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## Effects of Integrated Risk Counseling for Cancer and Cardiovascular Disease in African Americans

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### Abstract

**Objective**—We evaluated a risk counseling intervention designed to enhance understanding about risk factors for cancer and cardiovascular disease, to improve self-efficacy for diet and physical activity, and to increase intentions to eat healthier and be physically active.

**Methods**—We conducted a quasi-experimental study developed by academic investigators and community stakeholders to evaluate the effects of integrated risk counseling in a community-based sample of African American adults ( $n = 101$ ). The intervention provided education about the overlap in risk factors for cancer and cardiovascular disease and included components from motivational interviewing.

**Results**—Changes in behavioral intentions were not statistically significant ( $p > .05$ ). Participants reported significantly greater levels of self-efficacy for diet ( $t = 2.25, p = .03$ ) and physical activity ( $t = 2.55, p = .01$ ), and significantly increased perceived risks of developing colon cancer ( $\chi^2 = 3.86, p = .05$ ) and having a heart attack ( $\chi^2 = 4.50, p = .03$ ).

**Conclusions**—Integrated risk counseling may have some benefits among African Americans.

### Keywords

African Americans; cardiovascular; cancer; risk behaviors; research

## INTRODUCTION

Each year thousands of African Americans are diagnosed with cancer and cardiovascular diseases (CVDs) and experience poorer outcomes from these conditions compared to whites.<sup>1,2</sup> Physical inactivity and poor nutrition are 2 major risks for both of these diseases, and several interventions to improve physical activity and nutrition have been developed and evaluated in a variety of settings and populations to reduce racial disparities in morbidity.<sup>3,4</sup> The modest impact of interventions has prompted efforts to explain their effects; the research suggests that only addressing knowledge about guidelines for diet and physical activity may not be sufficient for behavioral change.<sup>5-7</sup> The limited effects of health promotion interventions have also been attributed to not using a theoretical framework to guide their development<sup>8</sup> and focusing on constructs that may not be the most useful for encouraging behavioral change. But health promotion interventions that targeted African Americans using social learning theory were insufficient to motivate sustained behavior change.<sup>3</sup> While increasing knowledge about risk factors in isolation may not be sufficient to promote healthy behavior change, greater knowledge about nutrition has been associated with increased weight loss,<sup>7</sup> and individuals with greater knowledge about risk factors for CVD report lower body mass index.<sup>5</sup> As such, knowledge about risk factors for cancer, CVD, and risk exposure behaviors may not be sufficient but is necessary to motivate healthy behavior changes among African Americans. Thus, innovative strategies are needed to enhance knowledge about risk factors for diseases and address other theoretical constructs or motivational issues that are important to behavioral change.

Recent work has suggested that an integrated approach may be effective at reducing disparities in health outcomes among African Americans.<sup>9</sup> An integrated approach is based on an ecological model of health that emphasizes multiple types of determinants that operate at individual and community levels. Although integrated approaches may focus on population-based initiatives such as modifying the built environment to facilitate physical activity or interventions that increase access to healthy foods,<sup>9</sup> it is also important to apply the central concept of integrated methods to health promotion interventions. Moreover, while interventions have been integrated with respect to behavioral outcomes and target both diet and physical activity,<sup>8</sup> much less is known about the effects of interventions that are integrated in terms of disease foci. Previous research has shown that providing education and risk counseling within a specific disease context may be effective at enhancing health behaviors among African Americans;<sup>5,10,11</sup> however, whether the effects of these approaches may be enhanced if interventions are integrated in terms of both disease foci and behavioral outcomes is unclear. For example, risk factors for some forms of cancer and CVD are similar (eg, obesity); if interventions help individuals to make the connection between the similarities in risk factors for these conditions, then motivation to make health behavior changes may be increased.

