



Research Article

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Cultural Tailoring of Electronic Behavior Change Interventions for African Americans

Shirley M Moore*, Elizabeth Williams, Garlandria Johnson, Amy Zhang, Latina Brooks, Cathy Baker and Tanya Smith

Frances Payne Bolton School of Nursing, Samson Pavilion, Euclid Ave, Cleveland, OH, USA



Abstract

The purpose of this study was to seek the views of African Americans about the unique factors on which to culturally tailor when designing electronic behavior change interventions. Ethnic-specific focus groups were held to obtain and compare responses of African Americans and non-Hispanic Caucasians enrolled in a cardiovascular disease prevention behavior change program (N = 21). Results of a thematic analysis indicated considerable heterogeneity in desired tailoring factors among both African Americans and Caucasians. Three factors emerged highlighting preferences for features of electronic health behavior change interventions in African American as compared to Caucasian participants: (1) The importance of involving family members in health behavior change programs; (2) Storytelling as a narrative approach to providing behavior change information, and (3) Inclusion of spiritual messages. African Americans expressed differences regarding the type of spiritual messages they desired. Four levels of spirituality on which to tailor behavior change information emerged from the responses.

Keywords

Cultural adaptation, Electronic interventions, Spirituality, Behavior change, African American

Introduction

There has been a rapid shift to the use of electronic approaches for the delivery of health behavior change interventions to assist individuals in making improvements in their diet, physical activity, stress reduction, sleep, or medication taking [1,2]. Moving beyond the reliance on face-to-face interventions, behavior change interventions are now delivered using personal computers and applications (apps) for mobile technology, such as iPad, Android tablets, and smart phones. An important feature of electronic behavior change interventions is the potential of existing technology to tailor health information and materials at the level of the individual or subgroups within a target population, rather than only to the general characteristics of a particular racial, ethnic or cultural group. We have not yet, however, taken full advantage of the technological ability to tailor electronic behavior change interventions at the population, subpopulation, and individual level. To build culturally-tailored interventions, more knowledge is needed about the range of cultural and situational attributes specific to subpopulations and individuals within a given population. Thus, the purpose of this study was to identify the views of African Americans about the unique factors on which to culturally tailor electronic health behavior change interventions.

Evidence exists that minority populations can and will use

computer technologies for health services. The computer penetration rate has grown significantly over the past three decades; the so called "digital divide" between groups of Americans is closing, as evidenced by African American smartphone penetration of 81% [3]. In a systematic review of 18 trials to assess the benefit of using electronic, mobile and telehealth tools for vulnerable patients with chronic disease, Parker and colleagues [4] found that electronic health interventions were acceptable to ethnically diverse and low income users managing chronic illness.

The literature presents conflicting evidence about the effect of culturally-tailored interventions, however. In a systematic review of 31 studies of cultural adaptations in health-promotion and behavior change studies, Healey and colleagues [5] found that there was not consistent evidence to support use of any specific type of cultural adaptation nor

***Corresponding author:** Shirley M Moore, Frances Payne Bolton School of Nursing, Samson Pavilion, 9501 Euclid Ave, Cleveland, OH 44106, USA

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increased efficacy with any particular cultural group. Similar findings were found in a systematic review of culturally adapted interventions for persons with HIV by Wilson and Miller [6]. In contrast, several systematic reviews of culturally-enhanced diabetes management programs showed improved outcomes [7-9]. The lack of consistent evidence regarding the effectiveness of culturally adapted interventions could be due a need for greater understanding of the salient factors to take into account when designing and implementing culturally-adapted interventions and how they vary among individuals in the population of interest. Increased matching of stimuli to the individual patient has been hypothesized to be critical to increasing motivation and self-efficacy for health behavior change using electronic interventions [4]. To design electronic behavior change interventions that are more effective, greater understanding is needed about what and how cultural variables might be incorporated into adapted interventions and the mechanisms by which those variables might contribute to intervention efficacy [5].

