USA

<sup>3</sup>University of Alabama at Birmingham, AL, USA

### Abstract

The purpose of this study was to develop a participant-informed technology-based physical activity (PA) promotion tool for young overweight and obese African American (AA) women. A mixed-method 3-phase study protocol design was used to develop text messages to promote PA in AA women attending the University of Alabama at Birmingham during the Spring of 2013. Nominal focus groups and a 2-week pilot were used to generate and test participant-developed messages. Participants ( $n = 14$ ) had a mean age of 19.79 years ( $SD = 1.4$ ) and mean body mass index of 35.9 ( $SD = 5.926$ ). Focus group data identified key themes associated with the use of text messages to promote PA including message frequency, length, tone, and time of day. Participants preferred text messages that were brief, specific, and time sensitive. Results showed that text messaging was a feasible and acceptable strategy to promote PA in overweight and obese AA women in a university setting.

### Keywords

women's health; adolescents; focus group analysis

### Introduction

African American (AA) women perform low levels of physical activity (PA) when compared with other demographic groups with only 36% meeting the national PA recommendation for achieving 150 minutes per week of moderate-intensity aerobic PA (Centers for Disease Control and Prevention [CDC], 2010). The low-PA levels among AA women are concerning

Reprints and permissions: [sagepub.com/journalsPermissions.nav](http://sagepub.com/journalsPermissions.nav)

**Corresponding Author:** Jasmine M. Reese, MD, MPH, Physicians' Primary Care, 9350 Camelot Drive, Fort Myers, FL 33919, USA. [jasminemreese27@gmail.com](mailto:jasminemreese27@gmail.com).

#### Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

given that this population is disproportionately burdened by various conditions associated with insufficient aerobic PA, including cancers of the breast and colon, obesity, and type 2 diabetes (CDC, 2010). These PA-related health disparities highlight the need for innovative strategies to promote PA in this underserved group (Harley, Rice, Walker, Quintiliani, & Bennett, 2014).

One potentially innovative strategy to promote PA includes the use of text messages. Given that 95% of 18- to 29-year-olds send and receive text messages (Smith, 2010), this approach may be particularly advantageous to promote PA among young adult AA women. Reviews of text message-based PA interventions have shown favorable outcomes (Buchholz, Wilber, Ingram, & Fogg, 2013; Stephens & Allen, 2012). However, few studies have examined text messages to increase PA exclusively among AA (Gerber, Stolley, Thompson, Sharp, & Fitzgibbon, 2009; Kim & Glanz, 2013), and no studies, to our knowledge, have evaluated this approach in young adult AA women. Furthermore, among studies examining text messages to promote PA, most messages were generated by the research team with limited input from participants (Cole-Lewis & Kershaw, 2010). Given that the types of messages necessary to promote PA among young AA women may differ from those targeting older women or those of various race/ethnic groups, research is needed to explore the types of text messages desired from this group. Engaging young AA women in the development of text messages could help ensure the end product will resonate with the intended audience.

The purpose of the current study was to conduct a series of formative assessments to understand what information in a text message would allow AA female college students to feel motivated, socially supported, and have a positive body image in order to increase their engagement in PA. Given limited research has examined the use of text messages to promote PA among AA female college students, we hypothesized that findings would yield unique outcomes regarding the type, tone, and style of messages needed to encourage PA among this population of young adult women. In this article, we describe the iterative mixed-method process used to develop and pilot participant-informed text messages promoting PA, highlight key themes desired by young AA women, and provide information regarding the acceptability and feasibility of the approach.

## Method

### Recruitment

Participants ( $N=14$ ) were a subset of volunteers enrolled in a larger pilot study evaluating the acceptability of an Internet-enhanced PA promotion program for overweight and obese AA women (Joseph et al., 2014). The study was conducted during the Spring of 2013 over a span of 4 months. Eligibility criteria for the parent study included (a) 19 to 30 years of age at the time of study enrollment, (b) body mass index greater than 25, (c) self-identified as AA, (d) enrolled as a student at the university where the study was conducted, (e) absence of any self-reported medical conditions that would inhibit or limit performance of PA, and (f) access to personal cellular phone with text messaging capability. Participants provided informed consent and were compensated \$25 for each focus group they attended. All study procedures were approved by the Institutional Review Board at University of Alabama at Birmingham (UAB) and data were collected during the Spring of 2013.

