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Results of a Culturally Adapted Internet-Enhanced Physical Activity Pilot Intervention for Overweight and Obese Young Adult African American Women

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Abstract

Purpose—This study evaluated a culturally relevant, social cognitive theory–based, Internet-enhanced physical activity (PA) pilot intervention developed for overweight/obese African American (AA) female college students.

Design—Using a 3-month, single group, pretest–posttest design, participants accessed a culturally relevant PA promotion website and engaged in four moderate-intensity PA sessions each week.

Results—Study completers (n = 25, mean age = 21.9 years) reported a decrease in sedentary screen time ($p < .0001$); however, no changes in moderate-to-vigorous PA were reported ($p = .150$). A significant increase in self-regulation for PA ($p < .0001$) and marginally significant increases in social support ($p = .052$) and outcome expectations ($p = .057$) for PA were observed. No changes in body mass index ($p = .162$), PA enjoyment ($p = .151$), or exercise self-efficacy ($p = .086$) were reported.

Conclusions—Findings of this exploratory study show some preliminary support for Internet-enhanced approaches to promote PA among overweight/obese AA women.

Implications for Practice—Future studies with larger samples are needed to further explore culturally relevant Internet-enhanced PA programs in this underserved population.

Keywords

health disparities; women's health; African American; Black; physical activity; college; exercise

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Introduction

African American (AA) women are the least active demographic group in the United States with only 36% meeting the national physical activity (PA) recommendations (Centers for Disease Control and Prevention, 2010). This is of particular public health concern given AA women are disproportionally burdened by a myriad chronic diseases associated with insufficient PA levels (i.e., obesity, colon cancer, type II diabetes, and cardiovascular disease; U.S. Cancer Statistics Working Group, 2013). The low PA levels and disparate chronic disease burden among AA women highlights the need for innovative theory-based interventions to promote PA in this underserved population.

Researchers have used a variety of strategies to deliver culturally relevant PA promotion programs to AA women in recent years. Examples of these strategies include the following: mailed print materials (Pekmezi et al., 2013), print materials plus telephone counseling (Parra-Medina et al., 2011), face-to-face and/or group session counseling (Fitzgibbon et al., 2010; Rodriguez, Christopher, Johnson, Wang, & Foody, 2012; Stolley et al., 2009), faith-based programs (Peterson & Cheng, 2011; Whitt-Glover, Hogan, Lang, & Heil, 2008), and cable television programming (Risica, Gans, Kumanyika, Kirtania, & Lasater, 2013). Results of these approaches have varied with some researchers reporting favorable outcomes for increased PA (Pekmezi et al., 2013; Peterson & Cheng, 2011), while others have reported null or inconsistent findings according to the postintervention follow-up period (Fitzgibbon et al., 2010; Risica et al., 2013) or PA assessment method (Parra-Medina et al., 2011). The varied outcomes of these studies indicate the need for researchers to further explore strategies in which to intervene and promote PA in this underserved population.

One potential strategy that has received considerably less attention by researchers over the years is the use of Internet-based approaches to promote PA in AA women (Joseph, Durant, Benitez, & Pekmezi, 2014). In fact, to our knowledge, only two published studies (Joseph et al., 2013; Pekmezi et al., 2010) have evaluated Internet-based efforts promoting PA among AA women. The paucity of studies using the Internet to promote PA among AA women is particularly surprising given the high prevalence of Internet use in this population (Duggan & Smith, 2013; Pew Internet and American Life Project, 2013) and the established success of many previous Internet-based PA programs with predominately White populations (Davies, Spence, Vandelanotte, Caperchione, & Mummery, 2012; Joseph et al., 2014).

The first published study evaluating an Internet-based approach to promote PA among AA women was conducted by Pekmezi et al. (2010) and retrospectively evaluated the feasibility of an Internet-based PA intervention among a subset of middle-aged AA women enrolled in a larger randomized controlled trial (Marcus, Lewis, et al., 2007). AA women in this study reported increased PA levels and favorable outcomes for the feasibility and acceptability of the approach. The second published study, conducted by our research team (Joseph et al., 2013), evaluated a prospectively designed culturally relevant, Internet-enhanced intervention designed to promote PA among overweight and obese young adult AA women enrolled in college. Results of this 6-month pilot study showed a significant increase in PA at 3 months (p = .02); however, PA was attenuated by 6 months and was no longer different from

baseline PA levels (p = .31). Significant increases in several psychosocial outcomes (including self-regulation for PA, p = .02; and social support for PA, p = .02) were also observed at 6 months.

