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A Theoretically-Grounded Investigation of Perceptions About Healthy Eating and mHealth Support Among African American Men and Women in New Orleans, Louisiana

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Abstract

There has been a surge in diet-related mobile health (mHealth) interventions. However, diet-related mHealth research targeted toward racial/ethnic populations has been relatively limited. Focus groups with African American men and women from New Orleans, Louisiana, were conducted to (1) describe perceptions about healthy eating, (2) determine the acceptability of mHealth interventions, and (3) identify preferred mHealth intervention features. Descriptive statistics and thematic content analyses were performed. Qualitative data were organized within the context of the Theory of Planned Behavior and Social Cognitive Theory's theoretical components. Results may inform the development of mHealth research to improve eating behaviors among the target population.

Keywords

health behavior; healthy diet; minority health; telemedicine

Obesity is a complex disease influenced by individual, social, environmental and cultural/contextual factors.[1–3] Along with its associated comorbidities, obesity presents an even greater challenge among African-Americans, who not only demonstrate a higher prevalence of obesity and cardiovascular disease but are also less likely to lose weight and more likely to regain weight compared with other racial/ethnic groups.[4,5] Scores from the Healthy Eating Index reveal that African American adults have a poorer diet quality (eg, low total vegetable intake—dark green, orange—increased added sugars) relative to white and Hispanic adults—which has implications for their higher rates of obesity and chronic disease.[6] Despite this, African Americans have historically been underrepresented in weight-related behavior change research.[7–9] This has been particularly notable in technology-based

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behavior change interventions,[10] for which there has been a marked increase in the relevant literature,[11] including research that specifically focuses on nutrition behaviors.[10]

Technology-based channels of delivery offer accessible, far-reaching, low-cost, and potentially long-term methods of intervention, which is an ideal approach for prompting behavior change in real time.[10–12] A 2014 systematic review of mHealth interventions around weight management only found 6 studies with a focus on racial/ethnic minorities relative to 62 articles with predominantly Caucasian samples.[13] Of the 6 studies, only 3 provided long-term follow-up of at least 12 months, which makes it challenging to draw meaningful conclusions about sustainable behavior change for racial/ethnic minority populations. A more recent systematic review found similar disparities in the mHealth literature, with only 8 studies meeting review criteria.[14] This gap is amplified by the fact that African Americans are more likely than other racial groups to own and use smartphone technologies, positioning them as prime potential mHealth research participants.[15] In the relatively few studies that have been published with African Americans as the target population, smartphone-based interventions exhibit significantly higher African American enrollment, suggesting that the use of SMS (short message service, or text messaging) for this population may be particularly promising for health behavior change.[16] Feasibility studies suggest that adherence and acceptability of SMS programs among African Americans are generally positive.[17,18] Furthermore, advice and support through SMS programs have been effective for chronic disease management, increased fruit and vegetable intake, and decreased fat intake, which is important for the prevention of obesity and chronic diseases.[10]

It has been well-documented across the relevant literature that health behavior change theory is essential in the development of mobile health behavior change interventions.[19–21] However, as noted in a comprehensive review by Winter and colleagues,[22] there is a need for more theoretically grounded mHealth interventions that aim to reduce cardiovascular disease risks factors. This is particularly important given that theoretically grounded interventions are more effective than those that are not.[23] Mummah et al[24] argue that not only do researchers need to think critically about how and in what ways behavior change can be part of intervention development, but also that members of the target population need to inform the intervention design as well. Thus, among a sample of African Americans with overweight and obesity residing in New Orleans, Louisiana, the aim of the current study was 3-fold: (1) examine perceptions about healthy eating within the context of health behavior change theory; (2) assess the acceptability of using mobile phone-based support for healthy eating and (3) identify appealing features of mobile phone-based support for healthy eating. Data obtained from this study will inform the development of a mobile phone-based intervention for this population.

