

Exploring Disparities and Variability in Perceptions and Self-Reported Colorectal Cancer Screening Among Three Ethnic Subgroups of U.S. Blacks

Clement K. Gwede, PhD, MPH, RN, Claire M. William, MD, Kamilah B. Thomas, MPH, Will L. Tarver, MLS, MPH, Gwendolyn P. Quinn, PhD, Susan T. Vadaparampil, PhD, MPH, Jongphil Kim, PhD, Ji-Hyun Lee, PhD, and Cathy D. Meade, PhD, RN

Colorectal cancer (CRC) is the second leading cause of cancer deaths among American men and women, with 51,370 deaths and 142,570 new cases estimated to occur in 2010 (American Cancer Society [ACS], 2010). Trends since the early 1980s indicate that U.S. blacks have at least a 20% higher incidence, a 40% higher overall mortality, and a lower five-year relative survival rate compared to whites (ACS, 2008; Kelly, Dickinson, Degraffinreid, Tatum, & Paskett, 2007). The lower rates of survival may reflect disparities in access to and receipt of high-quality screening and treatment as well as later stage at diagnosis (ACS, 2008, 2010; Kelly et al., 2007). Early CRC is curable, and current screening guidelines are aimed at early detection or prevention through the discovery and removal of polyps before they become cancerous (ACS, 2008; Kelly et al., 2007).

Given the high rates of CRC in U.S. blacks and the recent increase in immigrants from the Caribbean and Africa, a broad question is whether the influx of adult foreign-born blacks from these and other regions of the world is likely to improve or exacerbate the already startling black-white cancer health disparities. A specific question in this article is whether disaggregation of U.S. blacks by region of birth may facilitate understanding of CRC perceptions (e.g., awareness of screening tests, perceived risk, barriers to screening) and self-reported screening behaviors among ethnic subgroups.

Background Literature

Studies disaggregating the U.S. population based on region of birth have found that foreign-born people have better general health outcomes than U.S.-born people, but as the number of years living in the United States increases, their health status begins to mirror that of U.S.-born

Purpose/Objectives: To explore perceptions of colorectal cancer (CRC) and self-reported CRC screening behaviors among ethnic subgroups of U.S. blacks.

Design: Descriptive, cross-sectional, exploratory, developmental pilot.

Setting: Medically underserved areas in Hillsborough County, FL.

Sample: 62 men and women aged 50 years or older. Ethnic subgroup distribution included 22 African American, 20 English-speaking Caribbean-born, and 20 Haitian-born respondents.

Methods: Community-based participatory research methods were used to conduct face-to-face individual interviews in the community.

Main Research Variables: Ethnic subgroup, health access, perceptions of CRC (e.g., awareness of screening tests, perceived risk, perceived barriers to screening), healthcare provider recommendation, and self-reported CRC screening.

Findings: Awareness of CRC screening tests, risk perception, healthcare provider recommendation, and self-reported use of screening were low across all subgroups. However, only 55% of Haitian-born participants had heard about the fecal occult blood test compared to 84% for English-speaking Caribbean-born participants and 91% for African Americans. Similarly, only 15% of Haitian-born respondents had had a colonoscopy compared to 50% for the English-speaking Caribbean and African American subgroups.

Conclusions: This exploratory, developmental pilot study identified lack of awareness, low risk perception, and distinct barriers to screening. The findings support the need for a larger community-based study to elucidate and address disparities among subgroups.

Implications for Nursing: Nurses play a major role in reducing cancer health disparities through research, education, and quality care. Recognition of the cultural diversity of the U.S. black population can help nurses address health disparities and contribute to the health of the community.

people (Arthur & Katkin, 2006; LaVeist, 2005; Read & Emerson, 2005; Read, Emerson, & Tarlov, 2005). Research in this area has been informed by experiences with the disaggregation of U.S. Hispanics, specifically comparing U.S.-born and Mexican-born Mexican Americans (Bradshaw & Frisbie, 1992; Franzini, Ribble, & Keddie, 2002; Goff, Ramsey, Labarthe, & Nichaman, 1994; John, Phipps, Davis, & Koo, 2005; Shah, Zhu, & Potter, 2006). A similar body of work exists among Asians and Pacific Islanders (Kwong, Chen, Snipes, Bal, & Wright, 2005; Lee-Lin & Menon, 2005), but studies are sparse among U.S. blacks. Emerging research suggests that specific subgroups of blacks remain at risk, and health-promotion efforts should focus on specific barriers of the groups in particular (Arthur & Katkin, 2006; Blanchard & Lurie, 2005).

Screening guidelines recommend that individuals at average risk for CRC should engage in one or a combination of the following screening strategies: (a) annual fecal occult blood testing (FOBT), (b) flexible sigmoidoscopy every five years, (c) double-contrast barium enema every five years, or (d) colonoscopy every 10 years (ACS, 2010; Pignone, Rich, Teutsch, Berg, & Lohr, 2002; U.S. Preventive Services Task Force, 2002). However, usage of screening is poor in the general population, with only about 45%–50% of all adults reporting being up to date on their screening (Chen, White, Peipins, & Seeff, 2008), and only 39% of all CRC is diagnosed at early stages (ACS, 2010) when disease is localized and potentially curable. National trend data from the Behavioral Risk Factor Surveillance Survey (Centers for Disease Control and Prevention [CDC], 2006) indicate that blacks are less likely to receive flexible sigmoidoscopy or colonoscopy screening compared to whites. The receipt of flexible sigmoidoscopy or colonoscopy among blacks increased from 53% in 2004 to 54% in 2006, whereas the rate for whites increased from 55%–59%, respectively (CDC, 2006).

Regardless of race-ethnicity, commonly reported barriers to usage of cancer screening include a variety of demographic and sociocultural factors such as lack of knowledge or awareness of cancer screenings, lack of access to general preventive healthcare and screening services, institutional or healthcare system barriers, and individuals' socioeconomic status, language barriers, immigration status, and cultural beliefs (Gany, Herrera, Avallone, & Changrani, 2006; Gany, Trinh-Shevrin, & Aragones, 2008; Robb, Power, Atkin, & Wardle, 2008; Robb, Solarin, Power, Atkin, & Wardle, 2008; Shokar, Carlson, & Weller, 2008; Shokar, Nguyen-Oghalai, & Wu, 2009; Shokar, Vernon, & Weller, 2005). Physician recommendation is well established as a powerful motivator to screening behavior (Busch, 2003; Gany et al., 2008; Janz, Wren, Schottenfeld, & Guire, 2003; Kelly et al., 2007; Madlensky, Esplen, Gallinger, McLaughlin, & Goel, 2003; Shokar et al., 2008, 2009).

