

Breast and Cervical Cancer Screening Behaviors of African American Sexual Minority Women

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Abstract

Background: African American women experience elevated risk for breast and cervical cancer compared to White women. Health risk behaviors and cancer screening practices are known to contribute to cancer disparities; however, little is known about the relationship between race, sexual orientation, and cancer risk. The objective of this paper is to report on engagement in a range of health risk behaviors associated with cancer and adherence to cancer screening guidelines among African American Women sexual minority women.

Methods: This was a cross sectional descriptive study. Data were collected using a self-administered survey instrument. Participants ($N=226$) were a convenience sample of urban African American sexual minority women recruited as part of a community health needs assessment study.

Results: Cancer risk behaviors were prevalent including high rates of obesity, physical inactivity, tobacco and alcohol use. Despite these health risk behaviors, perceptions of cancer risk were low. Eight-five percent of women over the age of forty reported ever having a mammogram and 69% reported having the screening examine in the previous year. The majority of participants reported ever having a Pap test but reports of past year screening were low (68%). Predictors of ever having a mammogram were older age and having a physician recommendation to screen. Past year mammography was associated with perceived cancer risk with those reporting higher perceived risk less likely to have been screened in the past year. None of our study variables were associated with adherence to cervical cancer screening guidelines.

Conclusions: Study findings suggest the need for increased efforts to reduce cancer risk behaviors and to encourage adherence to routine cancer screening among African American sexual minority women. Provider recommendations play an important role in breast cancer screening adherence. Additional research is needed to better understand barriers and facilitators to adherence to cervical cancer screening in this population.

Keywords: Cancer screening; African American; Lesbian and bisexual women

Abbreviations: SMW: Sexual Minority Women

Introduction

Four decades after the institution of the war on cancer, advancements in prevention, screening, and treatment have resulted in downward trends in mortality rates and actual cancer deaths [1]. Nevertheless, cancer continues to exact a tremendous toll on subsections of the U.S. populations, with continuing disparities in how cancer affects different ethnic and racial groups [2]. In 2012, it was estimated that nearly 1.6 million cases of cancer were diagnosed – 790,740 cases for women in particular [3]. In 2013, another 1.7 million cases are expected to be diagnosed in the United States, and about 580,350 Americans are expected to die of cancer this year [3]. Among women, African Americans continue to face disproportionate burden associated with cancer. For example, breast cancer is the most common cancer in African American women, with an estimated 26,840 new cases expected to occur in this population in 2011 [4]. Long-term survival rates for breast cancer among African Americans are significantly lower than their white counterparts despite a lower breast cancer incidence rate (78% vs. 90%) [4]. Similar disparities by race exist in cervical cancer incidence and death rates, with African American women having a 2.6% higher incidence than Caucasian women [4]. Overall cancer death rates are 7.7% higher in African American women than white women [4]. Despite the extensive body of literature on the cancer risk and

screening behaviors of African American women, little is known about differences in this population based on sexual orientation. To address this gap in the literature, study aims were to examine cancer-related risk and screening behaviors in a sample of African American sexual minority women (lesbians, bisexual, and other non-heterosexually identified women; SMW).

Cancer Screening Rates

Researchers have identified a clinical basis for differential cervical and breast cancer survival rates among African American women [5,6]. Primary among these clinical factors is that African Americans are more likely to be diagnosed with more advanced stages of cancer compared to Caucasians [7]. African American women are also less likely to follow up on abnormal mammography results in a timely

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fashion, which leads to a decreased likelihood of being diagnosed at earlier stages of cancer formation [8]. Routine screening with Pap tests has increased the likelihood of detecting pre-invasive lesions or early stage disease resulting in survival rates of over 92% in women following such regular screening practices [1]. The majority of the cervical cancers diagnosed in the United States occur in women who have never received a Pap test or who have not been screened in the past five years [9]. Similarly, research specific to breast cancer attributes a proportion of the racial and ethnic disparity in survival rates to barriers to cancer screening [5,6].

Sexual minority women have also been identified as a population at risk for late-stage diagnosis of cancer [10-12]. For example, health care factors place SMW women at late stage detection and treatment of cancers including a lower likelihood of having medical insurance, poor access to health care services, the lack of culturally competent health care providers, and unmet medical needs [13-15]. Among heterosexual women, these factors have been directly related to lower screening rates [16]. Cancer screening behaviors may also contribute to elevated risk for late-stage diagnosis. Grindel et al. [17] found that among lesbians, rates of breast cancer screening in the past two years ranged from 58-84%. Additionally, rates of cervical cancer screening continue to be lower than expected for women in the general population [18-20]. Charlton et al. [21] reported that compared to heterosexual women, SMW are significantly less likely to report past year and ever cervical cancer screening. In one of the few studies reporting on African American SMW, Ramsey et al. [22] found that 35% of a sample of 1,596 African American lesbians, age 18-70 years, reported they did not see a gynecologist regularly. Although access to health care is a known barrier to cancer screening, Kerker et al. [23] found that SMW were less likely than heterosexual women to have had routine breast or cervical cancer screenings, even after controlling for health insurance coverage.

