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## Developing an intervention to address physical activity barriers for African–American women in the deep south (USA)

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### Abstract

**Aim**—To address high rates of inactivity and related chronic diseases among African–American women.

**Materials & methods**—Eleven focus groups on physical activity barriers for African–American women in the deep south (USA) were conducted (n = 56). Feedback guided an intervention development process. The resulting Home-Based Individually Tailored Physical Activity Print intervention was vetted with the target population in a 1-month, single arm, pre–post test demonstration trial (n = 10).

**Results**—Retention was high (90%). Intent-to-treat analyses indicated increases in motivational readiness for physical activity (70% of sample) and physical activity (7-day Physical Activity Recall) from baseline (mean: 89.5 min/week, standard deviation: 61.17) to 1 month (mean: 155 min/week, standard deviation: 100.86). Small improvements in fitness (6-Min Walk Test), weight and psychosocial process measures were also found.

**Conclusion**—Preliminary findings show promise and call for future randomized controlled trials with larger samples to determine efficacy. Such low-cost, high-reach approaches to promoting physical activity have great potential for addressing health disparities and benefiting public health.

### Keywords

African–American women; exercise; health disparity; physical activity

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Regular physical activity plays a critical role in chronic disease prevention and has been consistently associated with lower risk of early death, coronary heart disease, stroke, high blood pressure, hyperlipidemia, Type 2 diabetes, metabolic syndrome and colon and breast cancer. Furthermore, an active lifestyle can help prevent weight gain and even promote weight loss, particularly when combined with a reduced calorie intake [1,2]. Despite these health benefits, most Americans are sedentary. National surveys indicate that, while women

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#### Ethical conduct of research

The authors state that they have obtained appropriate institutional review board approval or have followed the principles outlined in the Declaration of Helsinki for all human or animal experimental investigations. In addition, for investigations involving human subjects, informed consent has been obtained from the participants involved.

overall are more sedentary than men [1], African–American women report particularly low levels of regular leisure-time physical activity (19.8%) and suffer disproportionately from related conditions, such as obesity and breast and colon cancer [101].

Interventions are needed to address such health disparities, but most efforts to promote physical activity among African–American women to date have relied upon center- or clinic-based programs [3–5], which have limited reach and may be difficult for many individuals to attend. For example, in rural regions, participation in such programs may be precluded by the long distances and extensive travel required to reach these centers. Home-based interventions minimize many of the barriers to interventions that are commonly cited by African–American women (e.g., childcare and monetary costs) [6] and may be particularly well suited for under-served and rural areas, such as the deep south (USA). Our research team has developed and tested a computer expert system that individually tailors self-help print materials on constructs from the Social Cognitive Theory [7] and the Transtheoretical Model [8]. This program can be mail-delivered, and thus may be suitable as a home-based intervention to decrease the physical activity barriers that are encountered by rural women. Several studies, with mostly white, New England (USA) samples, provide support for the efficacy of this approach [9–17].

However, past research suggests that cultural differences regarding physical activity exist between African–American and other groups [4,18]. While most women report a lack of time and energy, and caregiving is a barrier that is common to both African–American and Hispanic women, African–American women have also described some different reasons for not being active (e.g., lack of a safe place to exercise or walk) than white and Hispanic women (e.g., self-conscious) [19]. Another study reported unique attitudes among African–American women regarding body image, concerns about safety in their neighborhoods, the burden of redoing their hair after exercise and the lack of time for exercise due to extensive family and church commitments [18]. Thus, the next step was to translate this intervention derived from mostly white women in New England to address the needs and preferences of African–American women in the deep south [7–15].

