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Correlates of Dominicans' Identification of Cancer as a Worrisome Health Problem

Alsacia L. Pacsi, RN, DNS, CEN, CCRN, FNP¹ and Suzanne Bakken, PhD, RN, FAAN, FACMI^{1,2}

¹Columbia University School of Nursing

²Department of Biomedical Informatics, College of Physicians & Surgeons, Columbia University

Abstract

There is a paucity of studies centering on the correlates of cancer worry among Hispanics from the Dominican Republic and the potential informatics strategies to address such worries. Data were analyzed using descriptive and correlational statistics, and logistic regression with the dependent variable of cancer worry. Independent variables for the regression were: age, gender, marital status, education, socioeconomic status, previous diagnosis of cancer, anxiety, depression, sleep disturbance, and chronic burden. Four variables significantly increased cancer worry: married marital status (OR = 1.19 [95% CI 1.01, 1.41]), younger age (OR = .992 [95% CI 0.987, 0.997]), less depression (OR = .96 [95% CI 0.94, 0.98]), and cancer diagnosis (OR = 2.12 [95% CI 1.24, 3.65]). New knowledge was generated on the contextual factors that influence these health concerns in a major Hispanic sub-group. Implications for practice, research and education are discussed.

Background

Dominicans are the fifth largest Hispanic subgroup in the United States (US), comprising 2.9% of the US Hispanic population in 2011¹. In particular, from 2000 to 2007, the Dominican population in New York City (NYC), primarily residing in Northern Manhattan (Washington Heights/Inwood), Southern Bronx, and Corona, NY, increased 13%. NYC Dominicans are considered the fastest growing Hispanic ethnic immigrant group of any city worldwide^{1, 2, 3}. There are numerous social and economic disparities in this population. For example, they are among the self-reported poorest citizens in NYC⁴ and only 56% report being proficient in English¹. Approximately 21% of Dominican residents do not have a primary healthcare provider due to lack of health insurance as compared to 15% of the US population⁵. In addition, 8% of Dominicans under 17 do not have health insurance and tend to use emergency rooms for their health care needs^{5,6}. Cancer is the primary cause of premature death in Washington Heights/Inwood⁷. Moreover, cancer has been identified among the top health concerns in studies of NYC neighborhoods with large Dominican populations^{6,8}.

As part of the Washington Heights/Inwood Informatics Infrastructure for Comparative Effectiveness Research (WICER) project, a large community survey was conducted⁹. Although less than 3% of the more than 3,000 Dominican participants reported they had been diagnosed with cancer, greater than 60% listed cancer among the three health problems that they worry about most⁹. The primary goal of the WICER study was to understand the community's health in order to improve their health. The aim of the current secondary analysis was to examine the relationships among sociodemographic variables and cancer worry.

Examining Dominicans' listing cancer among their top three concerns is important for several reasons. First, most research about cancer worry and factors it is related to in Hispanics relates to worry about recurrence, focuses on high-risk populations, or has Hispanics subgroups clustered together^{10–13}. Cancer worry has historically been defined as an emotional response such as fear and anxiety regarding the perceived threat of cancer¹⁴. However, identifying cancer among the three health problems that one worries about is not necessarily synonymous with this definition. Moreover, cancer worry has typically been measured using a variety of scales, such as the Cancer Worry Scale^{15,16}, Colon Cancer Worry scale¹⁷, the Hospital Anxiety and Depression Scale (HADS)¹⁸, and the Revised Impact Events Scale (RIES) and Intrusion Subscales^{19,20}. This indicates a lack of consistency in the measurement of cancer worry.

Second, current statistics related to disparities about cancer worry (similar to disparities in areas such as screening, diagnosis, treatment, and mortality rates), primarily reflect all Hispanics and do not specify country of origin subgroups²³. There has been research regarding cancer worry in racial and ethnic groups examining sociodemographics, acculturation, cancer screening, genetic risks, and recurrence among Caucasian, African American, Asian, and Hispanic populations, but most ethnicities in this research are viewed as homogeneous groups^{23–25}. Moreover, when research outcomes are reported for Hispanics, they are usually clustered together²⁶. Other studies have focused on the influence of cancer worry among Hispanics on participation in preventive cancer screening and examined contextual factors that would promote active participation in screening practices^{17,27,28}. While few studies have centered on specific Hispanic subgroups, these have been focused primarily on Mexicans^{29,30}. Consequently, there is a paucity of research on the correlates of cancer worry within Hispanic subgroups, resulting in a knowledge gap for these populations^{29,30}.