Despite consistent reports of lowered screening rates, little is known about the factors contributing to the disparity. One factor that may serve as a unique barrier to screening for SMW is homophobia and the lack of cultural competency of health care providers. Research suggests that SMW are less likely to engage in preventive health care [15]. This may be in part explained by communication barriers with health care providers arising from fears of homophobia or based on past negative experiences [23-26]. Perceived discrimination in health care settings has been associated with lower rates of cancer screening among SMW. Tracy, Lydecker, and Ireland found nonroutine screeners were more likely to delay seeking healthcare and less likely to disclose sexual orientation to their primary care physician as a result of perceived discrimination [27]. Further, health care provider frequently do not ask about sexual orientation which serves as a key barrier to providing necessary and culturally appropriate physical health care [28,29].

Behavioral Risk Factor for Cancer Disparities

In addition to lower rates of cancer screening, behavioral and lifestyle factors also place African American women at increased risk for cancer [30]. For example, 78.2% of African American women met criteria for being overweight and 49.6% for obesity, while 61.2% of Caucasian women met the criteria for being overweight and 33.0% for obesity [30]. Rates of physical inactivity, limited knowledge about cancer symptoms, underutilization of preventive health care services and poor access to quality health care services further increase African American women's risk of cancer [30]. Sexual minority women have numerous behavioral risks for cancer including high rates of obesity, high rates of alcohol and tobacco use; and reproductive risk factors such as nulliparity; lower rates of birth control use, and older age of

first birth [10,12,18,31-35]. In summary, the combined impact of poor adherence to cancer screening, barriers to adequate health care services and engagement in cancer promoting health risk behaviors may place SMW at elevated risk for cancer disparities. The negative impact of these factors may be compounded by the combined influences of a sexual minority status and a racial minority status among African American SMW.

Specific aims

A confluence of socioeconomic, behavioral, and health care factors is known to contribute to cancer disparities among African American women [2]. However, little is known about cancer-related risk and screening behaviors among African American SMW. As such, the focus of this paper was to: (1) measure presence of behavioral risk factors associated with a range of cancers including nulliparity, tobacco use, body mass index (BMI), alcohol use, and physical activity; (2) examine level of adherence to breast and cervical cancer screening recommendations; and (3) explore the socioeconomic, behavioral, and health care factors associated with adherence to cancer screening guidelines.

Methods

Study design

The study was a cross-sectional descriptive study. Data for this study were collected as part of a larger community-based needs assessment study. The "Take Charge" study was initiated by Affinity Community Services, a not-for-profit organization serving the needs of lesbian and bisexual women of African descent in the greater Chicago Metropolitan area in partnership with researchers at the University of Chicago. The overall goals of the study were to examine the general health status, health behaviors, and risks of African American SMW and to identify programmatic targets for the organization's health promotion initiatives.

Sample

African American SMW over the age of 18 were eligible to participate in the survey study. Obtaining a large probability sample of SMW is difficult and costly [36]. As such, much research in this population has been conducted with volunteer and convenience samples [37]. Recruitment for the "Take Charge" study consisted of a range of strategies designed to obtain a diverse cross-section of African American SMW. The primary recruitment strategy was to mail a copy of the survey to members of Affinity's mailing list (over 500 constituents, supporters, and allies). In addition, the survey was distributed at a broad range of formal and informal lesbian-friendly venues (e.g., potluck dinners; discussion groups; bookstores; coffee houses; college, social, support, therapeutic, musical, and political groups and organizations). We sought participants through informal social networks (e.g., peer outreach in older and younger age groups). Women who completed the survey were given additional copies of the survey to distribute to their friends.

Data collection

Data were collected using self-administered, paper-and-pencil survey questionnaires. Instructional letters accompanying survey packets were mailed to study participants describing the study's goal as "collecting information about the health of a broad group of African American lesbian and bisexual women of differing ages, backgrounds, and occupations". Each informational packet contained two questionnaires

– one to be completed by the participant and one to be distributed to someone else in her social network. Information printed on the survey instructed participants to complete and return the survey in person (in a sealed return envelope) or by mail in a postage-paid, pre-addressed envelope. To ensure anonymity, no code numbers or identifying information were included. While our intent was to encourage participation of SMW who tend to be underrepresented in research (e.g., SMW who may have been less open about their sexual orientation), this method prohibited accurate calculation of the response rate. A total of 226 completed surveys were returned. Participants received a \$5.00 stipend for completion of the study. Offering nominal stipends (i.e., \$5.00) are not known to be coercive or to introduce bias in rates of participation. The Institutional Review Board of the University of Chicago approved the survey and procedures.

Survey development

An interdisciplinary team of stakeholders from various universities, organizations, and community groups helped to develop the survey instrument. Questionnaire items covered a broad range of health behaviors and health indicators, including personal health history (e.g., general, menstrual, and gynecological health); health-related practices (e.g., diet, health screening); substance use (alcohol, cigarettes, and illegal drugs,) depression, anxiety, and suicide (ideation and attempts); access to and use of health care services; relationships and social support; and demographic information. The broad scope of the survey questionnaire precluded assessment of specific health conditions or behaviors using standardized measures. However, where feasible, we used abbreviated measures from previous research. The survey contained six major sections with a total of 130 questions. All items used simple check boxes or Likert-type rating scales. Efforts were made to ensure questionnaire comprehensibility at the eighth-grade level or lower. Items used for the current analyses are described below.