Culturally-tailored interventions are designed to consider and incorporate the values and norms of a population [10]. Tailored interventions are based on individual level factors that are related to the health or behavioral outcome of interest and address the heterogeneity within a group [11], whereas, targeted interventions are designed with the implicit assumption that there is sufficient homogeneity within the target population to justify using one common approach to reach all its members [12]. Culturally tailored approaches identify the cultural dimensions relevant to health (e.g., spirituality, communalism), measure individual differences on those dimensions, and deliver individualized health promotion messages matching an individual's endorsement of cultural dimensions. The term "culturally tailored" is often used as a synonym for culturally adapted interventions.

Studies have reported that racial and ethnic minorities typically place high regard on family relationships, communalism, religion/spiritualism, expressiveness, respect for verbal skills, connection to ancestors and history, faith-based organizations, social gatherings, and respect for authority [13]. Interventions that incorporate these values are more likely to be viewed as relevant to African Americans and successful in achieving changes in health behavior [10]. To develop tailored electronic health behavior change interventions for African Americans, factors reflecting the norms, values and beliefs of the populations must be taken into account. Increased matching of stimuli to the individual patient has been hypothesized to be critical to increasing motivation and self-efficacy for health behavior change. This includes collaboratively defining goals in ways that make sense to the individual, identifying resources and barriers to behavioral change, developing coping and problem-solving strategies, and providing follow-up support.

To achieve cultural tailoring, it is essential to assume significant heterogeneity of the target population. The African American community is not a homogenous group, but a culture comprised of individuals with considerable variability with regard to nation of origin, religiosity, educational attainment, norms, experiences, values, income, skills, interests, and

political beliefs. Understanding how groups differ while simultaneously understanding how they are alike is central to designing culturally-tailed interventions. Electronic behavior change interventions offer the opportunity for deeper, more individualized cultural tailoring than has currently been done. In a report outlining the process for the cultural adaptation of health interventions, Barrera and colleagues [14] recommend that the first stage of cultural adaptation should include conducting formative (qualitative) research with potential participants to assess their opinions of the original intervention materials and procedures and gather suggestions for additions and improvements. In other words, first-hand information from African Americans about their preferences for features and content on which to tailor in electronic health behavior change interventions is needed.

Methods

Design and sample

In this focus group study, a qualitative approach was used to identify the views of African Americans about the unique factors on which to culturally tailor electronic health behavior interventions. Ethnic-specific focus groups were held to obtain and compare responses of African Americans and non-Hispanic Caucasians. The convenience sample consisted of 21 participants (10 African Americans and 11 non-Hispanic Caucasians) who had recently completed a Phase II cardiac rehabilitation program held in a face-to-face format in a Midwestern city. This population (cardiac rehabilitation participants) was selected because these individuals were presently grappling with making healthy behavior changes following an acute cardiac health event. Study inclusion criteria were (1) 19 years of age or older, (2) Recovering from a cardiac event (myocardial infarction, coronary artery bypass graft, angioplasty), and (3) Ability to read and speak English. Table 1 displays characteristics of the sample. Participants ranged from 43 to 86 years of age, with a mean of 71.2 ($SD = 10.8$) years and had a mean of 15.4 years of education (range = 11-20). On the whole, participants were older, college educated, and had a moderately-high level of income. Most were married (67%) and retired (61%). There were no differences between African Americans and Caucasians regarding experience using computers. There were no statistically significant differences in demographic or clinical characteristics between African Americans and Caucasians.

Procedures

Participants were approached after completing a Phase II cardiac rehabilitation program and asked to participate in the focus group study. Of the 47 people approached, 25 (53%) agreed to participate, 21 of whom attended the focus group sessions. Participants were informed about the study protocol and provided agreement using written consent. The focus groups were ethnic-specific (3 African American groups and 2 Caucasian groups) and were held in a conference room in an outpatient health center. The face-to-face focus groups were moderated by an experienced focus group leader (African American) using a semi-structured interview guide. Focus group questions focused on seeking individuals' perceptions,

Table 1: Sample characteristics.

