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The Effect of Changes in Health Beliefs Among African-American and Rural White Church Congregants Enrolled in an Obesity Intervention: A Qualitative Evaluation

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Abstract

Church interventions can reduce obesity disparities by empowering participants with knowledge and skills within an established community. The purpose of this study was to evaluate the Biomedical/Obesity Reduction Trial (BMORE) and investigate changes in health beliefs among obese adult participants. Ten pre-/post-intervention focus groups applying the Health Belief Model conducted in two African-American churches in Tennessee (n = 20) and South Carolina (n = 20), and one rural Appalachian church in Kentucky (n = 21). Two independent coders using NVivo analyzed transcribed audio data and notes. Participants' health status of being overweight/obese and having comorbidities of diabetes and high blood pressure motivated enrollment in BMORE. Initially participants voiced low self-efficacy in cooking healthy and reading food labels. BMORE made participants feel “empowered” after 12 weeks compared to initially feeling “out of control” with their weight. Participants reported improvements in emotional health, quality of life, and fewer medications. During post-intervention focus groups, participants reported increased self-efficacy through family support, sharing healthy eating strategies, and having accountability partners. Solidarity and common understanding among BMORE participants led focus group attendees to comment how their peers motivated them to stay in the program for 12 weeks. Long-term barriers include keeping the weight off by maintaining habits of exercise and healthy eating. Implementation of pre-/post-intervention focus groups is an innovative approach to evaluate an obesity intervention and track how changes in health beliefs facilitated behavior change. This novel approach shows promise for behavioral interventions that rely on participant engagement for sustained effectiveness.

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Keywords

African-Americans; Rural health; Health knowledge; attitudes; practice; Obesity

Introduction

Poor diet, obesity, and physical inactivity contribute to one-third of cancer cases [1]. African-Americans, impoverished individuals, and Appalachian rural residents experience a greater proportion of cancer health disparities and diet-related conditions [2–5]. Compared to non-Hispanic White adults, African-Americans are 1.4 times more likely to be obese, 33 % more likely to die from heart disease, and 22 % more likely to die from cancer [6, 7]. Rural residents also face disproportionate obesity burden with 40 % of rural adults classified as obese compared to 33 % of urban adults [5].

Faith-based health interventions have successfully increased chronic disease prevention behaviors among African-American congregants [8, 9] and increased cancer screening among Appalachian Kentucky residents [10, 11]. To evaluate faith-based interventions, researchers sometimes conduct quasi-experimental [12, 13] or randomized controlled trials [14–16] to assess quantitative changes through pre-/post-intervention surveys and participant biomedical data [12–19]. However, no studies published to date have used pre-/post-intervention focus groups to evaluate nutrition and physical activity interventions. Instead, researchers have conducted focus groups to inform the development and tailoring of nutrition and physical activity interventions prior to implementation [20–22].

Our primary objective was to qualitatively investigate changes in health beliefs among overweight/obese adults before and after participating in an obesity intervention at three faith-based organizations to explore how participant attitudes influence behavior change. Since partners on our study team oversaw the collection of quantitative surveys and biomedical data, this complementary study collected qualitative data to capture changes in health beliefs expressed in a focus group format. This innovative evaluation approach introduces the value of collecting pre-/post-intervention focus group data to learn about intervention effectiveness.

Methods

Institutional review board approval was obtained from George Washington University for this study in addition to Meharry Medical College, University of Kentucky, and the University of South Carolina for each intervention site.

Intervention

The primary study objective was to qualitatively examine health belief changes among overweight and obese adults participating in the Biomedical/Obesity Reduction Trial (BMORE). The Geographical Management of Cancer Health Disparities Program (GMaP), created by the National Cancer Institute's (NCI) Center to Reduce Cancer Health Disparities (CRCHD), tested BMORE as a Region 1 and 2 GMaP Project. This 12-week intervention replaced high-fat, pro-inflammatory foods (i.e., fast foods, highly processed foods), with a

pescearian diet of fruits, vegetables, beans, whole grains and seafood. The intervention included 30 min per day of moderate-intensity physical activity at least 5 days a week, and two 20-min strength-training sessions. Participants were trained in mindfulness practices and educated on how obesity can cause cancer, cardiovascular disease, and diabetes.

