Promoting Breast Health among Women in the U.S. Virgin Islands: A Focused Study of the Needs of Caribbean Women

Sandra Underwood, RN, PhD, FAAN

Edith Ramsay Johnson, RN, EdD

Gloria Callwood, RN, PhD

Edris E. Evans, RN, BSN

Alina Matthew, SN, Casandra Scotland-Brooks, SN, Chantal Hanley, SN, Damali Johnson-Harrigan, SN, Devette LeFlore, SN, Dionne Williams, SN, Harricia Samuels, SN, Jahtara Francis, SN, Jamela Arthur, SN, Jowana Clinkscales, SN, Martha Joseph, SN, Nihjole Heskey, SN, Rachel D'Abreau, SN, Rashima Fleming, SN, Stacey Penn, SN, Tameka A. Browne, SN, Tiffany Donastorg, SN, and Yvette Scarbriel, SN .

Abstract:

Breast cancer is the number one cause of cancer death among women in the United States Virgin Islands. Consequently, the Bureau of Health has identified breast cancer as a priority health concern. Within the medical community, increasing emphasis is being placed on the importance of hereditary, familial, environmental, and behavioral risk factors to breast cancer control. Little research has been conducted regarding these factors, however, to explore their influence on breast cancer detection and breast cancer risk management. This report highlights the outcomes of a study undertaken to explore the associations between breast cancer risk, risk assessment, risk communication, screening, and receptivity to the management of breast cancer risk among women from the United States Virgin Islands. Results of this study suggest a need within the territory to expand the systems that are responsible for monitoring and reporting breast cancer trends; forums to discuss concerns of women relative to breast health; forums to discuss communication with health-care providers; and, research efforts that address breast cancer detection and control among women in the United States Virgin Islands.

Key Words: adult, African-American women, breast cancer, cancer screening, female, guidelines adherence, minority women, risk assessment, risk communication, risk management

Introduction

Breast cancer detection and control has been identified as a national health concern by the United States Depart-ment of Health and Human Services (USDHHS, 2000), the National Cancer Institute (Ries, Harkins, Krapcho, Mariotto, Miller, Feuer, et al., 2006), and the National Center for Health Statistics [NCHS] (NCHS, 2006). Consequently, numerous initiatives have been under-taken to track trends in breast cancer morbidity and mortality, to increase breast cancer awareness, to improve breast cancer screening, to improve treatment and ensure access to breast care for women in need throughout the United States. These efforts have reached and impacted, in one way or another, the greater majority of women throughout the United States. However, the extent to which the initiatives reach and impact the women who reside in the organized territories of the United States appears to be limited.

Breast cancer is the second most common cause of can-cer death among women throughout the United States (American Cancer Society, 2007). However, within the United States Virgin Islands (USVI), breast cancer is the number one cause of cancer death among women (USVI Department of Health, 2003). The United States Virgin Islands is an organized, unincorporated territory of the United States in the Atlantic Ocean and the Caribbean Sea, about 50 miles east of Puerto Rico. The manner and extent to which data relative to the breast cancer mortality in the USVI is collected, analyzed, and reported makes it diffi-cult to compare data reflective of breast cancer mortality among women in the USVI with data reflective of breast cancer mortality of women from other states and territo-ries. Nevertheless, the USVI Bureau of Health has identified

Sandra Millon Underwood, RN, PhD, FAAN, is an American Cancer Society Oncology Nursing Professor, Northwestern Mutual Life Research Scholar, Professor University of Wisconsin Milwaukee, School of Nursing, Milwaukee, WI 53201.

Edith M. Ramsay-Johnson, RN, EdD, is a Professor, Division of Nursing Education, University of the Virgin Islands, #2 John Brewers Bay, St. Thomas, VI 00802.

Gloria Callwood, RN, PhD, is a Dean and Professor, Division of Nursing Education, University of the Virgin Islands, #2 John Brewers Bay, St. Thomas, VI 00802.

Edris E. Evans, RN, BSN, is a Clinical Instructor, Division of Nursing Education, University of the Virgin Islands, # 2 John Brewer's Bay, St. Thomas, VI 00802.

Address Requests for Reprints and Correspondence to: Sandra Millon Underwood, RN, PhD, FAAN, Professor, University of Wisconsin Mil-waukee, School of Nursing, P.O. Box 413, Milwaukee, WI 53201. Email: underwoo@uwm.edu

regional trends in breast cancer mortality among women in the U.S. Virgin Islands to be a priority health concern (USVI Department of Health, 2003).