Measures

Demographics

Participants reported their age (years), education (High school or less, Some college, Bachelor’s degree, Graduate or professional degree), race/ethnicity (African American-non Hispanic, African American-Hispanic, Afro-Caribbean, Biracial/multiracial), relationship status (In a committed relationship or not), employment status (Full time, Part time, Unemployment), sexual identity (Lesbian, Bisexual, Uncertain), health insurance coverage (Insured or not), and access to medical care, including whether they have a primary physician and their medical appointment (Last 6 month, Last 7-12 month, More than 1 year) (Table 1).

Health Risk Behaviors

Items from the Centers for Disease Control and Prevention 2009 Behavioral Risk Factor Surveillance System (BRFSS) survey were used to collect risk assessment data on health status, smoking, BMI, physical activity, and health screening behaviors (http://www.cdc.gov/brfss/annual_data/pdf-ques/2009brfss.pdf). Perceived health status was measured by asking women in the study to rate their overall health during the past year using the following categories: (1) Poor, (2) Fair, (3) Good, (4) Very Good, or (5) Excellent. To assess smoking status, respondents were asked “Do you currently smoke cigarettes?” Answers to this question were used to classify participants as current smokers, non-smokers, previous smokers. Three categories of alcohol consumption (Never, Former, Current) were measured by asking

respondents two questions “Do you drink alcoholic beverages?” and “How long ago did you quit drinking”. Body mass index was calculated after obtaining information about the participant’s height and weight (weight in kilograms divided by height in meters squared; kg/m²). Physical activity was measured by frequencies of exercising at least 20 minutes a week. Finally, nulliparity was measured by asking women if they had ever been pregnant (Yes/No) and whether they had ever had a live birth (Yes/No).

Cancer and Disease History

History of breast diseases, including cancerous and non-cancerous condition was reported. Family history of breast cancer was obtained by asking people whether a first degree blood relative had ever been diagnosed with breast cancer. A history of abnormal breast or cervical cancer screening results was also collected. Participants were also asked their perceived risk for the development of cancer (scale from 0-100,

Variable ^a	n	%
Age (\bar{x} =39.5; \pm 10.6 years)		
<30	51	22.7
31-40	75	33.3
41-50	63	28.3
>50	36	16.0
Education		
High school or less	23	10.3
Some college	80	35.7
College degree or higher	121	54.0
Race/ethnicity		
African American (non-Hispanic)	191	84.5
African American (Hispanic)	5	2.2
Afro-Caribbean	5	2.2
Biracial/multiracial	25	11.1
Relationship status		
Not in a committed relationship	90	40.0
In a committed relationship	135	60.0
Employment status		
Full time	152	67.6
Part time	21	9.3
Unemployed	35	15.6
Retired	9	4.0
Disabled	8	3.6
Sexual identity		
Lesbian	167	75.6
Bisexual	33	14.9
Uncertain	21	9.5
Health insurance coverage		
Not insured	43	19.3
Insured	180	80.7
Have primary physician		
No	33	14.7
Yes	191	85.3
Last time seen doctor		
Last 6 months	164	74.9
Last 7-12 months	38	17.4
More than 1 year	17	7.8
Family history of breast cancer		
No	155	68.6
Yes	71	31.4
Perceived lifetime cancer risk (x =34% \pm 26.39)		

^aNumber of valid responses for variable

Table 1: Characteristics of the Study Sample (N=226).

with higher scores representing more perceived risk).

Breast cancer screening behaviors

The American Cancer Society recommends baseline mammograms for all women at age 40 [38]. Participants 40 years and older who reported having received a baseline mammogram by age 40 were coded as adherers. Past year screening was also measured by asking women whether they had obtained a mammogram in the previous 12-months (Yes/No). Women who reported not screening were asked about their intention to screen in the next six months. There were 108 study participants aged 40 and over.

Cervical cancer screening behaviors

American Cancer Society Screening Guidelines recommend that all women who are or had been sexually active for 3 years, or who are no more than 21 years old, have an annual Pap test and pelvic examination [38]. Women were asked to report if they had ever received a Pap test and whether they had received a Pap test in the previous 12 months. Women who reported not screening were asked about their intention to screen in the next six months. There were 221 study participants aged 18 and older.

Data analyses

Descriptive statistics were used to summarize demographic characteristics of the sample. Univariate statistical techniques were used to generate frequency distributions, measures of central tendency and dispersion. Logistic regressions were performed to explore predictors of breast and cervical cancer screening. All independent variables included in the regression analyses were coded as binary variables. All significant differences reported here have probabilities of $p < 0.05$.