## Study Design

A three-phase, qualitative mixed-method study design was used to create, test, and revise text messages to promote PA in AA women and is illustrated in Figure 1. In the first phase of the study (Phase I), nominal group technique (NGT) was used to generate participant-informed text messages to promote PA among overweight and obese young adult AA women. NGT facilitates balanced participation among participants and permits qualitative data to be transformed into a structured rank list (Delbecq, Van de Ven, & Gustafson, 1975; Jefferson et al., 2010; MacPhail, 2001; Van de Ven, 1974). This method has been previously used in studies to generate feedback to develop health promotion programs specifically targeted to those that are AA (Jefferson et al., 2010; Seale et al., 2013). In the second phase of the study (Phase II), a 2-week demonstration trial was conducted to pilot the messages developed in Phase I. For the third and final phase of the study (Phase III), feedback from participants was used to further revise text messages and conduct a final pilot.

All NGT and focus group sessions were approximately 1.5 hours in length and conducted by two doctoral-level researchers experienced in conducting qualitative research. Focus groups took place in a campus library conference room and were audio recorded. A professional transcriptionist transcribed all recordings which were reviewed only by the research staff. While not all 14 participants were able to attend each of the three focus groups because scheduling conflicts, the same participants were used throughout the three phases of this study. Participants were familiar with one of the two focus group leaders who played a role in the larger pilot study described in Joseph et al. (2014).

### Phase I: Development of Participant-Informed Text Messages

In each NGT session, participants were presented with three different scenarios that represented potential barriers to PA. Potential barriers were based on our prior formative research (Durant et al., 2014) and included lack of social support, lack of motivation, and body image concerns. Each scenario was read aloud to participants and simultaneously placed on a projector screen for participants to view. After each scenario was presented, participants were asked to write a maximum of five motivational PA promotion text messages in response to each scenario. Once participants formulated their response text messages, they were asked to rank each message in order from 1 to 5 (with 1 being their “best” message or message they thought would be most successful in promoting PA in the scenario presented and 5 being their “least favorite” message). Participants then shared their “best” messages with the group as the NGT moderator displayed each participant message on the projection screen for participants to view as a group. After all messages were reviewed, the NGT facilitator led the discussion with the group to elicit feedback regarding each text message shared by participants. Messages were discussed in detail and edited by the participants as a group. In order to reach consensus participants were encouraged to comment on time of day, tone, length, and effectiveness the messages. Each message was analyzed until the majority of the group agreed to the aforementioned characteristics. Once the participants agreed on final edits for each message, they were instructed to rank the edited list of messages with 1 being the most preferred message. At the conclusion of the NGT session, the research team collected participant rankings of the edited messages for the three scenarios.

## Phase II: Revision and Pilot of Participant-Informed Text Messages

After completion of the NGT sessions of Phase I, the research team reviewed the participant-developed text messages and refined the top 3 messages for each scenario based on feedback obtained from the NGT session. Minor revisions were also made to address grammatical and/or spelling errors. Once revisions were made, a 14-day pilot was conducted where participants received messages either once or twice per day. Text messages were sent by a trained research staff member from a cellular phone only used for the purposes of this study. Text messages were sent with no particular pattern in place and at various times per day (i.e., morning, afternoon, and evening). The schedule for text message delivery was determined by the lead author and designed to ensure messages were sent at varying times throughout the day so that participants could document and provide feedback on the ideal time of day they would like to receive text messages. Staff members documented which messages were sent as well as the timing and day of the week they were sent. Participants were asked to keep a diary reporting their responses/feelings associated with the text messages to help facilitate group discussion in Phase III; however, diary documentation was not required nor collected by the research team but only encouraged to serve as a memory aid in the focus group discussion.

## Phase III: Final Revision and Pilot of Text Messages

In Phase III, focus groups were conducted to obtain participant feedback on the content and psychological responses elicited from the text messages that were piloted in Phase II. Each message was reviewed individually for message content, length, time of day sent, and for its ability to make one feel motivated, socially supported, or feel differently about their body image.