Breast Cancer Risk and Breast Cancer Risk Communication

While the exact cause of breast cancer is not known, several factors that influence a woman's risk of developing breast cancer have been identified (American Cancer Society [ACS], 2007; Smith, Cokkinides, & Eyre, 2007). The factors known to increase a woman's risk of developing breast cancer include age, race, reproductive and menstrual history, history or hormone use, personal history of breast cancer, family history of breast cancer, genetic alterations, radiation to the chest at an early age, and certain breast conditions. The factors identified as causing the most significant risk are first-degree family history of pre-menopausal bilateral breast cancer or pre-menopausal breast cancer, first-degree family history of breast and ovarian cancer, evidence of the susceptibility gene BRCA1/BRCA2, a personal history of lobular carcinoma in-situ, breast atypical hyperplasia, and mammographic density occupying > 75% of the breast volume (see Table 1).

Identifying risk factors that are associated with breast cancer is an essential component of quality breast care. Breast care specialists suggest that, before making recommendations regarding breast cancer screening, health-care providers engage them in discussions about factors that could contribute to their breast cancer risk. Determining the presence or absence of breast cancer risk factors can help health-care providers to make recommendations to women relative to the optimal type of breast cancer screening and to make recommendations relative to managing their breast cancer risk.

Breast Cancer Risk Assessment

Several tools have been developed to help health-care providers evaluate breast cancer risk. Included among them are the Gail Model, the Claus Model, and the family health history. The Gail Model has been validated as a predictor of breast cancer risk in women who adhere to regular mammography screening (Bondy, Lustbader, Halabi, Ross, & Vogel, 1994; Speigelman, Colditz, Hunter, Hertzmark, 1994). The Gail Model, which is based on data derived from the Breast Cancer Detection and Demonstration Project (Andrews, Fullerton, Holtzman, & Motulsky, 1994), estimates a woman's risk of developing breast cancer by analyzing her age, the number of first-degree relatives with breast cancer, the age of menarche, the age of first live birth, and the number of breast biopsies. The Gail Model does not take into account the ages at which affected relatives were diagnosed with breast cancer, bilateral breast cancer, a family history of ovarian cancer, second-degree relatives with breast cancer, any history of breast cancer on the father's side of a woman's family, or known BRACA1 or BRACA2 mutations. As a result, the Gail Model can under-predict breast cancer risk in women who have one or more of these factors and can

Table 1. Risk Factors Associated with Breast Cancer

Weak risk factors

- Family history of postmenopausal breast cancer, except if associated with male breast cancer + bilateral disease
- High socioeconomic status
- Nulliparity
- Later age at first birth (> 30 yr vs > 20 yr)
- Later age at menopause (> 55 yr vs > 45 yr)
- Early age at menarche (< 11 yr vs > 15 yr)
- Postmenopausal obesity
- Alcohol consumption
- Diet
- Hormone replacement therapy (long term usage)

Moderate risk factors

- Older age
- North American and Northern European residence
- Family history of pre-menopausal breast cancer
- Personal history of breast cancer
- Breast hyperplasia without atypia
- Mammographic density occupying >50% of the breast volume

Strong risk factors

- Family history of pre-menopausal bilateral breast cancer or pre-menopausal breast cancer in mother, grandmother, sister, daughter and aunt or breast cancer and ovarian cancer in mother, grandmother, sister, aunt
- Evidence of susceptibility gene BRCA1/BRCA2
- Personal history of lobular carcinoma in situ
- Breast atypical hyperplasia
- Mammographic density occupying > 75% of the breast volume

over-estimate breast cancer risk in young women who do not have annual mammograms. Using the Gail Model, projections for women of African-American, Hispanic, and other racial and ethnic descent are subject to greater uncertainty than projections for White women.

The Claus Model is used to evaluate breast cancer risk among women with a family history of breast cancer. The Claus Model, which is based on empirical data from the Cancer and Steroid Hormone Study (Claus, Risch, & Thompson, 1994), assumes that inherited risk is attributable to an autosomal dominant mutation with high penetrance. The breast cancer risk is estimated based on a woman's current age, the number of first-degree and second-degree relatives with breast cancer, and their age of onset. The Claus Model provides breast cancer risk estimates for women with a positive family history of breast cancer, however, it is not recommended for use in women who have three or more relatives with breast

cancer. In addition, because the Claus Model does not take into account other breast cancer risk factors, it may underestimate the risk in women with behavioral risk factors or reproductive histories that increase their breast cancer risks.

