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Understanding Multiple Behavioral Risk Factors for Cancer in Rural Women

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Abstract

Objectives—This study examined demographic and health-related factors associated with risk behaviors that have been linked to cancer including smoking, high BMI, and low physical activity.

Design and Sample—A secondary analysis was conducted using data from Rural Families Speak about Health, a multi-state, epidemiologic study of rural American women and their families (N=444).

Measurement—Validated measures for various demographic and health related items including tobacco use, BMI, physical activity, and depression were used.

Results—Of the total sample with complete data (n=399) the mean age was 32 years and the majority were white (64%), married (67%), had a high school education or higher (73%), and had an annual household income of less than $40,000 (90%). Regarding cancer risk behaviors, 36% of the sample were smokers, 39% reported low levels of physical activity, and 45% had a calculated BMI over 30. Thirty-five percent of participants reported engaging in two or more risk behaviors. There were significant differences in income, perceived health status, and depression depending on the number of risk behaviors reported.

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Conclusions—Understanding combinations of risk behaviors can assist nurses and other health professionals in tailoring multiple health behavior change interventions to prevent cancer among rural women.

Keywords

cancer prevention; chronic disease; multiple behavioral risks; rural; women's health

Background

Cancer prevention remains a major public health issue and a priority of public health nurses. Although screening is a mainstay for cancer prevention in the community, there is now sufficient evidence that certain behavioral lifestyles including tobacco use, obesity, and physical inactivity are related to increased cancer risk (Kabat, Matthews, Kamensky, Hollenbeck, & Rohan, 2015; Centers for Disease Control and Prevention (CDC), 2014). Thus, changes in health risk behaviors can reduce cancer risk. Unfortunately, most of the United States population engage in multiple unhealthy behaviors that additively increase morbidity and mortality risk for chronic diseases including cancer (Heroux et al., 2012). McCullough and colleagues (2011) reported that men and women in the Cancer Prevention II- Nutrition Cohort Study who had low levels of compliance with the American Cancer Society Cancer prevention guidelines on body mass index (BMI), physical activity (PA), diet, and alcohol had a higher risk of death compared to those with higher compliance levels.

Multiple Health Risk Behaviors

As the 2009 National Institutes of Health (NIH) meeting on the Science of Behavior Change acknowledged, current research suggests that risk behaviors do not occur in isolation but tend to co-occur in specific combinations (de Vries et al., 2008; Fine, Philogene, Gramling, Coups, & Sinha, 2004). Pronk (2004) found that 92% of smokers engaged in at least one additional risky health behavior including problem drinking, physical inactivity, and unhealthy diet. Using data from the 2001 Health Interview Survey, Fine and colleagues (2004) found that almost a quarter of the adult sample had three or more risk factors for chronic disease and these risk factors clustered together. Inactivity and being overweight were the most common clustered risk factors, followed by the combination of inactivity, being overweight, and smoking. Given research supports the co-occurrence of risk behaviors and eliminating these risk behaviors including inactivity, obese BMI, and smoking would prevent almost half of all cancers, addressing multiple risk behaviors simultaneously may prove more effective in decreasing cancer risk than addressing a single behavior (Anand et al., 2008). This may be especially true when there are likely to be shared self-regulatory resources, social cues, and environmental cues for the behaviors (Spring, Moller, & Coons, 2012). Although multiple health behavior change (MHBC) interventions are still in their infancy, studies have shown promising results (Prochaska & Prochaska, 2011). López and colleagues (2007) reported a significant decrease in five cancer risk behaviors including tobacco use, alcohol use, poor diet, weight, and sun exposure after receiving a multiple behavior cancer prevention intervention. A smoking cessation intervention that also targeted high fat diets and high risk sun exposure showed effectiveness in decreasing smoking as well as the co-occurring risk factors (Prochaska, Velicer, Prochaska, Delucchi, & Hall, 2006).