Focus group transcripts and moderator notes were reviewed by the research team to identify primary and repetitive themes that emerged from the focus group sessions. Participant-informed text messages for each scenario were then revised according to their feedback. The revised text messages were then sent over a 1-week period to the 14 participants. Messages were sent once per day Monday through Friday varying in time of day. No message was sent on Saturday one message was sent on Sunday evening. Last, a confirmatory focus group was conducted for respondent validation of focus groups findings, also called “member checking” (Cohen & Crabtree, 2008). All focus group participants were invited to attend this follow-up focus group. During this focus group, each text message was projected onto a large screen for review by all participants in attendance.

## Results

### Participant Characteristics

Participants ( $N = 14$ ) had a mean age of 19.79 years ( $SD = 1.423$ ) and a body mass index of 35.9 ( $SD = 5.926$ ). The majority were undergraduate students ( $n = 13$  undergraduate;  $n = 1$  graduate) and all were single. The Consolidated Criteria for Reporting Qualitative Studies was used to report the following qualitative data (Tong, Sainsbury, & Craig, 2007).

## Phase I: NGT

Participant-informed messages during Phase I were ranked individually before any revisions were made by the research team. With 1 being a *favorite message* and 5 being a *least favorite message* in response to one of the three scenarios, the message that received the highest rank was, *Go to a [exercise] class the people are very friendly and the instructors are motivating so you do not feel alone*. Other messages that received high rankings for each barrier scenario included

*Social Support*: “Seeing how well you are doing may motivate those around you to do the same.”

*Motivation*: “Try going to the gym before classes. You may find you feel best when you start the day with exercising.”

*Body Image*: “The gym isn’t for a particular body type it’s for you to love yourself enough to be healthier.”

Table 1 provides example participant-created text messages targeting each of the barriers to PA scenarios presented in Phase I. These messages show the diverse creativity among the participants and exemplify their initial thoughts on what they would prefer to read if they identified with the particular scenario.

## Phase II: 14-Day Pilot

As noted in the Method section, study staff made minor modifications for brevity and grammatical errors to the text messages conceived by participants in Phase I. For example, the participant-created message “Look at the Ufit schedule and find a class, all the people are motivating and the instructors are fun!” was modified to read “Commit to being fit! Take a look at what the Rec has to offer and join some fun and motivating classes!” Messages were sent at various times during the day with 21 total text messages sent during the 14-day pilot. Table 2 shows example messages sent during the pilot. No messages were returned to study staff as “undeliverable” by cellular phone service providers.

## Phase III: Participant Feedback

The number of participants in the second and third focus groups conducted were  $N=13$  and  $N=4$ , respectively. Participants shared specific ideas on how the messages made them feel and how they wanted messages to be read. Text message revisions based on their feedback are shown in Table 2. Five key themes emerged from our qualitative data regarding the use of text messages to promote PA among young overweight and obese AA women. These themes included frequency and time of day of message delivery, message signature, message focus, message length, and message tone/humor. Themes are shown in Table 3 and are further described below.

**Frequency and Time of Day**—Participants reported that the optimal number of text messages they would like to receive each week ranged from three to five with a preference for no more than one text message per day. They also indicated that they preferred to receive messages during the late morning or midafternoon hours. Messages sent too early were thought to disturb early class times or interfere with sleep, which would make them less

likely to read them. Messages sent during midafternoon hours were read more often because classes were more likely to be completed by this time. Participants expressed that receiving text messages too late in the evening would not be as motivating and would not be shared with peers because they felt their day would be winding down by this time, eating dinner, working, or doing school work.

**Message Signature**—Participants preferred that text messages end with the FIT HARRT Plus signature so that they knew who the message was being sent from. Participants expressed that receiving messages in which they can identify the sender were more likely to be read. Overall, they liked knowing that the research team was supportive and trying to motivate them to lead healthy lifestyles. It was not important to them which member of the research team was sending the message. For example, receiving a message from the primary investigator versus the research data coordinator did not make a difference.

**Message With a Specific Focus**—Messages with a particular focus or theme such as “weekly challenges,” “healthy eating tips,” and “inspirational quotes” were preferred by participants if they were sent judiciously. For example, inspirational quotes were read more often if they were sent a limited number of times per week.