The family health history has also been shown to be a useful tool for evaluating a woman's breast cancer risk (Hoskins, Zwaagstra, & Ranz, 2006). The family health history can be used to construct a pedigree that identifies breast and ovarian cancer (as well as other health conditions), environmental factors, and health behaviors common within a family. The pedigree, along with other breast cancer risk assessment tools, can then be used by health-care providers to counsel women about breast cancer screening and about ways to be proactive in the management of their breast cancer risk.

Breast Cancer Screening and Breast Cancer Risk Management

Breast cancer screening has been shown to contribute significantly to reductions in breast cancer mortality (Gotzsche & Olsen, 2000; Tabar, Vitak, Chen, Yen, Duffy, & Smith, 2001; Humphrey, Helfand, Chan & Woolf, 2002; Duffy, Tabar, Chen, Holmqvist, Yen, Abdsalah, et al., 2002; CDC, 2003; Tabar, Yen, Vitak, Chen, Smith & Duffy, 2003; Swan, Breen, Coates, Rimer, & Lee, 2003). Several cancer societies have proposed breast cancer screening recommendations for asymptomatic women with an average risk of developing breast cancer. Most recommend that asymptomatic women at average risk for developing breast cancer have regular clinical breast examinations beginning at 20 years of age and have an annual screening mammography beginning at 40 years of age (Smith, Cokkinides, & Eyre, 2007; Komen, 2007). Similar recommendations have been proposed for women at increased risk for developing breast cancer. Recommendations for women at increased risk for developing breast cancer include semiannual clinical breast examination starting at 25 years of age, annual mammograms starting at 40 years of age or 5 to 10 years prior to the earliest breast cancer in their family (although not before 25 years of age), and, the consideration of investigational imaging and screening studies. Given that research suggests that breast cancer risk may be effectively reduced using preventive drug therapy, prophylactic surgery, and behavioral modification, it is recommended that women at increased risk have discussions with their health-care providers about their risk and the use of breast cancer risk reduction strategies (Smith, Cokkinides, & Eyre, 2007; Komen, 2007) (see Table 2).

Purpose of the Study

Within the scientific, medical, and lay literature, increasing emphasis is being placed on the relevance of hereditary, familial, environmental, and behavioral risk factors to breast cancer detection and breast cancer control. However, in spite of the importance of breast cancer risk assessment and risk communication to quality breast care,

Table 2. Risk Specific Breast Cancer Screening Recommendations (ACS, 2007)

Recommendations for Women at Average Risk for Developing Breast Cancer

- Yearly mammograms are recommended starting at age 40 and continuing for as long as a woman is in good health.
- Clinical breast exam should be part of a periodic health exam, about every 3 years for women in their 20s and 30s and every year for women 40 and over.
- Women should know how their breasts normally feel and report any breast change promptly to their health care providers.

Recommendations for Women at Moderate Risk for Developing Breast Cancer

- Clinical breast examination, semiannually starting at age 25
- Annual mammogram starting at age 40 or 5 to 10 years prior to the earliest breast cancer in the family (although not before age 25)
- Discuss the benefits and limitations of adding MRI screening to their yearly mammogram with primary care provider
- Consider investigational imaging and screening studies

Recommendations for Women at High Risk for Developing Breast Cancer

- Clinical breast examination, semiannually starting at age 25
- MRI and a mammogram every year
- Consider investigational imaging and screening studies

little research has been undertaken to explore their influence on breast cancer detection and breast cancer risk management. The Bureau of Health in the USVI has identified trends in breast cancer mortality among women in the USVI to be a priority health concern (USVI Department of Health, 2003). The USVI has long been an organized, unincorporated territory of the United States. However, few efforts have been undertaken by researchers from within or beyond the territory to examine the breast health practices of these women. A study to explore associations between breast cancer risk, breast cancer risk assessment, breast cancer risk communication, breast cancer screening, and receptivity to the medical management of breast cancer risk among women from the USVI was therefore proposed. The study, which was undertaken by researchers, faculty, and students from the USVI School of Nursing, was designed in an effort to:

1. Assess the breast cancer risk perceptions and projected breast cancer risk of women in the USVI;

2. Assess the degree to which women in the USVI discuss their family health history, breast cancer risk, and breast cancer risk management with health-care providers;

3. Assess the breast cancer screening practices and receptivity to medical management of breast cancer risk of women in the USVI; and;

4. Assess the extent to which perceived risk, projected risk, risk assessment, and provider communication influenced the breast cancer screening practices and receptivity medical management of breast cancer risk among women in the USVI.

