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Fatalistic Cancer Beliefs and Information Seeking in Formerly Incarcerated African-American and Hispanic Men: Implications for Cancer Health Communication and Research

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Abstract

African-American and Hispanic men are disproportionately affected by cancer experiencing higher rates of cancer-related morbidity and mortality for many cancers (but not all). These challenges may be magnified for a subpopulation of African-American and Hispanic men who have been incarcerated. A survey assessing demographics, incarceration experience, psychosocial, behavioral, and cancer health information seeking was administered to 230 previously incarcerated men aged 35 years and older. Data analysis was performed to assess the association between fatalism, perceived susceptibility, and health information seeking in this population. This study revealed the following: the majority of the participants (68.7%) held the fatalistic belief: “When I think of cancer, I automatically think of death.” Second, the fatalistic belief, “There’s not much you can do to lower your chances of getting cancer,” is more prevalent among those who perceived a higher risk of developing cancer. Third, older participants (those between 55 and 70 years old) and widowed are less likely to think of death when they think of cancer. In addition, those who use the Internet to look for health or medical information (i.e., engaging in health information seeking) are less likely to agree with the fatalistic belief: “It seems like everything causes cancer.” Given the high incidence of certain cancers among African-American and Hispanic men and the vulnerability of those involved in the criminal justice system, our findings highlight the importance of understanding perceived susceptibility to cancer, fatalistic beliefs about cancer, and information seeking in formerly incarcerated men.

Introduction

Cancer is the second most common cause of death in the United States, accounting for nearly one out of every four deaths (American Cancer Society, 2015a). The American Cancer Society estimates that, in 2015, about 1.7 million new cases of cancer were

diagnosed, and about 589,430 Americans, or 1,620 people per day, died of cancer (American Cancer Society, 2015a).

Race/ethnicity and cancer

Race, ethnicity, and poor socioeconomic status are highly correlated with cancer risk and poor cancer health outcomes (Freeman, 2004; Giuliano et al., 2000; Hayward, Crimmins, Miles, & Yu, 2000; Zhao, 2010). Substantial differences in cancer incidence and death rates among racial and ethnic minority groups have been documented, especially among African-Americans and Hispanic men (American Cancer Society, 2013; Flores et al., 2008; Institute of Medicine, 1999; Siegel, Miller, & Jemal, 2015). For most cancers, African-Americans have the highest death rate and the shortest survival of any racial and ethnic minority group in the United States (American Cancer Society, 2013). About one in two African-American men will die from cancer (American Cancer Society, 2013). Additionally, cancer is the leading cause of death among Hispanics; the probability of dying from cancer is one in five for Hispanic men (Siegel et al., 2015). About one in three Hispanics will be diagnosed with cancer in their lifetime (American Cancer Society, 2015c).

Incarceration and cancer

The criminal justice system may be contributing to the cancer risk and poor health of incarcerated men due to a lack of effective tobacco control policies across all prison facilities (Binswanger et al., 2014; Matthew, Elting, Cooksley, Owen, & Lin, 2005). Matthew and colleagues (2005) found cancer diagnoses in this population were associated with higher mortality rates than the diagnoses of cancer patients from the general population after assessing the cancer diagnoses of 1,807 incarcerated individuals. Lung carcinomas were the most common malignancy among the participants (443 patients), followed by non-Hodgkin lymphoma and carcinomas of the oral cavity and pharynx. The majority of the Surveillance, Epidemiology, and End Results (SEER) participants who were diagnosed with these cancers had histories of tobacco use.

The fact that incarceration impacts the cancer health status of minority men is significant because of the large size of the prison and probation population in the United States. In the United States at the end of 2014, there were approximately 5.1 million males under correctional supervision, including those on probation or parole, or in jail or prison (Bureau of Justice Statistics, 2015a). Of these, an estimated 3.6 million were on probation or parole, with African-Americans and Hispanics accounting for almost 60% of this population (Bureau of Justice Statistics, 2015b). Of the approximately 1.4 million men who were imprisoned: African-American men accounted for 37%, Whites accounted for 32%, and Hispanics accounted for 22% of this population (Bureau of Justice Statistics, 2015b). Part of the reason that incarcerated racial and ethnic minority men may have poorer cancer health outcomes than their peers may be attributed to the inadequate healthcare provided to them during and after their incarceration, contributing to their vulnerability as a population (Wilper, Woolhandler, Boyd, Lasser, McCormick, Bor & Himmelstein, 2009). While correctional facilities are required to provide health care services to inmates, many lack the staffing and resources to provide adequate health-care (Underhill, Dumont, & Operario, 2014). In addition, multiple reports indicate that approximately 60–80% of inmates in the