Results

Health risk behaviors

The mean BMI of the sample was 31.7 (SD=8.0). Based on BMI scores, over half of the participants were identified as obese (53.9%) and an additional 24.7% were overweight. Twenty-six percent of participants were current smokers and about two-thirds of the sample reported drinking alcoholic beverages (72.6%). Less than half of the sample (44%) reported exercising 3 or more times per week. The majority of participants reported their health status to be very good to excellent (59.7%). Most study participants (53.1%) reported never having been pregnant (nulliparity).

Cancer screening behaviors

Participant's cancer screening behaviors are shown in Table 2. The majority of participants reported having ever having had a screening mammogram or Pap test (84.9% and 98.1%, respectively). Nearly 90% of all participants reported being advised by their doctors to receive cancer screenings. Percentages for recent screenings (past year mammogram and Pap test) were similar (69.4% and 68.2%, respectively). The average age for first time screening was 37.9 years for mammography and 21.9 years for obtaining a Pap test. One-fourth (25.9%) of participants had ever seen a doctor for a breast lump and 14.4% reported a history of breast biopsy. Reports of actual breast disease were low with 11.1% and 2.8% of participants reporting a history of non-cancer breast disease and breast cancer, respectively. Nearly one-fifth (19.7%) of the sample reported ever receiving an abnormal Pap test. Among non-screeners, intention to obtain a breast or cervical cancer screening exam in the next six months was high (72.0% and 73.8%, respectively). The average

perceived lifetime risk of developing cancer was low (34.4% risk of developing cancer in one's lifetime).

Logistic regression models of mammogram and pap test adherence

Demographic characteristics included age (continuous); education level (reference=some college or higher); and insurance coverage (reference=insured). Other variables included perceived lifetime cancer risk (continuous), family history of breast cancer (reference=yes); history of non-cancerous or cancerous breast disease (reference=yes); health status (reference=good or above), and received doctor recommendation for mammogram screening (reference=yes). Table 3 presents the odds ratios corresponding confidence intervals, and p-values for the logistic regression models examining correlates of screening behaviors. The first model tested the relationship between predictor variables and ever receiving a mammogram. Women who were younger ($p < 0.05$) and had not received a recommendation from their doctor ($p < 0.001$) were less likely to have ever had a mammogram. ($R^2 = 0.28$, Chi-Square=34.47, $p < 0.001$). The second model tested the relationship between predictor variables and having a mammogram in the past year. People with higher perceived lifetime cancer risk were less likely to have mammogram screening in the past year ($p < 0.05$).

Mammogram (Age ≥40, n=108)		
Variable ^a	n	%
Mammogram		
Ever had this test		
No	16	15.1
Yes	90	84.9
Had test in past year		
No	30	30.6
Yes	68	69.4
Planning test in next 6-months (non-screeners)		
No	4	16.0
Yes	18	72.0
Not sure	3	12.0
Doctor recommendation		
No	14	13.0
Yes	94	87.0
Abnormal mammogram test		
	18	17.3
History of any breast disease		
Non-cancerous	12	11.1
cancerous	3	2.78
Cervical Cancer Screening (Age ≥21) n=221		
Pap test	n	%
Ever had this test		
No	4	1.9
Yes	209	98.1
Had test in past year		
No	67	31.8
Yes	144	68.2
Planning test in next 6-months (non-screeners)		
No	9	14.8
Yes	45	73.8
Not sure	7	11.5
Doctor recommendation		
No	20	9.1
Yes	199	90.9
Abnormal pap test		
	41	19.7

^aNumber of valid responses for variable

Table 2: Breast and Cervical Cancer Screening Behaviors (N=226).

Variable	Ever Mammogram (N=108)		Past Year Mammogram (N=108)		Past Year Pap Test (N=221)	
	OR	95% CI	OR	95% CI	OR	95% CI
Age	1.26*	1.06 - 1.51	1.00	0.93-1.07	0.98	0.95-1.01
Education (Reference: Some College or Less)						
College or above	0.50	0.11-2.32	1.53	0.57-4.13	1.24	0.68-2.29
Insurance (Reference: Yes)	0.53	0.09-3.06	1.61	0.42-6.10	1.36	0.61-3.00
Perceived Cancer Risk	0.98 ⁺	0.96 -1.00	0.98*	0.97-1.00	1.00	0.99-1.01
Family History of Breast Cancer (Reference: Yes)	0.22	0.04-1.46	0.56	0.20-1.59	n/a	
Breast Diseases (Reference: Yes)	0.18	0.01-3.02	0.41	0.09-1.85	n/a	
Health Status (Reference: Good or above)						
Fair or below	0.22 ⁺	0.04-1.31	0.55	0.15-2.09	1.04	0.37-2.94
Doctor Recommendation (Reference: Yes)	0.03***	0.00-0.19	0.29 ⁺	0.06-1.31	0.51	0.18-1.47
Model Fit	R ² =0.28, Chi-Square=34.47, p< 0.001		R ² =0.12, Chi-Square=12.66, p>0.05		R ² =0.02, Chi-Square=4.23, p>0.05	

*p ≤ 0.10; *p<0.05; ***p<0.01; OR: odds ratio
Family history of cervical cancer and cervical diseases were not available from the database.