We conducted extensive formative research (focus groups with African–American women in the deep south and comprehensive literature reviews [3,20]) to identify the physical activity barriers and intervention preferences of our target population. Participants reviewed and provided feedback on materials from the existing empirically-supported physical activity intervention. Participants gave vital suggestions of how to increase the appeal and relevance of the intervention content for African–American women in the deep south. Once feedback was incorporated into the intervention development process (see Table 1 for themes on physical activity barriers and intervention preferences of African–American women in the deep south from the focus groups and resulting intervention modifications), the Home-Based Individually Tailored Physical Activity Print (HIPP) intervention for African–American women in the deep south was vetted in a 1-month demonstration trial. We hypothesized that recruitment, retention and participation satisfaction ratings would demonstrate the feasibility and acceptability of the HIPP intervention. Furthermore, we anticipated that changes in self-reported physical activity (based on 7-day Physical Activity Recall [PAR] interview data) from baseline to 1-month assessment would support the preliminary efficacy of such a potentially low-cost [21], high-reach approach to promoting physical activity in African–American women in the deep south.

## Methods

A mixed methods research design was used for the current study. First, focus groups were conducted to learn more about the physical activity barriers and intervention preferences of

African–American women in the deep south (n = 56). This feedback guided the intervention development process. Then, a single arm, pre–post test demonstration trial (n = 10) was conducted to vet the resulting theory-based individually tailored physical activity intervention with the target population. Physical activity and psychosocial assessments were conducted at baseline and 1 month.

### Focus groups

**Setting & samples**—Overall, we conducted 11 focus groups on physical activity barriers and preferences among African–American women in the deep south. Seven focus groups were conducted with community health advisors from the Deep South Network for Cancer Control. Throughout this 13-year long academic–community partnership to reduce cancer disparities in Alabama and Mississippi (USA) [22,23], over 500 ‘natural helpers’ have been recruited and trained as Community Health Advisors as Research Partners (CHARPs) in Alabama and Mississippi. These CHARPs help educate the community about breast, cervical and colorectal cancer, address issues related to healthcare access and resources [22], and serve as a vital link between community members, community health agencies and resources. They bridge the gap between individuals and healthcare resources/cancer information by providing health education, explaining cancer screening tests and enhancing community participation in clinical trials [24], and were recruited for participation in focus groups in the current study owing to expertise with health promotion in the community. We also conducted four of these focus groups with African–American women recruited from the Birmingham, Alabama community to obtain reactions from the actual target population.

First, six exploratory focus groups (n = 39; mean [M] age: 55.82; standard deviation [SD]: 7.91; range: 35–70 years old) were held with CHARPs from the Deep South Network For Cancer Control. Given past research indicating differences in physical activity in rural and urban regions [25], these focus groups were stratified by geographic area. Three focus groups were conducted with CHARPs from rural counties and another three focus groups were conducted with CHARPs from urban counties. These focus groups were held in several community settings (e.g., meeting rooms at local conference centers, libraries and churches). Upon completion of the initial exploratory focus groups, a random subsample of participants were invited back to attend a confirmatory focus group (n = 6), during which the preliminary themes in the feedback provided thus far were discussed. This provided an opportunity to confirm identified physical activity barriers and intervention preferences (or correct any misunderstandings), and further elaborate upon initial focus group responses. We also discussed potential intervention modifications based upon feedback and provided samples of modified intervention materials, so that participants could approve or disapprove of any changes. Next, three exploratory focus groups were held with African–American women recruited from the Birmingham, Alabama community (n = 17; M age: 36.82; SD: 6.31; range: 25–47 years old). Once again, a random subsample of participants were invited back to participate in a confirmatory focus group (n = 5).

**Protocol**—Focus group sessions lasted approximately 90 min and were scheduled in the evening to accommodate participant work schedules. Catered meals were provided. Approximately six participants were scheduled for each session, as the researchers noted that larger focus groups can be difficult to keep on topic. A trained, experienced African–American female moderator guided participants through the following discussion topics (Box 1), while a comoderator (African–American female graduate student) took careful notes. All focus groups were audiotaped.

**Qualitative analyses**—Executive summaries of the focus groups were prepared within 24 h of each focus group and helped set the agenda for confirmatory focus groups.

Furthermore, these summaries provided preliminary data for immediate use in modifying the intervention content. Audiotapes of the focus group sessions were transcribed verbatim and a content analysis was performed to generate key themes in the participants' suggestions for modifying the program.