Theoretical Framework

Because the ultimate goals of this intervention were behavioral, and these behaviors are influenced by changes in participant attitudes, this study was based on the Health Belief Model (HBM) [23]. Public health practitioners have applied HBM to predict and explain health behaviors by focusing on individuals' attitudes towards health issues [23]. Researchers applying HBM to design health interventions reason that behavioral changes arise when individuals identify health related threats. Perceived benefits of behavior change must outweigh barriers observed by the individual. HBM posits that individuals must embody self-efficacy to change behavior and be motivated to change from cues to action [23]. Incorporation of the HBM constructs (i.e., perceived severity, perceived susceptibility, perceived barriers, perceived benefits, self-efficacy, cues to action) in our evaluation design allowed us to qualitatively examine pre-/post-changes in participants' health beliefs.

Setting

BMORE was conducted at two predominantly African-American churches in Nashville, TN and Columbia, SC and one rural Appalachian church in Hazard, KY. These churches were targeted due to existing partnerships with local universities affiliated with BMORE, and needing intervention implementation in communities most vulnerable to diet-related chronic conditions with high obesity rates.

Participants

Between January and March 2013, BMORE participants ages 18 and older considered overweight or obese [body mass index (BMI) > 25 kg/m²] were voluntarily recruited for pre/post intervention focus groups through local project team member and pastor outreach. In South Carolina, 10 BMORE participants and 10 BMORE supporters (i.e., whoever is supporting them in their weight loss efforts) were recruited. In Kentucky and Tennessee, 20 BMORE participants were recruited at each church. These sites did not distinguish between participants and supporters in running the intervention. Tennessee and South Carolina participants were predominantly African-American while Kentucky attendees were White residing in rural Appalachia.

Data Collection

All intervention participants were invited to take part in a 90-min focus group capturing their health beliefs during the first and last week of the BMORE intervention. South Carolina intervention participants and supporters met only at the conclusion of BMORE, given the timing of the intervention. Focus groups took place in the intervention church for participant convenience. Researchers trained trusted community members to lead the focus groups. The South Carolina church pastor, a local Kentucky social worker, and African-American university staff in Tennessee were moderators. They asked a set of semi-structured questions

organized by HBM constructs. At the end of the focus groups participants completed an anonymous demographics survey. Participants were paid \$25 or this amount in gift cards and offered dinner for their participation. These same procedures were implemented during the post-intervention focus groups.

Analysis Strategies

Transcribed audio data and notes from four pre-intervention and six post-intervention focus groups were analyzed by two independent coders using NVivo 10. The coders implemented a deductive approach by using the HBM constructs and supplemental question themes as a framework of parent nodes to code data. Child nodes, grandchild nodes, and greatgrandchild nodes were iteratively created as sub-themes under overarching parent nodes through the repetition method [24]. Thematic content analysis revealed consistent themes with inter-coder reliabilities of 0.86 kappa for pre- and 0.94 kappa for post-intervention analyses. Generated matrices captured patterns in the data and displayed frequencies of certain “nodes” or themes mentioned by participants before and after the intervention [25]. Recurrent and emergent themes resonating for BMORE participants across all three sites are summarized below.

Results

Table 1 illustrates characteristics of church congregants (n = 61) who participated in BMORE pre-/post-intervention focus groups. Most participants were female, married, and between the ages of 51 and 64. Table 2 highlights examples of health beliefs shared during focus groups conversations before and after the BMORE intervention, organized by each HBM construct. Findings presented below elaborate on participants' changes in health beliefs and behaviors, and additional themes that emerged from focus group conversations.

Perceived Susceptibility

Genetic predisposition, older age, and a slower metabolism were listed by Kentucky pre-intervention focus group participants as biological causes of obesity. Sedentary lifestyle, lack of time to cook, convenience of fast food, and emotional eating were additional reasons for obesity. Tennessee participants centered their conversation on fast food accessibility, large portion sizes, and limited time to exercise as contributing to obesity. One woman shared how she was taught to clean her plate and cook with lard. As a BMORE participant, she stated “now we have to de-program ourselves.”

Kentucky and Tennessee participants expressed similar obesity causes when re-asked this question during the post-intervention focus groups. More emphasis was placed on emotional eating of sweets “when nervous and scared” and overeating from “stress”, “insecurity,” and “boredom.” South Carolina participants discussed that obesity resulted from a lack of nutrition education and not realizing physiological impacts of food. One participant declared “That comes with education. I think that was one of the benefits of the [BMORE] program.” South Carolina participants expressed heredity, “eating a certain ways for years,” and having “a love affair with food” as additional obesity causes.