The purpose of the current investigation was to extend our previous research on culturally relevant Internet-enhanced PA promotion efforts among young adult AA women by evaluating a 3-month Internet-enhanced intervention grounded in social cognitive theory (SCT) and designed to reduce screen time and promote moderate-to-vigorous intensity PA among overweight and obese AA female college students. In this article, we report the intervention's effect on moderate-to-vigorous intensity PA, sedentary screen time, and select SCT variables. Findings from the current study add to the limited existing literature on Internet-enhanced approaches to promoting PA in overweight and obese young adult AA women.

Method

Study Design

A single group pretest–posttest research design was used to test the acceptability and feasibility of a culturally relevant Internet-enhanced PA intervention for overweight and obese young adult AA women. The study was powered to detect a meaningful improvement in minutes per week of moderate-to-vigorous of aerobic PA. Accordingly, based on a published review of Internet-based PA interventions at the time of study conception (van den Berg, Schoones, & Vliet Vlieland, 2007), we anticipated that participants would report a mean of 70 minutes per week of moderate-to-vigorous PA at baseline, and that PA would increase to 112 minutes per week by the end of the 3-month intervention (mean increase of 52 minutes per week, SD = 80). Based on these assumptions, we recruited a minimum sample size of 29 to achieve 80% power using a two-tailed paired t test with an alpha level of .05.

Intervention Description Overview: An Internet-Enhanced Physical Activity Program

Young women enrolled in the study agreed to participate in a minimum of four 30–60 minute moderate-intensity walking/exercise sessions per week for 3 months and use a culturally relevant Internet-based application as a PA monitoring and promotion tool. The study protocol was informed by our formative research with overweight and obese AA college females and is briefly described below.

Intervention Development—The study website and intervention protocol were developed through two formative phases. In Phase I, focus groups (n = 4) were conducted with the target population to identify features young overweight and obese AA women desire in a culturally relevant PA promotion web-site (Durant et al., 2014). Data collected were used to inform the development of the study website. In Phase II, a 6-week demonstration trial of the study protocol was conducted. In this phase, participants (n = 29) accessed the study website while concurrently attending alternating weeks of supervised moderate-intensity walking sessions (monitored by study staff) and "think aloud" (Ericsson

& Simon, 1993) discussion group sessions. Data collected through the demonstration trial were used to identify and repair technical problems associated with the website.

Intervention Website—The final version of the website used in the current study (www.loveyourheartaha.com) contained features grounded in the constructs of the SCT (i.e., social support, self-regulation, self-efficacy, and outcome expectations) and provided culturally relevant information to facilitate PA among overweight and obese young adult AA women. The website was divided into a public site for all Internet users to access and a secure, private site that only participants could access. The public site contained the following features for the general public to view: (a) nutrition blog, (b) physician blog, (c) wellness blogs, (d) tips for natural hair care, and (e) a photo gallery.

Study participants logged into the secure, private site using a username and passcode via a link on the public site's home page. The secure site included additional features to promote PA, including (a) personal profile page, (b) dietary tracking, (c) PA self-tracking/monitoring tools, (d) exercise demonstration videos, (e) online recipes, (f) blogs, and (g) message boards (see Table 1). The profile page allowed participants to create their own personal profiles where they could share photos and other personal information about themselves (similar to Facebook and other social networking sites).

Based on participant feedback from our formative research, three features were included on the study website to ensure cultural relevance: (a) images of AA women with diverse body types, (b) links to community-based PA groups for AA women, and (c) links to websites with guidance on natural hair care. The website was accessible via cellular phone using the website's iPhone application, and the web-site could be viewed and operated on any cell phone via the mobile phone site. Table 1 depicts the study website features and how each feature maps to specific constructs of the SCT. Screenshots of the website are shown in Figures 1 and 2.

Exercise Component—Participants were encouraged to engage in four moderate-intensity exercise sessions each week. Specifically, participants were asked to perform 30 to 60 minutes of at least moderate-intensity PA (defined as 50% to 70% of the maximum heart rate; Centers for Disease Control and Prevention, 2011) during each of the four weekly exercise sessions. For two of the weekly PA sessions, participants walked the indoor track of the university's recreation center while being monitored by trained research assistants. For the other two sessions, participants had the option to walk on their own or participate in a cardiovascular-based group exercise class (i.e., Zumba, kick-boxing, aerobics, etc.). Participants wore pedometers and heart rate monitors to self-monitor their PA during all exercise sessions. Heart rate monitors were individually programmed to alert participants if their heart rates dropped below a moderate-intensity level.