The research team developed a coding scheme. Then, two independent research team members reviewed and coded each transcript. Once completed, the coders compared passages coded, discussed discrepancies in coding and reached a consensus on the appropriate coding for each transcript. Transcripts were uploaded into NVivo 9 qualitative data management and analysis software. Master codes, agreed upon by the two independent coders and approved by the research team, were entered into the final database for subsequent analysis. Themes were summarized, interpreted and used to facilitate intervention modifications.

**Themes from participant feedback related to barriers to physical activity for African–American women in the deep south—“I let myself go trying to take care of everyone else”**

The most compelling theme regarding barriers to physical activity for African–American women in the deep south was a lack of time. The focus group participants reported often having difficulty finding the time to be physically active due to competing priorities at home and work. These women described themselves as balancing multiple roles (e.g., caretaker and employee) and experiencing fatigue and stress related to these many responsibilities. When expressing how being busy with her job and children had interfered with exercising, one woman stated “I let myself go trying to take care of everyone else.”

“Physical activity makes me tired & sweaty & ruins my hair”

Another theme that arose from the focus group feedback on barriers to physical activity for African–American women in the deep south included negative outcome expectations. Many of the participants reported avoiding exercise because it might make them feel tired and cause them to sweat. Concerns regarding perspiration were primarily due to the impact upon their hair. Some participants reported spending a good deal of time and money to maintain certain hairstyles, which can quickly become undone by sweating. Thus, these women may feel hesitant toward participation in activities that involve exertion, given their desire to preserve their hairstyles as long as possible.

“There are no health clubs out in the country”

Participants indicated that access to safe and affordable means to be active can also be an issue for African–American women in the deep south. The women consistently described costs as a barrier to physical activity (“If you don’t have the money to pay the light bill then you don’t have money to join the health club”), which is not surprising considering the high rates of poverty found in this region [102]. Furthermore, these focus groups were held in the midst of an economic recession and such historical context may have influenced participant responses.

“Physical activity is torture”

The moderator began the focus group session by asking participants about their past experiences with exercise (Box 1) and often received moans and groans in response. When asked to elaborate, participants described not enjoying exercise and used terms such as ‘torture’ to characterize their past experiences with physical activity.

“I just don’t see people in my neighborhood out walking”

Several participants described a general lack of social support for physical activity. In some cases, participants referred to broader social norms (“I just don’t see people in my neighborhood out walking”), whereas other women described specific experiences in which family and friends were not supportive of their efforts to become more physically active. This ranged from husbands who did not wish to supervise children while their wives took time to exercise to people expressing disapproval by asking questions such as “What are you walking for?” and “What are you trying to lose?” While we will discuss cultural differences in body-size ideals in more detail later on in this section, the women described ‘curvy figures’ as quite desirable in their community. Concerns regarding exercise resulting in the loss of these desirable curves may play a role in the lack of social support for physical activity.

“[Exercise] could do more harm than good”

Many of the participants felt that they already get enough activity in daily life (e.g., by driving to meetings) or that being busy (e.g., attending church) is the same as being active. Furthermore, some women were scared that they might actually do themselves harm by exercising. Fear of injury (e.g., sprained ankle or pain in knees) was often described as a barrier to physical activity during these focus groups.

**Themes from participant feedback related to physical activity intervention needs & preferences of African–American women in the deep south**—Overall, the women described busy, inflexible schedules that make attending center-based programs difficult and indicated that home-based approaches were more appropriate for this target population. As part of their participation in the focus groups, the women reviewed materials from an existing empirically supported HIPP intervention that was developed and tested by our research team in studies with mostly white samples in New England [9,13–17]. While the home-based, print format of the program was well-received, suggestions for how we could increase the appeal and relevance of the intervention content for African–American women in the deep south were as follows:

“We’re in the Bible belt”

The women were quick to remind us that “We’re in the Bible belt” and emphasized the high level of religiosity in this region, specifically among our target population (African–American women). While it was evident that intervention messages should be consistent with these beliefs, several personal statements from focus group participants such as “You need to put religion into everything that you do” helped stress the importance of taking it a step further and actually incorporating religiosity into our intervention.