Similarly, Sorensen et al. (2007) noted that a smoking cessation intervention combined with a healthy diet improved both smoking cessation rates and fruit and vegetable consumption.

Individuals with engage in multiple risk behaviors (e.g., smoking, poor physical activity, and high body mass index) have greater medical costs (Edington, 2001). Positive changes in health risk scores or wellness scores that consider the number of lifestyle risk factors present are associated with a decrease in health care costs (Edington, 2001). Therefore, addressing bundles of health behaviors represents an efficient use of limited resources and can save the health care system both time and resources (Vandelanotte, Reeves, Brug, & De Bourdeaudhuij, 2008). In fact, data show that simultaneously addressing two health behaviors effectively reduces medical costs by $2,000 a year (Prochaska, Spring, & Nigg, 2008).

Rural Health Risk Behaviors

Americans living in rural areas of the U.S. tend to engage in unhealthier lifestyle behaviors and consequently have higher rates of chronic disease, including cancer, compared to their urban counterparts (Eberhardt & Pamuk, 2004; Meilleur et al., 2013). These disparities are further exaggerated among certain subpopulations of rural residents, including women (Befort, Nazir, & Perri, 2012; Doescher, Jackson, Jerant, & Gary Hart, 2006; Eberhardt & Pamuk, 2004). While national rates of obesity have recently plateaued at 36%, the rate of obesity among rural women is 40%, which is higher than for women living in large metropolitan areas (29%) (Befort et al., 2012; Cleland, Ball, King, & Crawford, 2012; King, Mainous, Carnemolla, & Everett, 2009; Patterson, Moore, Probst, & Shinogle, 2004). Similarly, research has shown that rural women have higher levels of tobacco use compared to urban women, (American Lung Association, 2012; Doescher et al., 2006; Talbot, Szlosek, & Ziller, 2015) and they are less likely to engage in physical activity (Parks, Housemann, & Brownson, 2003). While research has established a general understanding of the prevalence of these cancer risk behaviors individually, the combination or bundling of these risk behaviors is not clearly understood among rural women in the U.S.

Research Questions

The lack of research on multiple health risk behaviors among rural women is a significant gap, because studies have shown that lifestyle risk factors tend to co-occur more frequently in those with lower educational attainment, lower income, poor health status, and higher levels of psychological distress (de Vries et al., 2008; Fine et al., 2004; Pronk et al., 2004). Compared to their urban and suburban counterparts, American women living in rural areas tend to have lower educational levels, lower socioeconomic resources, and poorer health thereby increasing the likelihood of the co-occurrence of these risky lifestyle behaviors (Griffin, Sherman, Jones, & Bayl-Smith, 2014). Understanding those factors associated with the co-occurrence of risk behaviors that have been linked to cancer provides important information that can be used to tailor cancer prevention interventions for MHBC initiatives. To our knowledge, very few studies have examined factors associated with co-occurrence of risk behaviors that have a strong correlation with cancer and other chronic diseases in rural American women. Thus, the research questions are: (1) What demographic and health-related factors are associated with the numbers of multiple risk behaviors including

smoking, BMI>30, and low levels of physical activity (PA). (2) What specific combinations of multiple risk behaviors are most strongly associated with demographic and health-related factors in rural women?

