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Weight and blood pressure reduction among participants engaged in a cancer awareness and prevention program

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Abstract

Objectives—African-Americans consume a diet high in fat, salt and sugar; such dietary habits increase the risks of cancer and other chronic diseases. The objective of this study was to engage rural communities in a nutrition and physical activity behavior modification program to promote cancer awareness and risk reduction.

Methods—Focus group discussions were conducted to generate information for the development of a nutrition and physical activity program. African Americans (N=62) from two rural counties (Bullock and Macon) in Alabama participated in a year-long intervention program in 2012 and 2013. Weight loss and blood pressure were evaluated to measure the impact of the intervention.

Results—Themes emerged for the focus group discussions were: nutrition, health, family, environment, and resource access. In Macon County participants lost weight irrespective of the exercise regimen, with those involved in floor exercise losing the most weight (−22.4 lbs, or −11.18 % change), while in Bullock county walking was most effective in weight loss (6.1 lbs or −3.40 % change) $p<0.05$. Systolic and diastolic pressure decreased from 5.3 to 10.5 mm Hg; −2.0 to −6.4 mmHg, respectively, for Bullock county, except for the walking group,). In Macon County, both systolic and diastolic pressure % change ranged from −8.94 to 12.66 and −5.34 to 12.66 mmHg respectively, irrespective of physical activity respectively.

Conclusion—In this study, changes in weight lost and blood pressure were observed among individuals engaged in a nutrition education and physical activity program.

Introduction

Cancer remains the second leading cause of death in the US and in the world (ACS, 2012). For all cancers, African Americans have the highest mortality and shortest survival rates.

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The cancer death rates among African American men are 32 % higher, and in African American women 16% higher relative to their Caucasian counterparts (ACS, 2011). Although there is a general decline in cancer death rates, the rates for the uneducated low socioeconomic segments of the population are more than two times higher than that for the educated segment (ACS, 2011). Obesity has been associated with many types of cancers (i.e. breast, prostate, and endometrial); Alabama has one of the highest (32.4%) obesity rate in the nation (CDC, 2013). According to the American Cancer Society (2013), obesity rates for African Americans have steadily increased since 1999. In addition, they assert that the increase in obesity is aligned with the increase in cancers and higher death rates among African Americans (ACS, 2013). Studies have shown that dietary intake of African-Americans consist of high amounts of fried foods, fat, salt and sugar; such as, macaroni and cheese, fried chicken, green vegetables prepared with ham hock and fat back, and pies (Bovell-Benjamin et al. 2009; James, 2004). Such dietary habits increase the risks of cancer and other chronic diseases. It's estimated that more than 35 % of cancer cases worldwide are preventable by dietary means (Jackson *et al* 2007). Foods rich in vitamins, whole grains, and antioxidant such as, lycopene and green tea have been shown to decrease cancer risk (Syed *et al.*, 2008). To prevent diet-related chronic diseases, dietary recommendations promote exercise and a high intake of fruits and vegetables (Salin and Lloyd, 2012; Lui, 2003; Schuurman *et al.*, 1998; Jackson *et al.*, 2007; Lentini *et al.*, 2010).

The yearly cancer incidence rate for Alabama is 464.5 per 100,000; for African Americans it is 469.5 compared to a rate of 461.4 for Whites (ADP/ASCR, 2013). Bullock and Macon County are rural counties with cancer rates of 461.9 and 405, respectively (ADPH/ASCR 2013). Additionally, Bullock and Macon County have obesity rates of 48.5 and 40.0% respectively, above the national (34.9%) and state (32.4%) rates. Both counties are located in Alabama's rural black belt, known for high concentrations of African Americans and high poverty rates, 22.6% and 28.1% respectively (U.S. Census 2008–2012). The objective of this study was to engage rural communities in a nutrition and physical activity behavior modification program to promote cancer awareness and risk reduction. It is hypothesized that nutrition education and physical activity program will result in weight loss and lower blood pressure in study participants which may contribute to cancer risk reduction and other health outcomes..

Materials and Methods

Development of survey instruments

As part of the Community Based Participatory approach focus groups were used to engage community participants in discussions. Focus group participants responded to 12 open-ended questions designed to measure their understanding of cancer, health and disease prevention within the context of their community. The sessions, conducted by an experienced moderator of similar ethnicity, consisted of eight to twelve individuals and lasted for approximately 90 min (Synnott, *et al.*, 2007; Bovell-Benjamin, 2009; Rovner, 2010). Sessions were audio-recorded and transcribed. Field notes were compared for consistency between observers and transcripts. Focus group participants were provided a modest incentive of $30 for their participation.