“It ain’t all about losing weight. It’s about health”

When reviewing intervention messages related to the benefits of exercise, the participants encouraged us to focus on improved physical and mental health as benefits of exercise. Participant statements such as “I’m not walking because of weight. I’m walking because of diabetes,” indicated that chronic disease prevention was likely a powerful motivator for physical activity. Moreover, the women felt that information on health disparities and how physical activity can help prevent “diseases that plague African–American women in particular” (e.g., heart disease, cancer and diabetes) would be helpful. On the other hand, the women reminded us that weight loss messages might not resonate as well with this target population. ‘Weight loss’ appeared to be associated with the concept of ‘thin’, which was seen as likely to be unappealing to many members of this community owing to different

body-size ideals. Participants who felt weight loss should not be emphasized as a benefit of physical activity for African–American women in the deep south were quite passionate about the issue. In fact, one participant pounded the table as she reminded us that “It ain’t all about losing weight. It’s about health.”

“Golf is not one of our number one sports”

While reviewing currently available physical activity intervention materials during these focus groups, several participants commented on the type of physical activities promoted in the text and pictures and suggested that some activities (e.g., golf, swimming and tennis) might be of less interest/relevance to African–American women in the deep south. Walking, aerobics and dancing were volunteered as options that would be more acceptable to our target population. Given the high poverty rates in this region [102], the participants also encouraged us to highlight free and low-cost activities.

“Where are all the black people?”

The women noted that there were no pictures of African–Americans included in the existing intervention materials and that adding pictures of African–Americans exercising might make the point that this physical activity information applies to people like them. Participants also wanted more diversity in the body sizes portrayed in the pictures (i.e., “we want to see fat and skinny [models in the pictures]”) to emphasize that physical activity is helpful for women of all sizes. Other appearance-related recommendations included increasing the font size, bullet pointing the text (i.e., “get to the point”) and adding more colorful graphics (“bright colors would catch more eyes”).

### **Similarities & differences between community health advisors & community members**

The feedback from community members on physical activity barriers and intervention preferences largely echoed themes from the seven prior focus groups with CHARPs and indicated that saturation had been reached. However, there were some differences. For example, when describing physical activity barriers, women recruited from the community (as opposed to those recruited by the CHARPs) expressed some concern that exercising at a fitness center would involve feeling awkward and out of place (“gyms are intimidating”) because there might not be many people like them (e.g., other African–American women) at such facilities. Thus, intervention messages on outcome expectancies that emphasize potential positive outcomes (e.g., feeling energized after physical activity) and help problem solve potential negative outcomes (e.g., bringing a friend for social support) might be particularly beneficial for this group.

### **Similarities & differences between urban & rural focus groups**

Once again, there were more similarities than differences between the urban and rural focus groups, in terms of physical activity barriers and intervention preferences. Sweating and ‘messaging up their hair’ were reported as barriers to physical activity; however, women in the urban focus groups seemed a bit more concerned about this issue than the women in the rural focus groups. Both groups reported barriers to physical activity related to safety. However, urban focus group participants described safety concerns related to crime and dogs, whereas the rural focus groups reported fears of encountering snakes while walking in the country and being run over due to lack of sidewalks. Thus, tips on haircare and sweating appeared (to some degree) of general interest and should be included in such a program, along with intervention messages regarding safety that address region-specific concerns.

## Demonstration trial

**Design**—After participant feedback was incorporated into the intervention development process (Table 1), a single arm, pre–post test design demonstration trial was conducted to vet the resulting HIPP intervention for African–American women in the deep south with the target population. Physical activity and psychosocial assessments were conducted at baseline and 1 month.

**Setting & samples**—Ten African–American women between the ages of 19 and 65 years were recruited from the Birmingham, Alabama community via flyers. Eligibility criteria were assessed during a telephone screening interview. Individuals were excluded from participation if they endorsed a history of heart disease, myocardial infarction, angina, diabetes, stroke, osteoarthritis, osteoporosis, orthopedic problems or any other serious medical condition that would make physical activity unsafe. Other exclusion criteria included current or planned pregnancy, hospitalization due to a psychiatric disorder in the past 3 years, BMI >40 and/or taking medication that may impair physical activity tolerance or performance (e.g.,  $\beta$ -blockers).