Methods

Design and Sample

The current study, Understanding Multiple Behavioral Risk Factors for Cancer in Rural Women, is a secondary analysis of data from the Rural Families Speak about Health (RFSH) study, a multi-state[1], epidemiologic study of rural low-income women (*N*=444) and their families (See Mammen & Sano (2012) for full study details). This study was designed to examine the physical and mental health of diverse rural low-income families from 2008–2009. The RFSH sample was composed of rural female caregivers 18 years of age or older with at least one child under the age of 13, and whose household income was at or below 185 percent of the Federal Poverty Line (FPL). Rural was defined using urban-influence codes, which are defined by the U.S. Department of Agriculture and consider population size, urbanization, and access to metropolitan areas. Codes range from 1–12, with nonmetropolitan counties having UIC≥3. RFSH counties had UICs 6 (noncore but adjacent to a small metro area) to 12 (noncore and nonadjacent to a metro area). Recruitment of participants occurred through mixed purposive sampling, a nonprobability sampling technique (Mammen & Sano, 2012). This technique combined both purposive sampling and chain-referral sampling, or respondent-driven sampling (Heckathorn, 2002) in an effort to recruit a diverse sample of rural low-income families. Across all data collection sites, interviewers trained in the RFSH protocol collected quantitative data via computer-assisted interviewer-administered questionnaires. These data were collated and cleaned at a central repository. RFSH investigators obtained necessary approvals from the Institutional Review Boards of their respective universities. The current secondary analysis was limited to women (n=399) with complete data for the three risk factors of interest (Physical Inactivity, Smoking, and Obese BMI).

Measures

Demographics—All demographics were self-reported. Age was a continuous variable in years. Marital status was reported categorically as single/never married/not cohabiting, divorced/widowed and currently single, married, civil union/domestic partnership, cohabiting, and other. Race/ethnicity was reported as White, Hispanic/Latino, African American/Black, Asian, and other. Annual household income was reported continuously in dollars and including all sources.

BMI—This variable was calculated using weights obtained from participants using a digital scale and self-reported height using the formula: weight (kg)/[height (m)]^2 (CDC, 2015).

[1]Participating were: California, Hawaii, Iowa, Illinois, Kentucky, Massachusetts, North Carolina, Nebraska, New Hampshire, South Dakota, Tennessee, New York, Texas, and Washington.

Physical Activity—This varaible was measured using the following question from the Family Nutrition and Physical Activity Scale: “How often does your family engage in at least 30 minutes of physical activity a day?” In this study family was defined as mother and child. Family activity level was used as a proxy for individual women’s activity level. This is consistent with previous research showing that maternal-child PA is highly correlated due to active parental modeling and direct involvement in their PA with their children, especially among youth under 12 years, who constitute the majority of children in RFSH (Edwardson & Gorley, 2010; Hesketh et al., 2014). Responses were dichotomized as “almost never” and “sometimes” = low levels and “often and “almost always”= high levels) (Ihmels, Welk, Eisenmann, & Nusser, 2009).

Tobacco—Tobacco use was self-reported. Participants were asked whether they currently smoke and responses were dichotomous (1 = yes and 5 = no).

Depressive Symptoms—*Depressive symptoms* were obtained using the short form of the Center for Epidemiologic Studies – Depression Scale, which includes 10 questions on a 4-point Likert-type scale. A cut-off score of 10 was used to indicate clinically significant depressive symptoms (Andresen, Malmgren, Carter, & Patrick, 1994).

Perceived Health Status—*Overall Perceived Health Status* was assessed using a single, Likert-type scaled question from the SF-12, a validated self-reported instrument that measures general health status. (Jenkinson et al., 1997) The question reads, “In general, would you say your health is: Excellent (1), Very Good (2), Good (3), Fair (4), or Poor (5).”

Chronic Disease—Heart disease and diabetes were self-reported. Participants were asked, “Have you been diagnosed with any of the following conditions?”

Heath Care—A regular source of primary care was self-reported. Participants were asked, “Do you have a healthcare provider who regularly cares for you?”

Analytic strategy

Of the total sample of 444 subjects, there were complete data for the three risk behaviors (Physical Inactivity, Smoking, and obese BMI) on 399, so these participants were included in the analysis. Risk behaviors were summed to 0, 1, 2, or 3. All analyses were conducted using SASv9.3.