Table 3: Logistic Regression Analyses for Adherence to Cancer Screening Guidelines.

However the overall model was not statistically significant (R²=0.12, Chi-Square=12.66, p>0.05). In the final model, we examined the relationship between predictor variables and Pap testing. Since over 90% of women aged 21 years or older ever had Pap test, our third model tested the relationship between predictor variables and having received a recent Pap test, only. The overall model was not statistically significant (R²=0.02, Chi-Square=4.23, p>0.05) nor were any of the predictor variables associated with having a recent Pap test.

Discussion

The reduction of breast and cervical cancer disparities among African American women has been identified as a national health priority [39]. To date, the research on African American women and cancer risk has focused almost exclusively on heterosexual women [33]. The purpose of this study was to examine levels of cancer-related risk behaviors and engagement in early detection screening among a sample of African American SMW. Strengths of the study included an age and educationally diverse sample of African American SMW, measurement of health risk behaviors associated with a range of cancer diagnoses, measurement of ever and recent screening, and the assessment of intention to screen for those women who were non-adherent to screening guidelines. In addition, in our multivariate models predicting cancer-screening adherence, we controlled for demographic and health care access variables known to influence these behaviors. The results of this study shed important light on the elevated rates of cancer-risk behaviors and barriers to early detection in this population of women and added to our knowledge about the factors contributing to cancer-screening behaviors. In the sections below, we highlight the key findings from the study and discuss the implications of the study findings.

Cancer screening rates

Primary among the target strategies for reducing cancer health disparities is to increase access to and participation in cancer early detection screening by racial and ethnic minorities [40]. In our sample, rates of ever screening for both breast and cervical cancer were high. The majority of participants reported adherence to recommended guidelines for the initiation of early detection screening (by aged 40,

85% and aged 21 years, 98% for breast and cervical cancer, respectively). These percentages are consistent with the upward trends in screening rates among African American women over the past decade [41]. However, rates of past year breast and cervical cancer screening were much lower compared to ever screening (69.4% and 68%, respectively). Further, these screening rates were also much lower than national data on African American women obtained during the same time span in which the current study was conducted. Adherence to recent cancer screening for African American women in 2004 was 82% for breast screening and 88% for cervical cancer [42]. Lower rates of cervical cancer screening (60%) were also reported in a recent study on African American SMW [33]. Rates of recent screening show clear disparities among African American women based on sexual orientation. To date, scant research is available to inform our understanding of this disparity. Additional research is needed to determine the barriers and facilitators to screening among African American women, with specific attention to the role of sexual orientation in screening behaviors.

Predictors of screening behaviors

A range of factors have been shown to increase adherence to cancer screening guidelines. In this study we examined the influence of socio-demographic, access to health care, and health variables on adherence to breast and cervical cancer screening. Overall the model testing associations with adherence to ever breast cancer screening was statistically significant and accounted for 28% of the variance. Rates of ever breast cancer screening were individually predicted by participant age with older women being more likely to report ever screening. A number of factors may explain the relationship between old age and screening including the higher likelihood of physician recommendation for older women and the clear guidelines for annual screening among women who are over age 50.

Research shows that a recommendation from a health care provider is the most important reason patients cite for having cancer-screening tests [43]. Consistent with previous studies of African American heterosexual women [44], provider recommendation, or lack thereof, was statistically significantly associated with ever breast cancer screening and marginally associated with past year screening.

Access to care was not associated with screening but women with lower self-reported health status were marginally less likely to report ever screening. In terms of past year screening, women with higher perceived risk for developing breast cancer were less likely to adhere to screening. Cognitive factors such as perceptions of cancer risk and the benefits and barriers to screening are known to influence cancer screening behaviors [45]. Future studies should include a more extensive assessment of cognitive and attitudinal barriers and facilitators to cancer screening.

Unlike the model for breast screening, the overall model predicting cervical cancer screening was not statistically significant and none of the variables were independently associated with adherence to past year cervical cancer screening. Our findings are consistent with recent reports that suggest sexual minority women still do not screen for cervical cancer at recommended rates [46]. Differences in cervical cancer screening rates between subgroups of women exist due to a mix of patient characteristics, healthcare factors, and patient and physician attitudes [47]. In one online study of lesbians, nonroutine screeners perceive fewer benefits, more barriers, and more discrimination and are less knowledgeable about screening guidelines than routine screeners [27]. Outreach and educational programs are needed to address these barriers to screening as well as cultural competency training for health care providers and other medical staff. Finally, studies suggest a higher rate of childhood trauma including sexual abuse [48]. Future research should examine the associations between sexual victimization and participation in cervical cancer screening.