**Protocol**—Once initial eligibility was established during the telephone screening interview, participants attended an in-person orientation session at the research center to learn more about the study and complete the informed consent process. The women also had measurements (height and weight) taken and filled out demographic questionnaires. Physical activity and psychosocial measures were completed at the baseline assessment. All participants received a 1-month trial of the HIPP intervention through the mail. Then participants returned for 1-month postintervention assessments, during which they completed the research measures again, along with participant satisfaction questionnaires to assess program satisfaction and solicit suggestions for improvement.

**Measures**—Physical activity assessments were conducted at baseline and 1-month sessions. The 7-day PAR interview served as the primary outcome measure [26,27]. The 7-day PAR provides an estimate of weekly min of physical activity and uses multiple strategies for increasing accuracy of recall, such as breaking down the week into daily segments (i.e., morning, afternoon and evening) and asking about many types of activities, including time spent sleeping and in moderate, hard and very hard activity. The 7-day PAR has been used across many studies of physical activity and has consistently demonstrated acceptable reliability, internal consistency and congruent validity with other more objective measures of activity levels [28–36]. Furthermore, this measure has been shown to be sensitive to changes in moderate intensity physical activity over time [37,38]. Participants also completed a 6-Min Walk Test at both time points. This widely used field test of fitness measures the distance that can be quickly walked on a flat, hard surface in 6 min [39,40] and was correlated ( $r = 0.73$ ) with peak oxygen uptake [41].

Psychosocial assessments were also conducted at the baseline and 1-month session. These data were used to generate the tailored expert system feedback reports (see ‘Intervention’ section below) and assess potential changes in the theoretical constructs directly targeted by the intervention. The four-item stage of change measure has demonstrated reliability ( $\alpha = 0.78$ ; intra-class correlation  $r = 0.84$ ) as well as shown acceptable concurrent validity with measures of self-efficacy and current activity levels [42]. The 40-item processes of change questionnaire is comprised of ten subscales that address a variety of processes of activity behavior change. Internal consistency of the subscales ranged from 0.62 to 0.96 [43]. Self-efficacy, or confidence in one’s ability to persist with exercising in various situations, such as when feeling fatigued or encountering inclement weather, was measured with a five-item instrument ( $\alpha = 0.82$ ) [42]. Decisional balance involves weighing the pros and cons of

physical activity and was assessed with a 16-item measure with good internal consistency (0.79 for pros and 0.95 for cons) and validity (correlated with stage of change;  $p < 0.001$ ) [44].

At the 1-month session, participant satisfaction with the intervention and study protocol was assessed with a 27-item measure that the research team has used in several past studies [45–47]. This questionnaire was adapted to assess the feasibility and acceptability of this approach to promoting physical activity among African–American women in the deep south.

**Intervention**—All participants received a 1-month trial of the HIPP intervention. This program was based on the Social Cognitive Theory [7] and Transtheoretical Model [8] and emphasized behavioral strategies for increasing activity levels (i.e., goal-setting, self-monitoring, problem-solving barriers, increasing social support and rewarding oneself for meeting physical activity goals). Participants received motivation-matched physical activity manuals and individually tailored computer expert system feedback reports through the mail. Computer expert system feedback reports were based on participants' psychosocial survey responses and included information on: current stage of motivational readiness for physical activity; increasing self-efficacy (i.e., confidence) in physical activity participation; weighing the pros and cons of engaging in physical activity (decisional balance); cognitive and behavioral strategies associated with physical activity behavior change (processes of change); how the participant compares with her prior responses (progress feedback); and how the participant compares with individuals who are physically active and with national guidelines (normative feedback). The computer expert system draws from a bank of 330 messages addressing different levels of psychosocial and environmental factors affecting physical activity. To encourage self-monitoring of exercise behavior, participants were given Accusplit® Eagle AE120XL pedometers with instructions to wear the device during waking hours each day for 1 month and to track the total steps and min of moderate intensity physical activity per day on an activity log.