Research Question 1: What demographic and health-related factors are associated with the number of multiple risk behaviors including smoking, BMI, and low levels of physical activity (PA)

To determine how membership in the 4 risk behavior groups (0, 1, 2, or 3) was associated with a set of characteristic variables, including demographic, comorbid conditions, and self-rated health, as appropriate, either chi-square analysis (for categorical measures) or ordinary least squares ANOVA (for continuous measures) were utilized to examine the bivariate association between the risk behavior group variable and each characteristic. The numbers of risk behavior variables were treated as a class rather than as an ordinal variable in order to

conduct an omnibus test with 3 degrees of freedom. As a method to prevent over testing, thus to preserve type I error, only if that omnibus test was significant were pairwise tests conducted using 1 degree of freedom contrasts between the risk behavior groups comparing each to the zero risk behavior group. For this analysis, p=.05 was used as the threshold of significance.

Research Question 2: What specific combinations of risk behaviors are most strongly associated with demographic and health-related factors in rural women

Observed risk behavior combinations were compared using pairwise tests with 1 degree of freedom contrasts. Separate analyses were conducted to determine which risk behaviors and risk behavior combinations were accounting for the association with demographic and health related characteristics. For the multiple risk behavior groups, each combination of risk behaviors was used (e.g., Smoking + BMI, Smoking + Physical Activity, Physical Activity + BMI, Smoking + BMI + Physical Activity) to create risk behavior combinations. For this analysis, p=.05 was used as the threshold of significance.

Results

Sample characteristics

Of the total sample (n=399) the mean age was 32 years and the majority were white (64%), married (67%), had a high school education or higher (73%), and had an annual household income of less than $40,000 (90%). Approximately 27% rated their health as fair or poor and 38.5% of the sample screened positive for depression (See Table 1).

Risk behaviors

Regarding risk behaviors, 36% of the sample were smokers, 39% reported low levels of physical activity, and 45% had a calculated BMI over 30. Of the entire sample (n=399), 22.6% reported zero risk behaviors, 42.1% reported one risk behavior, 27.6% of the sample engaged in two risk behaviors, and 7.7% of the sample reported engaging in all three risk behaviors. Among those with multiple risk behaviors (two or three risk behaviors, n= 141) the combination of high BMI and low levels of PA (36%) was most prevalent, followed by high BMI and smoking (26%) and smoking and low levels of PA (16%). Among those individuals with at least 2 risk behaviors (n=141), twenty-two percent reported all three risk behaviors.

Research Question 1: What demographic and health-related factors are associated with combinations of multiple risk behaviors including smoking, BMI, and low levels of physical activity (PA)

In the bivariate analysis, several demographic and health related factors were associated with the number of risk behaviors reported as reflected in the 3-degree of freedom Omnibus p-value in Table 2. There was a significant difference between risk behavior groups in income (p=0.03), perceived health status (p=.001), and depression (p=0.001). In the pairwise analysis, those who reported zero risk behaviors compared to those with one risk behavior were more likely to have a higher income (p=.008), higher self-perceived health status (p=0.001) and not screen positive for depression (p=0.025). Those who reported zero risk

behaviors compared to two risk behaviors were more likely to have a higher income (p=.01), higher perceived health status (p=0.08) and not screen positive for depression (p=0.0002). Those who reported zero risk behaviors compared to three risk behaviors were more likely to have a higher income (p=.003), higher perceived health status (p=0.0002) and not screen positive for depression (p=0.0004). (See Table 2)

Research Question 2: What specific combinations of risk behaviors are most strongly associated with demographic and health-related factors in rural women

Among participants with one risk behavior, compared to smokers those with low levels of PA were less likely to be single (51% vs. 19%, p=0.01), to report white race (81% vs. 50%, p=.001), and to screen positive for depression (45% vs 23%, p=0.018). Compared to those with high BMI, smokers were more likely to be single (29% vs. 51%, p=.015) and report white race (49% vs. 81%, p=.0006). Among those with two risk behaviors, compared to those with the combination of low PA and smoking those with the combination of high BMI and low PA were less likely to be single (61% vs.25%, p=.005). Compared to those with the combination of high BMI and smoking those with high BMI and low PA were less likely to report white race (78% vs. 49%, p=.008). Compared to those with the combination of low PA and smoking, those with all three risk factors were less likely to be single (61% vs. 26%, p=.012).