METHODS

Participant eligibility and recruitment

Participants were recruited from local health clinics, a local housing site, and by word of mouth. Individuals were eligible to participate if they were African American; resided in the New Orleans, Louisiana; 30 years and older; self-identified as being overweight or obese;

owned a mobile phone; and could provide verbal consent for participating in the focus group. In addition to food being provided at each focus group, each participant was given a $20 supermarket gift card after completing the study survey and participating in the focus group. Study protocols were approved by the university institutional review board to ensure the ethical conduct of research and protection of human subjects.

Study procedures

Four 90 to 120-minute focus groups with both men and women were conducted at the facilities of 2 community partners (ie, a local nonprofit and a housing site). Participants completed a brief study survey prior to the focus group discussion commencing. Surveys were self-administered unless a participant requested assistance—at which a member of the research team would then administer the survey. The survey included a series of closed and open-ended questions on basic demographics (age, sex, education, income, household), perceived health status, food-shopping behaviors, self-efficacy (for buying and preparing healthy food, respectively), and general comfort with using mobile phones. Apart from the self-rated health status item,[25] questions were developed by the research team and had been used in previous research activities.

A focus group guide was developed to drive discussions and ensure that the moderators (J.S. and R.D.) conducted the session in the same manner. Questions in the guide were grounded in behavior change theory. The Theory of Planned Behavior (TPB)[26,27] was used as a framework and posits that one's intentions to perform a behavior are predicted by 3 global constructs: normative beliefs (attitudes toward the behavior) perceived norms (about the performance of the behavior), and perceived behavioral control (self-efficacy to perform a behavior). The relative importance of these global constructs is determined by underlying salient beliefs—consequences (ie, advantages and disadvantages of the behavior), circumstances (ie, factors that make performing the behavior easier or harder), and referents (ie, people who approve and disapprove of performing the behavior).[26–28] Questions in the guide were also framed around Bandura's social cognitive theory (SCT)[29] which argues that there is a dynamic and reciprocal interplay of individual and socioenvironmental factors on one's behavior. Key components of the SCT, including outcome expectations (the consequences of performing a behavior), self-efficacy (confidence in one's ability to perform a behavior), self-regulation (goal-setting, self-monitoring, gaining and maintaining social support), behavioral capability (the provision of tools and resources to support the performance of a behavior), modeling (observing similar individuals performing a behavior), and the use of rewards to modify behavior, have been shown to reinforce behavior changes related to diet.[29–31] A comprehensive review of cardiovascular disease prevention interventions for adults with at least one technology component found that of those that integrated behavior change theory, the TPB and SCT were 2 of the most frequently used among the interventions identified.[23] Participant perceptions about healthy eating, as well as their preferences for mobile phone-based intervention components to improve eating behaviors, were applied to TPB and SCT theoretical components, respectively. Survey items assessing participants' general thoughts about healthy eating and overall acceptability of mobile phone-based support for healthy eating were asked as well. Each focus group was

audiorecorded with permission, along with handwritten copious notes being taken by a member of the research team.

Analysis

Descriptive statistics were used to describe quantitative survey data. A thematic analysis[32] of the transcribed audio recordings and notes was conducted by all members of the doctoral and masters-level research team (J.S., C.P., R.D., C.W.). Team members read the transcripts individually, and met regularly to review and discuss each transcript collaboratively. Transcripts were discussed until a consensus was reached on the identification of major themes of participant perceptions about healthy eating. Data were reviewed within the context of the TPB. Specifically, major themes were organized as salient consequences, circumstances, and referents for eating healthier foods. The theoretical components of the SCT were used as a framework with which to organize themes about participants' recommendations for intervention components that would support their efforts to engage in healthier eating behaviors.[29–31]