Participants

Women enrolled in the study met the following inclusion criteria: (a) aged 19 to 30 years at time of study enrollment, (b) body mass index (BMI) greater than 25 kg/m^2, (c) self-identified as AA, (d) enrolled as an undergraduate or graduate student at the university, and (e) absence of any self-reported medical conditions that would inhibit or limit performance

of PA. Exclusion criteria included (a) concurrent participation in another PA, nutrition, or weight loss program (commercial or research); and (b) uncontrolled high blood pressure (defined as greater than 140/90).

Measures

Demographic Information—Demographic data were collected via a self-report questionnaire. This questionnaire has been used in previous research (Joseph et al., 2013) and assessed age, marital status, current education level, and parents' education levels.

Physical Activity—The 7-Day Physical Activity Recall (7-Day PAR; Sallis et al., 1985) was the primary measure used to assess PA. This instrument assesses moderate-to-vigorous intensity PA performed in bouts of 10 minutes or greater over a previous 7-day period. The 7-Day PAR has demonstrated significant test–retest reliability estimates (r = .81, r = .99; Gross, Sallis, Buono, Roby, & Nelson, 1990; Sallis, Buono, Roby, Micale, & Nelson, 1993), has strong interrater reliability (r = .78) for assessments performed by multiple interviewers with the same subject (Sallis, Patterson, Buono, & Nader, 1988), and has been validated against more objective measures of PA, such as doubly labeled water (Washburn, Jacobsen, Sonko, Hill, & Donnelly, 2003) and accelerometers (Sloane, Snyder, Demark-Wahnefried, Lobach, & Kraus, 2009).

To corroborate self-report PA findings, participants were asked to wear an ActiGraph accelerometer (GT3X+ models) during all waking hours for a 7-day period at baseline and at the 6-month follow-up. This 7-day period precisely overlapped with the days assessed by the 7-Day PAR. Accelerometer data were prepared for analyses according to the protocol described by Troiano et al. (2008). Accordingly, to be considered as a valid assessment (and subsequently included in analyses), participants were required to wear the accelerometer for at least 10 hours per day for a minimum of 4 days during the 7-day assessment period. To corroborate data collected by the 7-Day PAR, only PA performed in bouts of 10 minutes or greater were included in analyses (known as a modified 10-minute bout; Troiano et al., 2008).

Sedentary Screen Time—Sedentary screen time was assessed with two items taken from a previously published sedentary behavior scale (Norman, Schmid, Sallis, Calfas, & Patrick, 2005). Participants were asked, "How much time on a typical day do you spend doing the following: (a) 'Watching television (including videos on VCR/DVD)'; (b) 'Playing computer or video games.'" Separate estimates were obtained for weekdays and weekends. This two-item measure has been used in previous research (Gibbs et al., 2013).

Social Cognitive Theory Variables—Self-efficacy for PA was assessed by the Exercise Confidence Survey (Sallis, Pinski, Grossman, Patterson, & Nader, 1988). This 12-item survey has previously established reliability and validity (Sallis, Pinski et al., 1988) and has demonstrated reliability estimates (Cronbach's alpha) of .65 and .78 at baseline and 3 months, respectively, in the current study.

Social support for exercise was evaluated using the Social Support for Exercise Survey (Sallis, Grossman, Pinski, Patterson, & Nader, 1987). This scale provides two separate

outcomes for social support, one in reference to family support (13 items) and the other in reference to support from friends (10 items). The Social Support for Exercise Scale has previously established validity (Sallis et al., 1987). In the current study, reliability estimates for the family subscale were 0.89 and 0.91 at baseline and 3 months; estimates for the friends subscale were 0.89 and 0.91.

Self-regulation for PA was assessed by the Self-Regulation Scale from the Health Beliefs Survey (Anderson, Winett, Wojcik, & Williams, 2010; Anderson, Wojcik, Winett, & Williams, 2006). This 10-item survey has been validated for use across various adult populations (Anderson et al., 2006; Anderson et al., 2010). In the current study, the Self-Regulation Scale demonstrated reliability estimates (Cronbach's alpha) of .64 and .74 at baseline and 3 months, respectively.

The nine-item Outcome Expectation Scale for Exercise (Resnick, Zimmerman, Orwig, Furstenberg, & Magaziner, 2000) was used to assess outcome expectations for PA. This scale has been validated in AA populations (Resnick, Luisi, Vogel, & Junaleepa, 2004) and has demonstrated reliability estimates (Cronbach's alpha) of .80 and .81 in the current study.