United States have histories of tobacco use (Binswanger et al., 2007; Valera, Cook, Darout, & Dumont, 2014), and over 80% of individuals involved in the criminal justice system report histories of substance use, including alcohol, marijuana, and crack cocaine (Travis, Western, & Redburn, 2014). This is concerning, considering tobacco; marijuana, crack cocaine, and alcohol are associated with an increased risk of certain cancers. Moreover, men who have been incarcerated have not generally been the focus of cancer health studies, despite the strong need for further investigation of this population (Matthew et al., 2005). Because of this, and the scant information available about cancer health disparities in this population, an urgent need exists for improving cancer prevention for people involved in the criminal justice system.

Perceived susceptibility and fatalistic beliefs about cancer

Exacerbated risk and increased cancer incidence impact are affected by individuals' beliefs about cancer. How individuals perceive their cancer risk is important to understanding their preventive and information-seeking behaviors. Beliefs surrounding cancer and perceived susceptibility to cancer can both positively and negatively influence whether individuals seek information, screening, diagnosis, and treatment for cancer (Kaphingst, Lachance, & Condit, 2009; Wigfall & Friedman, 2016).

Particularly relevant are fatalistic beliefs. Fatalism is defined as the belief that external forces control events and outcomes (Kobayashi & Smith, 2016). The affect of cancer fatalism is significant (Beeken, Simon, Von Wagner, Whitaker, & Wardle, 2011; Powe & Finnie, 2003), because perceived fatalistic beliefs about one's health may create barriers to individuals seeking out proper prevention and treatment methods for disease. Such beliefs might include a conviction that everything causes cancer or that cancer cannot be prevented. Those who hold cancer fatalistic beliefs are less likely to seek out information about cancer (Kobayashi & Smith, 2016). Fatalistic beliefs are also associated with a decreased likelihood of engaging in preventive health behaviors (Niederdeppe & Levy, 2007).

Fatalistic cancer beliefs disproportionately affect African-Americans and Hispanics. Using data from the first wave of the National Cancer Institute's Health Information National Trends Survey (National Cancer Institute, n.d.), Niederdeppe and Levy (2007) report that fatalistic cancer beliefs about cancer prevention are prevalent among Hispanics and African-Americans, the poor, and the less educated. As stated above, racial and ethnic minority men are more likely to be involved with the criminal justice system and, although there is limited data on the subject, research shows those involved with the criminal justice system also have low levels of educational attainment (Bureau of Justice Statistics, 2003; James, 2015).

Health information seeking

Cancer information seeking—Cancer information seeking enables individuals to engage in preventive, diagnostic, and control behaviors. Individuals may seek information from their physicians, public health clinics, family members, friends, or the Internet and social media sites. Notably, the Internet and social media sites are becoming increasingly powerful resources for locating and sharing information about health. While current research suggests cancer knowledge and higher rates of information seeking may reduce cancer risk-

taking behaviors (Hay, Orom, Kiviniemi, & Waters, 2015), only 53% of Americans report searching for information about cancer (Kobayashi & Smith, 2016).

Cancer information seeking in incarcerated minority men—This disappointing number may be amplified in African-American and Hispanic men. Significant cancer incidence and mortality disparities among racial and ethnic minority groups reflect obstacles to information about prevention, early diagnosis, and appropriate treatment of cancer (Flores et al., 2008). A number of factors influence the likelihood of African-American and Hispanic men engaging in preventive health behaviors, including educational level. Racial and ethnic minority men and those with lower levels of education are the least likely to seek information about cancer (Kobayashi & Smith, 2016), highlighting health literacy, cognition, and education as factors impacting information seeking, such as cancer information seeking and cancer fatalism (Von Wagner, Knight, Steptoe, & Wardle, 2007).