Participants also received tip sheets addressing physical activity barriers specific to African–American women in the deep south (as identified during our focus groups and comprehensive literature review). See Table 1 for physical activity barriers and intervention needs and preferences specific to African–American women in the deep south and our efforts to address these factors in all components of the intervention.

**Analyses**—Sample characteristics and participant satisfaction questionnaire data were summarized. Paired sample t-tests were conducted to examine changes in physical activity and related process variables from baseline to 1 month. One participant was lost to follow-up. To be conservative, intent-to-treat analyses, with baseline values carried forward in the case of missing data points, are reported below. However, a completer's analyses revealed similar findings.

## Results

### Sample characteristics

The sample ( $n = 10$ ) for the demonstration trial was recruited in less than 1 month and comprised of overweight (M BMI: 28.95; SD: 4.23) African–American women. The M age was 39.1 years old (SD: 12.64; range: 23–62 years old). See Table 2 for sample characteristics.



## Changes in physical activity, fitness, BMI & related process variables from baseline to 1 month

On average, participants reported increasing their moderate intensity or greater physical activity from 89 min/week (SD: 61.17) at baseline to 155 min/week (SD: 100.86) at 1 month;  $p = 0.056$  (Table 3). The 7-day PAR results indicated that gains in physical activity were primarily achieved through spending more time in moderate intensity activities, rather than hard or very hard activities. Small, nonsignificant improvements in fitness, BMI and related psychosocial variables (processes of change, self-efficacy and perceived disadvantages to participating in physical activity) were also found (Table 3 & Table 4). Moreover, 70% of the sample reported increased motivational readiness for physical activity at 1 month.

## Participant satisfaction with the program

Of those who responded to the postintervention participant satisfaction questionnaire ( $n = 8$ ), 87.5% reported having read 'most' or 'all' of the intervention materials and finding them 'helpful' and 'enjoyable'. Furthermore, responses indicated that all of the women would recommend the program to friends.

## Discussion

This two-phase mixed methods study adds to existing knowledge on physical activity barriers for African-American women and advances efforts to promote physical activity and resolve health disparities in this at-risk group. During the extensive formative research process, several surface structure elements unique to physical activity promotion in this population (i.e., including pictures of African-American women of all sizes in intervention materials, emphasizing preferred physical activities), as well as deeper structural issues (religiosity), were identified. Some of these findings corroborated results from past research in this area. For example, several qualitative studies on physical activity in minority women have also reported lack of time as a substantial barrier to physical activity [18,48–51], as well as negative outcome expectations [18,48,49,52–54], access to safe, affordable means to be active [6,18,48,51,53,55–59], lack of enjoyment [48,49,52–54] and fear of injury [54]. Another theme that arose in prior studies, lack of social support or even disapproval of physical activity [51,60], appears to be an important factor related to physical activity in this community. Efforts were made to address issues related to social support in the current study, but future researchers should examine whether even greater physical activity increases could be achieved with further attention to promoting social support from family and friends for this important health behavior (i.e., providing contact list of participants interested in being walking partners and/or support).

Participants also provided a wealth of information regarding their physical activity intervention preferences. Mirroring past findings from health promotion efforts in the African-American community [18,49,51,61,62], our focus group participants recommended using scripture and religious themes and discouraged focusing on physical activity for weight loss (vs chronic disease prevention). This feedback was particularly helpful, as our intervention materials incorporated the Bible verses and testimonials provided by focus group participants and emphasized the physical and mental health benefits that were described as more important determinants for physical activity programs for African-American women, rather than changes in BMI. Future studies are encouraged to take this a step further and include measurements addressing the health interests outlined by the focus groups (e.g., home monitoring of blood glucose, blood pressure, depression and anxiety). Moreover, past studies have suggested that African-American women may prefer different activities from white women [18,63]. Similar to findings from research conducted by

Resnicow and colleagues in which participants described ‘mostly black’ (basketball and jump rope) and ‘mostly white’ activities (hiking and ice skating) [18], the focus group participants in the current study indicated that African–American women in the deep south might be more likely to participate in activities such as dance versus golf and that such preferences should be reflected in our intervention messages.