The purpose of this exploratory study was to evaluate the effects of a brief integrated risk counseling program that was developed as part of an academic community partnership called the West Philadelphia Consortium to Address Disparities. This consortium consists of researchers from the University of Pennsylvania and members of community-based organizations that include the Christ of Calvary Community Development Corporation, the

Health Promotion Council of Southeastern Pennsylvania, the Philadelphia Chapter of the National Black Leadership Initiative on Cancer, and the Southwest Community Action Coalition. As part of our efforts to establish the Consortium, we found that residents were most concerned about cancer and CVD and suggested that interventions should focus on providing education about these diseases and ways to reduce risk factors. We saw this as an opportunity to develop an integrated counseling program that focused on risk comprehension. Although generally conceptualized as one's level of personal vulnerability or susceptibility to disease, risk comprehension also includes the extent to which individuals are aware of factors that modify their susceptibility and the outcomes that may result from exposure to these factors.<sup>12</sup> Risk comprehension is an important antecedent to health behavior change, and greater perceived risk is associated with utilization of prevention strategies for cancer and CVD.<sup>6,13,14</sup> To our knowledge, however, interventions designed to promote healthy lifestyle change have not specifically targeted risk comprehension in community-based samples of African Americans. For this reason, we developed an intervention that focused on enhancing risk comprehension about cancer and CVD in a sample of African Americans who were residents of an urban community in a large metropolitan city. We used the health belief model (HBM) as the conceptual model for the intervention because it focuses on perceived risk.<sup>15</sup> Specifically, the HBM posits that health behavior is a function of an individual's beliefs about whether or not they are susceptible to developing a particular disease, their beliefs about how serious a condition is, their beliefs about benefits of performing the behavior, and if individuals are exposed to information that is likely to prompt action. We predicted that by following risk counseling that is integrated with respect to disease foci (eg, cancer and CVD) and health behaviors (eg, diet and physical activity), individuals would report greater intention to change these behaviors and would also report an increased risk of developing these conditions. We also hypothesized that integrated risk counseling would be associated with increased self-efficacy for diet and physical activity.

## MATERIALS AND METHODS

### Study Population

Participants were adult African American men and women who were residents in an urban community in Philadelphia, Pennsylvania. Since this was an exploratory study, we did not use power calculations to determine the sample size and evaluated the effects of the intervention in a sample of 101 African American men and women who were recruited to evaluate receptivity to the newly developed integrated risk counseling intervention.<sup>16</sup> To be eligible for participation, individuals had to be at least 18 years of age and be a current resident in west or southwest Philadelphia. Residency was determined by self-report and was documented. Individuals who had a personal history of cancer and those who had ever had a heart attack, stroke, or heart disease were not eligible for participation because our interest was in assessing intention for behavior change for the primary prevention of these conditions. This study was conducted at the University of Pennsylvania and approved by the institutional review board.

## Procedures

Participants were recruited into the study through self-referrals from newspaper advertisements, flyers, and health fairs from July through November 2007. Newspaper advertisements were placed in free regional and community newspapers, and flyers were posted in community settings in west and southwest Philadelphia. Newspaper advertisements and flyers described the study as a research program that would provide information about risk factors for cancer and CVD and strategies for improving one's health. This same information was provided to individuals at health fairs and to those who were told about the study by community members of the partnership. Individuals also learned about the study from those who completed risk counseling. Regardless of how individuals learned about the study, those who were interested in participating were instructed to call the study line for additional information. Following self-referral, a screening interview was completed to determine eligibility; those who were eligible to participate in risk counseling completed a baseline telephone interview. The baseline was a 30-minute structured survey that obtained information on sociodemographics, height and weight, perceived risk of developing cancer and CVD, self-efficacy for diet and physical activity, and intentions to change one's diet and physical activity. These interviews were conducted by research assistants at the University of Pennsylvania following provision of verbal consent. At the end of the baseline, eligible individuals were invited to participate in risk counseling.