**Message Length**—Participants preferred messages that were short and succinct. Messages that exceeded more than two sentences were typically ignored. If text messages were split in to two separate texts participants were also less likely to read them.

**Message Tone/Humor**—Using humor in messages was accepted if used in moderation. Participants did not want to receive messages that used emoticons or Internet slangs and acronyms such as *LOL*. Some participants suggested the use of memes as an acceptable way to incorporate humor because they tend to be satires of real-life scenarios.

## Discussion

The FIT HARRT Plus study used an iterative mixed-method approach combining NGT and focus groups to develop participant-informed text messages to promote PA in overweight and obese AA women in a university setting. We hypothesized unique outcomes regarding the type, tone, and style of text messages needed to encourage PA among our study population of young adult women. We were able to identify key themes associated with the use of text messages to promote PA that included text message frequency, length, tone, and time of day. More specifically, participants showed preference for text messages that were succinct, had a specific focus, and time sensitive. This study showed that text messages were a promising strategy to promote PA in this population and emphasized the importance of participant involvement in message creation.

Our study emphasized the importance of having young adults directly involved in the creation of PA promotion text messages. After the 14-day pilot of text messages was conducted, the research team learned the most about what preferences and needs were actually being met by our messages and key areas for improvement. There were significant differences noted by the research team during focus group sessions between what the staff

thought to be inspiring and motivational versus what participants actually felt was motivating, socially supportive, and targeted positive body image appropriately. For example, the research team learned the significance of sending messages with a specific focus (e.g., inspirational quotes, health challenges). Furthermore, participants identified their preference for the use of memes as ways to capture their attention and increase motivation.

This study's findings also reinforced the importance of the factors of time of day and length of text message. If messages were sent too early, participants complained messages were likely to disturb sleep, and therefore, were unlikely to make a behavior change. However, participants expressed that messages sent too late in the evening were disruptive to the academic schedule and, as a result, they would be less likely to be opened, read, or shared with peers. Another important lesson learned was the optimal number of messages our sample of AA women liked to receive. Participants expressed that sending more than one message per day would be too overwhelming and they would stop reading them. Similarly, if the messages were too long and resulted in messages being divided into two separate messages by their mobile phone service provider, they indicated it would reduce the likelihood of the message being read. Prior studies in teens using text messaging to promote behavioral change have also highlighted the importance of time of day sent and message signature. In a study investigating text messaging use to promote safe sexual behaviors, researchers found that messages sent at less favorable times of day were less likely to be shared with peers and were more likely to be ignored. Also, similar to our study, they found that the addition of researcher "signature" to the end of messages was acceptable and favorable. It was thought to add credibility to the messages and ultimately increase trust of the recipients (Gold et al., 2011).

Results of our study are similar to other studies conducted in younger adolescents and older adults that have shown feasibility and acceptability of text messaging (Muench, Van Stolk-Cooke, Morganstern, Kuerbis, & Markle, 2014) to promote weight loss and/or PA (Gerber et al., 2009; Woolford, Clark, Strecher, & Resnicow, 2010; Woolford et al., 2011). In a study by Woolford and colleagues, young adolescent perspectives on the content of text messages in weight loss promotion were explored. Similar to our study, they found that careful text message construction was important. They discovered that some messages actually inadvertently led to unhealthy behaviors. For example, the authors reported that participants preferred direct messages that clearly stated what they should be doing rather than having to think about how to initiate weight loss behaviors. They also found that participants preferred messages with a positive tone incorporating limited use of slang and abbreviations, unlike that often used in peer to peer text messaging (Woolford et al., 2011). This is similar to the finding in our study where participants also endorsed limited use of abbreviations that are typically used by other young adults (e.g., LOL).

In another study aiming to promote weight loss and positive health behaviors in middle-aged AA women (Gerber et al., 2009), a text messaging system was developed to allow for ongoing communication to individuals in a weight maintenance program. Participants in this study had the option to receive general health promotion messages developed by the research team or to create their own health promotion text messages at the beginning of the study that would be subsequently delivered to them during the intervention phase. Although

the women in this study were older than our sample (e.g., aged 30 to 65 years), results showed that the use of text messages was a feasible and acceptable way to deliver health promotion messages (Gerber et al., 2009).