Among Caribbean-born women who lived in the United States for less than half their lives, only 52% ever had a provider recommend a mammogram compared with 77% of U.S.-born women (Garbers & Chiasson, 2006). However, whether differences exist in receipt of healthcare provider recommendation for CRC screening between U.S.-born and foreign-born blacks is unclear. Among immigrant blacks from the Caribbean region, whether differences exist between immigrants from English-speaking Caribbean countries (e.g., Jamaica, U.S. Virgin Islands, Trinidad and Tobago, Grenada) and immigrants from non-English-speaking Caribbean countries (e.g., Haiti, Dominican Republic) also is uncertain. Lessons learned from Hispanic (John et al., 2005; Shah et al., 2006) and Asian (Kwong et al., 2005; Lee-Lin & Menon, 2005) immigrant communities suggest that differences exist by the country or nationality of origin. In addition, general health (Arthur & Katkin, 2006) and breast cancer literature (Consedine, Magai, Krivoshekova, Ryzewicz, & Neugut, 2004; Consedine, Magai, & Neugut, 2004; Consedine, Magai, Spiller, Neugut, & Conway, 2004; Garbers & Chiasson, 2006; Magai, Consedine, Conway, Neugut, & Culver, 2004) suggests that disaggregation of U.S. blacks may reveal potential disparities concealed by "lumping" foreign-born with native U.S.-born blacks as one homogenous group (Gany, Herrera, et al., 2006; Gany et al., 2008; Klabunde et al., 2005; Powe, 1995; Powe, Daniels, & Finnie, 2005; Robb, Solarin, et al., 2008; Tiro, Vernon, Hyslop, & Myers, 2005).

To guide the selection of quantitative survey items, the authors identified those items that have been commonly reported to be associated with cancer screening behaviors. The items represent common elements from a variety of models and theories in health behavior, including the Health Belief Model (HBM) (Glanz, Rimer, & Viswanath, 2008; Janz, Champion, & Strecher, 2002), and have been widely reported in research involving blacks (Gany, Herrera, et al., 2006; Klabunde et al., 2005; Powe, 1995; Powe et al., 2005; Tiro et al., 2005). In this context, the HBM posits that people engage in screening behavior because of their perceptions of susceptibility, severity, benefits, barriers, cues to action, and self-efficacy. Strong evidence suggests that the common screening barriers (e.g., awareness and knowledge, risk perception, perceived barriers and benefits, physician recommendation) relate well to concepts of the HBM (Janz et al., 2003; Shokar et al., 2005, 2008; Vadaparampil et al., 2009).

Purpose

The primary aims of this exploratory study were to assess perceptions (e.g., awareness of screening tests, perceived risk, barriers to screening) of CRC and identify self-reported screening behaviors in three ethnic subgroups of U.S. blacks residing in Hillsborough

County, FL. The subgroups were native U.S.-born (i.e., African American), English-speaking Caribbean-born (e.g., Jamaica, Trinidad and Tobago, Grenada), and Haitian-born individuals. The long-term goal of this research is to better understand disparities among subgroups and inform future theoretically grounded intervention research that increases CRC screening among ethnic subgroups.

Methods

Setting and Overview

This study was conceptualized, designed, and implemented within the context of a larger ongoing community-based participatory project, the Tampa Bay Community Cancer Network (TBCCN), aimed at reducing cancer disparities among medically underserved populations (Gwede et al., 2009; Meade, Menard, Luque, Martinez-Tyson, & Gwede, 2009). TBCCN is one of 25 community network programs in the United States funded by the National Cancer Institute's (NCI's) Center for Reducing Cancer Health Disparities. The focus of TBCCN is to improve education and awareness about cancer prevention and control, increase community participation in preventive cancer screenings, and develop community-based participatory research projects to affect cancer disparities in selected areas of the Hillsborough, Pinellas, and Pasco counties in southwestern Florida.

TBCCN provided the infrastructure in which the current community-based participatory research pilot study was conducted. Therefore, key tenets of community-based participatory research (Gwede et al., 2009; Israel, Schulz, Parker, & Becker, 1998; Minkler & Wallerstein, 2008) including empowerment, principle of participation, issue selection, principle of relevance, social capital, and creation of critical consciousness fueled the project to ensure community benefit. This methodologic approach fosters an environment for the production of collaborative relationships with community members and academic researchers. Because the community level is the location of health prevention and health intervention programs, community-based participatory research is significant for obtaining positive health outcomes. Specifically, the TBCCN Steering Committee, TBCCN community partners including the Haitian American Alliance, cultural advisors, and a team of academic-based researchers collaborated to define the relevance and scope of this project, determine community benefit, design recruitment strategies and study materials, interpret findings, and plan the next study. Cultural advisors were key community leaders representing the three ethnic groups of interest and with long-standing ties to these communities.

The study concept originated from the identified need to address barriers to CRC screening in TBCCN (Gwede

et al., 2009) and the noted disproportionate burden among U.S. blacks (ACS, 2008, 2010). In particular, the Haitian American Alliance and representatives of other Caribbean cultural groups expressed a strong need to address subgroups of immigrants in such research, given the potential access barriers and cultural factors that may affect usage of CRC screening. Given the dearth of studies on CRC screening in the identified ethnic subgroups, an exploratory mixed qualitative and quantitative methods design was proposed in response to a competitive funding announcement from NCI. The TBCCN Steering Committee, comprised of academic investigators and community members, reviewed several concepts to evaluate scientific merit and significance, community participation, and long-term community benefit and selected this study for submission to NCI. As such, this approach can be an effective methodologic tool that enables nurses to meaningfully partner with the community.

Research Design

A descriptive, cross-sectional, exploratory, developmental design using sequential mixed qualitative and quantitative research methods was employed. Eligible consenting individuals participated in a semistructured in-depth qualitative interview followed by a battery of structured quantitative survey items for descriptive and exploratory purposes. Therefore, the sample size was based on estimates of the number needed for saturation of common themes in qualitative data (Guest, Bunce, & Johnson, 2006; Kvale, 1996), rather than on statistical power calculations. The project received institutional review board approval, and each participant provided written informed consent. This article focuses on the results from the quantitative survey.

Participant Inclusion and Exclusion Criteria

The authors recruited men and women aged 50 years or older who self-identified as non-Hispanic blacks or African Americans; had no personal diagnosis of any cancer; resided in Hillsborough County in medically underserved areas; self-declared as having ancestry from the United States (African American), English-speaking Caribbean, or Haiti; and stated the ability to read and understand English. Foreign-born immigrants must have lived in the United States for at least two years.