The literature suggests that seeking health information online is negatively associated with fatalistic cancer beliefs about cancer prevention (Lee & Chae, 2016). There is a potential for online cancer health information-seeking behaviors to influence fatalistic cancer beliefs, and vice versa. Similarly, fatalism has been linked with the avoidance of cancer-related information, suggesting those with fatalistic beliefs are less likely to seek health information and may even be less attentive to communication efforts than those without fatalistic beliefs (Miles, Voorwinden, Chapman, & Wardle, 2008). Additionally, information seeking has been found to be positively associated with knowledge about cancer and screening for specific cancers, including colon and prostate cancers (Shim, Kelly, & Hornik, 2006). As such, understanding the relationship between fatalistic beliefs and information seeking is important to understanding preventive and screening behaviors among African-American and Hispanic men (Anker, Reinhart, & Feeley, 2011).

Despite demonstrated health disparities and an increasing need for further investigation, we know very little about the cancer health of African-American and Hispanic men who have been incarcerated. Gaps in cancer health research reflect larger challenges to acquire knowledge about racial and ethnic minority men such as inequality and discrimination (Srinivasan et al., 2015), and these challenges are magnified for the hardly reached subpopulation of men who have been incarcerated. Because of this and the scant information available about cancer health disparities in this population, an urgent need exists for improving cancer prevention for people involved in the criminal justice system.

Aims of present study

Given that little is known about formerly incarcerated men's fatalistic beliefs about cancer, the present study examines the following relationships and associations in formerly incarcerated African-American and Hispanic men in New York City. The research questions for this study were the following: (1) What is the association between fatalistic cancer beliefs, demographic characteristics of African-American and Hispanic men with criminal justice histories, and their health status?; (2) What is the probability of agreeing with each fatalistic belief given these different factors?; and (3) What is the relationship between fatalistic cancer beliefs (and perceived susceptibility to cancer) and health information

seeking and other preventative behaviors in formerly incarcerated African-American and Hispanic men?

Methods

The data used for this analysis were collected as part of a larger study that examined cancer health disparities among 259 African-American and Hispanic men with substance abuse histories (Valera et al., 2014). The present study recruited men under parole or probation, aged 35 years and older. The inclusion criteria included the following: (1) self-identify as a male, (2) aged 35 years or older, (3) released from jail or prison to the Bronx, New York, (4) currently under parole or probation, (5) never been diagnosed with cancer or other chronic disease requiring intensive or ongoing care, (6) report substance abuse history, and (7) able to provide informed consent.

Detailed information about the data collection procedures of the present study have been reported elsewhere (Valera et al., 2014). The study was approved by Columbia University's Institutional Review Board, and a Federal Certificate of Confidentiality was obtained. The present study focuses on cancer fatalistic beliefs, perceived susceptibility to cancer, and health information seeking among men who were incarcerated in a New York state prison or New York City jail.

Measures

As part of the larger study, participants completed the fatalistic belief measure from the Health Information National Trends Survey (HINTS) developed by the National Cancer Institute. None of the HINTS measures had been used for men with criminal justice backgrounds prior to the present study. Other notable measures in the present study included sociodemographics and the following standardized instruments: Brief Symptom Inventory, Alcohol Use Disorders Identification Test, Group-Based Medical Mistrust Scale, Social Support Scale, and General Health Questionnaire, among others. For the purpose of the present study, we analyzed the data related to health information seeking, cancer fatalism, certain sociodemographic questions, and perceived susceptibility to cancer.

Demographic information—Demographic information was assessed using a 23-item measure comprised of fixed choice statements and fill-in-the blank questions. Participants completed items that included the following: age, race/ethnicity, incarceration status (in jail, prison, parole or probation), education (number of years), annual income, marital status (single, married, divorced or separated, widowed), and employment status (employed, or unemployed, disability).

Cancer fatalistic beliefs—The fatalistic belief items were derived from the HINTS surveys and used in a prior study that examined the associations between cancer fatalism and prevention behaviors (Niederdeppe & Levy, 2007). Three fatalistic cancer beliefs were examined in the study. Participants were asked to report their level of agreement to three statements of fatalistic cancer beliefs: (1) “*It seems like everything causes cancer*”; (2) “*There’s not much you can do to lower your chances of getting cancer*”; and (3) “*When I think of cancer, I automatically think of death*.” Each item was measured with a four-point

Likert scale with answers ranging from the sentiment, “strongly agree” to “strongly disagree.” Using the guidelines offered by Wright and Linacre (1992) for collapsing Likert scales, we created a histogram that visually displayed the frequency for each fatalistic cancer belief scale and determined which categories made sense to collapse to avoid creating artificial categories. Thus, the items were dichotomized into *agreement*, which included the responses *strongly agree* and *somewhat agree*, and *disagreement*, which included the responses *strongly disagree* and *somewhat disagree* (Kobayashi & Smith, 2016; Niederdeppe & Levy, 2007).