RESULTS

Four focus groups (N = 31) were conducted in spring and summer 2017, with data being analyzed in fall 2017. Results from the quantitative survey data revealed that participants were primarily women (81%, n = 25), aged between 32 and 78 years (mean = 58.8; standard deviation = 11.93), and single (never married) (39%, n = 12). Most (90%, n = 28) had achieved at least a high school degree, 45% (n = 23) earning incomes between $10 000 and $25 000 annually. Nearly three-quarters of the participants (71%, n=22) perceived their health to be "good" or "excellent." In terms of food-related behaviors, 45% (n = 14) shopped for groceries at 3 or more different food stores (eg, supermarket, big box store, general store, and farmers market) and primarily used one method of travel (84%, n = 26) to them (eg, car, bike, taxi, public transportation). Only 29% (n = 9) were extremely confident that they could choose healthy foods when shopping for groceries, whereas 19% (n = 6) were extremely confident that they could prepare healthy foods. On a scale of 1 to 10, the average level of comfort with technology, including mobile phones, was 7 (standard deviation = 2.79).

Overall, qualitative findings for salient beliefs were similar across sexes and focus groups—with a consensus from all participants that healthy eating was beneficial for their overall health. Participants consistently mentioned the desire to live as long as– or longer than, a relative; and preventing or eliminating a chronic condition as motivators for eating healthier foods. For example, they expressed the following: "I basically started changing the way I eat because I had big belly and I said no, I got to do something about this," "I had heart problems last year, so it scaredme,""I know that I am going to die … but I want to stay here a little longer if I can. So, I'm trying to eat a little bit better," and "My mother is 83 and my grandmother was 96 when she died. I am gonna live that long too. I know I want to live as long as possible. I want to live until God says it's time."

Salient consequences (advantages and disadvantages of healthy eating)

Among the salient consequences, major themes of perceived *advantages* of healthy eating were improving health and health outcomes (eg, heart disease and diabetes, weight loss, increased energy), maintaining independence as one ages, enhancing the potential for romantic relationships, and improving physical esthetics. Major themes related to *disadvantages* of healthy eating reported by participants included preparation time, lack of fresh produce, costs associated with buying healthy foods, and other people's perceptions about physical changes to one's body from eating healthily (eg, friends' perceptions that weight loss is due to an illness or illegal drug use). Exemplary quotes for each of the themes for salient consequences are displayed in Table 1.

Salient circumstances (factors that make it easier or harder to eat healthily)

Major themes of salient circumstances that make it *easier* to eat healthily reported by participants were preparing for meals in advance, culture and traditions, having access to food stores, the cost of food, dining out, education, living outside of New Orleans at some point in one's life, and hearing testimonials of people who were successful at improving their eating behaviors. Themes related to circumstances that make it *harder* for participants to eat healthfully were preparing meals in advance, the quality of produce in food stores, culture and traditions, access to food stores the cost of food, dining out, the preferences of other household members, as well as cultural elements unique to African Americans and being a Louisiana or New Orleans native, respectively. Exemplary quotes for each of the themes for salient circumstances are shown in Table 2.

Salient referents (people who approve or disapprove of eating healthily)

Participants perceived their family members (eg, spouse, children, siblings, and parents), as well as their doctor and friends, to be salient referents who would be approving their eating healthily. Among disapproving referents, the overall consensus was "no one." However, family was mentioned occasionally by a small number of participants. Exemplary quotes for each of the themes for salient referents are found in Table 3.

Acceptance of phone-based support for healthy eating and identification of appealing features of mobile phone-based interventions that aim to improve and support healthy eating behaviors

Focus group data revealed that most participants (90%, n = 28) expressed an interest in receiving phone-based support for healthy eating. While some participants reported ever using a health-related app (n=3), only one person shared that they had used a phone-based program (app) designed to help improve and track their eating behaviors. Instead, participants often obtained information about healthy eating from magazines, Internet searches, social media (eg, Facebook), and by word of mouth from their personal networks of family and friends.

Participants shared a wish list of appealing mHealth intervention features describing what would help them improve their healthy eating behaviors. Many of the features mentioned aligned with the previously described theoretical components of the SCT and are displayed in Table 4. Other preferred features include sending no more than up to two 1- and 2-way

messages (ie, the ability to both send and receive text messages), the provision of just-in-time personalized feedback, framing potential interventions around “healthy eating” instead of “weight loss.”Participants felt that “weight loss” may have a negative connotation and appear to be an unrealistic, far-reaching, and intimidating goal for some individuals.