Third, understanding the correlates of Dominicans' listing of cancer among the top three health problems they worry about will provide essential information for targeted intervention development. It has been shown that cancer worry has increased significantly among Hispanics compared to the non-Hispanic Caucasian population in the US, pointing to a need for targeted interventions¹².

Methods

Data Collection

The study was a secondary analysis of the Washington Heights/Inwood Informatics Infrastructure for Comparative Effectiveness Research (WICER) Community Survey Data Set⁹. The original WICER survey sampled 5,938 residents, and the current study used a subsample of 3,079 of these participants.

The WICER Community Survey Data Set—The WICER Community Survey Data Set comprises data from 5,938 residents of the Northern Manhattan community of Washington Heights/Inwood. Data were collected via interview by bilingual community health workers from a convenience sample of community residents in households, businesses, at a designated community space - the Columbia Community Partnership for Health - and in the Ambulatory Care Clinics of New York-Presbyterian Hospital. The data set includes variables related to social determinants of health, health behaviors, anthropometric measures (i.e., weight, height, waist circumference), and blood pressure. Variables were measured using standardized instruments including Patient-Report Outcomes Information Systems (PROMIS) measures³¹, the Perceived Stress Scale³², and a modified version of the Patient Health Questionnaire (PHQ-9)³⁴. The interview also included an open-ended question: “What three health problems worry you the most?” Further details regarding the methods have been published⁹.

Participants

To create the analytic sample data were extracted for participants meeting the following criteria: (a) 18 years and older; (b) Dominican immigrant; (c) spoke and understood English and/or Spanish; (d) able to provide informed consent for this study; and (e) completed worrisome health problems question.

Measures

Sociodemographic information was gathered regarding age, gender, marital status, and education as reflected in Table 1. Insurance status (Medicaid: Yes or No) was used as a proxy for socioeconomic status. The independent variables of depression, anxiety, sleep disturbance, and stress were chosen based on prior literature indicating they were related to cancer worry or were important control variables.

The PROMIS Short Forms are reliable and valid measures³¹. For this study the 4-item PROMIS Short Forms were used to assess three domains - anxiety, depression, and sleep disturbance – using a 5 point Likert type scale. The raw scale scores range from 5 to 20, and are then transformed into T scores, which have a mean of 50 and a standard deviation of 10. Higher scores indicate a greater level of the construct being measured. Internal consistency (Cronbach’s alpha) for these scales in the current study ranged from adequate to excellent (Anxiety: $\alpha = .87$, Depression: $\alpha = .93$, Sleep: $\alpha = .74$).

A second measure of depression assessing formal symptoms of Major Depressive Disorder was adapted from PHQ-9 of the Primary Care Evaluation of Mental Disorders (PRIME

MD)³³. For use in the WICER survey, the time frame was changed to within the last 30 days to better align with CDC 30-day measures. Scores range from 0 to 27 with higher scores indicating more depressive symptoms. The original PHQ-9 has been shown to have adequate reliability and validity^{33,34}. Internal consistency of the modified PHQ-9 for the current sample was high ($\alpha = .90$).

The Perceived Stress Scale³² was used to assess perceived stress in 5 domains of daily life: personal health stress, stress due to the health of someone close to you, job stress, financial stress, and relationship stress. The presence or absence of stressors in these five domains was coded 1 or 0 and summed to achieve a total chronic burden score. Total chronic burden score ranged from 0 to 5, with higher scores indicating greater levels of stress. Cronbach's α was .68 in the study sample.

Identification of cancer as a worrisome health problem, the dependent variable, was assessed through an open-ended question: "What three health problems worry you the most?" If the participant listed cancer in general or a specific type of cancer, they were scored as Yes.

Analysis

Descriptive statistics were computed including means, standard deviations, skewness, kurtosis, and frequencies. Chi-square analyses (sex, marital status, education, presence of a cancer diagnosis) and *t*-tests (scale scores and age) were conducted to assess the bivariate relationships of independent variables to the dependent variable (identifying cancer as a health concern). Variables which showed bivariate associations with identifying cancer as a concern at a $p < .2$ level were selected for inclusion in a logistic regression predicting cancer worry. All variables were entered into the logistic regression using backwards stepwise entry with entry criteria of $p = .30$ to enter and $p = .25$ to remove.