A multidimensional breast cancer screening and risk management framework was used to guide the design of the study. Incorporated in the framework were constructs reflective of breast cancer risk, breast cancer risk assessment, breast cancer risk communication, breast cancer screening, and breast cancer risk management. In applying the framework in this study, the independent variables were breast cancer risk, breast cancer risk assessment, and breast cancer risk communication. The dependent variables were self-reported use of breast cancer screening (i.e., breast self-examination, clinical breast examination, and mammography screening) and receptivity to the medical management of breast cancer risk (i.e., behavioral modification, radiology, surgery, pharmacologic intervention, and clinical trials) (see Figure 1).

Figure 1. Study Framework
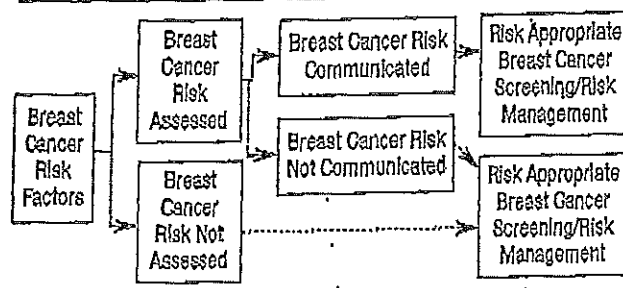
Methods

Study Design, Target Sample, and Recruitment

This cross-sectional exploratory study was conducted through the Exploratory Center at the School of Nursing at the University of the USVI. A purposive sample of women from St. Croix, St. Thomas, and St. John Island, who were 30 years of age and older and who had never been diagnosed with breast cancer, were recruited to the study. These women were recruited by the investigators and trained student assistants from the University of the Virgin Islands School of Nursing using flyers, directed mailings, word of mouth, and referrals.

During the process of recruitment, prospective participants were given an informational letter that described the study purpose and procedures. Prospective participants were informed that the study would require that they participate in a 45 to 60 minute interview during which they would be engaged in a discussion about breast cancer and their breast health practices. Prospective participants were informed that the information they shared

during the interview would be recorded by the investigators and research assistants on data collection sheets. Prospective participants were informed that no names or identifiers that could link them to the data would be recorded on the data collection sheets and that their responses would be confidential. Prospective participants were informed that the findings would be used to design breast cancer education and outreach programs for women within the USVI. A total of 178 women from the USVI volunteered to participate in the study.

Instrumentation

A focused interview guide was used to facilitate a dialog with the study participants about breast cancer, breast cancer risk, breast cancer risk communication, and breast care practices. Included in the interview guide were items relevant to perceived breast cancer risk, projected breast cancer risk, breast cancer risk assessment, breast cancer risk communication, breast cancer screening, breast cancer risk management, and family health history. This focused interview guide was developed by the investigators and it incorporated items from the literature.

Perceived Health Status and Breast Cancer Risk. Three items was incorporated in the interview to elicit data from the study participants reflective of their perceived breast cancer risk. One item asked women to respond to a statement about their health status, one item asked women to respond to a statement about their concerns about breast cancer, and another asked women to respond to a statement about their perceived risk of developing breast cancer compared with that of the average woman.

Projected Breast Cancer Risk. Seven items were incorporated in the interview to elicit data from the study participants reflective of their 5-year and lifetime projected breast cancer risk. Among them were forced choice items specific to age, race, number of first-degree relatives with a history of breast cancer, age at first live birth or nulliparity, age at menarche, number of breast biopsies, and history of atypical hyperplasia.

Breast Cancer Risk Assessment. Six items were incorporated in the interview to elicit data to evaluate the extent to which health-care providers collected historical information from the study participants regarding breast cancer risk.