Perceived Severity

When asked about obesity repercussions, conversation topics were similar between pre- and post-intervention focus groups. Participants across three sites acknowledged physical symptoms of having less energy, being out of breath after walking, knee and joint problems, and obesity comorbidities of diabetes, cancer, heart disease, and arthritis. Lower self-esteem resulting from ill-fitting clothes, not being able to “do the activities you would like,” and experienced discrimination were raised across sites. One Tennessee participant stated “psychologically it affects you. When you're a large person, people have a tendency to look at you differently.” Participants experienced higher costs in medical bills, medications, and clothing that fit. One Tennessee participant commented that obese people spend more money purchasing a big car “so you can get in and out of it.” She also felt ashamed in having to purchase two ticketed seats for her son to fly on an airplane.

Cues to Action

Participants' health status was the primary cue to take action and participate in BMORE. One Tennessee participant shared “My doctor told me he would take me off insulin if I lose more weight and change my eating habits. I stick four times a day. I want to get off that.” Family histories of health problems stemming from obesity were additional motivating factors. One participant noted “Some of my family members have passed [away] with issues [related to diabetes]. I want to do better.”

Perceived Benefits

Both Kentucky and Tennessee pre-intervention focus groups acknowledged improvements in physical health as benefits of losing weight. Tennessee participants indicated a desire to get off medications and be alive for their families. In Kentucky, improved emotional health, increased self-esteem, and saving money were additional perceived benefits for losing weight. During post-intervention discussions, new themes emerged across sites on the benefits of being healthy including being a role model for their family and children.

Empowerment

Post-intervention findings revealed that the BMORE intervention empowered participants, and helped them feel better physically and emotionally after 12 weeks compared to initially feeling “out of control” with their weight. One participant expressed:

“My eating habits were changed because of the BMORE study... I think overall it was an excellent program as far as awareness... participating in the program made a difference [two nodding heads].”

A major benefit for one participant was changing her mindset to “eat to live rather than live to eat.” Involvement in BMORE fostered self-education and seeking healthy habits outside of intervention, including looking up recipes and exercise techniques online.

Self-Efficacy

Pre-intervention participants across sites expressed lack of confidence in reading food labels and an inability to cook healthier at home as major impediments to changing eating habits.

Some participants explained that incorporating more vegetables into their diets and eating fish would be difficult given their family's preference for chicken and beef. One Tennessee participant exclaimed “When you're cooking food, you want the compliment.” Part of this discussion reflected the culture of southern fried cooking, habits adopted overtime through generations, and expectations of food taste and preparation.

After 12 weeks of BMORe, post-intervention focus groups voiced increased confidence in eating and cooking healthy meals for themselves and their families. Participants actively shared healthy cooking strategies such as flavoring food with spices and herbs. Healthy eating and exercising habits acquired through BMORe were also adopted by some family members who altered their behaviors. One Kentucky participant stated that her daughter “watched me... And she has listened so she's now drinking 3–4 bottles of water a day and trying to exercise more.”

Group Support

An unanticipated finding from Kentucky and Tennessee was participants' appreciation for being able to voice their current challenges and strategies for healthy eating, exercising, and motivations for participating in BMORe during the pre-intervention focus groups. One Tennessee attendee exclaimed she “like[d] this focus group,” because she could “hear that people feel the same way.” Knowing others were struggling with similar issues helped her not feel alone. Solidarity and common understanding among BMORe participants led South Carolina post-intervention focus groups to comment how peers motivated them to stay in the program and try to incorporate learned skills into daily habits. Some intervention participants formed walking groups enabling them to be accountable to each other for exercising and informally share strategies for healthy eating and cooking. During the post-intervention focus groups, attendees expressed how other church members would benefit from BMORe since they knew of congregants who were struggling with similar weight and health issues.

Perceived Barriers

Participants initially expressed frustration in not having time to adopt a healthier lifestyle resulting from competing demands of family and work obligations and not possessing skills to change eating habits and exercise. Cold weather was a deterrent to exercising outside in rural Appalachia Kentucky. One participant blamed the fast food industry for not having an appealing selection of affordable healthy food. “They charge you almost double for healthy food... you look at your pocket book and say it's not worth it to buy baked fish [and you] buy fried fish instead.”