Data Collection Procedures

Community partners and cultural advisors informed the selection of recruitment methods and data collection approaches. To increase access to medically underserved populations in the three subgroups, the authors' community partners and advisors strongly recommended using strategies that focused on established points of congregation and optimizing contact with potential participants in group settings to maximize trust

(Sadler et al., 2006; Wilson & Orians, 2005). Therefore, convenience samples from the three ethnic subgroups were recruited through TBCCN partners and cultural advisors, as well as through a variety of community locations including churches, barbershops, civic or community social service centers, health fairs, ethnic restaurants, grocery stores, health events, and clinics serving medically underserved patients. Recruitment approaches included (a) ethnically customized flyers distributed at community locations or events stated previously, (b) referral by community partners or cultural advisors, and (c) snowball sampling (i.e., a participant may nominate or refer another potentially eligible individual), based on community partners' and cultural advisors' guidance. All individuals contacted were evaluated for eligibility. The authors documented the number of individuals approached and contacted, number ineligible and reasons, number enrolled, and the recruitment method for each respondent. Eligible, consenting individuals were interviewed in person by a trained research assistant at a location selected by the participant. The research assistant read aloud all the interview materials including the questionnaire to each respondent to minimize literacy issues. Participants received \$30 at the end of the interview.

Regarding recruitment methods, face-to-face recruitment at community-based events had the most yield for English-speaking Caribbean-born and Haitian-born subgroups, whereas snowball referrals produced the most yield for African Americans. The primary reason for ineligibility was current residency outside the medically underserved areas or not qualifying as a medically underserved patient. The authors found that English-speaking Caribbean-born individuals were more likely to decline the study. Figure 1 summarizes the reasons for ineligibility by ethnic subgroup. The data will help to inform the authors' recruitment plans for a future larger-scale study.

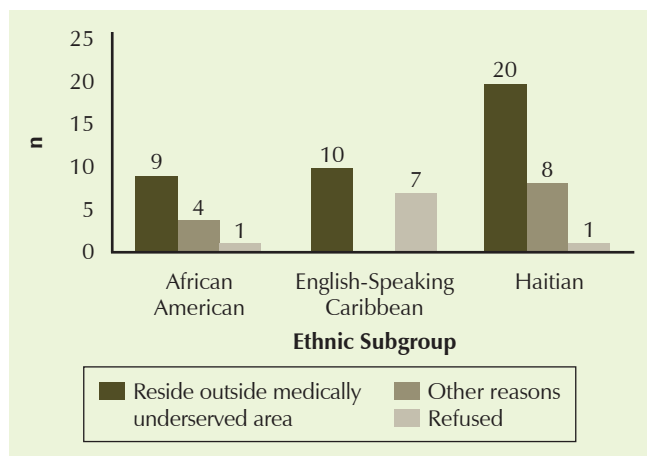


Figure 1. Reasons for Study Ineligibility by Ethnic Subgroup

Survey Measures

Survey items selected from the well-established **Health Information National Trends Survey (HINTS)** (NCI, 2006; Nelson et al., 2004) questionnaire were used to assess the main study variables (healthcare access, awareness of CRC screening tests, perceived risk and worry, perceived barriers to screening, provider recommendation, and self-reported screening behaviors). The items were selected based on known barriers to cancer screening, fit well with the HBM framework, and were administered and analyzed as single-item measures consistent with recent exploratory application (Geiger et al., 2008; Ling, Klein, & Dang, 2006; McQueen, Vernon, Meissner, Klabunde, & Rakowski, 2006) for hypothesis-generating analyses to examine patterns in the data and offer suggestions for future research related to ethnic subgroups. The community partners and cultural advisors reviewed all questions and offered valuable feedback about their cultural and literacy relevance in the subgroups.

Healthcare access: Three HINTS questionnaire items were used: (a) "Do you have a regular personal physician?" (no or yes), (b) "Do you usually have an annual checkup by a doctor?" (no or yes), and (c) "About how many times have you had a checkup by the doctor in the last 10 years?"

Awareness of screening tests: First, respondents were asked, "Can you think of any tests that can detect colon cancer?" Participants were coded as knowing a CRC screening test if they mentioned one or more valid tests. Then participants were provided the definition of each test and were asked: "Have you ever heard of a fecal occult or stool blood test?" (no or yes) and "Have you ever heard of a sigmoidoscopy or colonoscopy?" (no or yes).

Risk perception and worry: Regarding perceived risk, two items used the following response options: very low, somewhat low, moderate, somewhat high, or very high. The questions were as follows. "How likely do you think it is that you will develop cancer in the future? Would you say your chance of getting cancer is . . . ?" "How likely do you think it is that you will develop colon cancer in the future? Would you say your chance of getting colon cancer is . . . ?" A third question asked about colon cancer comparative risk: "Compared to the average (man or woman) your age, would you say that you are . . . ?" Response options were more likely to get colon cancer, less likely, and about as likely.

Two questions addressed worry about cancer or colon cancer. "How often do you worry about getting cancer? Would you say . . . ?" "How often do you worry about getting colon cancer? Would you say . . . ?" The response options were rarely or never, sometimes, often, or all the time.

Perceived barriers to screening: Perceived barriers to CRC screening were assessed with four statements with a five-category response format: strongly agree,

Table 1. Sociodemographic Characteristics of Study Participants by Ethnic Subgroup

Characteristic	African American (N = 22)				English-Speaking Caribbean (N = 20)				Haitian (N = 20)				p
	$\bar{X}$	SD	Mdn	Range	$\bar{X}$	SD	Mdn	Range	$\bar{X}$	SD	Mdn	Range	
Age (years)	58.9	6.4	57.5	50–73	63.4	8.6	62	52–76	56.1	6.9	53.5	50–73	0.007
U.S. residence (years)	–	–	–	–	28.1	10.8	28	7–46	20.1	11.1	22.5	4–39	0.044
Characteristic	n		%		n		%		n		%		p
Female	11		50		10		50		11		55		0.951
Employed or self-employed	7		32		10		50		9		45		0.523
Married or living as married	6		27		12		60		11		55		0.077
Three or more adults living in household	3		14		1		5		6		30		0.103
Children younger than age 18 living in household	3		14		1		5		11		55		0.001
High school graduate or less	11		50		6		30		12		60		0.169
Household income \$25,000 or less	14		64		8		40		13		65		0.235
No health insurance coverage	8		36		5		25		8		40		0.63
Positive family history of cancer	17		77		9		45		7		35		0.017
Mdn—median													

somewhat agree, somewhat disagree, strongly disagree, or no opinion. The questions were as follows. “Arranging to get checked for colon cancer would be easy for you.” “You are afraid of finding colon cancer if you were checked.” “Getting checked for colon cancer increases the chances of finding cancer when it’s easy to treat.” “Getting checked for colon cancer is too expensive.”

Provider recommendation: Regarding provider recommendation, participants responded no or yes to the following questions. “During the past 12 months, did a doctor, nurse, or other healthcare professional advise you to do a stool blood test using a home test kit?” “Did a doctor, nurse, or other healthcare professional advise you to get (a) a sigmoidoscopy? or (b) a colonoscopy?”

Self-reported screening behaviors: Screening behaviors were studied through a series of items that assessed past and most recent FOBT and sigmoidoscopy or colonoscopy, in accordance with ACS (2008) and the U.S. Preventive Services Taskforce (2002) evidence-based guidelines and consistent with recommendations of an NCI panel (Vernon et al., 2004) that proposed minimal measures for assessing self-reported colorectal cancer screening behaviors. Examples of lifetime screening behavior questions follow. “Have you ever done a stool blood test using a home test kit?” “Have you ever had a sigmoidoscopy?” “Have you ever had a colonoscopy?” Response options were no or yes.