Behavioral risk factors

Many risk factors for the development of cancer are behavioral in nature and include smoking and alcohol use, physical activity levels, dietary practices and obesity [49]. A growing body of work has documented that SMW have elevated rates of behavioral risk factors compared to heterosexual women. In the current sample, rates of multiple risks factors were elevated. Current smoking rates for this sample of lesbians were significantly higher than estimates of smoking rates among women in Illinois (25.8% vs. 21.7%, respectively) [50]. Nearly three-quarters of the sample (72.6%) reported being a current drinker and less than half the sample reported regular physical activity. These findings are important given that half the sample was obese and another 25% were overweight. The combination of obesity, tobacco and alcohol use, and physical inactivity and low rates of routine screening place this sample of SMW at elevated risk for cancer and other non-cancer related health disparities such as diabetes and cardiovascular disease. Cochran and colleagues noted more than a decade ago that despite massive public health efforts in promoting weight reduction, smoking cessation, reduced alcohol intake, and the use of preventive screening, lesbians and bisexuals were not being targeted by any of those programs [10]. The absence of health promotion interventions for SMW was reiterated in a recent report by the Institute of Medicine [51] and should be addressed in future research, policy, and funding decisions relating to African American women's health.

Implications of study findings

Breast and cervical cancer represent two important foci for reducing cancer health disparities among underserved minority women due to the widespread availability of effective early detection screening methods for these cancers [52]. To date, there are two published studies reporting the results of cancer screening interventions for SMW. Dibble and colleagues reported on the results of a small single-arm pilot test ($N=36$) of a one-hour, didactic program aimed at increasing cancer

screening among lesbians aged 50 and older [32]. Changes in breast and cervical cancer screening behaviors after 3 months were modest (33% and 25%, respectively) and virtually no changes were observed in colorectal cancer screening [32]. In addition, Bowen, Powers, and Greenlee conducted a randomized trial of a breast cancer risk counseling intervention for SMW [37]. The counseling intervention produced significant increases in breast screening rates at 24 months in the intervention arm, compared with the control arm participants. The results of both studies were encouraging; however, significantly more research is needed. Future research aimed toward reducing cancer disparities among African American women should also consider sexual orientation as another potential risk factor to be examined.

Provider recommendation played an important role in adherence to mammography screening but not Pap test adherence. Many health care providers mistakenly believe that SMW are not at risk for cervical cancer and as a result may not emphasize the importance of routine screening [46]. Another barrier to screening is that sexual minority women are less likely to routinely see gynecologists for oral contraceptives, as such having fewer opportunities for recommendations and routine screening [27]. Primary care providers with SMW patients should be extra vigilant in providing cervical cancer screenings as many of these women will have less contact with women's health providers and gynecologists. Finally, inclusion of LGBT issues in medical and nursing education would increase knowledge and cultural competency and decrease known barriers to the provision of appropriate health care for this underserved population [27].

Study limitations

A few limitations must be considered when interpreting these findings. These data are cross-sectional and, therefore, we cannot draw conclusions about causality. The study used nonprobability sampling methods and was restricted to African American lesbian and bisexual women from a single urban location. Questions of sampling and generalizability are known methodological limitations when working with hidden communities [53,54]. Obtaining a probability sample of LGB persons is difficult and costly [36]. As such, much LGB research has been conducted with volunteer and convenience [37]. Recruitment for this study was conducted using established strategies for accessing hidden populations (e.g., snowball methods, membership lists, and street recruitment) [53]. Our recruitment efforts resulted in a relatively large sample of African American SMW. However, we were unable to assess the extent to which our sample was representative of the general population of African American sexual minority women. The study would have been enhanced by the inclusion of a comparable sample of African American heterosexual women. Cancer risk and cancer screening adherence data were based on self-report. Study participants may have minimized health risk behaviors (e.g. weight) or over-reported cancer screening behaviors. The accuracy of breast cancer risk data can be improved in future studies by obtaining medically verified health and cancer screening history [55,56] or collecting data via computer-assisted techniques that may reduce reporting bias [56,57]. In light of the limitations of the current study, findings reported here should be viewed as exploratory.

Conclusion

Identification of potential sources of breast cancer disparities in underserved populations of women is critical to implementation of appropriate risk-management strategies [58]. Study findings make an important contribution to the literature on sexual orientation, breast

cancer risk and screening behaviors. These findings suggest the need for health education programs for African American SMW that emphasize prevention of cancer, including recommendations for screening and life-style modifications that may reduce the risk of developing cancer. Empirical evidence of this nature can lead to advances in prevention and cancer screening interventions tailored to this specific at-risk population.