Two survey instruments were constructed based upon the preliminary data gathered from focus groups: 1) Fact finding, a 19 item survey addressing issues related to community-based programs and individual willingness to participate; and 2) The Healthy Lifestyle survey, a 40-item survey addressing health behavior and the prevalence of diseases and related issues. Information from these instruments was used to design the nutrition education and physical activity program.

Participants

The study and survey instruments were reviewed and approved by the Tuskegee University Institutional Review Board. Participants were recruited through various formats: mayor's office, churches, cooperative extension offices, and other community-based organizations. Inclusion criteria were: 1) age 35–75; 2) residence in Bullock and Macon County; and 3) a one-year commitment to the program. Participants signed an informed consent after an explanation of the study was provided and their questions were answered satisfactorily.

Nutrition and Physical Activity Education Intervention

Eight team leaders and three nurses were selected from each county based upon willingness to serve and commitment to the year-long study. Team leaders were required to recruit a minimum of five persons to participate on their team. Participants received a $50 monthly incentive which assisted in any cost associated with participation in the program (gym membership).

The nutrition and cancer education curriculum consisted of a 12-week interactive program facilitated by a trained nutritionist. The sessions include: cancer education (i.e. types of cancer, screening, stages, and risk factors); food nutrients (Protein, carbohydrates, fats, vitamins and minerals) and their physiological functions, fruits and vegetables, phytochemicals (their anticancer potential), food choices, interpreting food labels and food preparation. The exercise component was based upon the recognized level of physical activity required to maintain optimal health, as stated by the Centers for Disease Control and Prevention. Participants chose their preferred physical activity based upon the available resources in their communities. Team leaders were responsible for the monthly group meetings and nurses were responsible for collecting weight and blood pressure measurements during monthly meetings.

Data analysis

Focus group data were analyzed using excerpts from the transcripts and grouped by computer assistance; quotes were clustered into themes using a cut-and-paste method (Forrester-Anderson, 2005). SAS Software (SAS Inst., Inc., Cary, North Carolina) was used to analyze changes in weight, systolic and diastolic pressure using one-way ANOVA. When significant differences were detected, means were separated using the pairedwise t-test. The level of significance for all data was defined at a probability of 0.05.

Results

Focus Groups

Focus groups included 39 female and 16 male participants between the ages of 35–75, with the largest group comprised of individuals 60 and over (38%). Four themes were identified: 1) health and nutrition, 2) family, 3) environment, and 4) access to resources (Table 1).

Intervention

All sixty-two participants remained throughout the duration of the study. Most of the participants in the intervention program were in the 41 and over age group (76%) and earned only $3,000 to 25,000 annually (60%). Of the participants 21% had no health insurance. Among Bullock county participants body weight decreases ranged from 0.69 to 3.40 %change, with the exception of the dance group. In Macon County participants lost weight irrespective of the exercise regimen, with those involved in floor exercise losing the most weight 11.18 % change (Table 2).

Percentage change reductions in systolic blood pressure among Bullock County participants ranged from −4.15 to −7.79 mmHg across exercise groups. Diastolic pressures ranged from −2.62 to 8.04 mmHg, with the exception of the walking group, which an increase of +0.97 mmHg (Table 2). In Macon County, both systolic and diastolic pressure % change ranged from −8.94 to 12.66 and −5.34 to 12.66 mmHg respectively, irrespective of physical activity (Table 2).

Discussion

Although many participants understood the benefits of exercise and a balanced diet, they were unwilling to change their health behavior without the presence of illness. Focus group participants referenced the safety of housing and a fresh food supply. These factors contribute to the environmental health of the community and directly impact the physical health and well-being of the community. The paradox of the expense associated with adopting a healthy lifestyle in the communities that have 26% or greater of its population living below the poverty rate was echoed by focus group participants in reference to lack of access to fresh food and affordable exercise facilities.

The impact of the physical activity component of the study was assessed through weight loss and blood pressure reduction. High blood pressure is associated with body weight (Neter et al., 2003; Appel et al., 2003), therefore the reduction in systolic and diastolic pressure in concert with body weight is of major consequence for this vulnerable population. Research studies have demonstrated positive correlations between weight loss and hypertension (Qian et al., 2007, Bacon et al., 2004, Braith et al., 1994).

The limitations include limited resources available for physical activity, small study sample size, and the lack of male participants in both groups. In addition study results were based on before and after data points and did not utilize a control.