Breast Cancer Risk Communication. Eight items were incorporated in the interview to elicit data to evaluate the extent to which health-care providers discussed breast cancer and breast cancer risk with the study participants.

Breast Cancer Screening. Nine items were incorporated in the interview to elicit data to evaluate the regularity of mammography, clinical breast examination, and breast self-examination.

Receptivity to Breast Cancer Risk Management. Ten items were incorporated in the interview to elicit data to evaluate the receptivity of the study participants to increased surveillance, medical intervention, surgical inter-

vention, and behavioral modification and clinical trials to manage breast cancer risk.

Family Health History. A family cancer history summary table was used to gather information regarding the cancer history of the study participants' first-degree and second-degree relatives.

Personal Characteristics. Ten items were included in the interview to elicit data reflective of gender, age, education, income, marital status, employment status, income, insurance status, finances, and perceived health status.

Validity and appropriateness of the interview guide for use among the targeted population was assessed by a panel of experts, including two nursing faculty, two breast care nurse clinicians, and two breast cancer survivors, prior to beginning the study.

Data Analysis

Information shared by the study participants during the interview was recorded on data collection sheets, coded, and entered into a computerized database and analyzed in two phases using the Statistical Package for the Social Sciences (SPSS, 2007). During Phase I, data that was reflective of the demographic, breast cancer risk, breast cancer risk assessment, breast cancer risk communication, and breast cancer risk management, the characteristics of the study participants were analyzed using descriptive statistics (frequencies, means, standard deviations, ranges). Later analyses, Phase II, used descriptive and inferential procedures to describe the associations between breast cancer risk, breast cancer risk assessment, breast cancer risk communication, and breast cancer screening and receptivity to medical management of breast cancer risk.

Protection of Human Subjects

The study was submitted for review and approval to the Institutional Review Board for the Protection of Human Subjects of the University of the Virgin Islands and the University of Wisconsin Milwaukee. Approval of the study by both Institutional Review Boards was obtained before the study was initiated.

Results

Demographic Profile

Study participants were profiled by age, marital status, education, employment status, income, finances, and health insurance status. The ages of the women involved in the study ranged from 30 to 74 years of age, with a mean of 44.47 years ($SD = 10.805$). Most of the women were single, high school graduates, employed full-time, and had access to health insurance. While most of the women involved in the study reported annual household incomes greater than $35,000, 46.6% ($n = 83$) reported that they were "living check to check" and 14.6% ($n = 26$) reported that they "needed financial help with the costs of living" (see Table 3).

Breast Cancer Risk Profile

In an effort to obtain baseline data reflective of perceived and projected breast cancer risk, the study participants were asked to respond to a series of questions related to perceptions of their health status, perceptions of their health risk, concern about developing breast cancer, personal and family history of cancer, childbearing history, menstrual history and history of atypical hyperplasia. When asked to describe their health status, 13.5% ($n = 24$) responded "excellent," 70.8.1% ($n = 126$) responded "good," 11.8% ($n = 21$) responded "fair," and 1.7% ($n = 3$) responded "poor." When asked if they ever think about their own risk of developing breast cancer 36.5% ($n = 65$) responded "often" and 23.0% ($n = 41$) responded "rarely or never." When asked to comment about their perceived breast cancer risk compared to that of the average women, 60.7% ($n = 108$) indicated that they perceived their risk to be "less" than that of the average woman and 6.8% ($n = 12$) indicated that they perceived their risk to be "higher" that that of the average woman.

As shown in Table 4, several of the women involved in the study had risk factors that could place them at increased risk for developing breast cancer. Twenty-two percent of the women ($n = 40$) reported that one or more of their maternal or paternal family members had a history of breast cancer. Five percent of the women ($n = 9$) reported that a maternal or paternal family member had a history of ovarian cancer. Twenty-five percent of the women ($n = 44$) reported that they had no children or that their first child was born after the age of 30. Twenty-two percent of the women ($n = 39$) reported that they began menstruating at 11 years of age or younger. Seventeen percent of the women ($n = 30$) reported having had an abnormal mammogram or breast ultrasound, and twelve percent of the women ($n = 21$) reported having had breast biopsies (see Table 4).

Projected breast cancer risk was estimated for women involved in the study who were 35 years of age and older using the model proposed by Gail. Among the women involved in the study who were 35 years of age or older, 87.9% ($n = 116$) were projected to have an "average risk" for developing breast cancer, 7.6% ($n = 10$) were projected to have a "moderate risk" for developing breast cancer, and 4.5% ($n = 6$) were projected to have a "high risk" for developing breast cancer.