After 12 weeks of participating in BMORe, focus group attendees voiced their ability to overcome these challenges through lifestyle modifications. Post-intervention conversations on barriers to change then shifted to long-term challenges of keeping weight off by maintaining exercise and healthy eating habits. One South Carolina participant stated the importance of peer support and voiced the need for BMORe to continue: “I looked for something else like BMORe... don't leave us hanging like this.” Some participants suggested starting a walking group among church members and bringing healthy food to

church gatherings to maintain their healthy habits and shift the church culture away from food as fellowship. One participant said “Keeping it off is going to scare me. If we stop... I may go back to my old ways.” Another participant expressed the need to continue meeting and setting goals: “That would be a lifestyle change for our church family.” She indicated the need for continued support, because behavior change is a “struggle.”

South Carolina Supporters

South Carolina supporters participating in the post-intervention focus group stated that when they think of BMORE they view it as a program fostering “encouragement,” “empowerment,” “determination,” and “tolerance.” One supporter stated that in order to succeed in BMORE one has to be determined to keep going with the program. Another supporter shared that BMORE enables participants to “be aware of yourself and health. The type of food [you put] in your body.” Certain BMORE participants were identified by name as being “an inspiration” to others given their weight loss.

Successful participants planned meals, set goals, and had a support team. Supporters agreed that maintaining healthy eating and exercise habits was a “lifestyle change” for family and friends. One supporter stated that the hardest part is starting. “If you say it, do it. If you feel I'm not going to lose weight, [you're] not going to lose weight. [It's a] mindset—‘speak it into existence.’”

Discussion

This study demonstrates how implementation of pre-/post-intervention focus groups is an innovative approach to both evaluate a physical activity and nutrition intervention and to qualitatively examine how health belief changes among participants impacted behavior change. BMORE made participants feel “empowered” after 12 weeks compared to initially feeling “out of control” with their weight and initial frustration in adopting healthier eating and physical activity habits. Facilitation of focus groups fostered the added benefit of an exchange of ideas and camaraderie among attendees. Focus group discussions also revealed intervention diffusion to non-participating family members with strategies learned during BMORE practiced at home.

Use of the Health Belief Model (HBM) to structure focus group conversations effectively tracked shifts in beliefs and behavior changes among BMORE participants. Pre-intervention focus group results revealed that initial threats to BMORE participants' physical and emotional health in being overweight and obese motivated them to voluntarily enroll in the intervention. Kentucky, Tennessee, and South Carolina participants voiced similar barriers to change expressed in other research studies such as an Alabama study where attendees stated an unwillingness to change until illness developed, and the lack of accessible exercise facilities and affordable healthy food [26]. Over the course of 12 weeks, BMORE participants' adoption of healthy eating, cooking, and exercise strategies empowered them to overcome initial barriers through lifestyle changes. Similar to other research [12–15, 27], this study demonstrated how a nutrition and physical activity intervention within the church environment can effectively decrease health disparities among minority populations including African-American and rural populations.

Study limitations include the interview protocol not being administered consistently across sites. During qualitative data analysis we found that not all of the same questions were asked during the pre-/post-intervention focus groups due to time limitations and if issues were covered during earlier questions. Ideally, we would have liked to have been able to compare pre- and post-intervention data from all three sites. Given the timing of the South Carolina intervention, we were only able to obtain post-intervention focus group data for that site. Finally, the composition of focus group participants was not consistent across sites. South Carolina had 10 BMORE participants and 10 supporters in each focus group whereas Tennessee and Kentucky had BMORE participants in all focus groups since these sites did not distinguish between participants and supporters in the intervention. These study design and implementation challenges are emblematic of real-world implementation studies and multi-institution collaboration [28, 29]. Communication and transparency among the study team and site liaisons were critical to strategize how to remedy implementation challenges and feasibly conduct this qualitative pre-/post-intervention assessment.

Conclusion

BMORE successfully empowered church congregants in three states to learn about and practice healthy eating and physical activity habits to prevent and overcome existing comorbidities associated with overweight and obesity. This study adds to growing literature on the effectiveness of nutrition and physical activity interventions implemented at faith-based organizations.

Larger implications of this work include the value of supplementing an intervention evaluation with pre/post qualitative data. Although most studies have conducted focus groups to plan tailored interventions, implementation of pre-/post-focus groups facilitated the opportunity to evaluate a nutrition and physical activity intervention qualitatively and examine positive shifts in health beliefs and behaviors among BMORE participants. This study supports recommendations to plan for sustainability of public health interventions [30]. Longitudinal research examining maintenance of skills acquired through faith-based interventions, and factors influencing the long-term goal of decreasing health disparities among African-Americans and rural populations are warranted.