Conclusions

In this study, changes in weight lost and blood pressure were observed among individuals engaged in a nutrition education and physical activity program. In rural areas, awareness and prevention programs are necessary for the reduction of cancer and other chronic diseases. Another important element of this study is the use of the community based participatory model and the construction of social support. It has been shown that the enlisting of a social support element to nutrition and physical activity programs increases the likelihood of success. Community engagement in the planning and implementation along with willingness and expressed need for a nutrition and physical activity program provided a foundation for future community based health program studies.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Major themes identified from focus group discussions in Macon and Bullock Counties in Alabama, 2012 and 2013 (N=55).

THEMES	SELECTED QUOTATIONS
Health and Nutrition	
	• Need for Nutrition and Health System
	• Reluctance to change health behavior
	• Need to make healthier food choice
	• The idea of wanting to live longer motivates one to change lifestyle choices
	• Preparing meals at home instead of eating out
	• eliminating high amounts of salt
	• would like to lose weight and have more control over diet
	• Getting an adequate amount of sleep
	• Not knowing where to access resource for health promotion
	• Physical Activity makes you look better and feel better and increases you mental ability
	• Living healthy exercising and feeling good
	• Being able to function
Family	
	• Having friends and family and loved ones to communicate and interact with
	• Focusing on our for sustained dietary and lifestyle changes
	• Increased family discussion of dietary and health habits
Environment	
	• Increase nutritional choices in the schools
	• Having a nice clean home without paint peeling or lead poisoning
	• Access to fresh food without contaminates
	• Lack of affordable and adequate exercise facilities
	• Lack of community support for health related facilities
Access to Resources	
	• Lack of county support for health facilities
	• Lack of adequate information sharing regarding health facilities
	• Lack of support from faith based community
	• Need more community discussion and information sharing
	• Lack of information regarding research findings by academic institutions

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Table 2

Weight and blood pressure measures of participants engaged in a cancer risk awareness and prevention program in Bullock and Macon Counties, Alabama, 2012 and 2013 (N=62)

Variables	Weight [a]					Blood Pressure [a]						
	Baseline	Final	% change	p-Value	Systolic b[b]	Systolic f[c]	% Change	p-Value	Diastolic b[b]	Diastolic f[c]	% Change	p-Value
Macon County (N=38)												
Curves (N=9)	216.90 (53.5)	206.60 (45.6)	−4.6	0.02*	148.0 (15.2)	131.8 (11.6)	−10.95	0.006**	85.3 (8.2)	77.4 (8.6)	−9.17	0.004**
Floor Exercise (N=10)	200.78 (46.3)	178.33 (41.6)	−11.18	.0001**	141.8 (15.0)	124.7 (17.8)	−12.06	0.008**	89.6 (10.8)	78.2 (6.9)	−12.66	0.0002**
Walking (N=10)	183.78 (34.6)	181.78 (35.4)	−1.09	0.65	138.7 (10.9)	126.8 (16.4)	−8.54	0.062	87.9 (8.1)	81.2 (4.0)	−7.53	0.029*
Water Aerobics (N=9)	180.5 (18.6)	179.00 (16.5)	−0.86	0.73	150.4 (34.2)	133.4(28.2)	−11.30	0.009**	85.1 (9.6)	80.5 (11.1)	−5.34	0.109
Bullock County (N=24)												
Aerobics (N=6)	235.5 (32.3)	233.9 (34.9)	−0.69	0.45	134.8 (24.0)	124.3 (10.1)	−7.79	0.12	134.8 (24.0)	124.3 (10.1)	−6.93	0.18
Dance (N=6)	212.0 (84.07)	215.0 (84.4)	+1.42	0.40	120.0 (12.2)	118.0 (10.6)	−4.83	0.57	120.0 (12.2)	118.0 (10.6)	−2.62	0.76
Gym (N=6)	178.0 (21.8)	174.80 (18.7)	−1.80	0.27	130.0 (12.2)	120.2 (12.3)	−7.69	0.82	130.0 (12.2)	120.2 (12.3)	−8.04	0.22
Walking (N=6)	180.1 (27.5)	174 (26.6)	−3.40	0.009**	126.5 (10.5)	121.3 (9.91)	−4.15	0.42	126.5 (10.5)	121.3 (9.91)	+0.97	0.85

*P <0.05

**p<0.01

[a]Mean and SD of weight and blood pressure measurements at baseline and at the end of the intervention

[b]Systolic and diastolic pressure collected at baseline

[c]Systolic and diastolic blood pressure collected at the end of the intervention