In addition, participants reported their age, gender, education, income, marital status, health insurance status, ethnic subgroup, family history of cancer, number of children and adults in household, and years of residence in the United States.

Data Analysis

Descriptive statistics such as mean (standard distribution) and frequency (proportion) were summarized by ethnic subgroups for each survey item of interest. Association between the ethnic subgroup and each variable was evaluated with Fisher’s exact test for categorical variables or Kruskal-Wallis test for continuous variables. All tests were two sided and declared significant at the 5% level. No multiple comparisons adjustment was considered because of the exploratory nature of this study. Variables showing a statistically significant ($p < 0.05$) bivariate association with ethnic subgroup were included in multiple logistic regression analysis. Ethnic subgroup was regressed on perceptions and behavioral variables, while adjusting for age and having young children (younger than 18 years) in household. In pooled analyses of the entire sample, screening behaviors (i.e., with FOBT, sigmoidoscopy, and colonoscopy as separate dependent variables) were regressed on common predictors of screening behaviors including age, education, income, health insurance status, and healthcare provider recommendation. Odds ratio (OR) and 95% confidence interval (CI) were estimated from the logistic regression models.

Results

Sample Characteristics

A total of 122 men and women were assessed for eligibility, and 60 were ineligible or refused to participate, resulting in a sample size of $N = 62$. The ethnic group distribution included 22 African American, 20 English-speaking

Caribbean-born, and 20 Haitian-born respondents. Selected sociodemographic characteristics of participants are summarized in Table 1. The subgroups were similar ($p > 0.05$) on sociodemographic characteristics except for age, having children younger than 18, and family history of cancer. The English-speaking Caribbean-born subgroup had a median age of 62 years compared to 57.5 years for the African American subgroup and 53.5 years for the Haitian subgroup ($p = 0.007$). A higher proportion of Haitians (55%) reported having children younger than age 18 compared to 14% and 5% for the African American and English-speaking Caribbean subgroups, respectively ($p = 0.001$). However, a higher proportion (77%) of the African American subgroup reported a positive family history of cancer compared to the English-speaking Caribbean and Haitian subgroups ($p = 0.017$).

Perceptions and Behaviors

Overall, participants had high levels of healthcare access and low levels of awareness, risk perception, or

worry about CRC. All groups perceived barriers to CRC screening and low healthcare provider recommendation and reported low use of CRC screening. No gender differences were found in perceptions or behaviors. However, results suggest that Haitian-born individuals report greater barriers to screening compared to other blacks. Results of bivariate associations are summarized in Table 2 by ethnic subgroup.

General healthcare access: No statistically significant associations were found between ethnic subgroup and the three healthcare-use measures: receipt of annual checkup by a doctor, having a regular personal physician, and number of times examined by a doctor in the past 10 years.

Risk perception and worry: No statistically significant associations were found between ethnic subgroup and perceived risk or worry about developing colorectal cancer. However, regarding worry about developing cancer, 95% of the English-speaking Caribbean-born subgroup reported that they rarely or never worry about developing

Table 2. Distribution of Responses on Perceptions and Screening Behaviors by Ethnic Subgroup

Response	African American (N = 22)		English-Speaking Caribbean (N = 20)		Haitian (N = 20)	
	n	%	n	%	n	%
Healthcare access						
Have a regular personal physician	17	77	15	75	14	70
Usually have annual checkup by a doctor	19	86	18	90	14	70
Risk perception and worry						
Likelihood of developing cancer (low or somewhat low)	13	59	14	70	13	65
Worry about getting cancer (rarely or never)	14	64	19	95*	13	65
Likelihood of developing colon cancer in the future (low or somewhat low)	13	59	15	75	16	80
Likelihood of developing colon cancer compared to average man or woman (less likely or about as likely)	20	91	19	95	17	85
Worry about developing colon cancer (rarely or never)	14	64	17	85	15	75
Awareness of screening tests						
Aware of (mentioned) sigmoidoscopy or colonoscopy as a test for colon cancer (yes)	14	64	13	65	6	30
Ever heard of a fecal occult blood test	20	91	17	85	11	55
Ever heard of a sigmoidoscopy or colonoscopy	20	91	16	80	10	50
Healthcare provider recommendation						
Did a healthcare professional recommend a fecal occult blood test in the past 12 months? (no)	17	77	20	100	19	95
Did a healthcare professional ever recommend sigmoidoscopy? (no)	16	73	15	75	20	100
Did a healthcare professional ever recommend colonoscopy? (no)	11	50	11	55	17	85
Self-reported screening behaviors						
Ever done a fecal occult blood test (yes)	11	50	7	35	4	20
Ever had a sigmoidoscopy (yes)	5	23	6	30	—	—
Ever had a colonoscopy (yes)	11	50	10	50	3	15
Perceived barriers						
Reason for not having sigmoidoscopy or colonoscopy: "doctor didn't order it or didn't say I needed it"	1	5	3	15	8	40
Arranging to get checked for colon cancer would be easy for you (agree or strongly agree)	17	77	20	100	12	60

* $p < 0.01$

cancer compared to only 64% for African Americans and 65% for Haitian-born participants ($p = 0.027$).

Awareness of screening tests: The interviewer read aloud a description of each CRC screening test per HINTS administration procedure and then asked whether the respondent had ever heard of each test. Only 55% of the Haitian-born subgroup had ever heard about FOBT, compared to 85% for the English-speaking Caribbean-born subgroup and 91% for the African American subgroup ($p = 0.017$). Similarly, only 50% of the Haitian-born subgroup had ever heard of a sigmoidoscopy or colonoscopy compared to 91% for African Americans and 80% for English-speaking Caribbean-born participants ($p = 0.01$).

Perceived barriers to screening: When responding to an item measuring screening-related self-efficacy, only 60% of Haitians agreed or strongly agreed with a statement that “arranging to get checked for colon cancer would be easy for you,” compared to 77% and 100% for the African American and English-speaking Caribbean subgroups, respectively ($p = 0.004$). No differences were found in the other three perceived barriers: fear of finding cancer, benefits of early detection, and cost (data not reported).

Provider-recommended screening as a barrier: Recommendations for sigmoidoscopy and colonoscopy screening tests were lowest for the Haitian subgroup. Asked whether a healthcare professional ever recommended sigmoidoscopy, 100% of the Haitian subgroup answered no, compared to 73% and 75% for African American and English-speaking Caribbean subgroups, respectively ($p = 0.026$). Similarly, when asked whether a healthcare professional had ever recommended colonoscopy, 85% of Haitians said no, compared to 50% and 55% for African American and English-speaking Caribbean subgroups, respectively ($p = 0.042$). Forty percent of the Haitian subgroup indicated their reason for not having sigmoidoscopy or colonoscopy was because “doctor didn’t order it or didn’t say I needed it,” compared to 15% for English-speaking Caribbean-born and 5% for African American subgroups, respectively ($p = 0.019$).