The current study has several limitations. Our sample was relatively small and comprised convenience sample of overweight/obese AA women enrolled at a single university. Findings may not be generalizable to AA women not enrolled in a university or to those who are not overweight or obese. Larger studies are needed to confirm our findings. We also caution against generalizing our findings to women of other minority groups (i.e., Latinos or African refugees), as the preferences for text messages to promote PA will likely vary among cultural groups. For example, Latinas may not relate to the participant-informed text message stating “Don’t be stressed about the fresh press!” as most may not have their hair chemically straightened and pressed. However, we hypothesize that some of the more general and supportive messages may resonate with women of all backgrounds (i.e., “It’s never too late to reach your physical goals” and “Ask a friend to join you at the Rec and make physical activity part of your daily schedule!”). As there are no known studies investigating this topic among women from other minority backgrounds, future studies are needed to explore the use of motivational text messages to promote PA in other groups of minority women to compare our findings. There is also the possibility of a “contagion effect,” as described in Woolford et al. (2011), in which some of the participants’ feedback in the traditional focus group sessions may have been influenced by the more vocal and expressive participants. However, use of trained focus group moderators likely reduced the impact of this potential influence. Last, we did not assess whether the participant-informed text messages actually influenced PA outcomes. While this task supersedes the scope and purpose of the current study, which was to identify the types and styles of text messages to motivate, socially support, and encourage a positive body image among AA women in order promote PA, testing the efficacy of messages to increase PA is the next sequential step in our research.

The current pilot study has many strengths including that it offers pilot data that incorporate an iterative feedback process and maximal participant input at multiple time points. Participants were able to view their own results and tell the research staff whether our interpretations were correct or if preferences had changed after actual receipt of text messages. In addition, results of the study provide key implications for the development of culturally congruent PA interventions for young adult AA women. First, study participants endorsed the use of text messages as a favorable PA intervention strategy. While this finding mirrors outcomes reported by studies focusing on both older AA women (Gerber et al., 2009; Kim & Glanz et al., 2013) and AA adolescents (Woolford et al., 2010; Woolford et al., 2011), this is the first study, to our knowledge, to support use of text messages among young adult AA women. Second, the in-depth information gained on the tone, type, and content of PA promotion text messages provides some understanding on how text messages can be constructed to motivate, support, and encourage PA among young adult AA women. Given that barriers and facilitators to PA as well as preferred text message styles may differ across the life span, results of this study provide insight on how researchers can develop effective PA promotion text messages on young adult AA women. Furthermore, this study adds to the field of culturally congruent health care by illustrating the importance of formative research



when developing health promotion programs for AA women. Interventions and programs that do not include input from their target population may fail to meet their specific needs. This issue was highlighted with our sample of AA women when women developed messages to overcome barriers of hair care and body shape concerns. Moreover, given the popularity and frequency of cell phone and text message usage among this age group, future studies incorporating this type of technology may further support advances in the delivery of culturally congruent health care.

## Conclusion

This qualitative mixed-methods study emphasized the importance of participant involvement in message creation and iterative feedback cycles to optimize text messages. Overall, the three-phase process showed that text messages are a promising and innovative approach to promoting PA in overweight/obese AA women in a college setting. Future studies are needed to study the effects on behavior change based on this type of text message intervention and participants' intent to engage in PA. In addition, interesting findings may arise if studies were done including young adult women of various cultural backgrounds. Including women of different backgrounds may generate valuable information that could further support innovative approaches to PA promotion tools.