Breast Cancer Risk Assessment and Breast Cancer Risk Communication

Identifying the factors that are associated with the development of breast cancer is an essential component of quality breast care, given that this information can help providers make appropriate recommendations regarding screening and breast care. Several items were incorporated into the interview guide to assess the extent to which breast cancer risk was assessed and breast cancer risk was discussed with the women by their health-care providers. Included were questions that related to the collection of information about personal and family health history, questions

Table 3. Demographic Profile of the Study Participants (N = 178)

Characteristics	n	%.
Age (years)		
30-39	76	42.7
40-49	45	25.3
50-59	40	22.5
60-69	16	9.0
70 +	1	0.6
Highest educational level		
Elementary	12	6.7
High school	79	44.4
College or technical school	70	39.3
Graduate school	14	7.9
Marital status		
Never married	70	39.3
Married	61	34.3
Separated	7	3.9
Divorced	17	9.6
Widowed	10	5.6
Partnered	13	7.3.
Employment status		
Employed full time	132	74.2
Employed part time	13	7.3
Unemployed and looking for work	5	2.8
Unemployed and not looking for work	5	2.8
Home maker	8	4.5
Student	5	2.8
Retired	6	3.4
Disabled, not able to work	2	1.1
Other	2	1.1
Yearly household income		
$75,000 or more	13	7.3
$50,000 to $74,999	28	15.7
$35,000 to $49,999	38	21.3
$25,000 to $34,999	36	20.2
$20,000 to $24,999	21	11.8
$15,000 to $19,999	10	5.6
$10,000 to $14,999	5	2.8
Need heFinances		
Need help with costs of living	26	14.6
Live check to check with debt	44	24.7
Live check to check with little to no debt	39	21.9
Living comfortably	58	32.6
Living with no financial difficulties	10	5.6
Health Insurance Status		
Individual plan paid by the study participant	17	9.6
Group plan through an employer, union, etc.	56	31.5
Government health plan	59	33.1
Medicaid	3	1.7
Medicare	3	1.7
No insurance	40	22.5

that related to collection of information about personal and family history of breast cancer, and questions about discussions with health-care providers about breast cancer, breast cancer risk, and breast cancer screening.

Data analysis revealed that historical information relative to personal and family health was not routinely collected from the women involved in the study. Sixty-seven percent of the women (n = 120) involved in the study

Table 4. Cancer Risk Profile of the Study Participants (N = 178)

Characteristics	n	%
Family history of cancer		
Maternal history of cancer	68	38.2
Paternal history of cancer	43	24.2
Maternal or paternal history of cancer	86	48.3
Family history of breast cancer		
Before menopause	17	9.6
After menopause	25	14.0
Family history of ovarian cancer	9	5.1
Childbearing history		
No children	4	2.72
First child born at 30 < years of age	14	9.86
Menstrual history		
Menstrual cycle began < 12	37	21.39
History of abnormal mammogram or breast ultrasound	30	17.24
History of breast biopsy	2	1.19
Five year breast cancer risk*		
Average	116	87.9
Moderate	10	7.6
High	6	4.5

* Five year breast cancer risk was calculated using procedures described in the Gail Model for study participants > 35 years of age.

reported that historical information about their personal health and family health was collected prior to their last physical examination. Among those reporting the collection of historical health information, 87.5% (n = 105) indicated that they were asked questions about their family history of breast cancer. However, significantly fewer reported having had discussions with providers about breast cancer risk factors and their breast caner risk. Forty-four percent (n = 53) of these women indicated that they were asked questions about their menstrual history, childbearing history, history of abnormal mammograms, and history of biopsies. Forty-six percent (n = 82) of these women reported having had discussions with their providers about their projected breast cancer risk.

When women involved in the study were asked about discussions they had had with health-care providers about breast cancer screening, 52.8% (n = 94) reported having discussed clinical breast examination and 77.5% (n = 138) of the women reported having had discussions about breast self-examination. Among those under 40 years of age, 28.9 % (n = 22) reported having had discussions with health-care providers about mammography screening. Among those 40 years of age and older, 92.2% (n = 102) reported having had discussions with health-care providers about mammography screening.