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References

1. American Cancer Society (2007) Cancer Facts & Figures 2007. American Cancer Society, Atlanta, Georgia.
2. Deshpande AD, Sanders Thompson VL, Vaughn KP, Kreuter MW (2009) The use of sociocultural constructs in cancer screening research among African Americans. *Cancer Control. Journal of the Moffitt Cancer Center* 16: 256-265.
3. American Cancer Society (2013) Cancer Facts & Figures 2013. American Cancer Society, Atlanta, Georgia.
4. American Cancer Society (2013) Cancer Facts & Figures for African Americans 2013-2014. American Cancer Society, Atlanta, Georgia.
5. Edwards MJ, Gamel JW, Vaughan WP, Wrightson WR (1998) Infiltrating ductal carcinoma of the breast: the survival impact of race. *J Clin Oncol* 16: 2693-2699.
6. Lannin DR, Mathews HF, Mitchell J, Swanson MS, Swanson FH, et al. (1998) Influence of socioeconomic and cultural factors on racial differences in late-stage presentation of breast cancer. *JAMA* 279: 1801-1807.
7. Ghafoor A, Jemal A, Cokkinides V, Cardinez C, Murray T, et al. (2002) Cancer statistics for African Americans. *CA Cancer J Clin* 52: 326-341.
8. Adams SA, Smith ER, Hardin J, Prabhu-Das I, Fulton J, et al. (2009) Racial differences in follow-up of abnormal mammography findings among economically disadvantaged women. *Cancer* 115: 5788-5797.
9. Saslow D, Solomon D, Lawson HW, et al. (2012) American Cancer Society, American Society for Colposcopy and Cervical Pathology, and American Society for Clinical Pathology screening guidelines for the prevention and early detection of cervical cancer. *American Journal of Clinical Pathology* 137: 516-542.
10. Cochran SD, Mays VM, Bowen D, Gage S, Bybee D, et al. (2001) Cancer-related risk indicators and preventive screening behaviors among lesbians and bisexual women. *Am J Public Health* 91: 591-597.
11. Dibble SL, Roberts SA, Robertson PA, Paul SM (2002) Risk factors for ovarian cancer: lesbian and heterosexual women. *Oncol Nurs Forum* 29: E1-7.
12. Valanis BG, Bowen DJ, Bassford T, Whitlock E, Charney P, et al. (2000) Sexual orientation and health: comparisons in the women's health initiative sample. *Arch Fam Med* 9: 843-853.
13. Bowen DJ, Alfano CM, McGregor BA, Andersen MR (2004) The relationship between perceived risk, affect, and health behaviors. *Cancer Detect Prev* 28: 409-417.
14. Diamant AL, Wold C, Spritzer K, Gelberg L (2000) Health behaviors, health status, and access to and use of health care: a population-based study of lesbian, bisexual, and heterosexual women. *Arch Fam Med* 9: 1043-1051.
15. Buchmueller T, Carpenter CS (2010) Disparities in health insurance coverage, access, and outcomes for individuals in same-sex versus different-sex relationships, 2000-2007. *Am J Public Health* 100: 489-495.
16. Barton M, Moore S, Shtatland E, Bright R (2001) The relation of household income to mammography utilization in a prepaid health care system. *Journal of General Internal Medicine* 16: 200-203.
17. Grindel CG, McGehee LA, Patsdaughter CA, Roberts SJ (2006) Cancer prevention and screening behaviors in lesbians. *Women Health* 44: 15-39.
18. Roberts SJ, Patsdaughter CA, Grindel CG, Tarmina MS (2004) Health related behaviors and cancer screening of lesbians: results of the Boston Lesbian Health Project II. *Women Health* 39: 41-55.
19. Koh AS (2000) Use of preventive health behaviors by lesbian, bisexual, and heterosexual women: questionnaire survey. *West J Med* 172: 379-384.
20. Matthews AK, Brandenburg DL, Johnson TP, Hughes TL (2004) Correlates of underutilization of gynecological cancer screening among lesbian and heterosexual women. *Prev Med* 38: 105-113.
21. Charlton BM, Corliss HL, Missmer SA, Frazier AL, Rosario M, et al. (2011) Reproductive health screening disparities and sexual orientation in a cohort study of U.S. adolescent and young adult females. *J Adolesc Health* 49: 505-510.
22. Ramsey F, Hill MJ, Kellam C (2010) Black lesbians matter. Zuna Institute, Sacramento, CA, USA.
23. Kerker BD, Mostashari F, Thorpe L (2006) Health care access and utilization among women who have sex with women: sexual behavior and identity. *J Urban Health* 83: 970-979.
24. Bernhard LA (2001) Lesbian health and health care. *Annu Rev Nurs Res* 19: 145-177.
25. Bjorkman M, Malterud K (2009) Lesbian women's experiences with health care: a qualitative study. *Scand J Prim Health Care* 27: 238-243.
26. Neville S, Henrickson M (2006) Perceptions of lesbian, gay and bisexual people of primary healthcare services. *J Adv Nurs* 55: 407-415.
27. Tracy JK, Lydecker AD, Ireland L (2010) Barriers to cervical cancer screening among lesbians. *J Womens Health (Larchmt)* 19: 229-237.
28. Petroll AE, Mosack KE (2011) Physician awareness of sexual orientation and preventive health recommendations to men who have sex with men. *Sex Transm Dis* 38: 63-67.
29. Boehmer U, Case P (2004) Physicians don't ask, sometimes patients tell: disclosure of sexual orientation among women with breast carcinoma. *Cancer* 101: 1882-1889.
30. American Cancer Society (2011) Breast Cancer Facts & Figures 2011-2012. American Cancer Society, Atlanta, Georgia.
31. Case P, Austin SB, Hunter DJ, Manson JE, Malspeis S, et al. (2004) Sexual orientation, health risk factors, and physical functioning in the Nurses' Health Study II. *J Womens Health (Larchmt)* 13: 1033-1047.
32. Dibble SL, Roberts SA, Nussey B (2004) Comparing breast cancer risk between lesbians and their heterosexual sisters. *Womens Health Issues* 14: 60-68.
33. Dibble SL, Eliason MJ, Crawford B (2012) Correlates of wellbeing among African American lesbians. *J Homosex* 59: 820-838.
34. Kavanaugh-Lynch MHE, White E, Daling JR, Bowen DJ (2002) Correlates of lesbian sexual orientation and the risk of breast cancer. *Journal of the Gay and Lesbian Medical Association* 6: 3-4.
35. Gruskin EP, Hart S, Gordon N, Ackerson L (2001) Patterns of cigarette smoking and alcohol use among lesbians and bisexual women enrolled in a large health maintenance organization. *Am J Public Health* 91: 976-979.
36. Mays VM, Yancey AK, Cochran SD, Weber M, Fielding JE (2002) Heterogeneity of health disparities among African American, Hispanic, and Asian American women: unrecognized influences of sexual orientation. *American Journal of Public Health* 92: 632-639.
37. Bowen DJ, Powers D, Greenlee H (2006) Effects of breast cancer risk counseling for sexual minority women. *Health Care Women Int* 27: 59-74.
38. American Cancer Society (2009) Cancer Facts & Figures 2009. American Cancer Society, Atlanta, Georgia.
39. United States Department of Human Health and Services (2010) Healthy People 2020 topics and objectives: cancer. USDHHS.
40. United States Department of Human Health and Services (2000) Healthy People 2010: Understanding and improving health (2ndedn). USDHSS.
41. Centers for Disease Control and Prevention (CDC) (2012) Cancer screening - United States, 2010. *MMWR Morb Mortal Wkly Rep* 61: 41-45.
42. Henley SJ, King JB, German RR, Richardson LC, Plescia M; Centers for Disease Control and Prevention (CDC) (2010) Surveillance of screening-