Self-reported screening behaviors: Regarding self-reported screening behaviors, none (0%) of the Haitian-born subgroup ever had a sigmoidoscopy performed compared to 30% and 23% for the English-speaking Caribbean-born and African American subgroups, respectively ($p = 0.022$). Similarly, only 15% of the Haitian subgroup ever had a colonoscopy done, compared to 50% for the other two subgroups ($p = 0.029$). All participants were provided a description of the tests before answering the screening questions.

Multivariable Logistic Regression Analysis

Despite the small sample (because of the exploratory nature of this study), statistically significant associations were found, with the Haitian subgroup being less likely

to report a positive family history of cancer ($OR = 0.1$, 95% $CI = 0.02$ – 0.52) compared to African Americans. The Haitian subgroup also was less likely than African Americans to have ever heard of a sigmoidoscopy or colonoscopy ($OR = 0.05$, 95% $CI = 0.01$ – 0.37). Similarly, the Haitian subgroup was significantly more likely to say that the reason for not having a sigmoidoscopy or colonoscopy was because “my doctor didn’t order it or didn’t say I needed it” ($OR = 39.2$, 95% $CI = 3.4$ – 450.6). No statistically significant associations were found for the English-speaking Caribbean subgroup.

In pooled analyses (with all participants pooled together regardless of ethnic subgroup), colonoscopy screening was significantly associated ($p < 0.05$) with age, education, health insurance status, and healthcare provider recommendation. Healthcare provider recommendation also was associated with FOBT and sigmoidoscopy. However, when adjusting for ethnic subgroup, only healthcare provider recommendation remained significantly associated with colonoscopy screening ($p < 0.001$). In adjusted analyses, all other covariates (age, education, health insurance status, income) were not associated with screening behaviors, but the Haitian ethnic subgroup remained consistently associated with lower colonoscopy screening, suggesting the importance of cultural differences.

Discussion

To date, the authors believe that this study is among the first to report lower usage of CRC screening tests among Haitian-born blacks compared to African Americans or English-speaking Caribbean-born blacks. The screening rates found in this study suggest that Haitians are disproportionately underusing colonoscopy screening. The colonoscopy screening rate in the other two subgroups is consistent with colonoscopy screening rates reported for blacks in Florida (CDC, 2006) and the general U.S. population (CDC, 2006; Chen et al., 2008; Shapiro et al., 2008). Although the groups were not different in general healthcare access (having a regular doctor, receipt of annual checkup, and number of doctor visits), other barriers to screening were identified in this study, including lack of awareness about risk and screening tests and lack of provider recommendation for screening tests, consistent with findings from published literature (Francois, Elysee, Shah, & Gany, 2008; Gany, Shah, & Changrani, 2006). The findings support the link to the HBM framework.

The findings from pooled multivariate analyses also support the importance of other known barriers to screening such as age, education, health insurance, and healthcare provider recommendation. Physician recommendation is a well-established predictor in many cancer-screening behaviors (Busch, 2003; Gany et al., 2008; Janz et al., 2003; Kelly et al., 2007; Madlensky et al., 2003; Shokar et al., 2008, 2009); results of the pooled analysis

also support this notion. The importance of healthcare provider recommendation also is supported by the results showing that lack of provider recommendation was the reason cited for not getting screened. The finding, similar to that reported by Gany et al. (2008), suggests that efforts such as continuing education for nurses and healthcare providers and usage of cancer screening reminders should be part of an overall plan of action. In consideration with other published literature (Gany et al., 2008; Shokar et al., 2009), the current findings suggest that culturally and linguistically tailored screening reminders and provider recommendations may facilitate uptake of FOBT and colonoscopy screening.

Among immigrants, time spent in the United States is an important predictor (Brown, Consedine, & Magai, 2006; Brown, Naman, et al., 2006), with the lowest screening rates and greatest barriers among those who have immigrated within the past 10 years. The median residency years in the United States for the current study's sample were 28 for English-speaking Caribbean and 22 for Haitian immigrants. Therefore, future larger studies should include other measures of acculturation and better representation of recent immigrants who might experience even greater access barriers.

Notable lessons having implications for nursing research and practice were identified from this project. First, broad categorization of a racial-ethnic group pays little regard to the existence of subcultures within the black community. For example, culturally centered recruitment strategies (Sadler et al., 2006; Wilson & Orians, 2005) that foster trust of researchers are important for all subgroups, but perhaps more so for foreign-born subgroups. Second, cultural advisors offer a critical asset to understanding and overcoming study design and recruitment barriers. They serve as trusted ambassadors and cultural brokers who facilitate linkages to community events and population subgroups. Third, populations of foreign-born blacks often are dispersed geographically, and recruitment efforts of foreign-born respondents may need to involve recruiting them outside of designated medically underserved areas.

Such sites may involve recruitment at community meetings, which offer a nonthreatening forum to explain the study goals and expected community benefit, thus fostering trust of potential participants. Consistent with other studies (Sadler et al., 2006; Wilson & Orians, 2005), the current study's community-based recruitment approach suggests that in-person recruitment at cultural group meetings may be a feasible and acceptable approach for recruiting foreign-born blacks in future studies. Finally, studies that are based in the community provide teachable moments to disseminate cancer education materials and to foster awareness of important health topics, particularly for medically underserved populations. For example, after the interview was complete and when interest in cancer screening was heightened, the authors

provided participants with easy-to-read cancer information and listings of community resources.

Recognizing the importance of community participation, TBCCN has become a central platform and provides infrastructure for conducting research to understand and reduce cancer health disparities in diverse, medically underserved populations (Gwede et al., 2009; Meade et al., 2009). The current preliminary findings have been discussed with TBCCN community partners and cultural advisors to obtain the community's input on the design of the next study. Two important components essential for extending this research include the availability of translated, culturally appropriate study materials for non-English speakers and access to free or low-cost screenings. To that end, the translation of study materials and instruments into Haitian Creole is under way. In addition, the TBCCN collaboration has initiated and prioritized efforts to identify affordable and accessible CRC screening resources in the local community.

Study Limitations

The study has several limitations including small convenience sample size (limiting statistical power), availability of English-only instruments, use of self-reported screening status, and the long time of residence in the United States among the immigrant subgroups. As a result of the small sample sizes, the current study's results suggest trend rather than definitive differences. Therefore, a larger-scale, appropriately powered, controlled, matched comparative design is planned to further elucidate the magnitude of disparities by using a more complete battery of instruments and scales (rather than single-item measures), including knowledge, acculturation, and literacy measures. Since the current study was completed, the authors have received additional funding to begin the translation and transcreation of measures into Haitian Creole. Recent published reports suggest that the validity of self-reported CRC screening generally is respectable (Zapka, 2008) but may vary by test (Partin et al., 2008; Vernon et al., 2008) and by other factors such as age, education, family history (Partin et al., 2008), and race (Rauscher, Johnson, Cho, & Walk, 2008).