Results

The sample comprised 3,079 Dominican participants (Table 1). The majority were female ($n = 2,359$, 76.6%). The average age of the sample was 52.90 years ($SD = 15.50$) with a range of 18 to 100 years old. Marital status and education level (Table 1) were widely represented. The sample was largely low income as the majority of the sample (74.3%, $n = 2,287$, 21.9% missing data) were Medicaid recipients. Seventy-seven participants (2.5%) reported having been told they had cancer.

Means and standard deviations for the scales administered in the study (Table 2) indicate relatively low levels of anxiety, depression, and stress. Sleep disturbance is slightly above the mean T-score. Approximately two thirds ($n = 1,966$, 63.85%) of the current sample listed cancer among the three health problems that they worry about the most.

Bivariate Analyses

Greater education was significantly positively associated with identification of cancer as a worry ($\chi^2 [8, N = 3,033] = 17.62, p = .02$). Examination of the categories suggested that participants with higher levels of education more often identified cancer as a worrisome health problem than did those with less education. A second chi square was run comparing

those with less than high school education to those with high school or greater education, and the relationship between greater education and cancer worry was confirmed ($\chi^2 [1, N = 3,033] = 6.21, p = .01$). Having been told that one had cancer (hereafter called cancer diagnosis) was associated with greater frequency of identifying cancer as a worrisome health problem ($\chi^2 [1, N = 3,040] = 5.56, p = .02$). There was also a trend level association between identifying cancer as a worry and marital status ($\chi^2 [4, N = 3,057] = 8.63, p = .07$). Married participants were more likely (66.6%) than divorced or separated participants (60.0%) to list cancer as a worrisome health problem (66.6%). There were no significant associations between identifying cancer as a worry and gender ($\chi^2 [2, N = 3,063] = 0.78, p = .68$) or Medicaid status ($\chi^2 [1, N = 2,410] = 0.16, p = .69$).

Independent sample *t*-tests were conducted to determine whether listing cancer as a concern was associated with age, anxiety, depression, sleep disturbance or stress (Table 3). Significant differences were found between participants who identified cancer as a worrisome health problem and those who did not on three variables: age ($p = .001$), depression ($p < .001$), and stress ($p = .005$).

Multivariate Analysis

Variables that met the criterion for inclusion ($p < .20$) in the logistic regression were age, education, marital status, cancer diagnosis, depression, and stress. Marital status was coded into two dummy variables labeled Married (1 = married and 0 = unmarried) and Divorced (1 = divorced and 0 = not divorced). Cancer diagnosis was coded such that 1 = yes and 0 = no. Education was coded as 0 = less than high school degree, 1 = high school degree or higher. Backwards entry was used and all variables were entered in the first step. Divorced marital status was removed in Step 2, and Education was removed in Step 3, leaving the variables of age, stress, depression, married marital status, and cancer diagnosis (Table 4). Of these variables, all but stress were significant individual predictors in the model. The model explained 2.3% of the variance in identifying cancer as a worry (Nagelkerke $R^2 = .023$). The Hosmer and Lemeshow goodness of fit test was not significant ($\chi^2 [8, N = 2,882] = 12.62, p = .13$) indicating a good fit of the model for the data. Those who were married (OR = 1.19 [95% CI –1.01, 1.40]) or had been told they had cancer (OR = 2.27 [95% CI –1.31, 3.93]) were more likely to identify cancer as a health problem they worried about than those who were unmarried or who had not been told they have cancer. Those with greater levels of depression were less likely to identify cancer as a worrisome health problem (OR = .96 [95% CI: 0.95, 0.98]) as were older participants (OR = .99 [95% CI .987, .997]).

Discussion

This is the first study of its kind to address the correlates of identifying cancer as a worrisome health problem in urban Hispanics of Dominican descent, by having them list the top three health problems they worried about the most, and explored the influence of not only sociodemographics but also of patient-reported outcomes including depression, anxiety, sleep disturbance, and stress.