Breast Cancer Screening Practices

A review of the study data suggested that the greater majority of the women involved in the study did not comply with recommended breast cancer screening guidelines. Among the women from 30 to 39 years of age, 28.9% (n = 22) reported that they examined their breasts monthly and 47.4% (n =36) reported that they had received a breast examination by a physician or nurse practitioner within the past year. Among women 40 years of age and older, 29.4% (n = 30) reported that they examined their breasts monthly, 66.7% (n = 68) reported that they had received a breast examination by a physician or nurse practitioner within the past year, and 47.1% (n =48) reported having obtained a mammogram with in the past year.

The guidelines proposed by the American Cancer Society (Smith, Cokkinides, & Eyre, 2007) and the Susan G. Komen Foundation for the Cure1 were used to assess the overall compliance with breast cancer screening recommendations. Women from 30 to 39 years of age and older with an "average" projected risk for developing breast cancer were deemed to be compliant if they reported breast self-examination and clinical breast examination screening consistent with the guidelines of the American Cancer Society and the Susan G. Komen Foundation for the Cure. Women 40 years of age and older with an "average" projected risk for developing breast cancer were deemed to be compliant if they reported breast self-examination, clinical breast examination and mammography screening consistent with the guidelines of the American Cancer Society and the Susan G. Komen Foundation for the Cure. Women 40 years of age and older whose projected risk for developing breast cancer was "moderate" or "high" were

deemed to be compliant if, in addition to reporting breast cancer screening consistent with the published guidelines, they indicated that they had discussed their breast cancer risk and breast cancer screening with their health-care provider. Seventeen percent of the women with an average risk for developing breast cancer ($n = 20$) were assessed as being compliant with breast cancer screening recommendations. Twenty-five percent of the women with a moderate/high risk for developing breast cancer ($n = 4$) were assessed as being compliant with breast cancer screening recommendations.

Receptivity to Medical Management of Breast Cancer Risk

In an effort to determine the receptivity to medical management of their breast cancer risk, women participating in the study were asked if they would be willing to consider genetic testing, increased surveillance, and medical intervention if they were found to have a significant risk for developing breast cancer. Seventy-one percent of the women involved in the study ($n = 126$) reported that they would be willing to undergo genetic testing. Among women indicating a willingness to undergo genetic counseling and testing, 76.2% ($n = 96$) reported that they would be willing to undergo more frequent breast examinations, and 50% ($n = 63$) reported a willingness to undergo drug therapy. In addition, 31.7% ($n = 40$) reported a willingness to undergo surgical intervention, 69.8% ($n = 88$) reported a willingness to undergo behavioral modification, and 44.4% ($n = 56$) reported a willingness to participate in a breast cancer risk management clinical trial.

Influence of Perceived Risk, Projected Risk, Risk Assessment, and Provider Communication on Breast Cancer Screening and Receptivity to Breast Cancer Risk Management

During the second phase of the data analysis, efforts were undertaken to determine the influences of perceived risk, projected risk, risk assessment, and provider communication on the study participants' breast cancer screening practices and receptivity to breast cancer risk management. Participants were stratified by perceived risk, projected risk, risk assessment, and provider communication. After which, chi square analyses were used to examine the influence of perceived risk, projected risk, risk assessment, and provider communication on the breast cancer screening practices and receptivity to breast cancer risk management.

Data analysis revealed that breast cancer screening practices and receptivity to breast cancer risk management were not significantly influenced by perceived breast cancer risk, projected breast cancer risk, or health assessment of the study participants. However, data analysis revealed that provider communication significantly influenced the breast cancer screening practices and receptivity to breast cancer risk management of the study participants. Study participants who perceived themselves to be at increased risk for developing breast cancer were no more likely than those who perceived themselves to be at average or lower risk to report compliance with breast cancer screening recommendations. Study participants with an average projected risk of developing breast cancer were no more likely than those with a moderate or high projected risk to report compliance with breast cancer screening recommendations. Study participants who reported that their providers collected detailed information about their personal breast cancer risk were no more likely than those who did not to report compliance with breast cancer screening recommendations. However, the study participants who reported having had discussions with health-care providers about their breast cancer risk were more likely to report compliance with breast self-examinations, clinical breast examination and mammography screening recommendations. In addition, the study participants who reported having had discussions with health-care providers about their breast cancer risks were more likely to express a willingness to consider risk management strategies.