Finally, the subgroups were similar in all areas, given that the non-African Americans had all been in the United States longer than 20 years. With an increased length of residence in the United States, adult immigrants may have improved access to healthcare resources (Arthur & Katkin, 2006; LaVeist, 2005; Read & Emerson, 2005; Read et al., 2005), which may help explain the similarities and lack of differences shown in the pooled multivariate logistic regression. Therefore, a future study should include more recent immigrants (e.g., those with fewer than 10 years of residence in the United States), who may likely face greater access barriers (Brown, Consedine, et al., 2006; Brown, Naman, et al., 2006). Although the current study's findings are preliminary, they provide

a sound and reasonable basis to inform the design of a larger study to test the authors' hypothesis that disparities exist among cultural, ethnic subgroups.

Implications for Nursing

Nurses play a major role in reducing cancer health disparities through research, education, and practice that improve access to screening for medically underserved and diverse racial ethnic populations. The current study's preliminary findings call for additional public health and nursing research to explore potential disparities among ethnic subgroups of a population generally considered a homogenous group. Improved understanding of the heterogeneity within the black population may foster more effective nursing care across the cancer continuum in the primary care and oncology settings. As such, nurses should recognize the diversity of the U.S. black population and operationalize black ethnicity to determine ethnic subgroup differences that may affect usage of cancer services. In addition, nurses must be knowledgeable about key concepts central to community organization and work toward mutual beneficial research activities to effect change at the community level. Nurses should conduct cross-cultural studies that empirically demonstrate any similarities and differences through the use of community-based participatory approaches. Such approaches should support a community-engagement framework for reducing cancer-related health disparities among traditionally disenfranchised population groups, include the formation of community academic interdisciplinary teams that emphasize local relevance to key stakeholders, and promote processes that foster community involvement and inclusion.

Nurses should presume diversity rather than assume homogeneity when working with multi-ethnic populations. Consideration of the cultural differences that may be inherent because of subethnicity is an important aspect of cultural sensitivity and competency and aids in assuring quality care for all individuals. The awareness of potential diversity and the implications for access to

care are important paradigms for clinicians, researchers, educators, and public health practitioners to follow for promoting therapeutic relationships. As nurses design new and novel education interventions for cancer awareness and screening, strategies must be empowering and participatory to those involved. In addition, equal access and equal treatment are core values for addressing health disparities and health equity (Institute of Medicine, 2002; Healthy People, 2010), and nurses are at the center of efforts to achieve these goals.

Conclusions

Overall, the current findings reiterate that U.S. blacks are a diverse, multi-ethnic, multicultural community and support the need for a larger-scale community-based study to elucidate and address disparities among subgroups of this population. Although the current study's findings are exploratory, they corroborate other literature on the importance of examining cultural diversity to understand cancer screening barriers and behaviors among ethnic minority populations. Therefore, nurses as well as other clinical and public health practitioners and researchers can benefit from the findings in their day-to-day practices and interactions with an increasingly diversifying black population.

Clement K. Gwede, PhD, MPH, RN, is an assistant member; Claire M. William, MD, was a research assistant; Kamilah B. Thomas, MPH, and Will L. Tarver, MLS, MPH, both are study coordinators; Gwendolyn P. Quinn, PhD, and Susan T. Vada-parampil, PhD, MPH, both are associate members; Jongphil Kim, PhD, is an assistant member; Ji-Hyun Lee, PhD, is an associate member; and Cathy D. Meade, PhD, RN, is a full member, all at the H. Lee Moffitt Cancer Center and Research Institute in Tampa, FL. This publication was supported by grants (3U01CA 114627-03; 3U01CA 114627-03S1) from the National Cancer Institute, and its contents are solely the responsibility of the authors and do not necessarily represent the official views of the National Cancer Institute. Gwede can be reached at clement.gwede@moffitt.org, with copy to editor at ONFEditor@ons.org. (Submitted February 2009. Accepted for publication September 30, 2009.)

Digital Object Identifier: 10.1188/10.ONF.581-591

References

- American Cancer Society. (2008). *Colorectal cancer facts and figures 2008-2010*. Atlanta, GA: Author.
- American Cancer Society. (2010). *Cancer facts and figures 2010*. Atlanta, GA: Author.
- Arthur, C.M., & Katkin, E.S. (2006). Making a case for the examination of ethnicity of blacks in United States health research. *Journal of Health Care for the Poor and Underserved*, 17, 25-36. doi:10.1353/hpu.2006.0017
- Blanchard, J., & Lurie, N. (2005). Preventive care in the United States: Are blacks finally catching up? *Ethnicity and Disease*, 15, 498-504.
- Bradshaw, B.S., & Frisbie, W.P. (1992). Mortality of Mexican Americans and Mexican immigrants: Comparisons with Mexico. In J.R. Weeks & R. Ham Chande (Eds.), *Demographic dynamics of the U.S.-Mexico border* (pp. 125-150). El Paso, TX: Texas Western Press, University of Texas at El Paso.
- Brown, N., Naman, P., Homel, P., Fraser-White, M., Clare, R., & Browne, R. (2006). Assessment of preventive health knowledge and behaviors of African American and Afro-Caribbean women in urban settings. *Journal of the National Medical Association*, 98, 1644-1651.
- Brown, W.M., Consedine, N.S., & Magai, C. (2006). Time spent in the United States and breast cancer screening behaviors among ethnically diverse immigrant women: Evidence for acculturation? *Journal of Immigrant and Minority Health*, 8, 347-358. doi: 10.1007/s10903-006-9005-y
- Busch, S. (2003). Elderly African American women's knowledge and belief about colorectal cancer. *Association of Black Nursing Faculty Journal*, 14(5), 99-103.
- Centers for Disease Control and Prevention. (2006). Behavioral risk factor surveillance system. Retrieved from <http://www.cdc.gov/brfss>