- detected cancers (colon and rectum, breast, and cervix) - United States, 2004-2006. *MMWR Surveill Summ* 59: 1-25.
43. Schueler KM, Chu PW, Smith-Bindman R (2008) Factors associated with mammography utilization: a systematic quantitative review of the literature. *J Womens Health (Larchmt)* 17: 1477-1498.
44. Davis C, Emerson JS, Husaini BA (2005) Breast cancer screening among African American women: adherence to current recommendations. *J Health Care Poor Underserved* 16: 308-314.
45. Katapodi MC, Lee KA, Facione NC, Dodd MJ (2004) Predictors of perceived breast cancer risk and the relation between perceived risk and breast cancer screening: a meta-analytic review. *Prev Med* 38: 388-402.
46. Marrazzo JM (2004) Barriers to infectious disease care among lesbians. *Emerg Infect Dis* 10: 1974-1978.
47. BrankoviÄ‡ I, Verdonk P, Klinge I (2013) Applying a gender lens on human papillomavirus infection: cervical cancer screening, HPV DNA testing, and HPV vaccination. *Int J Equity Health* 12: 14.
48. Reisner SL, Falb KL, Wagenen AV, Grasso C, Bradford J (2013) Sexual orientation disparities in substance misuse: the role of childhood abuse and intimate partner violence among patients in care at an urban community health center. *Subst Use Misuse* 48: 274-289.
49. Danaei G, Ding EL, Mozaffarian D, Taylor B, Rehm J, et al. (2009) The preventable causes of death in the United States: comparative risk assessment of dietary, lifestyle, and metabolic risk factors. *Public Library of Science*.
50. Woldemichael G, Bocskay, KA, Harper, D., Thomas, SD (2007) Behavioral Risk Factor Surveillance System (BRFSS): Chicago Reference Tables. *Health Status Index Series*. Chicago, Illinois. PMID:17564468 PMCID:2288652.
51. Institute of Medicine (2011) *The health of lesbian, gay, bisexual, and transgender people: building a foundation for better understanding*. The National Academies Press.
52. Schiffman M, Brinton L, Devesa S, Fraumeni J, Joseph F (1996) cervical cancer. *Cancer Epidemiology and Prevention* 2: 1090-1116.
53. Cochran SD, Mays VM (2000) Relation between psychiatric syndromes and behaviorally defined sexual orientation in a sample of the US population. *Am J Epidemiol* 151: 516-523.
54. Rothman KJ, Greenland S (1998) *Modern epidemiology*. Lippincott-Raven, Philadelphia, PA, USA.
55. Gordon NP, Hiatt RA, Lampert DI (1993) Concordance of self-reported data and medical record audit for six cancer screening procedures. *Journal of the National Cancer Institute* 85: 566-570.
56. Morrison-Beedy D, Carey M, Tu X (2006) Accuracy of Audio Computer-Assisted Self-Interviewing (ACASI) and self-administered questionnaires for the assessment of sexual behavior. *AIDS and Behavior* 10: 541-552.
57. Kissinger P, Rice J, Farley T, Trim S, Jewitt K, et al. (1999) Application of computer-assisted interviews to sexual behavior research. *American Journal of Epidemiology* 149: 950-954.
58. Jemal A, Tiwari RC, Murray T (2004) Cancer statistics, 2004. *A Cancer Journal for Clinicians* 54.