DISCUSSION

The current study investigated a sample of African Americans’ perceptions about healthy eating, as well as the acceptability and preferences for diet-related mHealth interventions. Findings suggest that the TPB can be used to identify the sample population’s salient consequences, circumstances, and referents regarding healthy eating behaviors. In reviewing the findings, factors at each level within the social-ecological model[33] were mentioned. According to Robinson,[34] each of the theoretical components of the social-ecological framework must be used to instigate changes in eating behaviors, particularly among African American populations. For example, salient consequences were related to individual and environmental-level factors. The individual-level factors related to health outcomes and maintenance, time, lack of fresh food, and cost. Interestingly, it was observed across sexes that perceived weight loss as a health outcome of eating healthier foods was both an advantage and disadvantage. Weight loss equated to looking “sick” for some; whereas for others, it equated to being more esthetically pleasing and increased the likelihood of romantic relationships. This finding somewhat contrasts with previous research arguing that that heavier body sizes are more accepting among African American populations.[35,36] Salient circumstances spanned each level—individual, interpersonal, community, and societal/environmental level of the social ecological model and related to access to food stores, food quality, education, ever living outside of new Orleans, and New Orleans’ food-related practices and traditions. Participants cited that an unintended implication of Hurricane Katrina was that they re-located to other parts of the country and learned about new foods and new preparation and cooking styles. Some participants reported weigh loss, but regained the weight after returning to New Orleans. The impact of traumas, such as Hurricane Katrina, on dietary behaviors should be investigated further (ie, learning new ways of preparing food based on the city in which an individual relocated after the storm). Participants perceived that their salient referents—family, doctors, and friends—both approved and disapproved (except for the doctor) of their eating healthy foods. This was related more to the individual and interpersonal levels, which is consistent with research indicating that social support received from family and/or friends is influential on African American eating behaviors.[37,38]

Findings also revealed that SMS interventions were acceptable to study participants. Study participants identified specific intervention features that would support them in eating healthier foods such as educational information, low-cost recipes, food preparation videos, and food security/nutrition resources to better impact determinants of healthy eating. Many of the recommendations by the focus group aligned with SCT theoretical components and haven been recognized as effective strategies for traditional and mHealth dietary interventions.[30,31]

There is a great need for alternative strategies to improve the eating behaviors among African Americans and address their high rates of obesity and chronic disease.[4–6] mHealth interventions designed for this population may be a viable strategy for improving health outcomes. Therefore, research that includes, or targets this population, has to be conducted to determine its efficacy. Research that integrates health behavior change theory and involves participants in the early stages of intervention development should be conducted with African American and other hard-to-reach populations as well. To our knowledge, few studies have engaged participants—particularly African American participants, in the development of SMS interventions, despite end-user engagement being a robust predictor of behavior change in mHealth.[14,39]

LIMITATIONS

While the aim of the study was met, there were limitations. First, ideally there would have been separate groups for men and women to enable participants to speak freely without any potential bias about sharing information in front of the opposite sex. However, recruitment efforts for men were relatively unsuccessful. Efforts were made to recruit male participants, yet only 6 enrolled into the study. Limited male participation may impact the generalizability of the findings to both men and women and may warrant further investigation. Second, participants in each focus group did not contribute equally relative to other members in their focus group. This may have resulted in some participants not fully communicating their thoughts and experiences on the topic at hand. Third, while participants met the study criteria and generally experienced similar barriers and facilitators to healthy eating, some participants seemed to be further along in their decision and /or action to start making healthy lifestyle changes (eg, dietary changes and physical activity). This may have biased some of the results. In the future, additional screening measures may need to be implemented prior to the participant consenting to participate.

CONCLUSIONS

Participant perceptions about healthy eating and diet-related mHealth interventions were assessed. Findings revealed a number of factors that influenced the healthy eating practices of the target population. These factors should be considered when developing mHealth interventions, in addition to actively involving them in the iterative design process.