The goals of the integrated risk counseling intervention were to facilitate risk comprehension, increase self-efficacy, and increase intentions to make healthy behavior changes. The intervention was developed by members of the consortium using the HBM as the conceptual framework.<sup>15</sup> We intentionally developed a brief intervention because attendance is modest in interventions that involve multiple sessions that are provided over several weeks.<sup>17</sup> Also, we wanted to develop a program that could be disseminated to community settings; therefore, participation in risk counseling involved completing 1 group session. This session was delivered by an experienced health educator using a multimedia format that included a verbal presentation of the material, visual aids (eg, PowerPoint slides) that reinforced the verbal content, and a video that addressed risk factors for CVD<sup>18</sup> after obtaining written informed consent. For example, to address perceived severity and susceptibility to cancer and CVD, participants were provided with information about the occurrence of these conditions and mortality among African Americans and risk factors for these diseases, respectively. A novel aspect of the intervention was that the similarities between risk factors for cancer and CVD were emphasized. For this component of the intervention, *risk factors* were defined as things that increase one's chances of developing a disease and, following the video, the health educator led a discussion about risk factors for CVD that were identified in the video. After this, participants were asked to describe risk factors for cancer based on what they have heard or read. Participants then completed a group exercise in which they identified risk factors that were common to both cancer and CVD. Participants also received information about the roles that diet and physical activity play in cancer and CVD and were given guidelines for recommended levels of physical activity and fruit and vegetable intake to promote awareness. The benefits of making healthy changes to one's lifestyle were also reviewed and culturally transmitted risk factors (eg, environmental influences on eating) were also discussed to address the context within which

diet and physical activity practices develop. Although motivational interviewing<sup>19</sup> is typically delivered individually, motivational techniques have been used previously in group settings.<sup>20,21</sup> Therefore, elements from motivational interviewing were included in the intervention to increase motivation to make behavioral changes. Specifically, participants completed a values clarification exercise and were asked to indicate how motivated and confident they were to make changes in their diet and physical activity practices. The values clarification exercise was included because this is a technique that is designed to help individuals examine the extent to which their current behaviors are consistent with their core values; this process can enhance an individual's internal motivation to change their behavior. Participants also identified a health-related change that they wanted to make at the end of the session. We did not address barriers specifically in the intervention because, while developing the content, we envisioned that these issues would be addressed in individual sessions. A follow-up survey was completed immediately at the end of the counseling session to reassess behavioral motivation, perceived risk, and self-efficacy. Individuals who completed counseling received an incentive of \$20 and an additional \$15 was provided to compensate individuals for travel-related expenses.

## Measures

The following sociodemographic factors were obtained during the baseline telephone interview: gender, age, marital status, education, employment status, and income. We created dichotomous variables for these characteristics based on the distribution of responses. We obtained height and weight by self-report during the baseline telephone interview and calculated body mass index (BMI) as weight (kilograms) divided by height squared (m<sup>2</sup>). We categorized participants as being obese (BMI ≥ 30) or nonobese (BMI <30). We used items from previous research to evaluate perceived risk of developing cancer and CVD.<sup>22</sup> Specifically, participants were asked to indicate how likely it was that they would develop specific forms of these diseases compared to other individuals their age (1, much lower, to 5, much higher). We focused on perceived risks of developing colon cancer and having a heart attack and created a dichotomous variable for each measure. Specifically, individuals who reported that they had a much lower, a little lower, or the same risk of developing these conditions were compared to those who reported that they had a higher or much higher risk. We used instruments from previous research to evaluate perceptions of confidence to eat a healthy diet and to be more physically active. Specifically, dietary and physical activity self-efficacy were assessed in terms of perceived confidence to eat fruit and vegetables and exercise under a variety of circumstances.<sup>23,24</sup> Both instruments had good internal consistency (Cronbach  $\alpha$  for diet, .86; physical activity, .79 self-efficacy). We developed items to evaluate intentions for behavioral change. Specifically, participants were asked to indicate how likely it was that they would try to eat healthier and exercise more (1, not at all likely, to 4, very likely) during the next month. We recoded these items into dichotomous variables and compared participants who reported that it was very likely that they would try to eat healthier and exercise more compared to those who reported that it was not at all, a little, or somewhat likely that they would make these changes. We focused on behavioral intentions because our ultimate objective was to develop an intervention that would be effective at improving diet and physical activity behavior, but recognized that evaluating