Perceived susceptibility to cancer—Participants were asked to rate their perceived chances of getting cancer in the future. Perceived susceptibility to cancer was measured by the following two questions: (1) “*How likely do you think it is that you will develop cancer in the future? Would you say your chance of getting cancer is?*” and (2) “*How often do you worry about getting cancer?*”. Participants responded to the first question in a five-point Likert-type scale ranging from “very low” to “very high,” and the responses were categorized into “low,” “moderate,” and “high”; the second question was measured by a four-point Likert-type scale containing “rarely or never,” “sometimes,” “often,” and “all the time,” and the later two categories were combined to “often/all the time” for the purpose of statistical analysis and based on guidelines derived from Wright & Linacre, 1992).

Health information seeking and social media—The health information-seeking behavior and access to social media sites were measured by three separate single items: (1) “*Have you ever looked for health or medical information on the Internet?*”; (2) “*Before your last incarceration, did you have access to any social media sites (e.g., Facebook, Myspace, Flipboard, Twitter, etc.)?*”; and (3) “*Do you currently have access to any social media sites? (e.g., Facebook, Myspace, Flipboard, Twitter, etc.)?*”. Participants were asked to answer “yes” or “no” to these three questions.

Perceived health status—Participants were asked to rate their current overall health status using a five-point Likert scale. The scale ranged from “very poor” to “very good”. For the purpose of data analysis, the responses were collapsed into “very poor/poor,” “average,” and “good/very good”. Based on the histogram, it made sense to collapse several of the responses because some of the categories contained very little observations and therefore collapsing the items facilitated our analysis only (Wright & Linacre, 1992).

Statistical analysis

Descriptive statistics were used to present the participants’ socioeconomic characteristics and other factors, including perceived susceptibility to cancer. Cross tabulation analysis was performed to assess the association between each fatalistic belief and demographic variables, health status, health information-seeking pattern, perceived susceptibility to cancer, etc. Several binary logistic regression models were established using each fatalistic belief as dependent variables and examined variables as predictors to estimate the probability of agreeing with each fatalistic belief. All statistical analysis was performed using SAS 9.4, and the level of significance for the logistic regression models was set at 0.05 (5%).

Results

Initially, the sample included 259 formerly incarcerated men; however, 12 men reported their race/ethnicity as “other” without any specification and were excluded from further data analysis, and 17 observations with missing values were also excluded. The final sample was comprised of 230 men of diverse incarceration status and demographic characteristics.

Of these, 140 (60.87%) men were incarcerated in a New York state prison, and 90 (39.13%) men had been incarcerated in a New York City jail. Nearly half of the sample (47.83%) self-identified as Hispanic, and the other half (52.17%) self-identified as African-American. Close to half of the participants (48.7%) were between 45 and 54 years old and about one-third (35.65%) were between 35 and 44 years old. The majority of the men had never married (63.04%), had less than a high school education (62.61%), reported an annual of less than \$10,000 (83.48%), and were unemployed or disabled (87.39%). The sociodemographic characteristic of the sample is displayed in Table 1.

Health information seeking and social media

The Internet can be a powerful resource for locating and sharing important information about health (Ventola, 2014). In terms of Internet use (specifically, seeking health or medical information on the Internet and accessing social media sites, where individuals can acquire and share health information), the majority of the men in this study (79.13%) indicated that they had never searched for health or medical information on the Internet. Similarly, before their incarceration, less than one-fifth (16.52%) of them had access to social media sites (i.e., Facebook, Twitter); however, after their release, more of them (39.13%) started to have such access (Table 1).

Perceived susceptibility to cancer and health status

We asked participants about their beliefs and the likelihood of developing cancer in the future. More than half of the men (58.70%) perceived their chances of getting cancer in the future as low, while 26.09% of them perceived their risk as moderate, and 15.22% thought they were highly likely to develop cancer in the future. Relatedly, the majority (74.34%) of the participants reported that they rarely or never worried about getting cancer, 14.78% of them worried about getting cancer sometimes, and only 10.87% of the men worried about getting cancer often or all the time.