Preliminary findings from the demonstration trial of the HIPP intervention for African–American women in the deep south were promising. There was almost a doubling of moderate-to-vigorous physical activity from baseline (M: 89.5 min/week; SD: 61.17) to 1 month (M: 155 min/week; SD: 100.86;  $p = 0.056$ ), along with small, nonsignificant improvements in fitness (6-Min Walk Test time), BMI and important psychosocial variables targeted by the intervention. Furthermore, the program was warmly received by participants, based upon participant satisfaction questionnaire data and low attrition (10%).

While strengths of the current study included examining an important public health concern (health disparities and sedentary lifestyles) in an at-risk sample (African–American women in the deep south) with an intervention grounded in strong behavioral theory and informed by extensive formative research with the actual target population, there were also sizable limitations. The high educational achievement reported by participants may limit our ability to generalize these findings to the overall population. There was no control condition and sample size was small ( $n = 10$ ). Thus, future studies with larger samples and randomized controlled designs will be needed to determine the efficacy of this program and advance this important line of research.

Similar qualitative findings from community health workers from urban and rural counties led to the decision to vet the program in the Birmingham, Alabama area (near the research center), which greatly assisted with logistics (i.e., minimized staff travel) in a project with limited funding. However, once efficacy is shown, the next steps will be to disseminate such programs through the harder-to-reach, rural deep south counties. Telephone calls, DVDs and/or other growing avenues for communication (texts and emails) will be added as ‘needed’ to support and extend the reach and cost–effectiveness of these self-help print materials and respond to evolving technology use/access/preferences in this rural area.

## Conclusion & future perspective

This line of research explores low-cost, high-reach strategies for promoting physical activity in African–American women and has great potential for addressing related health disparities and benefiting public health.

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### Financial & competing interests disclosure

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**Box 1. Exploratory focus group interview guide****Introduction**

- Describe purpose of the study and informed consent process

**Grand tour questions**

- What does 'exercise' mean to you?
- Can you tell me about your own experiences with exercise?

**Follow-up questions**

- What are the pros/cons of exercise?
- What things get in the way of exercising for you?
- What kind of physical activities are you interested/not interested in participating in?
- What would motivate you to start/continue with an exercise program?
- How could your friends and family support your efforts to exercise?
- What would increase your confidence in exercise?

**Show slides of existing intervention materials**

- Overall, what are your impressions regarding the appearance of the intervention materials? How might it be made more attractive?
- What do you find motivating/not motivating about the pictures of people exercising?
- What do you think of the amount of color/text?
- Is there anything more you can tell me about how we might better develop materials to encourage African–American women in the deep south to exercise?

**Closing**

- Thank you for participating. This information is helpful and will help us improve the physical activity intervention

### Executive summary

- Findings from the qualitative research add to existing knowledge on physical activity barriers and intervention preferences among African–American women.
- Themes related to barriers included competing priorities, negative outcome expectations, safety, costs, lack of enjoyment, lack of social support and fear of injury.
- For enhanced appeal, suggestions included incorporating religion, focusing on health (not weight) and low-cost popular activities (walking/dancing and not golf).
- Preliminary findings from the demonstration trial support the feasibility and acceptability of the Home-Based Individually Tailored Physical Activity Print intervention for African–American women in the deep south.
- Retention was high (90% at 1 month).
- Participant satisfaction questionnaire data indicated that most women found the program helpful/enjoyable and would recommend the program to friends.
- Participants reported an almost doubling of moderate-to-vigorous physical activity from baseline (mean: 89.5 min/week; standard deviation: 61.17) to 1 month (mean: 155 min/week; standard deviation: 100.86).
- Small, nonsignificant improvements in fitness (6-Min Walk Test time), BMI and important psychosocial variables targeted by the intervention were also found.
- Such low-cost, high-reach strategies for promoting physical activity in African–American women have great potential for addressing related health disparities and benefiting public health.
- Future studies with larger samples and randomized controlled designs will be needed to determine the efficacy of this program and advance this important line of research.