Variable	Total Sample	African American	Non- Hispanic Caucasian
	<i>N</i> = 21	<i>n</i> = 10	<i>n</i> = 11
	<i>n</i> (%)	<i>n</i>	<i>n</i>
Gender			
Male	13 (62)	5	8
Female	8 (38)	5	3
Income			
< \$30,000	5 (23.8)	3	2
\$30,000-\$60,000	4 (19.1)	2	2
> \$60,000	8 (38.1)	3	5
Diagnosis			
MI	2 (9.5)	1	1
CABG	6 (28.6)	3	3
Angioplasty	5 (23.8)	4	1
MI/CABG	1(4.8)	0	1
MI/PTCA	5 (23.8)	0	5
MI/CABG/PTCA	2 (9.5)	2	0

expectations, and actual experiences with behavior change to reduce cardiovascular risk factors following a cardiac event. They were then shown brief examples of electronic behavior change programs and asked how the programs could be improved and what would make them more effective and useful for them. All focus group interviews were audiotaped and two observers in each focus group scribed notes regarding verbal and non-verbal behaviors of the participants. Background demographic and clinical information was obtained using a short questionnaire. The focus groups were approximately 2 hours in length.

Analysis

Data were transcribed verbatim from the audiotapes and analyzed using Nudist software (QSR N6). To protect privacy, no names were used on the transcripts or summaries of data and the transcripts were kept in a secure file. Several individuals (two African Americans, one Caucasian, and one Asian team member) participated in data coding and interpretation. One team member was trained in cross-cultural studies and two team members were experienced qualitative researchers. The coders reviewed the transcripts individually, then met to compare, redefine, and finalize coding. Each team member read the entire transcript and the Nudist software output. A summary of themes was developed from each focus group and compared across the groups. Comparisons between African American and non-Hispanic Caucasians were done to discern similar and different perspectives regarding electronic health behavior change programs. The goal was to discover differences that might represent cultural preferences and gain suggestions for culturally tailoring electronic health behavior change interventions.

Results

An important theme found in this research was that there

is great heterogeneity within racial groups. Participant views in both African American and Caucasian groups varied from individual to individual. Several similarities and differences, however, emerged between the African American and Caucasian participants.

Similarities between African Americans and Caucasians

Considerable similarity among African Americans and Caucasians was found regarding the problems and barriers to health behavior change following cardiac events. For example, low cost, easy-to-access places to exercise, convenient hours, and transportation and time were identified as factors that affected their exercise maintenance. The complexity and frequent changes in medication regimen was described as a barrier to consistent medication taking. Social support from family and friends was considered to be essential by all participants for all types of behavior change. Both African Americans and Caucasians expressed positive attitudes about the use of technology for the delivery of health behavior change intervention and the potential convenience of them. A few African Americans and Caucasians expressed concerns about the ability to use computers and confidentiality. All participants agreed that experiencing the health benefits of behavior changes was motivating. They stated that important features are being able to be connected to their clinicians and getting tips about behavior change. The ability to graph behavior over time was seen as a nice, but not essential, feature.

Differences between African Americans and Caucasians

Three themes emerged that addressed differences in factors important in the design of electronic health

behavior change between African American and Caucasian participants: (1) The importance of including family members in health behavior change programs; (2) Storytelling as a desired method of learning; and (3) The inclusion of spiritual messages. These three factors were brought up and discussed in the African American groups, but were not mentioned at all in the Caucasian focus groups.