Nearly two thirds of the participants in this study identified cancer as one of three worrisome health problems. A similar study⁸ assessed worry and perceptions related to health care at

five institutions finding that a large majority of participants ($n = 3,058$; 89.0%) self-reported the following health worries: hypertension, diabetes, cancer, weight, and heart problems. Cancer worry was ranked by the participants as one of the top four health problems the worried about the most. It is important to note that although the participants in Cottler's study were diverse, the majority self-identified as African American (51.6 %, $n = 3,058$), and all Hispanics (grouped together, regardless of national origin) made up only 16.9% ($n = 1,001$) of the sample. Thus, it is not known whether Hispanic subgroups differed in their concern about specific illnesses nor whether Dominicans participated in this study.

In the current study, identifying cancer as a worrisome health problem was found to be associated in bivariate analyses with age, education, marital status, depression, a diagnosis of cancer, and stress. Those who were younger, more educated, married, less depressed, diagnosed with cancer, or were less stressed were more likely to list cancer as a health worry. Divorced participants were less likely to list cancer.

However, in the multivariate analysis only four variables were significant correlates: age, depression, married marital status, and cancer diagnosis. Interestingly, general anxiety was not predictive of identifying cancer as a health concern. And, unlike McBride et al.¹⁷, gender was not associated with listing cancer as a concern.

Previous quantitative and qualitative studies of cancer worry have focused on those at high risk for cancer including those with family history of cancer, recurrence of illness, and often in the context of genetic risk counseling^{13,25,34–40} while the current study did not. However the above studies used participants who were North American, European Whites, and Hispanics, specifically, Mexicans, whites, Cubans, and Puerto Ricans.

New Contribution to the Literature

There continues to be a gap in the research related to the Dominican population and their high level of cancer worry. Dominican immigrants bring their cultural beliefs about health and disease prevention to the country they migrate to and this influences their participation in primary prevention and screening⁴¹, despite their expression of cancer worry. This study supports the important need to continue to conduct interdisciplinary studies in the Dominican population in an effort to gain a better understanding of their cancer worry. This in turn will enable the creation of culturally congruent strategies and interventions to increase awareness and knowledge regarding cancer, in an effort to deliver evidence-based high-quality care^{42,43}.

Nurses, in collaboration with other healthcare professionals, can use this knowledge to develop educational outreach and web-based programs designed to address Dominicans' concerns about cancer. The variables found to be significant predictors of identifying cancer as a worry, marital status, age, depression, and a diagnosis of cancer, must be taken into consideration when assessing patients in primary healthcare settings. For example, when obtaining clients' health care history medical professionals should pay particular attention to those that express cancer worry. Using this information, health care providers and educators can increase awareness by developing educational and outreach community programs that

are designed to meet the community health care needs of people who indicate that they worry about cancer.

Development of outreach and community web-based programs that are user friendly, culturally appropriate, and written at an accessible reading level in both English and Spanish may be effective in alleviating at least some worry about cancer. These web-based health education programs might increase the community's awareness and knowledge about cancer, including providing information about the nature of cancer and its genetic and environmental risk factors. The emphasis should be on increasing awareness and prevention, and on the importance of screening exams such as age appropriate breast self-examination and clinical breast exams by a health care professional⁴⁵. In addition, continued research in collaboration with the Dominican stakeholders in this community is needed to help identify existing knowledge gaps. These efforts will create programs that can address and ultimately decrease the cancer worry of this under-represented population, with the goal of empowering individuals to play a more proactive role in making informed decisions related to their health care which in turn will promote well-being⁴⁵.

Limitations and Strengths

This study had several strengths. The first is that the model derived (specifically, that cancer worry in Dominicans is associated with depression, age, married marital status, and previous diagnosis of cancer) was statistically significant. The large sample size was also a strength and contributes to the confidence in the results. Limitations of this study were the use a non-probability convenience sample of mostly low-income and female Dominicans, recruited from the Washington Heights/Inwood area of New York City, therefore, the results from this study may not be generalizable to the Dominican community as a whole nor to all Hispanics. In addition, only a small amount of variance related to listing cancer as a worry was explained, indicating that other, unknown factors also play a role. More research is needed to explore these factors.