In terms of how they perceived their health status to be, more than half of participants (56.09%) were satisfied with their current health status, and nearly one-third of them (33.48%) perceived their current health status as average. Approximately, 10.43% perceived their current health status as poor or very poor.

Fatalistic cancer beliefs

The three fatalistic beliefs were weakly correlated and the Spearman correlation coefficients were 0.09427 (belief 1 vs. belief 2, $P = 0.1542$), 0.24499 (belief 1 vs. belief 3, $P = 0.0002$), and 0.00864 (belief 2 vs. belief 3, $P = 0.8964$). Cronbach's coefficient alpha for the three

items was 0.28, indicating a relatively low internal consistency among the three items and that they should not be used as a scale.

Participants were asked whether they agreed or disagreed with statements designed to assess fatalistic beliefs. Nearly half of the men (48.71%) agreed with the statement, “*It seems like everything causes cancer* (belief 1),” and nearly half of them (51.30%) disagreed. Interestingly, while the majority of the participants (73.04%) disagreed with the statement, “*There’s not much you can do to lower your chances of getting cancer* (belief 2),” the majority of the respondents (68.7%) held the third fatalistic, “*When I think of cancer, I automatically think of death*” (Table 1).

The relationship between each fatalistic belief and other participant characteristics is presented in Table 2 (proportion of agreement with each fatalistic belief) and Table 3 (odds ratio). Fatalistic belief 1 (“*It seems like everything causes cancer*”) was significantly associated with the participants’ pattern of health information seeking. Those who had ever looked for health or medical information on the Internet tended to be less likely to agree with fatalistic belief 1, “*It seems like everything causes cancer*” (OR = 0.502, $P < 0.005$). On the other hand, fatalistic beliefs 1 (“*It seems like everything causes cancer*”) and 3 (“*When I think of cancer, I automatically think of death*”) were significantly influenced by participants’ perceived chances of developing cancer in the future. Those who perceived having a higher risk of cancer were more likely to believe that it seemed everything causes cancer (belief 1, OR = 2.672, $P < 0.01$) or were more likely to think of death automatically when they thought of cancer (Belief 3, OR = 3.333, $P < 0.01$). Comparatively, participants who worry about getting cancer were more likely to believe that there were not much they could do to lower the chances of getting cancer (Belief 2, OR = 2.339, $P = 0.0534$) and think of death automatically when they thought of cancer (Belief 3, $P < 0.05$). Interestingly, age and marital status were other factors that influenced fatalistic belief 3 (“*When I think of cancer, I automatically think of death*”). Older participants (those between 55 and 70 years old) (OR = 0.394, $P < 0.005$) and widowed (OR = 0.218 $P < 0.005$) were less likely to think of death automatically when they thought of cancer.

Discussion

This study of formerly incarcerated African-American and Hispanic men revealed three important findings regarding their perceived fatalistic cancer beliefs. First, the majority of the participants (68.7%) held the fatalistic belief, “*When I think of cancer, I automatically think of death*.” Second, the fatalistic belief, “*There’s not much you can do to lower your chances of getting cancer*,” is more prevalent among those who believed that they had higher odds of developing cancer. Third, participants older in age (ages 55–70) and widowed were less likely to agree with fatalistic belief three (“*When I think of cancer, I automatically think of death*”).

The problem of cancer fatalism in formerly incarcerated minority men

Findings with respect to both fatalistic cancer beliefs 1 and 2 show the lack of confidence formerly incarcerated ethnic minority men have in returning to health after developing cancer. These findings are consistent with previous HINTS research among those with low

education, Hispanics, African-Americans, and low-income populations (Viswanath et al., 2012). Though our findings are consistent with previous HINTS research, it is one of the first studies to specifically examine the relationship between information seeking and the cancer fatalistic beliefs of formerly incarcerated African-American and Hispanic men. Because of this, we are unable to determine whether cancer fatalistic beliefs have increased or decreased in this population.

Greater information seeking leads to decreased cancer fatalism

Our findings with respect to fatalistic belief 1 that most formerly incarcerated African-American and Hispanic men in the study strongly associated cancer with death emphasize the need to educate this population about cancer. As stated above, information seeking is an excellent mechanism for assisting individuals in learning more about the real possibilities of recovery from cancer. In our study, those who sought information online were less likely to agree with fatalistic belief 1. Previous research found information seeking was positively associated with knowledge about cancer, healthy lifestyle choices, and screening for specific cancers (Shim, Kelly, & Hornik, 2006).