- Chen, X., White, M.C., Peipins, L.A., & Seeff, L.C. (2008). Increase in screening for colorectal cancer in older Americans: Results from a national survey. *Journal of the American Geriatrics Society*, 56, 1511–1516. doi: 10.1111/j.1532-5415.2008.01796.x
- Consedine, N.S., Magai, C., Krivoshekova, Y.S., Ryzewicz, L., & Neugut, A.I. (2004). Fear, anxiety, worry, and breast cancer screening behavior: A critical review. *Cancer Epidemiology, Biomarkers and Prevention*, 13, 501–510.
- Consedine, N.S., Magai, C., & Neugut, A.I. (2004). The contribution of emotional characteristics to breast cancer screening among women from six ethnic groups. *Preventive Medicine*, 38, 64–77. doi: 10.1016/j.ypmed.2003.09.030
- Consedine, N.S., Magai, C., Spiller, R., Neugut, A.I., & Conway, F. (2004). Breast cancer knowledge and beliefs in subpopulations of African American and Caribbean women. *American Journal of Health Behavior*, 28, 260–271.
- Francois, F., Elysee, G., Shah, S., & Gany, F. (2009). Colon cancer knowledge and attitudes in an immigrant Haitian community. *Journal of Immigrant and Minority Health*, 11, 319–325. doi: 10.1007/s10903-008-9126-6
- Franzini, L., Ribble, J.C., & Keddie, A.M. (2002). Understanding the Hispanic paradox. In T.A. LaVeist (Ed.), *Race, ethnicity, and health: A public health reader* (pp. 280–310). San Francisco, CA: Jossey-Bass.
- Gany, F.M., Herrera, A.P., Avallone, M., & Changrani, J. (2006). Attitudes, knowledge, and health-seeking behaviors of five immigrant minority communities in the prevention and screening of cancer: A focus group approach. *Ethnicity and Health*, 11(1), 19–39. doi: 10.1080/13557850500391394
- Gany, F.M., Shah, S.M., & Changrani, J. (2006). New York City's immigrant minorities. Reducing cancer health disparities. *Cancer*, 107(8, Suppl.), 2071–2081. doi: 10.1002/cncr.22155
- Gany, F.M., Trinh-Shevrin, C., & Aragones, A. (2008). Cancer screening and Haitian immigrants: The primary care provider factor. *Journal of Immigrant and Minority Health*, 10, 255–261. doi: 10.1007/s10903-007-9076-4
- Garbers, S., & Chiasson, M.A. (2006). Breast cancer screening and health behaviors among African American and Caribbean women in New York City. *Journal of Health Care for the Poor and Underserved*, 17(1), 37–46. doi: 10.1353/hpu.2006.0024
- Geiger, T.M., Miedema, B.W., Geana, M.V., Thaler, K., Rangnekar, N.J., & Cameron, G.T. (2008). Improving rates for screening colonoscopy: Analysis of the health information national trends survey (HINTS I) data. *Surgical Endoscopy*, 22, 527–533. doi: 10.1007/s00464-007-9673-2
- Glanz, K., Rimer, B.K., & Viswanath, K. (2008). *Health behavior and health education: Theory, research, and practice* (4th ed.). San Francisco, CA: Jossey-Bass.
- Goff, D.C., Jr., Ramsey, D.J., Labarthe, D.R., & Nichaman, M.Z. (1994). Greater case fatality after myocardial infarction among Mexican Americans and women than among non-Hispanic whites and men. *American Journal of Epidemiology*, 139, 474–483.
- Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field Methods*, 18(1), 59–82. doi: 10.1177/1525822X05279903
- Gwede, C.K., Menard, J.M., Martinez-Tyson, D., Lee, J.H., Vada-arampil, S.T., Padhya, T., & Meade, C.D. (2009). Strategies for assessing community challenges and strengths for cancer disparities participatory research and outreach. *Health Promotion Practice* [Epub ahead of print]. doi: 10.1177/1524839909335803
- Healthy People. (2010). Leading health indicators: Priorities for action. Retrieved from <http://www.healthypeople.gov>
- Institute of Medicine. (2002). *Unequal treatment: Confronting racial and ethnic disparities in health care*. Washington, DC: National Academies Press.
- Israel, B.A., Schulz, A.J., Parker, E.A., & Becker, A.B. (1998). Review of community-based research: Assessing partnership approaches to improve public health. *Annual Review of Public Health*, 19, 173–202. doi: 10.1146/annurev.publhealth.19.1.173
- Janz, N.K., Champion, V.L., & Strecher, V.J. (2002). *The Health Belief Model*. In K. Glanz, B.K. Rimer, & F.M. Lewis (Eds.), *Health behavior and health education: Theory, research, and practice* (3rd ed., p. 45). San Francisco, CA: Jossey-Bass.
- Janz, N.K., Wren, P.A., Schottenfeld, D., & Guire, K.E. (2003). Colorectal cancer screening attitudes and behavior: A population-based study. *Preventive Medicine*, 37(6, Pt. 1), 627–634. doi: 10.1016/j.ypmed.2003.09.016
- John, E.M., Phipps, A.I., Davis, A., & Koo, J. (2005). Migration history, acculturation, and breast cancer risk in Hispanic women. *Cancer Epidemiology, Biomarkers and Prevention*, 14, 2905–2913. doi: 10.1158/1055-9965.EPI-05-0483
- Kelly, K.M., Dickinson, S.L., Degraffinreid, C.R., Tatum, C.M., & Pas-kett, E.D. (2007). Colorectal cancer screening in three racial groups. *American Journal of Health Behavior*, 31, 502–513.
- Klabunde, C.N., Vernon, S.W., Nadel, M.R., Breen, N., Seeff, L.C., & Brown, M.L. (2005). Barriers to colorectal cancer screening: A comparison of reports from primary care physicians and average-risk adults. *Medical Care*, 43, 939–944. doi: 10.1097/01.mlr.0000173599.67470.ba
- Kvale, S. (1996). *Interviews: An introduction to qualitative research interviewing*. Thousand Oaks, CA: Sage.
- Kwong, S.L., Chen, M.S., Jr., Snipes, K.P., Bal, D.G., & Wright, W.E. (2005). Asian subgroups and cancer incidence and mortality rates in California. *Cancer*, 104(12, Suppl.), 2975–2981. doi: 10.1002/cncr.21511
- LaVeist, T.A. (2005). *Minority populations and health: An introduction to health disparities in the United States*. San Francisco, CA: Jossey-Bass.
- Lee-Lin, F., & Menon, U. (2005). Breast and cervical cancer screening practices and interventions among Chinese, Japanese, and Vietnamese Americans. *Oncology Nursing Forum*, 32, 995–1003. doi: 10.1188/05.ONF.995-1003
- Ling, B.S., Klein, W.M., & Dang, Q. (2006). Relationship of communication and information measures to colorectal cancer screening utilization: Results from HINTS. *Journal of Health Communication*, 11(1, Suppl.), 181–190. doi: 10.1080/10810730600639190
- Madlensky, L., Esplen, M.J., Gallinger, S., McLaughlin, J.R., & Goel, V. (2003). Relatives of colorectal cancer patients: Factors associated with screening behavior. *American Journal of Preventive Medicine*, 25, 187–194. doi: 10.1016/S0749-3797(03)00202-2
- Magai, C., Consedine, N., Conway, F., Neugut, A., & Culver, C. (2004). Diversity matters: Unique populations of women and breast cancer screening. *Cancer*, 100, 2300–2307. doi: 10.1002/cncr.20278
- McQueen, A., Vernon, S.W., Meissner, H.I., Klabunde, C.N., & Rakowski, W. (2006). Are there gender differences in colorectal cancer test use prevalence and correlates? *Cancer Epidemiology, Biomarkers and Prevention*, 15, 782–791. doi: 10.1158/1055-9965.EPI-05-0629
- Meade, C.D., Menard, J., Luque, J., Martinez-Tyson, D., & Gwede, C.K. (2009). Creating community-academic partnerships for cancer disparities research and health promotion. *Health Promotion Practice* [Epub ahead of print]. doi: 10.1177/1524839909341035
- Minkler, M., & Wallerstein, N. (Eds.). (2008). *Community-based participatory research for health: From process to outcomes* (2nd ed.). San Francisco, CA: Jossey-Bass.
- National Cancer Institute. (2006). Health Information National Trends Survey questions. Retrieved from <http://hints.cancer.gov/hints/questions/index.jsp>
- Nelson, D.E., Kreps, G.L., Hesse, B.W., Croyle, R.T., Willis, G., Arora, N.K., . . . Alden, S. (2004). The Health Information National Trends Survey (HINTS): Development, design, and dissemination. *Journal of Health Communication*, 9, 443–460. doi: 10.1080/10810730490504233
- Partin, M.R., Grill, J., Noorbaloochi, S., Powell, A.A., Burgess, D.J., Vernon, S.W., . . . Fisher, D.A. (2008). Validation of self-reported colorectal cancer screening behavior from a mixed mode survey of veterans. *Cancer Epidemiology, Biomarkers and Prevention*, 17, 768–776. doi: 10.1158/1055-9965.EPI-07-0759
- Pignone, M., Rich, M., Teutsch, S.M., Berg, A.O., & Lohr, K.N. (2002). Screening for colorectal cancer in adults at average risk: A summary of the evidence for the U.S. Preventive Services Task Force. *Annals of Internal Medicine*, 137, 132–141.
- Powe, B.D. (1995). Cancer fatalism among elderly Caucasians and African Americans. *Oncology Nursing Forum*, 22, 1355–1359.