these outcomes would not be feasible within the scope of the present study. Behavioral intentions are hypothesized to be a precursor to actual behavior.<sup>25</sup>

### Data Analysis

First, we generated descriptive statistics to characterize participants in terms of sociodemographic factors. We then used paired *t* tests to evaluate pre-post changes in self-efficacy, and McNemar's tests were used to compare changes in risk perceptions from baseline to post counseling. We conducted these analyses in the total sample and stratified by obesity status to determine if these changes were present among those with and without risk factors for disease. We used obesity status as the stratifying variable because it represents the cumulative effects of diet and physical activity behaviors. Next, we generated multivariate regression models to evaluate changes in perceived risk, intentions, and self-efficacy while controlling for sociodemographic factors. Specifically, logistic regression analysis was used to evaluate changes in binary variables while controlling for sociodemographic factors and linear regression analysis was used to evaluate changes in self-efficacy variables while controlling for sociodemographic factors. Since we were interested in evaluating changes in perceived risk, behavioral intentions, and self-efficacy while controlling for sociodemographic characteristics, we included all of these factors in the regression models for each outcome.

## RESULTS

Table 1 shows the characteristics of the study sample. Forty-six percent ( $n = 47$ ) of participants were obese. Table 2 shows the changes in perceived risk from baseline to post counseling. At baseline, 27% of participants reported that they were at risk for having a heart attack, whereas post counseling, 39% reported that they were at risk. Similarly, 18% of participants reported that they were at risk for developing colon cancer, whereas 27% reported that they were at risk at post counseling.

Changes in intention to eat healthier or exercise regularly were not statistically significant. When the analyses were stratified by obesity status, changes in perceived risk for developing colon cancer and having a heart attack were found only among participants who were obese. Similar trends were reported in changes for perceived risk of developing colon cancer. We did not conduct stratified analyses for behavioral intentions because these changes were not statistically significant from baseline to post-counseling in the total sample. The results for changes in self-efficacy are provided in Table 3. Following participation in risk counseling, participants reported significant increases in dietary and physical activity self-efficacy. When the analyses were stratified by obesity status, we found that significant changes in dietary self-efficacy were present only among those who were not obese (Table 3). For physical activity, significant changes were only observed among those who were obese.

The results of the multivariate regression analysis for perceived risk and behavioral intentions are shown in Table 4. Age had a significant effect on intentions to eat a healthier diet and to exercise more; increasing age was associated with a decreased likelihood of reporting intentions to change one's lifestyle. In addition, participants who had some college education and those who were college graduates were about 6 times more likely to report

that they intended to eat a healthier diet following risk counseling. The results of the multivariate regression analysis of self-efficacy are shown in Table 5. None of the sociodemographic factors had a significant association with dietary self-efficacy following risk counseling, but marital status also had a significant association with postcounseling levels of self-efficacy for physical activity. Compared to participants who were not married, those who were married reported significantly greater self-efficacy for physical activity. Obesity status did not have a significant effect on risk perceptions, intentions, or self-efficacy.

## DISCUSSION

The purpose of this study was to evaluate the effects of a brief risk counseling intervention that was developed specifically for African Americans on intentions to make healthy lifestyle changes and self-efficacy for diet and physical activity. We were also interested in determining the extent to which counseling that emphasizes the overlap in risk factors for cancer and CVD led to changes in perceived risk. We found increases in risk perceptions and increases in confidence in making lifestyle changes, but no change in intentions. Importantly, increases in risk perceptions were found among individuals who had at least 1 risk factor for developing these diseases. Similar results were obtained for changes in self-efficacy for physical activity; however, the changes that were observed for these variables were small.