Enjoyment of PA was assessed using the PA Enjoyment Scale (Kendzierski & DeCarlo, 1991). This 18-item questionnaire has previously established validity (Kendzierski & DeCarlo, 1991) and has demonstrated internal consistency estimates of .86 and .92 in the current study.

Body Mass Index—BMI was calculated from measurements collected from a trained senior research staff member. To ensure consistency, the same staff member conducted measurements for BMI calculations for all study participants. Weights were measured to the nearest kilogram using a Scale-Tronix (Wheaton, IL) digital scale. Height was measured to the nearest inch using the Digi-kit stadiometer by Measurement Concepts and Quick Medical (North Bend, WA).

Website Usage—The website tracked participant activity and awarded "points" based on the amount of time spent on the website and the number and type of applications used. Thus, the more frequently participants logged onto the website and used the available applications, the higher number of points they accumulated during the study (Table 2 illustrates the website point algorithm).

Exercise Session Attendance—Exercise session attendance was documented on logs collected by staff weekly at the university recreation center. Logs contained (a) activity date, (b) activity type, (c) activity duration, (d) average heart rate, and (e) total pedometer steps. For supervised walking sessions at the university's campus recreation center, study staff recorded participant attendance and verified information in the logs. For exercise sessions participants completed on their own, logs were completed independently by participants.

Feasibility and Acceptability—Feasibility and acceptability of the intervention were assessed using a 36-item consumer satisfaction measure adapted from previous research (Pekmezi et al., 2009; Pekmezi et al., 2012; Pekmezi et al., 2013) and were administered to

participants at the conclusion of the study. This measure assessed participant satisfaction regarding the study website, exercise sessions, and study protocols. Sample questions include, “Overall, how helpful do you find the study website?” and “Would you recommend the study to a friend?”

Procedure

Participants were recruited via convenience sampling methods (i.e., flyers, recruitment tables at the university center, word-of-mouth) from the university campus during the Spring 2013 semester. Potential participants were screened for eligibility via telephone. Eligible participants were scheduled for their baseline study assessment.

Baseline assessment procedures required participants to attend two clinic visits approximately 1 week apart. At the initial baseline visit, informed consent was obtained; behavioral, psychosocial, and anthropometric data were collected; and blood draws were performed. Participants were also provided an accelerometer to wear during all waking hours for the next 7 days. One week following each participant’s initial visit, participants returned their accelerometer to study staff and completed the 7-Day PAR. The 3-month data collection procedures were similar to baseline.

Statistical Analysis

Normality of the data was assessed using box plots, histograms, and QQplots. Despite the small sample size, the majority of outcomes met assumptions for normality. Paired *t* tests were used to evaluate pre–post intervention changes for variables meeting normality assumptions. PA and sedentary screen time data did not meet normality assumptions and were accordingly analyzed using Wilcoxon signed rank tests. Complete case analysis was conducted using only data from participants ($n = 25$) who provided both baseline and the 3-month follow-up data. All data analyses were conducted using SAS version 9.3.

Results

Participant Characteristics

Figure 3 shows participant flow for the 3-month program. At baseline, participants ($n = 31$) had a mean age 21.3 years ($SD = 3.1$ years) and were mostly obese (mean BMI = 32.8 kg/m^2, $SD = 5.7$; see Table 3). Twenty-five participants completed the 3-month follow-up assessment (81% retention). There were no differences in demographic characteristics ($p < .05$) among participants who completed the study versus those who did not complete the study.

Website Utilization and Exercise Session Adherence

Participants ($n = 25$) engaged in a mean of 64.9% ($SD = 24.0\%$) of the recommended exercise sessions, which equates to participating in approximately 2.6 exercise sessions each week. Sixty-four percent ($n = 16$) of participants self-reported logging onto the study website at least one time per week. The median number of website points accumulated by participants over the 3-month study was 100 (range 0–1,039; $M = 187.77$, $SD = 245.4$).

Physical Activity

Correlation analyses showed that self-reported PA (measured by the 7-Day PAR) and accelerometer-measured PA were significantly correlated at baseline (Spearman's ρ = .43, *p* = .03) but not at 3 months (Spearman's ρ = .03, *p* = .92). Comparison of PA outcomes indicated that participants over-reported PA on the 7-Day PAR when compared with accelerometer data. No significant pre- and postintervention changes in moderate-to-vigorous PA were observed (7-Day PAR, *p* = .15; accelerometer *p* = .08). PA outcomes are presented in Table 4.