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Table 1
Demographic characteristics of Kentucky and Tennessee pre-intervention focus group participants and South Carolina post-intervention participants, 2013

	Kentucky N = 21	Tennessee N = 20	South Carolina ^a N = 20
Gender			
Male	5	4	4
Female	16	16	16
Age			
18–25	0	0	5
26–30	0	0	0
31–40	2	3	0
41–50	3	4	3
51–64	8	8	11
65 and over	7	5	1
No answer	1	0	0
Education level			
High school degree/GED certificate	2	6	6
Some college	3	5	3
2-year college degree	4	2	1
4-year college degree	5	5	6
Masters	6	1	3
Doctoral degree, MD, JD	0	1	1
No answer	1	0	0
Marital status			
Single, never married	1	5	8
Married	15	13	6
Separated	0	0	1
Divorced	1	1	4
Widowed	4	1	1
Race/ethnicity			
White, non-Hispanic	21	0	0
Black/African-American, non-Hispanic	0	20	20
Hispanic	0	0	0
Other race options	0	0	0

GED general educational development, *MD* doctor of medicine, *JD* juris doctor

^aSouth Carolina did not have pre-intervention focus groups due to the timing of the site's Biomedical/ Obesity Reduction Trial (BMORe) program

Table 2
BMORe focus group quotes illustrating pre- and post-intervention health belief changes categorized by health belief model constructs

	Pre-intervention health beliefs	Post-intervention health beliefs
Perceived susceptibility	<p>"I think what we experience now, was handed down to us. Clean your plate. Cook with lard. We were taught to do that. Now we have to de-program ourselves"</p> <p>"Older you get, your metabolism slows down"</p>	<p>"Lack of understanding of nutrition and food intake"</p> <p>"Emotional eating [causes you to] eat sweets when nervous and scared"</p>
Perceived severity	<p>"When you're a large person, people have a tendency to look at you differently. They really judge you"</p> <p>"Normal routine things we do every day become more difficult with more weight on you"</p> <p>"Obesity is a disease. It controls your life"</p>	<p>"[Being] overweight affects self-esteem. When you try to go to a store and can't find clothes that fit. If it happens enough, feel bad. [Being] tremendously obese lowers your confidence"</p> <p>"[Obesity causes] diabetes, cancer, arthritis, knee and joint problems, and heart disease"</p>
Cues to action	<p>"My mother who is dead and gone. Mother had stroke, heart attack, open heart surgery... That's a motivator for me"</p> <p>"I want to do better and have an example for my children and grandchildren"</p> <p>Participants' obesity comorbidities of "heart trouble, diabetes, high blood pressure"</p>	<p>"I think having an accountability partner; somebody that will just keep up"</p> <p>"Trying to get rid of some of this high cholesterol is one of my biggest motivators"</p> <p>"Magazines, TV ads; I mean it's all over the media to be healthy or to lose weight"</p>
Perceived benefits	<p>"The doctor said if I get my weight off, hopefully I can get off medicine"</p> <p>"If I can accomplish this [BMORe] program, lose weight and feel better physically period"</p>	<p>"Lowers blood pressure and lowers your sugar count"</p> <p>"You're not going to the hospital all the time or a doctor"</p>
Perceived barriers	<p>"I was exercising right until the wintertime came and then it just got too cold to get out there"</p> <p>"Losing weight is difficult. Cooking healthy takes a lot of time"</p> <p>"I blame the fast food industry... they don't have a good selection of healthy food. They charge you almost double for healthy food"</p>	<p>"It's a lifestyle change. Not a temporary thing"</p> <p>"Finding the time to exercise is a challenge"</p> <p>"I mean it was one thing to lose it but it's another thing to keep it off"</p>
Self-efficacy	<p>"Well I struggle [reading food labels] because I don't understand; I can't even pronounce some words"</p> <p>"I'm not confident. I love to eat [and have] no self-control"</p>	<p>"I buy trail mix and put it in snack bags and measure it out. I may not eat it, but always keep in my lunch box"</p> <p>"One of the things in BMORe program was herbs and spices. I really got into that... Putting them in the foods makes a difference"</p>

BMORe Biomedical/Obesity Reduction Trial