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TABLE 1

Salient Consequences for Eating Healthy Foods

Themes	Advantages	Themes	Disadvantages
Improving health outcomes	"I lose weight when I do what I'm supposed to do. Intentionally."	Time	"It takes more times to prepare. More shopping because you can't buy a week's worth of groceries."
	"I no longer have diabetes from the way I changed my eating habits, you know." The doctor said "what you are doing, keep doing."	Lack of fresh produce	"The produce will start to spoil after a few days."
	"It makes you feel good. Get healthier—especially your blood pressure."	Cost	"But to eat healthy it just cost more. That's just the way it is."
	"You will feel better. You will have more energy."	Physical esthetics	"My friend was like, 'you're looking sick,' and it kind of bothered me. My doctor said 'Those people are just jealous of you. You're not sick and there is nothing showing in your blood that anything is wrong with you. They are not used to seeing you. Please do not gain more weight.'"
Maintain health and independence	"Maintaining my health. I have 2 daughters–one lives away and one lives here. I try to keep myself. I don't want to put them with the responsibility because I have known people that come in everyday and say 'do this.' I see things happening with the elderly and the children and kids. I don't really want that to take place with me."		
Potential for relationships	"We want to lose weight. We want to get married."		
	"Slimmer and get married. Everybody needs companionship, I was married 40 years but my husband is deceased. Companionship…"		
Physical esthetics	"You can call it vanity if you will. I just like to look good in my old age."		
	"Eating healthy affects your skin. And water, oh my God, water. This is what keeps skin beautiful …"		

TABLE 2

Salient Circumstances for Eating Healthy Foods

Themes	Easier		Harder
Preparation	"For me, it's convenience and ease of preparation."	Preparation	"It has to be prepared ahead of time … It's a matter of preparation and time. I feel good eating right, but that's an issue."
	"I'm more apt to grab something because the fruit is lined up in the pretty trays, well not trays but containers, the clear containers. All I have to do is open it up and eat it versus taking a whole melon at home or going to my desk to chop it up."	Quality of food	"In this community, even if they get tomatoes in there, when you touch it, you'd know that it's not fresh."
Culture and traditions	"Our food is so rich! That's why everybody loves our food. If you can show me a healthy way to make it, and have it taste good, I am willing to try it."	Culture and traditions	"It is about perception, how you are raised. If you are taught to see a plate with no meat, then that's a poor man's plate. What's a good meal versus what's not a good meal. That's what we grew up thinking."
Access to food stores	"I guess how close it is to your neighborhood. The places I go, like _____, is 4 blocks. New Orleans East doesn't have much."		"Those [dishes from growing up] that each individual is fond of, are the dishes that some nutritionist are trying to get us away from."
Nutrition education	"When we were in school, we had home making class. I think we need to get back to that to learn how to cook healthy food that we can eat."		"Typical new Orleans menu: on Sunday we have roast, rice and vegetable and potato salad. On Monday typically some type of red beans or black beans. On other days of the week we have fried food—fried chicken, fried potatoes. On Fridays, fried fish and potato salad; and on Saturdays hamburgers or whatever."
	"When _____ [organization] comes and shows how to prepare food that comes in our commodity boxes."	Access to food stores	"Food being available in the areas. I think _____ is super expensive and that's the only place we have available within half a mile."
Living outside of New Orleans	"During the storm [Hurricane Katrina] we would eat [fish] in different places. This food was presented differently [than in New Orleans] during our travelling. Now I have it in all kind of ways."		"You have to make multiple trips to multiple stores, like _____ and _____, to get fresh food. So, I think access to the foods is a critical part of being able to get them."
Testimonials	"Testimonials are good. They really help … that's a lot of motivation."		"After Katerina it got to a point that there were no stores. When the stores started reopening, it became expensive …. In order to have food here, you have to bring it from where you are coming from."
	"He may say something like, you are getting older now, you may have something wrong with you and don't even know. Just get checked. So maybe if they hear things coming from the male perspective … If it comes from a woman they may think it's more feminine. A guy will know how to relate and talk to another guy. They talk different among the presence of women than they do each other. For example, a man eating a salad. It's like what's wrong with you?"	Cost [of food relative to individual and household factors]	"For me it's the availability but also the cost. That's a big deal because I'm not just preparing food for myself."
Cost [of food]	"If you buy things [fruits and vegetables] in season, I think it's really cheaper than buying a lot of meat."		"It is very hard to get the healthy food … We have to find somewhere to live and survive … It shouldn't be, but it is really a hard choice