**Table 1**

Themes from focus groups and resulting intervention modifications.

<b>PA barriers</b>	<b>Addressed in the HIPP intervention by</b>
Competing priorities (e.g., work and home) and related fatigue/stress: "I let myself go trying to take care of everyone else"	Provided tip sheet 'Working exercise into a busy schedule' with testimonials on benefits of self-care to oneself and others
Negative outcome expectations: "Physical activity makes me tired and sweaty and ruins my hair"	Provided tip sheet 'Looking fine and being healthy', which emphasized positive outcomes (increased energy) and helped problem solve issues with sweating and hairstyles
Access to safe, affordable means to be active: "No health clubs out in the country"	Provided tip sheet 'Exercising safely without breaking the budget', pedometers and a local low-cost physical activity resource list
Lack of enjoyment: "Physical activity is torture" and "Gyms are intimidating"	Provided tip sheet 'Are we having fun yet?', which promotes enjoyment (trying a variety of interesting activities and incorporating music)
Lack of support/disapproval of physical activity: "I just don't see people in my neighborhood out walking"	Added testimonials on social support for physical activity (encouraging fun group activities and getting children involved in activities)
Fear of injury: "Could do more harm than good"	Provided more information on stretching, warm-ups and cool-downs
High religiosity: "We're in the Bible belt"	Included scripture and quotes from Community Health Advisors as Research Partners on physical activity and religion in the intervention text
Incentives and motivators for physical activity: "It ain't all about losing weight. It's about health"	Emphasized physical/mental health benefits rather than focus on potentially less appealing motivators (e.g., weight loss)
Relevant, acceptable activities: "Golf is not one of our number one sports"	Highlighted activities identified by focus group participants as preferred by African-American women in the deep south (e.g., walking, dancing and aerobics), rather than activities described as less acceptable to our target population (e.g., golf, swimming and tennis)
Appearance of intervention materials: "Where are all the black people?"	Worked with local, minority-owned graphic design company to improve appearance. Added pictures of African-American and overweight women. Increased font size, streamlined text and included more color graphics

HIPP: Home-Based Individually Tailored Physical Activity Print; PA: Physical activity.

**Table 2**

Demographic characteristics for demonstration trial participants (n = 10).

<b>Characteristics</b>	<b>n</b>	<b>%</b>
<b><i>Education</i></b>		
Some college	3	30
College graduate	4	40
Postgraduate work	3	30
<b><i>Marital status</i></b>		
Single	6	60
Married	2	20
Divorced/separated	2	20
<b><i>Employment</i></b>		
Full time	10	100
<b><i>Income</i></b>		
Between US\$10,000 and 19,999	1	10
Between US\$20,000 and 29,999	2	20
Between US\$40,000 and 50,000	4	40
Over US\$50,000	3	30

**Table 3**

Changes in physical activity, fitness and BMI.

Variables	Baseline mean (SD)	1-month mean (SD)
Moderate activity	73.13 min/week (55.09)	143.13 min/week (106.57)
Hard activity	11.25 min/week (22.32)	3.75 min/week (10.61)
Very hard activity	0 min/week (0)	6.25 min/week (17.68)
Total activity <sup>*</sup>	89.5 min/week (61.17)	155 min/week (100.86)
6-min walk test	498.94 m (58.94)	517.92 m (78.45)
BMI	28.95 (4.23)	28.81 (4.36)

\* p = 0.056.

SD: Standard deviation.

**Table 4**

Changes in psychosocial variables.

<b>Variables</b>	<b>Baseline mean<sup>†</sup> (SD)</b>	<b>1-month mean<sup>†</sup> (SD)</b>
Self-efficacy	2.5 (0.46)	2.78 (0.67)
<i>Processes of change</i>		
Cognitive	3.22 (0.51)	3.45 (0.53)
Behavioral	2.94 (0.58)	3.24 (0.53)
<i>Decisional balance</i>		
Cons	2.93 (0.74)	2.67 (0.69)
Pros	4.06 (0.47)	3.93(0.86)

<sup>†</sup>Range of possible scores: 1–5.

SD: Standard deviation.