Sedentary Screen Time

At baseline, participants reported a median of 3 hours per day of sedentary screen time on a typical weekday and 4 hours per day on a typical weekend day. At 3 months, participants reported significantly lower sedentary screen time on both weekdays (*Mdn* = 5 hours/day, *p* < .0001) and weekend days (*Mdn* = 1 hour/day *p* < .0001; Table 4).

Social Cognitive Theory Outcomes

Table 5 shows pre–post intervention changes in SCT variables. Participants reported a significant increase in self-regulation for PA over the duration of the study (*p* = .0001). Trends for enhanced outcome expectations (*p* = .057), social support from family (*p* = .052), and social support from friends (*p* = .052) were also observed; however, improvements in these variables did not reach statistical significance. No changes in exercise self-efficacy (*p* = .086) or PA enjoyment (*p* = .150) were reported.

Feasibility and Acceptability

Results from consumer satisfaction survey were favorable. Ninety-two percent of participants (*n* = 23) identified the study website as being "somewhat" to "very helpful" for promoting PA, and 76% reported gaining knowledge regarding PA from the website. In reference to the supervised exercise sessions, 84% (*n* = 20) of participants reported gaining knowledge associated with PA from participating in the exercise sessions, and 88% identified the exercise sessions as "somewhat" to "very helpful" for promoting PA. Lastly, all participants (*n* = 25) reported being "somewhat" to "very satisfied" with the study, and 76% (*n* = 20) said they would recommend the study to a friend.

Discussion

The aim of the current study was to evaluate a 3-month, culturally relevant Internet-enhanced intervention based on SCT and designed to reduce screen time and promote moderate-intensity PA among AA female college students. Study results show several positive outcomes; including a significant decrease in sedentary screen time, an increase in self-regulation for PA, and favorable consumer satisfaction outcomes for the acceptability and feasibility of the Internet-enhanced approach.

Participants reported a significant reduction in sedentary screen time from baseline to 3 months; however, improvements in moderate-to-vigorous PA at 3 months were not reported (*p* = .15). The lack of a significant increase in moderate-to-vigorous PA was somewhat

surprising and may suggest that the intervention lacked components necessary to successfully promote increased PA, highlighting the need for researchers to further explore Internet-based strategies to motivate and increase PA among AA women. However, the nonsignificant PA outcomes may have been associated with the time period in which follow-up data were collected. The 3-month follow-up assessment was performed at the end of the semester during final exams. Study staff conducting the 7-Day PAR interviews reported that participants commonly identified end of semester coursework and final exams as interfering with their normal PA patterns. In future research, scientists should consider academic schedules when designing all intervention activities, including the timing of PA assessments, to ensure the integrity of study outcomes.

Comparison of self-reported and accelerometer-measured PA indicated that participants over self-reported their PA at both study assessment periods. Over self-reporting of PA is a commonly reported issue (LeBlanc & Janssen, 2010; Westerterp, 2009), and future studies should incorporate strategies to correct the overreporting of PA. One potential strategy could involve having participants exercise at a moderate-intensity level prior to completing a subjective PA assessment, which would provide a reference point for participants to appropriately estimate the intensity and duration of their PA.

Participants reported a significant increase in self-regulation for PA ($p < .001$) over the 3-month study and similar trends, although not statistically significant, for enhanced social support from family ($p = .052$), social support from friends ($p = .052$), and outcome expectations ($p = .057$) for PA. The significant increase in self-regulation mirrors the results of a previous Internet-enhanced approach to promoting PA among AA women (Joseph et al., 2013) and suggests that the website features targeting this construct (i.e., PA tracker) were successful in increasing self-regulatory processes associated with PA. Similarly, trends for enhanced social support were promising given the breadth of research suggesting that social support is a salient factor associated with PA engagement among AA women (Anderson et al., 2010; Fleury & Lee, 2006). The trend for increased social support from friends suggests that the message boards, blog posts, and social networking tools available on the study website may have promoted social support among participants. Moreover, enhanced social support from family was somewhat surprising given the intervention did not include a family-based component. Perhaps, participants shared their study experiences with family members and received encouragement/feedback to continue engaging in PA.