## Acknowledgments

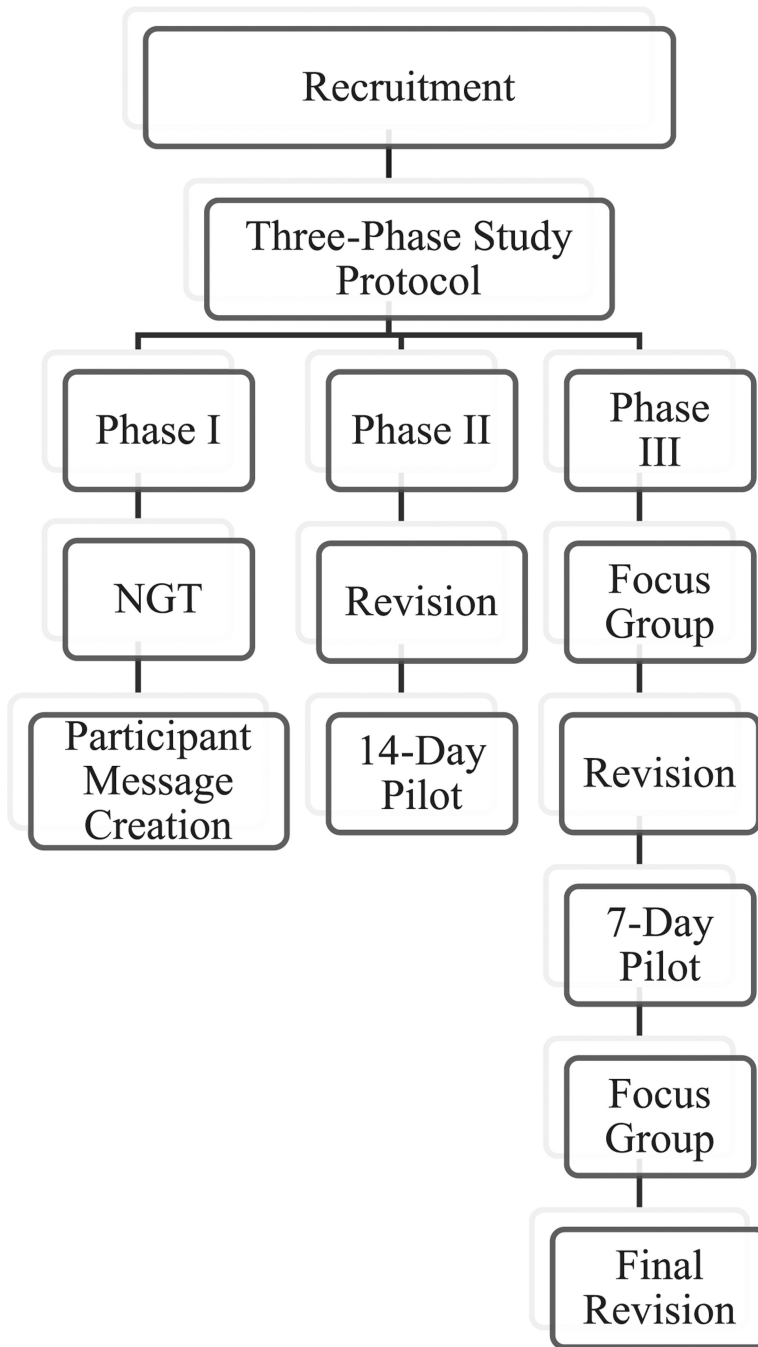
### Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Financial support for the parent FIT HARRT study was provided by American Heart Association, Robert Wood Johnson Foundation, University of Alabama at Birmingham (UAB) Minority Health and Health Disparities Research Center, UAB Nutrition Obesity Research Center under Grant DK056336, and the UAB Center for Clinical and Translational Science under Grant UL1TR000165 from the National Center for Advancing Translational Sciences and National Center for Research Resources component of the National Institutes of Health. Support was also provided by the Leadership Education in Adolescent Health Interdisciplinary Training Program at UAB. Research assistance for data analysis and article development for RPJ was supported by training funds from the National Institutes of Health/National Institute on Nursing Research, award T32 1T32NR012718-01—Transdisciplinary Training in Health Disparities Science.