Discussion

The U.S. Virgin Islands, after being "acquired" from Denmark, became an organized territory of the United States in 1917. According to the 2000 Census, there are nearly 108,612 residents in the U.S. Virgin Islands (U.S. Census, 2007). Approximately 95% of the USVI population lives on the islands of St. Thomas, St. Croix, and St. Johns. Its inhabitants, though they cannot vote in U.S. presidential elections, are citizens of the United States.

The USVI Bureau of Health has identified regional trends in breast cancer mortality among women in the U.S. Virgin Islands to be a priority health concern (USVI Department of Health, 2003). This study provided the investigators, faculty, and students of the USVI School of Nursing, most of which are natives of the U.S. Virgin Islands, an opportunity collect empirical data that could be used to define the breast health, breast cancer detection, and control care needs of women within the USVI. In addition, it provided investigators, faculty, and students with information that could be used in planning future programs to address needs specific to the community.

The results of this study should be interpreted as suggestive rather than strongly conclusive. The small sample size and the use of a purposefully non-probability selected sample of USVI women 30 years of age and older that had never been diagnosed with breast cancer limits the generalizability of the findings of this study. Yet, in spite of these constraints, there are several finding of significance worth noting.

The identification and review of reports of the National Cancer Institute (Ries, et.al, 2006), the American Cancer Society (ACS, 2007) and the National Center for Health Statistics (NCHS, 2006) include little data specific to the breast cancer incidence and mortality of women in the USVI. While the data limitations make it difficult to compare breast cancer trends among women in the USVI with women from other states and territories, it calls attention to the need for expanding the scope of systems that are

responsible for cancer surveillance within the United States and its organized territories.

Smoking prevalence among native islanders in the USVI is far less than that in the states (CDC, 2007). Consequently, unlike other states, lung cancer is not the number one cause of cancer death among women (USVI Department of Health, 2003). Findings revealed that while a significant proportion of women involved in the study reported risk factors that could place them at increased risk for developing breast cancer, most perceived their breast cancer risk to be "lower than the average women." Most of the women involved in the study reported that information about their personal health and their family health was collected prior to their last physical examination. While the greater majority reported that they had been asked about a family history of breast cancer, few reported that they had been queried about breast cancer risk factors related to their childbearing history, menstrual history, and medical history. While discussions with health-care providers about breast cancer screening were noted by the women to be common, discussions with health-care providers about breast cancer risk were not.

The greater majority of the women involved in the study reported that they were not in compliance with the recommended breast cancer screening guidelines. However, careful review of the data revealed that women reporting having had discussions with health-care providers about their personal breast cancer risk were more likely to report compliance with breast screening recommendations. In addition, women who reported having had discussions with health-care providers about their personal breast cancer risk were more likely to express an interest in medical strategies for the management of breast cancer risk.

Recommendations for Research, Practice, and Education

Significant advances have been made over the past twenty years relative to breast cancer screening, diagnosis, and control. Within scientific and medical communities it is generally believed that breast cancer could be controlled most effectively if screening, surveillance, and risk management strategies were effectively utilized.

Data from this study suggests a need for the development of more focused programs of research, education, and outreach to promote breast health among women in the USVI. Results of this study suggest that within the USVI there is a need to the enhance the systems responsible for monitoring and reporting cancer trends relative to cancer incidence, mortality, and survival within the territory; a need for forums for investigators, faculty, students, and the community to discuss the breast health needs and concerns of women across the territory; a need for educational programming for women in the community that focuses on breast cancer, breast cancer risk, breast cancer screening, and breast cancer risk management; a need for educational programming for women in the community that enhance communication with health-care providers; a need for educational programming for women in the community that focus on the relationship between personal health and family health; a need for training of health-care providers (i.e., physicians, nurse practitioners, oncology nurse specialists, etc.) relative to the assessment and communication of breast cancer risk; and, a need for the development of programs of research to address issues relevant to breast cancer detection and control among women in the USVI across the care continuum.

Numerous initiatives have been undertaken to track trends in breast cancer morbidity and mortality, to increase breast cancer awareness, to improve breast cancer screening, to improve treatment and to ensure access to breast care for women in need throughout the United States. Now is the time to ensure that similar efforts are undertaken to ensure that the same occurs for women in the USVI and other organized territories of the United States.

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