The lack of improvement for PA enjoyment was similar to the results observed in the previous culturally adapted, Internet-enhanced PA intervention for young adult AA women conducted by our research team (Joseph et al., 2013). However, our outcomes contrast with studies evaluating this construct in middle-aged and older AAs, which have shown significant improvements in enjoyment of PA over the duration of their respective interventions (Bopp et al., 2009; Papandonatos et al., 2012). Similarly, exercise self-efficacy did not significantly change from baseline to 3 months. This finding was unexpected given that participation in PA usually results in increased exercise self-efficacy; however, comparable results have been reported by other PA studies with AA women (Pekmezi et al., 2013; Thompson, Berry, & Hu, 2013; Zoellner et al., 2010). Perhaps, through attending the exercise sessions, participants realized that regular participation in moderate-to-vigorous PA

was more difficult than they had anticipated, which resulted in the lack of change for this variable.

Adherence to the study's recommended exercise sessions was also less than ideal; suggesting that this component of the intervention may not have been well received by participants. Overall, participants engaged in 65% of the recommended 4 exercise sessions each week; which equates to attending approximately 2.6 exercise sessions per week. Despite the modest engagement in these sessions, most participants reported gaining PA-related knowledge from the sessions (84%) and identified the sessions as "somewhat helpful" to "very helpful" for promoting PA (88%). These outcomes indicate that even though most participants reported gaining knowledge from the supervised exercise sessions, they did not enjoy them or had trouble attending them due to competing demands for their time. Adherence rates to the exercise sessions in our study are similar to findings of studies conducted by other researchers using similar exercise session protocols (Anton et al., 2011; Fitzgibbon et al., 2010; Joseph et al., 2013) and emphasize the need for researchers to further explore strategies to overcome barriers to PA in this underserved population. Potential strategies may include enhancing in-person group support components of the program (Ingram, Wilbur, McDevitt, & Buchholz, 2011), placing a greater emphasis on the physical and mental health benefits of PA (as opposed to focusing on weight loss; Harley, Odoms-Young, Beard, Katz, & Heaney, 2009; Pekmezi et al., 2013), incorporating family-based components (Wilcox et al., 2013), and further exploring the use of physically active AA women as role models (i.e., celebrities, community leaders) to promote PA (Harley et al., 2009; Ingram et al., 2011).

Findings from the consumer satisfaction survey were favorable and supported the acceptability and feasibility of the Internet-enhanced approach. For example, 80% of participants indicated that they would recommend the study to a friend, 92% identified the study as being "somewhat" to "very helpful" for promoting PA, and most (76%) reported learning new information associated with PA as a result of the program. Moreover, our attrition rate of 19% was slightly lower than the mean attrition found in a recent review of Internet-based PA interventions (22%; Joseph et al., 2014), further suggesting the feasibility of Internet-enhanced approaches to promote PA in young AA women.

Several study limitations must be noted. Participants were a convenience sample of university students, which limits generalizability of findings to AA women not enrolled in a university. Additionally, based on our a priori sample size calculation, we were underpowered to detect a significant improvement in moderate-to-vigorous of PA even if study completers (n = 25) achieved the anticipated 52-minutes per week increase in PA form baseline to 3 months. Other limitations include lack of a control group, small sample size, limited associated association between objective and self-reported measures of PA, and the method in which web-site usage was assessed. The point algorithm employed by the study website provided an approximate measure of website usage; however, more precise data (e.g., from analytic tracking software) would have been beneficial in evaluating website utilization.

Despite these limitations, the study has several strengths. This is one of few studies assessing a culturally relevant Internet-enhanced approach to promote PA in AA women. To our knowledge, only one other study (conducted by our research team) has explored a culturally relevant theory-based Internet-enhanced approach to promote PA among overweight and obese young adult AA women. Findings of the current study provide some preliminary support for the use of Internet-enhanced approaches to promote PA among overweight and obese young adult AA women while also highlighting potential limitations of this approach. Another strength of this work was the iterative, participant-informed process used to develop the study website. Incorporating participant feedback throughout study development helped ensure study activities met the needs and preferences of our target population.

This exploratory study is an important first step in understanding the potential role of technology to deliver culturally relevant PA programs to overweight and obese young adult AA women. Study findings suggest that an Internet-enhanced approach was associated with reducing screen time and enhancement of various PA-related SCT constructs (i.e., self-regulation, social support, and outcome expectations). The lack of a significant increase in moderate-to-vigorous intensity PA was unexpected and should be explored in future research. As technology continues to advance at a rapid pace, future studies should attempt to incorporate new and emerging technologies (i.e., text-messaging, smartphone applications, etc.) into Internet-enhanced PA promotion efforts.