Improving rates of information seeking in the formerly incarcerated

In light of previous research and despite tremendous progress in the accessibility and availability of cancer information by way of the Internet (Lee; 2008; Sarasohn-Kahn, 2008), hardly reached populations and socially disadvantaged groups, especially those who may have criminal justice backgrounds, demonstrate low access to and use of online health information that has the potential to impact, or even change, fatalistic cancer beliefs. Improving access to computers and the Internet in jails and prisons and making this technology available in probation and parole offices may be one way to increase information seeking in this population. Additionally, training corrections staff and probation and parole officers about educating ethnic and minority individuals about the resources available to them is an excellent way to encourage information seeking.

Older formerly incarcerated men and fatalistic cancer beliefs

These finding highlights the importance of further examining older formerly incarcerated men's perceived cancer fatalistic beliefs, as their experiences with the criminal justice system and emotional reactions toward the threat of cancer may be different than younger men with criminal justice backgrounds. The absence of this topic in the cancer literature is significant, and further research is needed.

These findings confirm that we know very little about the causal relationship between fatalistic beliefs, information seeking, and prevention behaviors among formerly incarcerated African-American and Hispanic men in the United States. As the population of men with criminal justice backgrounds continues to grow and age, it is possible that new communication strategies to increase cancer literacy and information seeking to ultimately encourage cancer screenings and preventive behaviors may be necessary to reduce cancer health disparities.

Limitations and implications for practice

This study has several limitations. The results from the cross-sectional survey limits our ability to speak to casual inferences of the associations found in the present study. A longitudinal study that further examines cancer fatalism, health information seeking, and perceived susceptibility to cancer across the criminal justice spectrum with a diverse sample is needed to help sort out these associations and possibly make casual inferences. In addition, this study provides secondary analysis and is restricted to the previously collected data. Since only purposive sampling was employed, selection bias may be a potential threat to external validity, which further limits the generalizability of our results. Also, only including men 35 or older limits the generalizability of the study findings.

Another key limitation is the lack of comparison data about fatalistic cancer beliefs and information-seeking behaviors among adults in the general population. While this study suggests fatalistic cancer beliefs are high among this very specific population, we are unable to determine whether there is a difference between this population and the general population. As such, we are unable to determine the extent to which communication and education strategies targeting previously incarcerated minority men should differ than those used in the general adult population in order to increase information seeking and preventive behaviors.

Implications for research

Despite those limitations, we believe that understanding fatalistic beliefs about cancer prevention, health information seeking, and perceived susceptibility to cancer among men who have been incarcerated has important implications for including subpopulations in cancer control research (Srinivasan et al., 2015). Future research should examine whether health information seeking in this population can mitigate beliefs of cancer fatalism and improve beliefs about cancer health.

Conclusion

Moving forward, involving the criminal justice system in cancer health efforts may help to reduce cancer risk and improve cancer outcomes among this vulnerable population. Instructing individuals under community supervision about ways in which to access health information, such as using the Internet and social media sites, may be one communication strategy to begin to improve cancer health outcomes. Until these needs are met, the ability to address cancer health disparities among men with incarceration histories will remain insufficient, placing thousands of men at an increase risk of developing and dying from cancer.

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Table 1Descriptive statistics of the pre-incarcerated African and Hispanic men ($N = 230$). *

Variables	Percentage
<i>Race/Ethnicity</i>	
African American	52.17
Hispanic	47.83
<i>Income</i>	
\$0–\$10,000	83.48
>\$11,000	16.52
<i>Marital Status</i>	
Single, never married	63.04
Married	16.96
Divorced or separated	16.09
Widowed	3.91
<i>Education</i>	
Less than high school	62.61
High school/GED	25.65
Trade school/some college	9.57
College degree	2.17
<i>Employment</i>	
Employed	9.13
Unemployed/Disabled	87.39
Other	3.48
<i>Age</i>	
35–44 years old	35.65
45–54 years old	48.7
55–70 years old	15.65
<i>Incarceration</i>	
Prison	60.87
Jail	39.13
<i>Information Seeking and Social Media Accessing</i>	
<i>Looked for health or medical information on Internet</i>	
No	79.13
Yes	20.87
<i>Access to Social Mediate Site (Pre-Incarceration)</i>	
No	83.48
Yes	16.52
<i>Access to Social Mediate Site (Post-Incarceration)</i>	
No	60.87
Yes	39.13
<i>Perceived Susceptibility to Cancer and Health Status</i>	
Perceived chance of developing cancer	