- Powe, B.D., Daniels, E.C., & Finnie, R. (2005). Comparing perceptions of cancer fatalism among African American patients and their providers. *Journal of the American Academy of Nurse Practitioners*, 17, 318–324. doi: 10.1111/j.1745-7599.2005.0049.x
- Rauscher, G.H., Johnson, T.P., Cho, Y.I., & Walk, J.A. (2008). Accuracy of self-reported cancer-screening histories: A meta-analysis. *Cancer Epidemiology, Biomarkers and Prevention*, 17, 748–757. doi: 10.1158/1055-9965.EPI-07-2629
- Read, J.G., & Emerson, M.O. (2005). Racial context, black immigration and the U.S. black/white health disparity. *Social Forces*, 84, 181–199. doi: 10.1353/sof.2005.0120
- Read, J.G., Emerson, M.O., & Tarlov, A. (2005). Implications of black immigrant health for U.S. racial disparities in health. *Journal of Immigrant Health*, 7, 205–212.
- Robb, K.A., Power, E., Atkin, W., & Wardle, J. (2008). Ethnic differences in participation in flexible sigmoidoscopy screening in the UK. *Journal of Medical Screening*, 15, 130–136. doi: 10.1258/jms.2008.007112
- Robb, K.A., Solarin, I., Power, E., Atkin, W., & Wardle, J. (2008). Attitudes to colorectal cancer screening among ethnic minority groups in the UK. *BioMed Central Public Health*, 8, 34.
- Sadler, G.R., York, C., Madlensky, L., Gibson, K., Wasserman, L., Rosenthal, E., . . . Tso, C. (2006). Health parties for African American study recruitment. *Journal of Cancer Education*, 21, 71–76. doi: 10.1207/s15430154jce2102_6
- Shah, M., Zhu, K., & Potter, J. (2006). Hispanic acculturation and utilization of colorectal cancer screening in the United States. *Cancer Detection and Prevention*, 30, 306–312. doi: 10.1016/j.cdp.2006.04.003
- Shapiro, J.A., Seeff, L.C., Thompson, T.D., Nadel, M.R., Klabunde, C.N., & Vernon, S.W. (2008). Colorectal cancer test use from the 2005 National Health Interview Survey. *Cancer Epidemiology, Biomarkers and Prevention*, 17, 1623–1630. doi: 10.1158/1055-9965.EPI-07-2838
- Shokar, N.K., Carlson, C.A., & Weller, S.C. (2008). Factors associated with racial/ethnic differences in colorectal cancer screening. *Journal of the American Board of Family Medicine*, 21, 414–426. doi: 10.3122/jabfm.2008.05.070266
- Shokar, N.K., Nguyen-Oghalai, T., & Wu, H. (2009). Factors associated with a physician's recommendation for colorectal cancer screening in a diverse population. *Family Medicine*, 41, 427–433.
- Shokar, N.K., Vernon, S.W., & Weller, S.C. (2005). Cancer and colorectal cancer: Knowledge, beliefs, and screening preferences of a diverse patient population. *Family Medicine*, 37, 341–347.
- Tiro, J.A., Vernon, S.W., Hyslop, T., & Myers, R.E. (2005). Factorial validity and invariance of a survey measuring psychosocial correlates of colorectal cancer screening among African Americans and Caucasians. *Cancer Epidemiology, Biomarkers and Prevention*, 14, 2855–2861. doi: 10.1158/1055-9965.EPI-05-0217
- U.S. Preventive Services Task Force. (2002). Screening for colorectal cancer: Recommendation and rationale. *Annals of Internal Medicine*, 137, 129–131.
- Vadaparampil, S.T., Moser, R.P., Loud, J., Peters, J.A., Greene, M.H., & Korde, L. (2009). Factors associated with testicular self-examination among unaffected men from multiple-case testicular cancer families. *Hereditary Cancer in Clinical Practice*, 7(1), 11. doi: 10.1186/1897-4287-7-11
- Vernon, S.W., Meissner, H., Klabunde, C., Rimer, B.K., Ahnen, D.J., Bastani, R., . . . Zapka, J. (2004). Measures for ascertaining use of colorectal cancer screening in behavioral, health services, and epidemiologic research. *Cancer Epidemiology, Biomarkers and Prevention*, 13, 898–905. doi: 10.1158/1055-9965.EPI-07-2855
- Vernon, S.W., Tiro, J.A., Vojvodic, R.W., Coan, S., Diamond, P.M., Greisinger, A., & Fernandez, M.E. (2008). Reliability and validity of a questionnaire to measure colorectal cancer screening behaviors: Does mode of survey administration matter? *Cancer Epidemiology, Biomarkers and Prevention*, 17, 758–767.
- Wilson, K.M., & Orians, C.E. (2005). Considerations in recruiting underscreened women to focus groups on screening for cervical cancer. *Health Promotion Practice*, 6, 379–384. doi: 10.1177/1524839905278755
- Zapka, J.G. (2008). Validation of colorectal cancer screening behaviors. *Cancer Epidemiology, Biomarkers and Prevention*, 17, 745–747. doi: 10.1158/1055-9965.EPI-08-0179