Self-efficacy, perceived risk, and intentions are important to health behavior change; self-efficacy is a primary mechanism that accounts for changes in health behavior.<sup>26</sup> The lack of significant changes in behavioral intentions could be due to the brevity of the intervention and the relatively high levels of intentions to make some behavioral changes that were reported at baseline. These issues could also explain the small changes that we observed in self-efficacy. It is also important to emphasize that we evaluated these changes immediately after the counseling intervention; thus, it is not clear if increases we observed are maintained for longer periods of time. Additional research is needed to evaluate changes in self-efficacy and risk perceptions at longer intervals following integrated risk counseling.

For the most part, sociodemographic factors were not associated significantly with post-counseling levels of perceived risk, self-efficacy, or behavioral intentions. For example, gender, employment status, and income level were not associated significantly with these variables. This demonstrates that integrated risk counseling is not likely to be more or less effective among individuals based on their sociodemographic background. However, increasing age was associated significantly with decreased intentions to eat a healthier diet and be more physically active. We also found that individuals who were not married reported lower self-efficacy for physical activity. Studies have shown that lack of social support is a barrier to being physically active;<sup>27</sup> it is possible that individuals who do not have spousal support also lack confidence to make this type of behavioral change. Our findings suggest that it may be important to help individuals who are not married to identify other sources of support for physical activity and address specific barriers to making lifestyle changes in older African American adults.

In considering the results of the present study, several limitations should be noted. These include the limited follow-up assessment and our modest sample size. While the use of nonrandom methods to recruit study participants is an additional limitation, it is important to note that our intervention was designed to target a specific community. An additional limitation is that we used a quasi-experimental pre-post design and did not evaluate actual behavioral change.

## CONCLUSIONS

Additional research is needed to evaluate the effects of this counseling approach using a randomized design that also measures actual behavioral change. It may also be important to enhance integrated risk counseling by providing specific information on strategies for overcoming barriers to making lifestyle changes during individualized sessions that are provided following the group session. Nevertheless, our findings suggest that a brief counseling intervention that focuses on helping individuals to see the connection between the similarities in risk factors for cancer and CVD may be effective at promoting short-term changes in variables that play an important role in health behavior change.

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**Table 1**

## Sample Characteristics (n = 101)

Variable	N (%)
Gender	
Female	64 (63%)
Male	37 (37%)
Marital status	
Not married	72 (71%)
Married	29 (29%)
Education level	
Some college	57 (56%)
High school	44 (44%)
Employment status	
Not employed	69 (68%)
Employed	32 (32%)
Income level <sup>a</sup>	
<\$20 000	51 (54%)
>\$20 000	44 (46%)
Age, y, mean (SD); range	48 (SD = 11.6); 23.1–74
BMI, kg/m <sup>2</sup> , mean (SD); range	29.9 (SD = 6.7); 19.4–50

<sup>a</sup>Six participants were missing data for income.

**Table 2**

Changes in Perceived Risk and Behavioral Motivation From Baseline to Postcounseling Follow-up

Variable	Baseline	Postcounseling	McNemar	P Value
Perceived risk				
Colon cancer (n = 96)	18%	27%	3.86	0.05
Heart attack (n = 101)	27%	39%	4.50	0.03
Behavioral intentions				
Eat healthier (n = 100)	69%	73%	0.57	0.45
Exercise more (n = 101)	48%	59%	3.67	0.06

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**Table 3** Changes in Self-Efficacy for Diet and Physical Activity From Baseline to Postcounseling Follow-up

	Diet Self-Efficacy (n = 98)			Physical Activity (n = 93)		
	Baseline	Postcounseling	T Value	Baseline	Postcounseling	T Value
Total sample	33.6 (6.2)	35.6 (8.9)	2.25 <sup>a</sup>	22.6 (4.9)	24.2 (6.0)	2.55 <sup>b</sup>
Obese (BMI ≥ 30)	33.9 (6.5)	34.8 (8.7)	0.74	21.5 (5.4)	24.4 (5.2)	0.53
Nonobese (BMI <30)	33.4 (5.9)	36.4 (9.0)	2.37 <sup>a</sup>	23.6 (4.3)	24.1 (6.6)	0.53

<sup>a</sup>  $p < .05$ .