## References

- Buchholz SW, Wilber J, Ingram D, Fogg L. Physical activity text messaging interventions in adults: A systematic review. *Worldviews on Evidence-Based Nursing*. 2013; 10:163–173. [PubMed: 23746267]
- Centers for Disease Control and Prevention. U.S. Physical Activity Statistics, 2010. Atlanta, GA: Author; 2010.
- Centers for Disease Control and Prevention and National Cancer Institute. U.S. Department of Health and Human Services. United States Cancer Statistics: 1999–2007. Atlanta, GA: Author; 2010. (Incidence and Mortality Web-based Report, in United States Cancer Statistics)
- Cohen DJ, Crabtree BF. Evaluative criteria for qualitative research in health care: Controversies and recommendations. *Annals of Family Medicine*. 2008; 6:331–339. [PubMed: 18626033]
- Cole-Lewis H, Kershaw T. Text messaging as a tool for behavior change in disease prevention and management. *Epidemiology Review*. 2010; 32:56–69.
- Delbecq, AL., Van de Ven, AH., Gustafson, DH. Group techniques for program planning: A guide to nominal group and Delphi processes. Glenview, IL: Scott, Foresman; 1975. (Management applications series)

- Durant N, Joseph RP, Cherrington A, Cuffee Y, Knight B, Lewis D, Allison JJ. Recommendations for a culturally relevant Internet-based tool to promote physical activity among overweight young African American women, Alabama, 2010–2011. *Preventing Chronic Disease*. 2014; 11:130169. [PubMed: 24433625]
- Gerber BS, Stolley MR, Thompson AL, Sharp LK, Fitzgibbon ML. Mobile phone text messaging to promote healthy behaviors and weight loss maintenance: A feasibility study. *Health Informatics Journal*. 2009; 15:17–25. [PubMed: 19218309]
- Gold J, Lim MS, Hocking JS, Keogh LA, Spelman T, Hellard ME. Determining the impact of text messaging for sexual health promotion to young people. *Sexually Transmitted Diseases*. 2011; 38:247–252. [PubMed: 20966830]
- Harley AE, Rice J, Walker R, Quintiliani LM, Bennett GG. Physically active, low-income African American women: An exploration of activity maintenance in the context of sociodemographic factors associated with inactivity. *Women & Health*. 2014; 54:354–372. [PubMed: 24617833]
- Jefferson WK, Zunker C, Feucht JC, Fitzpatrick SL, Greene LF, Shewchuk RM, Ard JD. Use of the Nominal Group Technique (NGT) to understand the perceptions of the healthiness of foods associated with African Americans. *Evaluation and Program Planning*. 2010; 33:343–348. [PubMed: 20047762]
- Joseph RP, Pekmezi D, Dutton GR, Cherrington AL, Kim YI, Allison JJ, Durant NH. Results of a culturally adapted Internet-enhanced physical activity pilot intervention for overweight and obese young adult African American Women. *Journal of Transcultural Nursing*. 2014; 27:136–146. [PubMed: 24934566]
- Kim BH, Glanz K. Text messaging to motivate walking in older African Americans: A randomized controlled trial. *American Journal of Preventive Medicine*. 2013; 44:71–75. [PubMed: 23253653]
- MacPhail A. Nominal group technique: A useful method for working with young people. *British Educational Research Journal*. 2001; 27:161–170.
- Muench F, Van Stolk-Cooke K, Morganstern J, Kuerbis AN, Markle K. Understanding messaging preferences to inform development of mobile goal-directed behavioral interventions. *Journal of Medical Internet Research*. 2014; 16(2):e14. [PubMed: 24500775]
- Seale JP, Fifield J, Davis-Smith YM, Satterfield R, Thomas JG, Cole B. Developing culturally congruent weight maintenance programs for African American church members. *Ethnicity & Health*. 2013; 18:152–167. [PubMed: 22943791]
- Smith A. Mobile access 2010. 2010 (Pew Internet and American Life Project). Retrieved from <http://www.pewinternet.org/2010/07/07/mobile-access-2010/>.
- Stephens J, Allen J. Mobile phone interventions to increase physical activity and reduce weight: A systematic review. *Journal of Cardiovascular Nursing*. 2012; 28:320–329.
- Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): A 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007; 19:349–357. [PubMed: 17872937]
- Van de Ven, AH. Group decision making and effectiveness: An experimental study. Kent, OH: Kent State University Press; 1974.
- Woolford SJ, Barr KL, Derry HA, Jepson CM, Clark SJ, Strecher VJ, Resnicow K. OMG do not say LOL: Obese adolescents' perspectives on the content of text messages to enhance weight loss efforts. *Obesity*. 2011; 19:2382–2387. [PubMed: 21869762]
- Woolford SJ, Clark SJ, Strecher VJ, Resnicow K. Tailored mobile phone text messages as an adjunct to obesity treatment for adolescents. *Journal of Telemedicine and Telecare*. 2010; 16:458–461. [PubMed: 20959393]