Conclusion

These findings should be utilized as the foundation to develop interdisciplinary, culturally congruent, informatics-based approaches that aim to decrease cancer worry by increasing awareness and education regarding cancer risk factors, prevention, and early detection. In addition, conducting more community participatory quantitative and qualitative research will provide insight into additional factors that fuel identification of cancer as a worrisome problem in the Dominican community residing in the Washington Heights/Inwood neighborhood of Manhattan. By both assessing and addressing the community's cancer worry researchers and stakeholders can more effectively work with this community and tailor internet-based information to address their cancer worry, and encourage them to make informed decisions and engage in more proactive health seeking behaviors.

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Table 1

Demographic characteristics of the sample

Demographic Variable	<i>n</i> (%)
Marital Status ^a	
Married	1012 (32.9)
Unmarried, Living with Partner	105 (3.4)
Single	962 (31.2)
Divorced or Separated	753 (24.5)
Widowed	225 (7.3)
Education ^b	
Never went to school	92 (3.0)
8th Grade or Less	1095 (35.6)
Some High School	509 (16.5)
High School Graduate	616 (20.0)
Some College	330 (10.7)
Associates Degree	137 (4.4)
Bachelor's Degree	228 (7.4)
Master's Degree	21 (0.7)
Doctoral Degree	5 (0.2)

^a22 (0.7%) subjects with missing data

^b46 (1.5%) subjects with missing data

Table 2

Descriptive statistics for scale scores

Independent Variable	N	Min	Max	Mean	SD
PROMIS Anxiety T score	2993	40.3	81.6	48.15	10.05
PROMIS Depression T score	2980	41.0	79.4	48.70	9.92
PROMIS Sleep Disturbance T score	2980	32.0	73.3	52.05	5.44
Chronic Burden (Stress)	2969	0.0	5.0	0.51	0.97
PHQ Depression Score	3064	0.0	27.0	1.93	4.32

Note. PROMIS = Patient-Report Outcomes Information System (Cella et al., 2010); PHQ = *Modified* Patient Health Questionnaire 9, modified from PHQ (Spitzer, Kroenke, Williams, & the Patient Health Questionnaire Study Group, 1999).

Table 3

Independent sample t-tests comparing those who reported cancer worry versus those who did not on independent variables

Variable	Reported Cancer Worry (<i>n</i> = 1966)		Did Not Report Cancer Worry (<i>n</i> = 1111)		<i>t</i>	<i>df</i>	<i>p</i>
	<i>M</i>	(<i>SD</i>)	<i>M</i>	(<i>SD</i>)			
Age	52.23	(15.34)	54.08	(15.72)	3.19	3075	.001
PROMIS Anxiety T score	47.93	(9.66)	48.54	(10.69)	1.55	2066.2	.12
PROMIS Depression T score	48.59	(9.72)	48.90	(10.28)	0.81	2113.4	.42
PROMIS Sleep Disturbance T score	52.08	(5.60)	51.99	(5.17)	-0.47	2378.5	.64
Chronic Burden	0.47	(0.93)	0.58	(1.04)	2.79	2010.2	.005
Modified PHQ-9 Depression	1.63	(3.89)	2.46	(4.95)	4.77	1881.6	<.001

Note. PROMIS = Patient-Report Outcomes Information System (Cella et al., 2010); PHQ = Modified Patient Health Questionnaire 9, modified from PHQ (Spitzer, Kroenke, Williams, & the Patient Health Questionnaire Study Group, 1999).

Table 4

Variables in the final logistic regression model with cancer worry as dependent variable

	B	SE	Wald	df	p	Odds Ratio	95% CI for Odds Ratio	
							Lower	Upper
Age	-.008	.03	9.96	1	.002	.992	.987	.997
Cancer Diagnosis	.819	.280	8.54	1	.003	2.269	1.310	3.931
Modified PHQ-9 Depression	-.037	.010	14.85	1	<.001	.964	.945	.982
Chronic Burden	-.065	.044	2.14	1	.144	.937	.860	1.022
Married	.173	.084	4.25	1	.039	1.189	1.009	1.402
Constant	1.037	.145	51.14	1	<.001	2.821	--	--

Note: Dependent variable is Cancer Worry, coded 1=worried about cancer, 0 = not worried about cancer. PHQ-9 = *Modified* Patient Health Questionnaire 9, modified from the PHQ (Spitzer, Kroenke, Williams, & the Patient Health Questionnaire Study Group, 1999). Married = dummy variable coded 1=married, 0 = not married.