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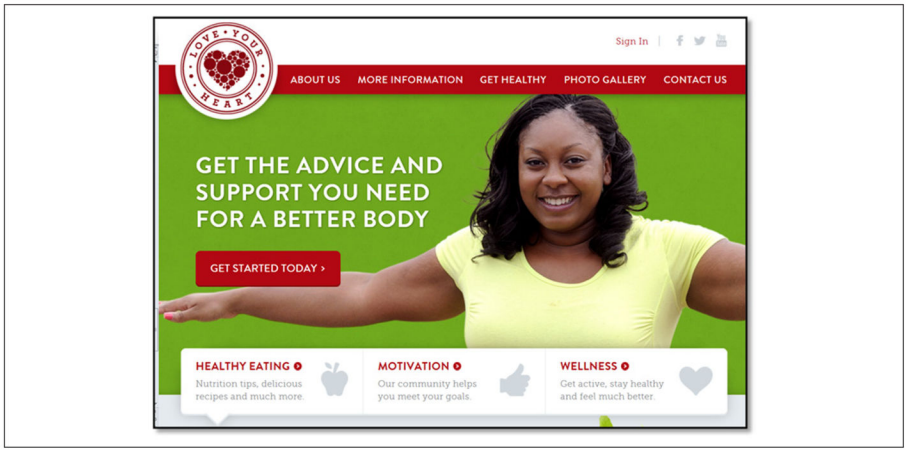

Figure 1.
Homepage of the Love Your Heart website.

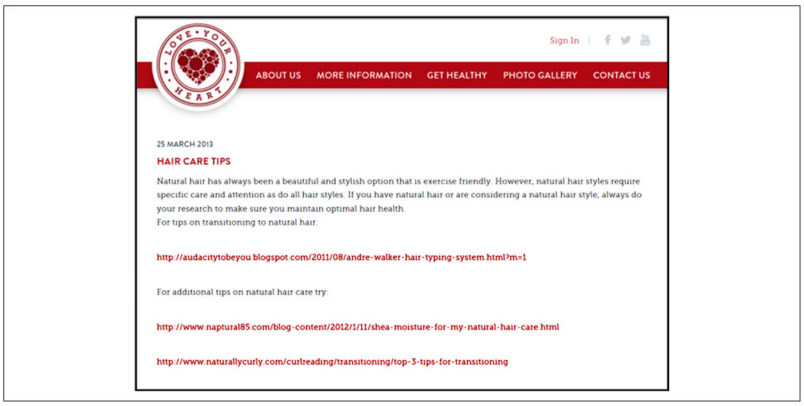

Figure 2.
Blog post illustrating hair care tips.

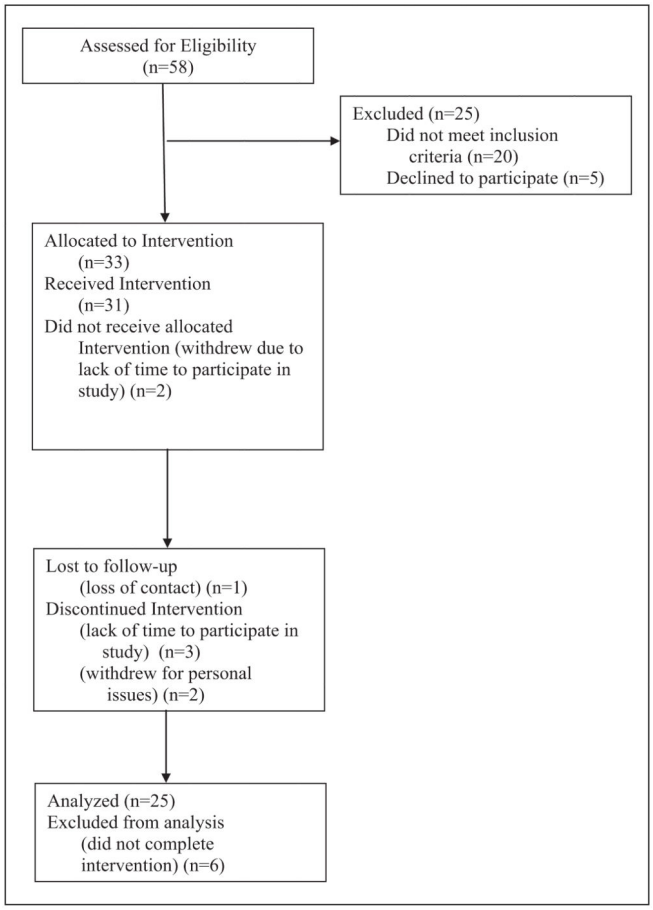

Figure 3.
CONSORT diagram illustrating participant flow.