<sup>b</sup>  $p < .01$ .

**Table 4**Multivariate Regression Model of Postcounseling Risk Perceptions and Behavioral Motivations<sup>a</sup>

Outcome Variable	Odds Ratio	95% Confidence Interval	P Value
Colon cancer (n = 90)			
Baseline level	10.1	2.73, 37.18	.001
Age	0.99	0.58, 1.76	1.00
Gender	2.33	0.65, 8.35	.19
Marital status	0.70	0.20, 2.54	.59
Education level	1.69	0.53, 5.41	.38
Employment status	0.62	0.17, 2.27	.47
Income level	1.21	0.37, 3.93	.75
Obesity status	2.09	0.70, 6.22	.18
Heart attack (n = 95)			
Baseline level	4.81	1.69, 13.65	.003
Age	0.90	0.68, 1.46	.68
Gender	0.62	0.23, 1.68	.35
Marital status	0.61	0.21, 1.78	.36
Education level	0.71	0.27, 1.88	.49
Employment status	0.57	0.20, 1.66	.30
Income level	1.09	0.41, 2.85	.87
Obesity status	2.22	0.86, 5.69	.10
Eat healthier (n = 94)			
Baseline level	9.33	2.56, 33.97	.001
Age	0.57	0.33, 0.99	.04
Gender	1.51	0.44, 5.15	.51
Marital status	2.08	0.58, 7.46	.26
Education level	6.42	1.78, 23.17	.004
Employment status	1.27	0.31, 5.13	.74
Income level	1.08	0.32, 3.58	.90
Obesity status	0.50	0.16, 1.58	.24
Exercise more (n = 95)			
Baseline level	9.80	3.23, 29.75	<.001
Age	0.49	0.28, 0.84	.01
Gender	1.03	0.35, 3.01	.96
Marital status	2.20	0.69, 7.00	.18
Education level	1.05	0.38, 2.96	.92
Employment status	0.45	0.14, 1.38	.16
Income level	1.19	0.42, 3.39	.74
Obesity status	0.52	0.19, 1.43	.21

Gender, 1 = female vs 0 = male; marital status, 1 = married vs 0 = not married; education level, 1 = some college vs high school; employment status, 1 = employed vs 0 = not employed; income level, 1 = >\$20 000 vs 0 = <\$20 000; obesity status, 1 = obese vs 0 = not obese.

**Table 5**

## Multivariate Models of Dietary and Physical Activity Self-Efficacy

Outcome Variable	$\beta$	P Value
Diet self-efficacy (n = 92)		
Baseline level	.52	.001
Age	-.08	.32
Gender	-.42	.83
Marital status	-1.72	.40
Education level	1.34	.48
Employment status	1.89	.37
Income level	2.20	.26
Obesity status	-1.84	.31
Physical activity self-efficacy (n = 87)		
Baseline level	.59	<.0001
Age	-.05	.28
Gender	.22	.86
Marital status	3.61	.01
Education level	1.62	.19
Employment status	.79	.57
Income level	-1.44	.25
Obesity status	.91	.43

Gender, 1 = female vs 0 = male; marital status, 1 = married vs 0 = not married; education level, 1 = some college vs high school; employment status, 1 = employed vs 0 = not employed; income level, 1 = >\$20 000 vs 0 = <\$20 000; obesity status, 1 = obese vs 0 = not obese.