Discussion

In this sample of rural, low-income women, we found a high prevalence of cancer risk behaviors, with 77% of participants reporting at least one risk behavior and 35% reporting at least two risk behaviors. For individual risk behaviors, we also found higher than national prevalence rates of smoking (35% in our study vs. 18.1% nationally and 25% in a rural national sample) (American Lung Association, 2012; CDC, 2014) and obese BMI (45.4% in our study vs. 36.6% nationally), (Ogden, Carroll, Kit, & Flegal, 2014) and the obesity rate was slightly higher than other national rural samples (American Lung Association, 2012; Befort et al., 2012). We also found a high prevalence of clinically significant depressive symptoms (65%), which has been associated with poor health behaviors in other studies, (Duivis et al., 2011; Katon et al., 2010) and was associated with reporting 1 or more risk behaviors in this study. The extremely high prevalence of depressive symptoms may in part reflect the use of the CES-D short form, which is a screening tool rather than a diagnostic tool. However, other studies of rural residents have demonstrated similarly high rates of depression (Simmons, Huddleston-Casas, & Berry, 2007; Smalley et al., 2010).

The high prevalence of multiple risk behaviors suggests that MHBC interventions in rural areas targeting women specifically may be an efficacious way to maximize resources to effectively combat multiple cancer risk behaviors among those most in need. Although MHBC interventions have been effective in reducing multiple cancer risk behaviors in the general population (López et al., 2007), more research is needed to determine whether MHBC interventions are an equally feasible and efficacious method to reduce cancer risk in rural women specifically. Given rural populations have higher than national prevalence rates of many cancer risk behaviors (Befort et al., 2012; ALA, 2012; Parks, Housemann, &

Brownson, 2003; Weaver, Palmer, Lu, Case, Greiger, 2013), MHBC interventions may help to reduce health disparities in this population of vulnerable women by targeting multiple risk factors simultaneously. Additionally, with health professional shortages in many rural areas, MHBC interventions may help rural providers to more easily manage behavioral risk factors in a time and resource efficient manner.

A number of demographic characteristics were associated with the number of risk behaviors reported as well as different combinations of risk behaviors that have important implications for MHBC interventions in rural settings. Lower income was associated with engaging in one or more risk behaviors among rural women in this study. Low socioeconomic status has been consistently linked to an increased risk for engaging in risk behaviors and continues to account for morbidity and mortality in vulnerable populations (Stringhini et al., 2010). MHBC interventions may be particularly efficacious for employed low-income women, who frequently have competing demands for time that negatively affect cancer risk factors, such as diet (Devine et al., 2006). Future studies should investigate whether and how women with limited resources benefit from approaches that provide knowledge and skills that can be applied across multiple domains of health.

Being married or having a partner also was consistently associated with risk behaviors, including low PA, low PA/high BMI, and all 3 risk factors. This suggests the potential for MHBC interventions that target couples and families as opposed to individuals. Studies have shown that the environment influences both diet and physical activity, with the family environment being crucial (de Vet, de Ridder, & de Wit, 2011; Schiotz, Bogelund, Almdal, Jensen, & Willaing, 2012; Withall, Jago, & Cross, 2009). MHBC interventions that help couples and families to navigate the challenges to consuming a healthy diet or exercising regularly – especially for families with limited resources and in limited resource rural environments such as those in this study – are likely to be more successful.

Minority race was associated with multiple risk behaviors, including high BMI/low PA. Specifically, low levels of physical activity are more common in rural minority populations of every race/ethnicity compared to urban populations (Patterson et al., 2004). These findings are consistent with other research showing that physical inactivity is lower in rural African American women (Wilcox, Castro, King, Housemann, & Brownson, 2000). Moreover, obesity has been shown to disproportionally affect minority women (Wang & Beydoun, 2007). Other research shows that chronic disease risk among minority groups is associated with multiple influences, including neighborhood environment, socioeconomic status, and community resources (Unger et al., 2014). Thus, consistent with our overall findings, MHBC interventions that consider multiple influences and include support systems may have the greatest chance of success for reducing the incidence and prevalence of unhealthy behaviors and cancer in this population.