Inclusion of family members: African Americans stressed the importance of including family members in health behavior change interventions. They preferred health education content language and approaches that were “we-” versus “I-” oriented. They would like less “you” statements that imply that individuals do this on their own and more acknowledgement that the whole family is affected and involved in changing health behavior. On the web pages in the behavior change program provided to them for comment, they pointed out specific use of the terms “you, your, and I.” They stated that they would like to see more pictures of families and references to “you and your family,” as well as case studies and stories that used “we” language and concepts of family inclusion. The following quotes are representative of the comments shared regarding the importance of family in making health behavior change. “I have a godchild who lives next door and insists that I wake up every morning and says, well you know you got your exercise so get up, so I do have that support.” Another participant said, “My son he asks me ‘have you had your exercise today?’ He questions me all the time, am I using my exercise equipment?” Not all of the family support identified by participants was viewed as supportive of behavior change, as indicated by the statement of one man, “My wife discourages me from exercising because she thinks I am too old.”

Storytelling: Stories about health behavior change were desired by African American participants. They said that storytelling approaches and testimonies would be a much more persuasive way to assist people to make behavior changes than text statements on websites, as the following quote illustrates: “If you are having difficulty (...) and you read where this helped, this same situation helped a person, you know it can help you too. Another participant said, “I mean telling a story is much more effective than just reading information, because then you get the emotions, you get the conviction and all that into what you are saying and you become believable to the other people who are listening and I think it has more of an impact on you.” In response to a short video presentation showing a demonstration, one participant said, “That [a video] would definitely be better, what I think is now that I find through my experience, African Americans do not like to read. I hate to say that, but we do not like to read.”

Spirituality: Inclusion of spiritual messages in the education materials addressing health behavior change was considered important by several African Americans. The amount of spiritual messages desired by African American participants varied among individuals, although all agreed that spiritual messages were important to most African Americans. Many participants specifically mentioned prayer as a major support for health behavior change, as the following quotes describe. “I think that I’m my own support because I just pray and be

grateful because I know how far I’ve come and I’ve come from nowhere, I’ve been resuscitated from nowhere and I’m very very grateful for where I am and that God has brought me thus far.” Another participant said, “I’m a praying man, God has brought me a long way. I’ve been outta here 3 different times and always bounce back and I got 80 years plus here and it hasn’t always been fun.”

Participants expressed different views on the importance and amount of spiritual messages to include in health behavior change programs and viewed the strength of electronic-[computer] delivered health education as being an efficient way to provide the level of spirituality desired by an individual. They acknowledged that some people might not like any spiritual messaging, they would want “just the facts.” Others might prefer content that is inspirational, but not religious. One woman stated, “Music is support enough for me.” Motivational speakers, such as Oprah, were mentioned by some participants as being important sources of inspiration to change. Spiritual content in health messages that contains religious references, such as references of help from God were described by others. One participant remarked, “... prayer I find is the biggest part of my life. That’s what keeps me going is prayer, because if it wasn’t for prayer I would give up but then I look back and see how far I’ve come so I know it had to be some greatness, some great power.” Other participants described that they would like spiritual messages that contained specific biblical quotes. One woman stated, “A good word of wisdom is always good to heed things.” The discussion on the amount of spirituality desired by African Americans in health behavior change interventions suggests four levels of spirituality that could be included in health behavior change interventions: (1) No spiritual content, (2) Inspirational messages that are not religious, (3) Religious messages, but not direct quotes or verses from the Bible or Koran, and (4) Direct quotes and verses from the Bible or Koran.

Discussion

Our findings regarding preferences of African Americans for features of health interventions are consistent with previous research regarding the importance of inclusion of family, spirituality, and storytelling [15-18]. Although focus group participants were asked to focus their comments on features important to include in electronic health behavior change interventions, most of their responses are also applicable to face-to-face interventions. The ability to apply the suggested tailoring suggestions may be easier to implement and more scalable, however, when using the algorithm capabilities of electronic approaches. For example, user responses to a few questions can be programmed to provide information and approaches that are consistent with the preferences of an individual. Our goal in this study was to not only identify the unique features on which to target health behavior change information representative of the African American population as a whole, but also to identify the range of preferences among individuals in the population. Our finding indicates that individuals’ preferences for a specific cultural factor often differ among members of the group. Computer-driven algorithms in electronic interventions offer a way

to tailor on those individual differences. There is a need, however, to define the factors important to include in these algorithms and determine the questions that assist in the matching of an individual’s preference with desired content.