Variables	Percentage
Low	58.7
Moderate	26.09
High	15.22
Frequency of worrying about developing cancer	
Rarely or Never	74.35
Sometimes	14.78
Often/All the time	10.87
Self-rated current health status	
Very poor/Poor	10.43
Average	33.48
Good/Very good	56.09
Fatalistic Cancer Beliefs	
Belief 1: It seems like everything causes cancer	
Agree	48.7
Disagree	51.3
Belief 2: There's not much you can do to lower your chances of getting cancer	
Agree	26.96
Disagree	73.04
Belief 3: When I think of cancer, I automatically think of death	
Agree	68.7
Disagree	31.3

* Cases with unspecified race/ethnicity were excluded.

* All the cases with missing values were excluded.

Table 2

Proportions of agreement with cancer fatalistic belief by participants socioeconomic characteristics and other factors ($N = 230$).

	Agreement (%)		
	Belief 1	Belief 2	Belief 3
Overall	48.7	26.96	68.7
Sociodemographic characteristics			
Race/ethnicity			
African-American	50.83	22.5	68.33
Hispanic	46.36	31.82	69.09
p-value	0.4981	0.1116	0.9015
Income			
\$0–\$10,000	48.44	26.04	69.27
>\$11,000	50	31.58	65.79
p-value	0.8602	0.4822	0.6724
Marital Status			
Single, never married	48.28	25.52	69.66
Married	43.59	28.21	64.1
Divorced or separated	62.16	27.03	78.38
Widowed	22.22	44.44	33.33
p-value	0.1312	0.6636	0.0632
Education			
Less than high school	49.31	29.17	72.92
High school/GED	47.46	25.42	61.02
Trade school/some college	45.45	22.73	63.64
College degree	60	0	60
p-value	0.939	0.4802	0.3549
Employment			
Employed	47.62	33.33	71.43
Unemployed/Disabled	47.26	26.87	68.16
Other	87.5	12.5	75
p-value	0.0822	0.5263	0.8835
Age			
35–44 years old	43.9	23.17	78.05
45–54 years old	49.11	29.46	65.18
55–70 years old	58.33	27.78	58.33
p-value	0.3499	0.6166	0.0556
Incarceration			
Prison	50.71	27.86	65
Jail	45.46	25.56	74.44
p-value	0.44	0.13	0.7
Information Seeking and Social Media Accessing			

	Agreement (%)		
	Belief 1	Belief 2	Belief 3
Looked for health or medical information on Internet			
No	52.2	28.02	69.23
Yes	35.42	22.92	66.67
p-value	0.0385 *	0.4783	0.7333
Access to Social Mediate Site (Pre-Incarceration)			
No	49.48	27.08	67.19
Yes	44.74	26.32	76.32
p-value	0.5931	0.9224	0.2676
Access to Social Mediate Site (Post-Incarceration)			
No	52.14	28.57	67.86
Yes	43.33	24.44	70
p-value	0.1921	0.4912	0.7323
Perceived Susceptibility to Cancer and Health Status			
Perceived chance of developing cancer			
Low	39.26	27.41	60
Moderate	63.33	31.67	83.33
High	60	17.14	77.14
p-value	0.0028 *	0.3009	0.0026 *
Frequency of worrying about developing cancer			
Rarely or Never	47.73	25.15	64.33
Sometimes	50	23.53	79.41
Often/all the time	56	44	84
p-value	0.7126	0.124	0.0484 *
Self-rated current health status			
Very poor/poor	58.33	37.5	83.33
Average	53.25	24.68	61.04
Good/very good	44.19	26.36	70.54
p-value	0.2752	0.4534	0.0956

*
p < 0.005.

^
p < 0.001.