Single status was associated with multiple risk behaviors including smoking/low PA. Single mothers have higher rates of tobacco use compared to their married counterparts (Jun & Acevedo-Garcia, 2007; Young, Cunningham, & Buist, 2005). Low physical activity has been inconsistently linked to single parent status (Dlugonski & Motl, 2013; Young et al., 2005). There may be similar underlying issues of the co-occurrence of these two behaviors

including stress, lack of social support, and time management problems. These issues should be the targets of future research and MHBC intervention strategies that aim to prevent cancer in rural women.

This study has a number of limitations. As previously noted, we measured depression using the CES-D short form, which is for screening and not diagnosis, and this may have resulted in the over-reporting of depressive symptoms. A second limitation is the fact that physical activity and smoking were self-reported, and this may have resulted in over- or under-reporting of these activities. Furthermore, the measure we used for physical activity for this study was from the Family Nutrition and Physical Activity Scale, therefore it captured not just the woman's exercise levels but those of their children, which may decrease the accuracy of the measure. However, given women are the head of the household and were answering the survey, it is plausible that their answers are reflective of their individual exercise patterns. Furthermore, research shows that mother-child activity levels are positively associated at all activity levels from sedentary to vigorous (Hesketh et al., 2014) due to active parental modeling and direct involvement in their PA with their children (Edwardson & Gorley, 2010). Also, the sample was not a representative sample of rural women in the U.S.; however it is one of the few studies to focus solely on the health and well-being of rural U.S. women.

Rural communities tend to have limited healthcare resources, and their residents frequently experience barriers to health information and care (Bice-Wigington, Simmons, & Huddleston-Casas, 2015; Smalley et al., 2010). This study suggests that rural women are engaging in multiple unhealthy behaviors that increase their risk for cancer. Given that cancer mortality is high in rural areas (Singh, Williams, Siahpush, & Mulhollen, 2012), MHBC interventions that focus on the common shared risk factors may serve as a valuable and necessary service to reduce unhealthy behaviors and improve cancer prevention strategies in this group of women. Moreover, these interventions can address multiple behaviors among women who have limited time and other resources to participate, increasing the likelihood of their success. To date, few MHBC interventions have been piloted in rural areas that target women. Our findings suggest this is a significant gap in rural cancer prevention and care that should be addressed immediately to help stem the rising tide of cancer and rural cancer disparities in the U.S.

Public health nurses can and should continue their efforts in promoting healthy lifestyles among their patients in an effort to prevent cancer and reduce cancer risk in rural women. Given significant cancer screening disparities exist in rural populations (Cole, Jackson & Doescher, 2012), it is imperative that nurses promote not only screening behaviors but protective lifestyle behaviors such as a healthy diet, physical activity and being tobacco free. Nurses should be aware that risk behaviors tend to occur in clusters and therefore should plan community intervention strategies appropriately. With their broad knowledge of health practice and counseling skills, public health nurses are also perfectly positioned to provide lifestyle counseling to their patients on an individual level and capitalize on teachable moments to address multiple cancer risk behaviors. Given that rural women face many barriers to care, addressing multiple behaviors at once is an efficient use of time and

resources and may aid in significantly reducing cancer risk and associated disparities to improve health for rural U.S. women.