African Americans in this study wanted electronic health behavior change programs that are more family-focused and less individual-focused. The family plays an essential role in the maintenance of health and management of illness for most African Americans. African Americans participants wanted the inclusion of a family focus to be included in intervention content such as case example, information content, pictures and peer models. African American participants also related that the use of “you” statements referring to just the individual instead of incorporating the family were not as helpful as “we, “us” and “our” statements. They suggested that information content include garnering social support from family and refer to different types of families, such as multiple generations in the home, in addition to references to spouses, school-age children or living alone. They also suggested that the use of peer models be expanded to do include more storytelling to convey information. This is consistent with the literature (Author - not in citation list).

Our African Americans participants suggested the use of less text to read on web pages and more storytelling through videos, testimonies, and short case studies. Storytelling as a preferred narrative approach to providing health promoting information has been identified in several previous studies [17,18]. Participants described that stories and testimonies highlighting both struggles and successes would be a more persuasive way to assist people to make behavior changes than factual or instructional text information. Story-telling, in short videos or text stories can be tailored by the electronic program to a user’s profile on factors such as age, gender, race, stage of change, type of behavior change undertaken. These stories could reflect both short and long term behavior change situations. Computer-driven algorithms can be used to provide stories and testimonies that match the user’s profile (age, gender, race) (Author - not in citation list).

The importance of addressing spirituality in behavior change intervention content was a clear message from the African American participants. However, another important theme to emerge from participants’ responses was the differences in the preferred levels of spirituality within the group. Given this finding, the research team concluded

Table 2: Definitions and examples of levels of spiritual messages for use in tailoring electronic health behavior change information.

Definition of Levels of Spirituality		Examples of Spirituality Information
Level I	No spiritual messages in health behavior change interventions	Not Applicable
Level II	Inspirational messages that are secular (not religious) included in health behavior interventions	<p>“Believe you can and you’re halfway there.” Theodore Roosevelt Theodore Roosevelt Quotes. (n.d.). BrainyQuote.com. Retrieved July 30, 2020, from BrainyQuote.com Web site: https://www.brainyquote.com/quotes/theodore_roosevelt_380703</p> <p>“I believe that the greatest gift you can give your family and the world is a healthy you.” Joyce Meyer Joyce Meyer Quotes. (n.d.). BrainyQuote.com. Retrieved July 30, 2020, from BrainyQuote.com Web site: https://www.brainyquote.com/quotes/joyce_meyer_567639</p>
Level III	Religious messages included in health behavior interventions, but do not include exact quotes or scripture verses from religious great books such as the Bible or the Koran	<p>“If we want to improve our physical health, we have to improve our emotional and spiritual health. God promises us peace when we trust him with all parts of our life”. (Faithful Workouts: faith-fitness-food website. https://www.faithfulworkouts.com/overview)</p> <p>“No other you has ever existed or will ever exist again. It’s time to care for His creation, His design”. (Keeton, Alisa, (2017). The Wellness Revelation: Lose What Weighs You Down So You Can Love God, Yourself, and Others. Tyndale House Publishers, Inc. Carol Stream, IL)</p>
Level IV	Exact quotes and scripture verses from religious great books (such as the Bible or the Koran) included in health behavior interventions	<p><u>Corinthians 6:19-20</u> Do you not know that your bodies are temples of the Holy Spirit, who is in you, whom you have received from God? You are not your own; you were bought at a price. Therefore honor God with your bodies.</p> <p><u>John 1:2</u> Dear friend, I pray that you may enjoy good health and that all may go well with you, even as your soul is getting along well.</p> <p><u>Corinthians 10:31</u> So whether you eat or drink or whatever you do, do it all for the glory of God.</p>

Table 3: Screening questions that can be used to assess the level of spiritual messages to include in an individual's health behavior change information.