Table 1

Overview of the Application of the Social Cognitive Theory to Intervention Activities.

Social cognitive theory construct	Component associated with the Internet-enhanced program
Self-efficacy	Social modeling and persuasion from participating with similar peers in the program (via supervised exercise sessions and website profiles)
Observational learning	Exercise Videos
Outcome expectations	Blog posts of young African American women providing personal testimonials on the benefits of being physical activity Videos of African American women performing physical activity
Self-regulation	Exercise tracker
Social support	Message boards and blogs discussing and encouraging performance of physical activity Wall posts where participants post messages promoting physical activity
Behavioral capability	Exercise plans Exercise videos Blogs

Table 2

Overview of Points Awarded to Participants for Website Utilization.

Website activity	Assigned point value
Submitting workout on the activity tracker	10
Updating personal weight	10
Updating body measurements (waist, hips, thigh, etc.)	2
Updating personal profile status	5
Uploading a profile picture	50
Requesting to be friends with another user	1
Posting on another user's wall	2
Commenting on another user's wall post	1
Joining a group	2
Posting on a group's wall	2
Posting on a challenge's wall	2
Replying to a message board thread	2
Having other users reply to message board thread you created	2
Setting up a personal blog	10
Commenting on an exercise, workout plan, or diet plan	2

Table 3

Demographic Characteristics of Participants at Baseline.

	Complete sample at baseline (*N* = 31)		Study completers (*N* = 25)	
Variable	***M***	***SD***	***M***	***SD***
Age (years)	21.3	3.2	21.9	3.3
Body mass index	33.8	5.7	32.9	6.0

	n	**Percentage**	***n***	**Percentage**
African American	31	100	25	100
Marital status				
Never married	29	93.5	23	92.0
Single	2	6.5	2	8.0
Degree currently obtaining				
Undergraduate	25	80.1	20	80.0
Masters	4	12.9	3	12.0
PhD	2	6.5	2	8.0
Highest degree father obtained				
Less than high school	0	0	0	0
High school or GED	11	34.4	11	44.0
Associates degree	5	16.1	5	20.0
Bachelors degree	6	19.4	2	8.0
Masters degree	5	16.1	5	20.0
Doctorate	0	0	0	0
No answer	4	12.9	2	8.0
Highest degree mother obtained				
Less than high school	2	6.5	1	4.0
High school or GED	10	32.3	9	36.0
Associates degree	3	9.7	3	12.0
Bachelors degree	6	19.4	2	8.0
Masters degree	7	22.6	7	28.0
Doctorate	3	9.7	3	12.0
No answer	0	0	0	0

Table 4

Physical Activity and Sedentary Behavior Outcomes (N = 25).

	Baseline		3 months		Baseline to 3-month change
	***M* (*SD*)**	**Median (range)**	***M* (*SD*)**	**Median (range)**	**Wilcoxon *p***
7-Day Physical Activity Recall (minutes/week)	99.4 (103.8)	80.0 (0–399)	134.7 (119.5)	100.0 (0–485)	.15
Accelerometer[a] (minutes/week)	45.0 (51.6)	22.0 (0–183)	29.8 (37.28)	12.0 (0–117)	.08
Sedentary Behavior Weekday (hours/week)	2.83 (1.9)	3.0 (0–7)	0.84 (0.87)	0.5 (0–4)	<.0001
Sedentary Behavior Weekend (hours/week)	3.85 (1.63)	4.0 (0.5–6)	1.47 (1.17)	1.0 (0–4)	<.0001

[a] Only 17 participants provided valid accelerometer data and were included in accelerometer outcome analysis.

Table 5

Pre–Post Intervention Changes for Social Cognitive Theory and BMI Outcomes.

Social cognitive theory variables	Range	Baseline	3 months	Baseline to 3-month change	*p*
Exercise self-efficacy	1–5	3.95 (0.40)	3.76 (0.55)	0.19 (0.53)	.086
Outcome expectations	1–5	4.17 (0.46)	4.31 (0.48)	0.13 (0.35)	.057
Self-regulation	1–5	2.21 (0.65)	2.88 (0.74)	0.67 (0.66)	<.0001
Social support from family	0–60	48.12 (14.23)	51.52 (16.12)	3.40 (8.34)	.052
Social support from friends	0–60	48.12 (14.23)	51.52 (16.12)	3.40 (8.34)	.052
Enjoyment	1–7	5.33 (0.78)	5.59 (1.04)	0.25 (0.86)	.150
Body mass index		32.94 (6.02)	32.65 (3.03)	29 (1.01)	.162