Themes	Easier		Harder
			for people to keep their health because they are not eating right and really can't afford it."
Dining out [healthier options]	"Having a list of places that we can go, whether it's a restaurant or a fast food restaurant, that has inexpensive healthier foods."	Cost [of food]	"Oh the cost! We could start with the cost. The healthier it is, the more expensive it is."
			"On Tuesdays you get 2 baked pork chops, beans, rice, and bread for $5. That's a little less than a salad."
		Dining out [portions]	"If you go out to eat for a meal, like at _____, there are no healthy foods on the menu. They have daily specials. Fried chicken—it's like 4 pieces per portion. If you have a normal portion, it should be the size of your hand. But if someone brought that out we would be like—where is the rest of my food?"

TABLE 3

Salient Referents for Eating Healthy Foods

Themes	Approves	Themes	Disapproves
Family	"My family."	No one	"No one."
	"My spouse."	Family	"I started cooking at home and if I try something different my wife will say 'Don't try to experiment. Keep it the same way we have been cooking it for years.'"
	"… My blood pressure was elevating and stuff and so, you know, my dad basically said' try to eat healthier instead of frying food'…"	Friends	"When we go to the casino some of my friends don't like when I eat healthy."
Doctor	"I started changing my eating habits because my doctor said I'm borderline diabetic. I think that if it wasn't for that I'd still have my old ways."		
Friends	"Have a good neighbor. Like, she and I are real good neighbors. I know her condition, she knows my condition. I will check on her, and say, 'did you do so and so', or 'did you have so and so to eat.'"		
Myself	"I will say myself because I am concerned with my health."		

TABLE 4

Alignment of SCT Components With Participant "Wish List" Features for Mobile Phone-Based Interventions

SCT Component	Description of Participant Preferences and Comments
Outcome expectations	• Nutrition education (eg, facts, tips, and healthy substitutes) about the benefits of healthy eating (eg, skin, body, and chronic disease).
Self-efficacy	• Setting small goals until larger goal is reached—including benchmarks. • Including faith-based messaging given some participants' view of God as a source of "strength" during health challenges. Those who were "neutral" in their beliefs about including faith-based messaging indicated that they could ignore the messages and/or share them with friends and family.
Self-regulation	• Goal-setting mechanisms with personalized, tailored feedback to encourage goal achievement • Food tracking mechanisms • The ability to send and receive messages • Reminders (eg, "I might not be thinking about it, and then, it [the message] hits the phone and I say 'You know what, let me do this.'")
Behavioral capability	• Providing the following: o Low-cost, simple, healthy recipes o Healthy cooking demonstrations (via URL link). The race/ethnicity of a chef/instructor was not of importance to participants. What did matter was that the food was similar to classic New Orleans-style dishes and flavorful. To manage expectations for this type of intervention strategy, it was suggested to call a healthier version of foods, such as gumbo, another name. If called "gumbo," then they would expect a traditional Louisiana recipe and likely be upset. Participants indicated that they would view the links online and share with others. o Lists of local and national food security resources (eg, services and programs) o Lists of food stores to purchase healthy foods on-the-go
Modeling	• Seeing and/or hearing the testimonials (video and/or text-based) of individuals similar to the target population who have been successful at eating healthier foods.
Rewards	• Offering rewards, financial or otherwise, would encourage people to actively participate over time (eg, meeting a smaller goal, receiving a "reward," and subsequently setting a new goal).

Abbreviation: SCT, social cognitive theory.