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Table 1

Characteristics of the Entire Sample (n=399)

Demographic	
Age M (SD)	32.0 (8.5)
Marital Status n (%) *	
Married/Partnership	266 (66.8)
Education n (%)	
High school or above	289 (73.0)
Race/Ethnicity n (%)	
White	254 (63.7)
Black	25 (6.3)
Hispanic	76 (19.1)
Other	44 (11.0)
Income n (%) *	
$4,999–19,999	193 (53.0)
$20,000–39,999	136 (37.4)
$40,000+	35 (9.6)
Health Related Factors	
Overall Health n (%) *	
Excellent	30 (7.5)
Very Good	86 (21.6)
Good	173 (43.5)
Fair	88 (22.1)
Poor	21 (5.3)
Diabetes n (%)	
Yes	24 (6.0)
Heart Disease n (%)	
Yes	10 (2.5)
Depression n (%)	
Yes	139 (38.5)
Regular Health Care Provider n (%)	
Yes	273 (68.4)
Number of Risk Factors	
n (%)	
0	90 (22.6)
1	168 (42.1)
2	110 (27.6)
3	31 (7.8)

Note.

* notes variables with missing cases

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Table 2

Bivariate Association Between the Risk Behavior Group and Demographic and Health Related Variables

Variables	Risk Behaviors				*P*-values			
	0	1	2	3	2 degree Omnibus	Pairwise 0 vs. 1	0 vs. 2	0 vs. 3
	n=90	*n*=168	*n*=110	*n*=31				
Demographic factors								
Age M (SD)	31.6 (8.2)	32.3 (8.8)	32.1 (8.5)	30.8 (7.2)	0.81			
Marital Status n (%)β								
Married/Partnership	62 (69.6)	113 (67.2)	68 (61.8)	23 (74.2)	0.51			
Education n (%)								
High school or above	73 (82.8)	113 (67.6)	78 (70.9)	25 (80.7)	0.051			
Race/Ethnicity n (%)								
White	62 (68.9)	101 (60.1)	70 (63.6)	21 (67.8)	0.63			
Black	2 (2.2)	8 (4.8)	10 (9.1)	5 (16.1)				
Hispanic	16 (17.8)	41 (24.4)	18 (16.4)	1 (3.2)				
Other	10 (11.1)	18 (10.7)	4 (10.9)	4 (12.9)				
Income n (%)β								
$4,999–19,999	27 (32.9)	85 (55.6)	60 (59.4)	21 (75.0)	0.03*	0.008*	0.01*	0.03*
$20,000–39,999	44 (53.7)	56 (36.6)	31 (30.7)	5 (17.9)				
$40,000+	11 (13.4)	12 (7.8)	10 (9.9)	2 (7.1)				
Health Related Factors								
Overall Health n (%)β								
Excellent	9 (10)	13 (7.7)	6 (5.5)	2 (6.8)	0.0001*	0.001*	0.08*	0.0002*
Very Good	33 (36.7)	31 (18.5)	21 (19.1)	1 (3.3)				
Good	37 (41.1)	77 (45.8)	46 (41.8)	13 (43.3)				
Fair	9 (10)	42 (25)	24 (21.8)	13 (43.3)				
Poor	2 (2.2)	5 (3)	13 (11.8)	1 (3.3)				
Diabetes n (%)								
Yes	5 (5.5)	6 (3.5)	9 (8.2)	4 (12.9)	0.18			
Heart Disease n (%)								

Variables	**Risk Behaviors**				***P*-values**			
	0	**1**	**2**	**3**	**2 degree**	**Pairwise**		
					Omnibus	**0 vs. 1**	**0 vs. 2**	**0 vs. 3**
	***n*=90**	***n*=168**	***n*=110**	***n*=31**				
Yes	0 (0)	6 (2.3)	3 (2.7)	1 (3.3)	0.36			
Depression n (%)								
Yes	18 (20.0)	56 (33.3)	50 (45.5)	15 (48.4)	0.001 *	0.025 *	0.0002 *	0.0004 *
Regular Health Care Provider n (%)								
Yes	59 (65.5)	114 (67.8)	76 (69.1)	24 (77.4)	0.67			

Notes.

* significance p<.05;

β notes variables with missing cases