1. Do you want to receive information that contains spiritual messages? (If the response is no, information without spiritual messages is provided (Level 1). If the answer is yes, the next question is asked.)
2. Do you want to receive information that includes religious messages? (If the response is no, information that includes inspirational, but not religious messages is provided (Level 2). If the answer is yes, the next question is asked.)
3. Do you want to receive information that includes Biblical verses? (If the answer is no, information that includes religious references, but not exact verses from the Bible is provided (Level 3). If the answer is yes, then specific passages from the Bible deemed to be statements addressing health are provided (Level 4)).

that caution should be taken in assuming a one-size-fits-all approach to cultural tailoring of health behavior interventions for a particular population. Four levels of spiritual messages that could be included in health information were identified in our analysis of the focus group data. Table 2 provides a description of the four levels of spirituality content on which one can tailor health behavior change information. Table 3 describes three screening questions that can be used to assess the level of spiritual messages that an individual desires. Answers to these questions can be elicited electronically and a computer-driven algorithm can then provide an individual with information and behavior change approaches tailored to their preferred level of spirituality content.

Examples of spiritual and religious content that can be added to health-promotion and behavior change interventions are available in the work of Pearce and colleagues [19] who developed religious-specific manuals for Christianity, Judaism, Islam, Hinduism, and Buddhism describing specific religious concepts, teachings, principles, and stories about religious figures that might inform health care treatment. Sacred scriptures, prayers, and rituals are also provided. These religion-specific manuals are designed to aid health care professionals to better meet the needs of their patients and provide background information about the various faith traditions that might be helpful in addressing spiritual needs. The electronic environment is ideal for tailoring health behavior change interventions because the medium is easily adaptable and can address a large number of tailoring factors at a time, offering a greater level of differentiation and specificity which is crucial in order to tailor interventions at the subgroup and individual levels that exist within a larger racial/ethnic minority group.

There are some limitations of this study that should be considered. First, our sample consisted of individuals recovering from a serious health event and had participated in a cardiac rehabilitation program, thus, they may not be representative of the general population of people seeking to make health behavior changes. Another limitation of this study is that the focus of our investigation addressed only the unique factors on which to culturally tailor electronic behavior change interventions for African Americans as compared to those of non-Hispanic Caucasians. It is unknown, therefore, how the findings may have been different if comparisons with other racial/ethnic, age, religious, socio-economic, or geographically-located groups had been included in the study.

A strength of this study was the inclusion of a comparison group (non-Hispanic Caucasians) by which to verify that

the factors desired in behavior change interventions were unique to African Americans. Most focus group studies of cultural preferences are only conducted with the population of interest, thus missing the opportunity to make direct comparisons of the similarities and differences between groups. Although the factors identified by African Americans in this study were consistent with those found in other studies, the fact that these factors did not arise in either of the two focus groups of Caucasians validated that the factors identified in our thematic analyses were dominant in the African American culture. The comparison group also helped us understand the heterogeneity in both racial groups, yet parcel out the unique factors of each group.

Future research should further explore spirituality in health behavior change interventions and test our suggested tailoring levels. Research on spiritual preferences in health behavior change that includes African Americans that identify with multiple faiths is needed. Additionally, more user-engagement research approaches, such as focus groups and in depth interviews with clients, are needed in which the goal is to identify the variance in preferences of a cultural factor traditionally held by individuals within that group. The replication of this study in other populations, such as Hispanic individuals following cardiac events, would inform culturally sensitive exercise interventions. Also, to advance the science of cultural tailoring, clinical trials are needed to examine the effectiveness of the culturally adapted intervention compared to the standard intervention in African Americans, including the effect of cultural factors as possible mechanisms influencing behavioral outcomes.

In the development of evidence-based interventions, there is a tension between wanting standardization and the desire to personalize interventions. Electronic interventions hold the potential to do both by providing standardization to our tailoring of personalized interventions. Such interventions can be also be scalable. Engaging patients as co-designers is needed as we build the computer-driven algorithms to support cultural tailoring of electronic health behavior outcomes.

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