**Figure 1.**  
 Study protocol.  
*Note.* NGT = nominal group technique.

**Table 1****Participant-Created Text Messages to Three Scenarios During NGT Session.**


---

Lack of Social Support: “Christina thinks about fitting the gym into her daily schedule but in reality school, family, and friends seem to take up all of her extra time. When she invites her best friend Tina, Tina bursts out and says ‘No way, I just got my hair done!’ Christina wishes she could just find someone who wanted to work out like she does and put all the excuses to rest.”

Participant Message: “Don’t be stressed about the fresh press! A little sweat never hurt! Come work out!”

Lack of Motivation: “Celina is struggling to stay motivated to keep up with going to the gym 3 times per week with her current busy school schedule. She often feels tired at the end of the day and ends up just taking a nap after classes. She wishes she had friends to share her feelings with or someone to help give her the extra motivation she needs to reach her work out goals. She keeps recommitting and promising herself that she will do better the next day but then she comes up with an excuse not to go again. The next day when her jeans from before she got to UAB are tighter than ever, she feels so bad. Yet, she can’t seem to muster the energy to change her habits.”

Participant Message: “Feeling tired after a long day of classes? Stop by the gym for some exercise!! Exercising will give you a boost of energy after a long day of school.”

Body Image Concerns: “Twenty-year old Lisa doesn’t like going to the Rec center because she feels no one ‘looks’ like her. She looks around the gym and feels like everyone just wears a size 2 except for her. She just wishes there were other women there that she could identify with.”

Participant Message: “You are beautiful no matter what. ... All that matters is that you are healthy in the body that you are in. So go ahead to the gym. Don’t pay attention to the others and work on your personal health.”

---

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

**Table 2**

Transformation of Participant-Informed Text Messages to Promote Physical Activity.

Initial participant-created text message during Phase I	Participant and research team revised message during Phase II	Participant and research team revised message during Phase III
“Everyone has to start somewhere. You have to work on yourself, to get to where you want to be.”	“It’s never too late to start your physical activity goals, everyone has to start somewhere. Start your plan today! <a href="http://www.loveyourheartaha.com">www.loveyourheartaha.com</a> ”	“It’s never too late to reach your physical activity goals. Keep up the hard work! FIT HARRT Plus”
“If you have friends that work out a lot or some that play sports, ask them how they balance out their classes and work outs.”	“Ask friends how to fit working out into your daily class schedule!”	“Ask a friend to join you at the rec and make physical activity part of your daily schedule! FIT HARRT Plus”
“Don’t be stressed about the fresh press! A little sweat never hurt! Come work out!”	“Don’t be stressed about the fresh press! A little sweat never hurt! Work out!”	“Don’t be stressed about the fresh press! A little sweat never hurt => FIT HARRT Plus”
“The gym isn’t for a particular body type it’s for you to love yourself enough to be healthier.”	“The gym isn’t for a particular body type; it’s for you to love yourself enough to be healthier. FIT HARRT Plus”	“The gym isn’t for a particular body type; it’s for you to love yourself enough to be healthier. FIT HARRT Plus”

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

**Table 3**

Participant Comments on Themes Identified During Focus Group Sessions.

Theme	Participant comments
Time of day	"I think it's a good time to send out the messages. Like around lunch time where people might be in downtime."
Message signature	"It's kind of like you do something trending ... you know every time you make a message here's my signature FIT HARRT Plus. I just like the consistency of the signature."
Message with a specific focus	"...on a Monday I would like to see a challenge for the Monday ...and I think the Wednesday one was inspirational, and then do a health tip again. I feel like it's established in a pattern and then you know what you will receive ...if you follow that same pattern every week."
Message length	"I really like the length. I don't look at the scroll."
Message tone	"Now that I did read it and I see the little smiley face, I like chuckled to myself. I'm just like the FIT HARRT Plus people have jokes ... and I think that ...if it's not too much to do, I think the meme would be funny too ..."

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript