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Knowledge of, and beliefs about, access to screening facilities and cervical cancer screening behaviors among low-income women in New Jersey.

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Abstract

Racial/ethnic disparities in cancer outcomes have been well documented. Access to Pap testing may account for some of the variation in the racial and socioeconomic differences in cervical cancer outcomes. Literature exploring perceived access to care as it relates to women of color and low-income women is lacking. The goal of the study was to evaluate and characterize the relationship between what respondents believe about access to free/low-cost screening facilities and screening behaviors among low-income women in New Jersey. We used multivariate logistic regression to investigate belief about access to affordable screening on cancer screening behaviors using data from a cross-sectional study of low-income women in New Jersey (n=430). Having had a Pap test in the past 3 years was inversely associated with age (OR= 0.94, 95% CI = 0.92 – 0.97) and was positively associated with having had insurance in the previous 2 years (OR=32.48. 95% CI = 1.04 – 5.91), higher perceived risk of cervical cancer (OR= 2.59, 95% CI= 1.29– 5.66), and knowing where to go to get a check-up that includes a cancer test (OR= 1.97, 95% CI= 1.11- 3.49). These results suggest that insurance status continues to be a predictor of screening behavior but also that perceived risk awareness of where to go to get cancer screenings in general may influence the likelihood of utilizing screening, which can be important in developing targeted prevention strategies.

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Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Background

According to the most recent data, incidence rates for cervical cancer have been declining in the United States since the early 1990s [1]. Hispanic women, however, continue to be more likely than their non-Hispanic White (NHW) counterparts to be diagnosed with cervical cancer [2] with incidence rates 40% higher than NHW women [3]. Non-Hispanic Black (NHB) women have also been found to have cervical cancer incidence rates 41% higher than NHW women [2].

While incidence rates overall have been declining, cervical cancer will still be responsible for an estimated 4,170 deaths in 2018 [4] and is the second leading cause of cancer death among women aged 20-39 after breast cancer [2]. As noted by Siegel et al. [4], while cancer survival has improved for the most common cancers, this is not the case for cervical cancer. Later stage of diagnosis is associated with dramatically lower five-year survival rates [5,6], which may account for some of the racial/ethnic disparities in cervical cancer mortality. Racial/ethnic differences in 5-year survival rates indicate Hispanic women exhibit better 5-year survival rates compared to NHW women (75% versus 70%) [3] while NHB women have poorer survival outcomes (60% 5-year survival rates) [2]. Notably, Hispanic women are most likely to be diagnosed with local stage cervical cancer [3], while NHB women are most likely to be diagnosed with advanced-stage cervical cancer [7-9,2]. However, even when stage at diagnosis was accounted for, NHB women still have a lower 5-year survival rates than NHW women [10].

Underlying racial/ethnic differences in cancer incidence and mortality may be differences in socioeconomic status (SES) [11,12,3,13,14]. Racial/ ethnic minority groups are more likely to be poor than NHW and individuals in lower SES categories tend to be at greater risk for cancer compared to individuals in higher SES categories [3]. Part of this may be explained by lack of access to care, including lack of access to screening, which has been shown to account for some of the variation in the socioeconomic differences in cancer incidence and outcomes [15,16,13].

Routine Papanicolau (Pap) Smears, given the potential to find and treat HPV associated cervical lesion, a known precursor to cervical cancer, could dramatically reduce cervical cancer incidence [17]. Access to these cancer screenings, however, are not evenly distributed across socioeconomic and racial groups [17,15,13].

Pap testing has been shown to be effective at early detection of precancerous cervical lesions and regular screening for cervical cancer has decreased the number of deaths associated with this disease [17]. Approximately 60-80% of women diagnosed with late stage cervical cancer, however, have not had a recent Pap test [17]. As reported by the American Cancer Society, 84% of women in New Jersey 21 years and older have had a Pap test within the past three years [17]. This rate varies by race/ethnicity and access to medical care, with rates being lower for women lacking a usual source of medical care (70.4%) or having no health insurance (71.5%) [17].

Cultural issues have been implicated as influencing a woman’s likelihood to receive cancer screening [18-20,14,21,22]. According to the literature, those without health insurance,

women with less education, and women who are not married, are the least likely to have had a recent Pap test [23,20,22,21]. According to the American Cancer Society Cancer Prevention and Early Detection [17] report (2015), fewer Hispanic women (77.0%) than NHW women (82.8%) and NHB women (82.3%) reported having had a Pap test within the past three years. Individuals dealing with low SES, language barriers, racial discrimination, and geography are likely to have poor access to health insurance, cancer information, a primary care provider (PCP), appropriate patient-doctor communication and medical facilities [18,23]. These factors can lead to underutilization of screening tests.

While access to health care has been associated with health care utilization, particularly preventive services [24-29] including likelihood of recent Pap test [30] few studies have explored perceived access to health care and/or cancer screenings to health outcomes. This study seeks to expand the literature to examine the effects of socioeconomic and demographic characteristics on cancer prevention behaviors among a racially/ethnically and geographically diverse population of limited resource women in New Jersey, which has one of the highest cancer rates in the nation [2]. Further, given the limited knowledge about the impact of perception of access to cancer screening and how that influences cancer screening behavior, this study will examine the association of perception of access to screening services on cervical screening behaviors among low-income NHW, NHB, and Hispanic women in New Jersey.

Methods

English- and Spanish-speaking women ages 18-79, who were currently participating in, or eligible for social service programs aimed at low-income individuals in New Jersey (e.g., Supplemental Nutrition Assistance Program-Education or Expanded Food and Nutrition Education Programs in New Jersey and the Work First NJ program) were eligible for inclusion in this study. A convenience sample was obtained by posting a flyer describing the study including the study parameters and inclusion criteria at collaborating agencies including NJ SNAP-Ed classes, Work First NJ program centers, and other agencies serving low-income individuals in New Jersey. Potential participants contacted the research team to schedule an interview. Participants were deemed ineligible for study inclusion if they have had a previous malignancy, race other than NHB, NHW, or Hispanic/Latino, race unknown, or were younger than 18 or older than 79 years of age. Participants were offered either $20 in cash or a gift card as compensation.

Montclair State University institutional review board approval was obtained prior to data collection and the authors assume full responsibility for analyses and interpretation of these data.

Data Collection

Informed consent was obtained from all individual participants included in the study in their preferred language (either English or Spanish). After obtaining informed consent, trained interviewers administered a structured questionnaire, in English and Spanish, that contained questions on demographics, medical history, occupational history, and health behaviors, to eligible women between November 2013 and February 2016. The questionnaire was

developed in English and then translated from English to Spanish by a native speaker and then back translated into English to ensure accuracy and quality. Based on the 2012 American Cancer Society Guidelines for the Early Detection of Cancer [31] participants were asked to report if they have received a Pap test in the past 3 years (yes/no).

Barriers to access were examined using the following measures: knowledge of where to get exam, awareness of free/low-cost screening centers, perceived distance to these centers, and transportation (Own car versus other). Participants were also asked about educational and financial barriers, including health insurance status (*Have you had insurance in the past 2 years?*), source of health care (*Do you usually see the same doctor or medical personnel?)* current employment status (yes/no), and highest grade or year of education completed, which have been previously identified as potential barriers to cervical cancer screening [26,27]. Participants were also asked to self-report their annual family income.

Race/ethnicity was assessed by asking the participant to self-identify as either non-Hispanic white, non-Hispanic Black, or Hispanic. In addition, we assessed a number of potentially confounding factors including marital status (married or living as married, single), and body mass index (measured using self-reported height and weight).

Statistical Analyses

Given the current American Cancer Society guidelines on Pap testing, only participants aged 21-65 were included in these analyses (n=452). Participants for whom we did not have data on the Pap testing in the past three years (n=8) and those whose race was something other than NHW, NHB, or Hispanic of for whom race/ethnicity was missing (n=15) were excluded from the analyses leaving a final sample size of n=430.

Unadjusted comparisons of potential explanatory variables were conducted using Analysis of Variance (for continuous variables) and Chi-square tests (for categorical variables) to determine differences between participants who reported having had a Pap test within the past three years and those that did not.

Next, unconditional logistic regression was used to estimate odds ratios (OR) and corresponding 95% confidence intervals (CI) for the association between barriers to screening facilities and cervical screening within the past 3 years (y/n). The primary predictor was assessed by asking participants if they were aware of any screening centers that provided free/low-cost Pap tests. The multivariate model included the primary predictor as well as covariates identified as having a p-value of <.10 in the bivariate analyses, with race and the primary predictor forced into the model.

All tests of significance were 2- sided, with a p value of 0.05 considered statistically significant. All analyses were performed using SPSS version 21.0 (IBM Corp. Released 2012. IBM SPSS Statistics for Macintosh, Version 21.0. Armonk, NY: IBM Corp.).

Results

Participants were, on average, 37.8 years of age, 39.8% identified as Hispanic, 34.9% as NHB, and 25.3%% as NHW. Hispanic (36.5 ± 11.0 years) and NHW women (35.7 ± 10.1

years) tended to be younger than NHB women (40.8 ± 12.6 years) in our study population (see Table 1). Hispanic women were also more likely to report being married or living as married than their NHW and NHB counterparts ($p < .05$). NHB women, however, were significantly more likely to report earning less than $8,000 per year compared to NHW and Hispanic women (64.5% versus 33.7% and 49.1%, $p < .05$).

Overall 97% of the women in this study reported ever having had a Pap test. Hispanic women, were less likely to report ever having had a Pap test (94.5%) compared to their NHW (100%) and NHB (99.2%) counterparts ($p<.01$). Compared to those who had received a Pap test in the past 3 years, women who reported not having a Pap test in the past 3 years tended to be older, were less likely to have health insurance in the past 2 years, were less likely to see the same physician at appointments, or know where to get a check-up that includes cancer tests and were more likely to report not having seen a physician in the past 2 years due to cost and transportation, as shown in Table 2.

Based on results from the adjusted logistic regression models, adherence to cervical cancer screening guidelines was positively associated knowing where to go for cancer tests in general (OR = 1.97, 95% CI: 1.11, 3.49) and higher perceived risk of cervical cancer ($OR_{\text{somewhat/very vs not sure}}$ 2.59, 95% CI: 1.19, 5.66) and having health insurance within the past 2 years (OR 2.48, 95% CI: 1.04, 5.91), and inversely associated with increasing age (OR 0.94, 95% CI: 0.92, 0.97; Table 3).

Discussion

We found that 81% of women in our study population reported having had a Pap test in the previous 3 years and 97% reported ever having had a Pap test. While it is possible that respondents did not want to admit not having been screened, our findings are in keeping with the most recent CDC estimates [32]. Hispanic women, however, were more likely to report never having had a Pap test compared to their NHW and NHB counterparts, which is consistent with the literature [32]. Unlike other studies [23,26,20,33] recent screening history was not associated with marital status or education in this study population, however, women were significantly more likely to have been screened recently if they reporting having had insurance within the past 2 years ($p<.001$).

Ackerson and Gretebeck [18] conducted an integrated literature review on factors influencing cancer screening utilization among underserved women and noted a number of extrinsic factors including access to insurance, source of health care, and socioeconomic factors. While the majority of our participants reported some type of health insurance coverage (public or private), we did find that women who lacked health insurance were less likely to have obtained a Pap test within the past 3 years, similar to what Ackerson and Gretebeck reported in their integrated review [18]. While Selvin & Brett [34] reported differences in screening between NHW women with public insurance and NHB and Hispanic women, we did not find this to be the case in our study population (data not shown).

In our study population women who reported that they did not know where to go for cancer tests in general were less likely to have been screened for cervical cancer in the past 3 years. This finding is similar to that of Facione, et al. [35], who measured perceived access to health care in a sample of 699 black, white and Latino women and found that women who had a lower perceived access to health care were significantly more likely to delay seeking health care if they should discover a breast cancer symptom compared to those women who scored relatively higher on the scale [$t=-7.75$, $P<0.001$] [35]. Likewise, Shavers et al. [36] examined the impact of perceived access to care on the prevalence of behavioral risk factors for chronic diseases among African American men (n=106) and women (n= 96) in Baltimore and found that those who perceived difficulty in obtaining care were less likely to have had a physical in the past year [36]. Thus, these results add to the evidence that an individual's perception of health care access may influence the use of health care services [35,36]. In addition, older women were both less likely to have had insurance within the past 2 years and less likely to have been screened for cervical cancer within the past 3 years. Thus, there is a possibility that older women were less likely to be screened due to lack of insurance. However, when both insurance status and age were in the model, they were both statistically significantly associated with probability of being screened indicating that both were independently associated with screening behavior.

All cross-sectional studies are susceptible to bias due to low response rates. We sought to maximize participation by recruiting participants at their scheduled SNAP-Ed/EFNEP classes and attempted to complete the guided survey at the end of the next class or at another time that was convenient for them. In addition, while all of the study participants are, by design, low-income, we expected sufficient neighborhood variability since women are being recruited from nine counties with varying degrees of neighborhood socioeconomic condition. Facione et al. [35] noted that lower income women were less likely to seek out breast cancer screening and Shaver et al. [36] reported an association between income and perception of access to health care for both men and women. In each of these studies, approximately 20% of the sample reported incomes of <$9,999/year, compared to our study in which half of the women reported incomes below $8,000/year, with incomes ranging from less than $2000/year to greater than $35,000/year, which might explain, in part, the differences in our findings. Another limitation of this study is that we did not collect data on HIV status. HIV status is a risk factor for cervical cancer and is associated with being connected to the health care system. The women in our study population, were connected to other social services, such as SNAP and WorkFirst, and therefore may be more likely to have been screened than other low SES women who are not as connected to social service programs and/or are not eligible due to their income.

The main strength of this study is that it sought to not only examine structural barriers to screening, such as transportation, and access in the form of health insurance, but attempted to understand women’s knowledge of, and beliefs about, access by assessing their awareness of free and low-cost screening options that are available in each county. Our findings, as they add to the current literature, support the need to change perceptions of access to care. Perceived access to care adds barriers to the already existing systemic barriers that exist for women. This is further exacerbated for women who are low SES or belong to minority racial and ethnic groups. And while systemic barriers require larger systematic policy

change over time to lessen the burden, perceived access to care could be integrated into current programming efforts. Given mortality rates for cervical cancer among young women, particularly young women of color, there is a need to continue to promote Pap testing and improve outreach and education in under-screened women. Our findings highlight the importance of providing targeted interventions that not only are culturally relevant but also understand the current perceptions of the target population. Given the disparities in cancer outcomes by race/ethnicity and SES, understanding the role of perceived access on screening behavior and practices has paramount importance for designing targeted community-specific interventions in these communities.

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Table 1.

Participant Demographics

	Total (n= 430)	White NH (n=109)	Black NH (n=150)	Hispanic (n=171)	*P*
Mean age (SD)[a]	37.8 (11.6)	35.7 (10.1)	40.8 (12.6)	36.5 (11.0)	.001
Number of children (SD) [a]	2.2 (1.7)	2.0 (1.5)	2.4 (2.0)	2.3 (1.5)	.10
Body mass index (SD) [a]	30.0 (7.4)	30.2 (7.1)	30.7 (7.9)	29.2 (7.0)	.18
Had insurance in past 2 years [b]	90.0%	89.7%	94.6%	86.7%	.06
Married/living as married [b]	18.6%	17.4%	11.4%	25.7%	.004
Currently employed [b]	15.6%	14.7%	14.7%	17.0%	.82
≤ High school education [b]	65.8%	68.8%	71.3%	59.1%	.052
Annual family income <$8,000 [b]	51.7%	35.1%	65.0%	49.5%	.001
Ever had a Pap test [b,c]	97.3%	100%	99.2%	94.5%	.01

[a]Continuous variables: age, number of children, body mass index (kg/m^2)

[b]Categorical variables: Had insurance in the past 2 years (yes vs no), Marital status (married/living as married vs. not married), Employment status (currently employed vs not employed), Education (≤ high school graduate vs > high school graduate), Annual family income (<$8,000/year vs ≥ $8,000/year), Ever had a Pap test (yes vs no), and Had a Pap test in the past 3 years (yes vs. no).

[c]Based on n= 388 responses

Table 2.

Association between screening behavior and potential explanatory variables

		Pap Test in past 3 years		
	N	**No (n=79)**	**Yes (n=351)**	***P***
Mean age (SD)	430	43.9 (11.6)	36.2 (11.1)	.001
Race				.61
Non-Hispanic White	109	29.1%	24.5%	--
Non-Hispanic Black	150	35.4%	34.8%	.32
Hispanic	171	35.4%	40.7%	.63
Currently employed				.11
No	363	78.5%	85.5%	
Yes	67	21.5%	14.2%	
Level of education				.29
≤ High school	283	70.9%	64.7%	
Some college+	147	29.1%	35.3%	
Annual family income				.20
<$8,000	178	44.8%	53.4%	
≥$8,000	166	55.2%	46.6%	
Marital status				.58
Not married	349	83.5%	80.9%	
Married/Living as married	80	16.5%	19.1%	
Mean Number of children (SD)	428	2.4 (2.0)	2.2 (1.6)	.28
Mean Body mass index (SD)	383	30.6 (7.8)	30.0 (7.5)	.55
Had insurance in past 2 years				<.001
No	41	23.7%	6.6%	
Yes	381	76.3%	93.4%	
Usually see the same physician at appointments				.01
No	307	61.0%	75.4%	
Yes	115	39.0%	24.6%	
In the past 2 years, you felt like you needed to go to the doctor but didn't because it cost too much				.004
No	316	61.8%	77.7%	
Yes	106	38.2%	22.3%	
In the past 2 years, you felt like you needed to go to the doctor but didn't because you couldn't miss work				.86
No	334	80.3%	79.4%	
Yes	86	19.7%	20.6%	
In the past 2 years, you felt like you needed to go to the doctor but didn't because you didn't have transportation to get there				.13
No	312	67.1%	75.4%	
Yes	110	32.9%	24.6%	
Know where to get a check-up that includes a cancer test				.07
No	197	55.1%	44.1%	

		Pap Test in past 3 years		
	N	**No (n=79)**	**Yes (n=351)**	***P***
Yes	230	44.9%	55.9%	
Perceived cervical cancer risk				.07
Not sure	97	33.3%	21.3%	--
A little/not at all likely	204	45.3%	50.3%	.06
Somewhat/very likely	112	21.3%	28.4%	.04
Know of a free or low-cost Pap screening center				.32
Don’t know of a free/low cost screening center	112	32.9%	27.4%	
Know of a free/low cost screening center	307	67.1%	72.6%	
Owns a car as a means of transportation to doctor				.07
No	319	83.8%	74.5%	
Yes	102	16.2%	25.5%	

Table 3.

Odds of having had a Pap Test within the past 3 years.

	Pap Test in past 3 years		
	OR*	95% CI	
Know where to get a check-up that includes a cancer test			
No	REF		
Yes	1.97	1.11	3.49
Know where to go for free or low-cost Pap test			
No	REF	-	-
Yes	1.29	0.71	2.35
Age	0.94	0.92	0.97
Race			
Non-Hispanic White	REF	-	-
Non-Hispanic Black	1.67	0.81	3.45
Hispanic	1.42	0.67	3.03
Insurance in the past 2 years (yes vs. no)			
No	REF	-	-
Yes	2.48	1.04	5.91
Usual Doc			
No	REF		
Yes	0.73	0.39	1.37
In the past 2 years, you felt like you needed to go to the doctor but didn't because it cost too much			
No	REF		
Yes	0.68	0.35	1.33
Perceived cervical cancer risk			
Not sure	REF		
A little/not at all likely	2.13	1.11	4.10
Somewhat/very likely	2.59	1.19	5.66

*Mutually adjusted for all other variables in the model