Table 3

Association between agreement with cancer fatalistic belief by participants socioeconomic characteristics and other factors ($N = 230$)

	Agreement (OR, 95% CI)		
	Belief 1	Belief 2	Belief 3
Sociodemographic characteristics			
<i>Race/ethnicity</i>			
African-American	1.00 (reference)	1.00 (reference)	1.00 (reference)
Hispanic	0.836 (0.498, 1.404)	1.607 (0.894, 2.891)	1.036 (0.593, 1.81)
<i>Income</i>			
\$0–\$10,000	1.00 (reference)	1.00 (reference)	1.00 (reference)
>\$11,000	1.065 (0.531, 2.135)	1.311 (0.615, 2.792)	0.853 (0.408, 1.783)
<i>Marital status</i>			
Single, never married	1.00 (reference)	1.00 (reference)	1.00 (reference)
Married	0.828 (0.406, 1.687)	1.147 (0.52, 2.529)	0.778 (0.37, 1.637)
Divorced or separated	1.76 (0.84, 3.689)	1.081 (0.478, 2.445)	1.579 (0.669, 3.728)
Widowed	0.306 (0.062, 1.524)	2.336 (0.596, 9.164)	0.218 (0.052, 0.911) *
<i>Education</i>			
Less than high school	1.00 (reference)	1.00 (reference)	1.00 (reference)
High school/GED	0.929 (0.506, 1.703)	0.828 (0.416, 1.646)	0.581 (0.307, 1.102)
Trade school/some college	0.857 (0.348, 2.109)	0.714 (0.247, 2.061)	0.65 (0.253, 1.669)
College degree	1.542 (0.25, 9.507)	<0.001 (<0.001, >999.999)	0.557 (0.09, 3.461)
<i>Employment</i>			
Employed	1.00 (reference)	1.00 (reference)	1.00 (reference)
Unemployed/disabled	0.986 (0.401, 2.425)	0.735 (0.281, 1.918)	0.856 (0.317, 2.309)
Other	7.7 (0.801, 74.051)	0.286 (0.029, 2.803)	1.2 (0.187, 7.703)
<i>Age</i>			
35–44 years old	1.00 (reference)	1.00 (reference)	1.00 (reference)
45–54 years old	1.233 (0.696, 2.185)	1.385 (0.72, 2.665)	0.526 (0.274, 1.01)
55–70 years old	1.789 (0.809, 3.954)	1.275 (0.523, 3.111)	0.394 (0.169, 0.916) *
p-value			
<i>Incarceration</i>			
Prison	1.00 (reference)	1.00 (reference)	1.00 (reference)
Jail	0.813 (0.478, 1.383)	0.889 (0.488, 1.621)	1.568 (0.872, 2.822)
<i>Information Seeking and Social Media Accessing</i>			
<i>Looked for Health or Medical Information on Internet</i>			
No	1.00 (reference)	1.00 (reference)	1.00 (reference)
Yes	0.502 (0.26, 0.971) *	0.764 (0.362, 1.611)	0.889 (0.451, 1.75)
<i>Access to Social Mediate Site (Pre-Incarceration)</i>			
No	1.00 (reference)	1.00 (reference)	1.00 (reference)
Yes	0.827 (0.411, 1.663)	0.962 (0.437, 2.117)	1.573 (0.703, 3.523)
<i>Access to Social Mediate Site (Post-Incarceration)</i>			

	Agreement (OR, 95% CI)		
	Belief 1	Belief 2	Belief 3
No	1.00 (reference)	1.00 (reference)	1.00 (reference)
Yes	0.702 (0.412, 1.196)	0.809 (0.442, 1.481)	1.105 (0.623, 1.962)
<i>Perceived Susceptibility to Cancer and Health Status</i>			
Perceived chance of developing cancer			
Low	1.00 (reference)	1.00 (reference)	1.00 (reference)
Moderate	2.672 (1.425, 5.010) [^]	1.227 (0.633, 2.381)	3.333 (1.557, 7.137) [^]
High	2.321 (1.086, 4.959) [*]	0.548 (0.21, 1.427)	2.25 (0.951, 5.322)
Frequency of worrying about developing cancer			
Rarely or never	1.00 (reference)	1.00 (reference)	1.00 (reference)
Sometimes	1.11 (0.532, 2.32)	0.916 (0.386, 2.174)	2.139 (0.88, 5.199)
Often/all the time	1.414 (0.608, 3.291)	2.339 (0.988, 5.538)	2.911 (0.956, 8.87)
Self-rated current health status			
Very poor/poor	1.00 (reference)	1.00 (reference)	1.00 (reference)
Average	0.813 (0.322, 2.055)	0.546 (0.206, 1.448)	0.313 (0.098, 1.007)
Good/very good	0.565 (0.234, 1.367)	0.596 (0.239, 1.488)	0.479 (0.153, 1.495)

^{*}
p < 0.005.

[^]
p < 0.001.