Sociocultural Context of Mammography Screening Use

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Purpose/Objectives: To examine variations in cultural and health beliefs about mammography screening among a socioeconomically diverse sample of African American and Caucasian women and to identify which set of beliefs predicted mammography screening adherence.

Design: Descriptive, retrospective, cross-sectional study.

Setting: Community-based organizations and public housing.

Sample: 111 African American women and 64 Caucasian women, aged 40 years or older, with no history of breast cancer.

Methods: Telephone and in-person structured interviews were conducted. Items used previously validated scales based on the Cultural Assessment Model for Health and the Health Belief Model.

Main Research Variables: Race or ethnicity, education, income, personal space, health temporal orientation, personal control, fatalism, susceptibility, benefits, barriers, self-efficacy, and mammography screening adherence.

Findings: African American women were more fatalistic about breast cancer and perceived fewer benefits to screening. Mammography screening-adherent women were more future oriented, believed that they had less control over finding health problems early, had fewer barriers to screening, and experienced more physical spatial discomfort during the screening procedure than nonadherent women.

Conclusions: Several of the cultural beliefs were not significantly different by race or ethnicity. However, cultural and health beliefs were significant predictors of mammography screening.

Implications for Nursing: Theoretically based cultural beliefs are important to consider for behavioral interventions to increase mammography screening in African American and Caucasian women.

Key Points . . .

- The sociocultural context of mammography screening behavior in women needs further investigation.
- Health behavior models often lack theoretically based cultural concepts, thus limiting the prediction of mammography screening.
- Study results showed that African American and Caucasian women held specific cultural beliefs about mammography screening.

Despite improvements in the use of mammography screening (Blackman, Bennett, & Miller, 1999), African American women have a 32% higher breast cancer mortality rate than Caucasian women and are more likely to be diagnosed with distant-stage disease (Ghafoor et al., 2003; Jemal et al., 2005). To improve African American women's use of screening for early disease detection, the effects of culture on screening behavior should be considered (Ashing-Giwa, 1999). The purpose of the current study was to determine the relationship of selected cultural beliefs, health beliefs, and sociodemographic characterisitics to mammography screening in a sample of African American and Caucasian women.

Previous studies have shown that health beliefs are related to variations in screening practices among women. Women are more likely to participate in mammography screening if they perceive increased susceptibility to breast cancer (Aiken, West, Woodward, & Reno, 1994; Champion & Miller, 1996), decreased barriers to screening (Aiken et al.; Champion & Miller; Champion & Springston, 1999; Holm, Frank, & Curtin, 1999), increased benefits of screening (Aiken et al.; Champion & Miller; Champion & Skinner, 2003; Holm et al.), and increased self-efficacy or confidence in their ability to get screened (Savage & Clarke, 1996). However, Yarbrough and Braden (2001), in their review of studies of women from various racial and ethnic groups, found only low to modest correlations between health beliefs and screening. As a result, they recommended taking into account the sociocultural context of ethnic women in breast cancer screening behavior.

A few studies have examined cultural beliefs about mammography screening. Although study designs varied, lacked theoretical frameworks in survey research, and had methodologic limitations, results suggested that African American women who held specific cultural beliefs, including holism, religiosity, collectivism, future orientation, less fear, and fewer fatalistic views about breast cancer, were more likely to get screened (Danigelis et al., 1995; Hoffman-Goetz & Mills, 1997; Lukwago et al., 2003; Mitchell, Lannin, Mathews, & Swanson, 2002; Phillips, Cohen, & Moses, 1999; Phillips, Cohen, & Tarzian, 2001; Smith, Phillips, & Price, 2001). Consistent results have emerged from investigations on sociodemographics and

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mammography screening behavior. Women with low incomes and low education levels are less likely to get screened than their more affluent counterparts (Blackman et al., 1999; Coleman & O'Sullivan, 2001; Hegarty, Burchett, Gold, & Cohen, 2000; Hiatt & Pasick, 1996; Katz, Zemencuk, & Hofer, 2000; Phillips & Wilbur, 1995).

Theoretical Framework

Because contemporary health behavior models have not included culturally related concepts, which limits prediction of mammography screening (Ashing-Giwa, 1999; Rajaram & Rashidi, 1998), the theoretical framework that guided the current study combined the Cultural Assessment Model for Health (Giger & Davidhizer, 1999) and the Health Belief Model (Rosenstock, Strecher, & Becker, 1988). Figure 1 outlines the framework. Constructs from the Cultural Assessment Model were personal space or sensory perceptions about the proximity and movement of objects in the physical space relative to the body, temporal orientation or beliefs about the value of present- and future-oriented health practices, and perceived personal control or power over the environment in relation to health activities. An additional cultural construct, fatalism or belief in the inevitability of death once diagnosed with cancer, was included in the model. According to the model, individuals learn beliefs from social organizations such as the family unit and religious groups. Cancer fatalism is an important belief that is learned in African American social structures, and research shows that individuals who have fatalistic beliefs about cancer are less likely to get screened for cancer than individuals who do not have fatalistic beliefs (Powe, 1995). The Health Belief Model constructs were perceived susceptibility to breast cancer, benefits and barriers to screening, and self-efficacy in getting screened.

For the current study, the authors investigated the following research questions.

1. Do differences exist in cultural beliefs and health beliefs between African American and Caucasian women and by education and income?
2. What set of beliefs predicts mammography screening adherence?

Methods

Sample and Setting

The descriptive, cross-sectional study consisted of a convenience sample of women residing in Indianapolis, IN. Inclusion criteria were non-Hispanic, self-identified as African American or Caucasian, and aged 40 years or older. Women were excluded if they had a history of breast cancer. The women were recruited from community organizations and public housing. The principal investigator posted flyers and developed newsletter announcements about the study and attended meetings with members and residents to discuss the study. A total of 214 women initially contacted the investigator about the study, and 175 signed consent forms and participated in the study (82% participation rate). Prior to the beginning of the study, institutional review board approval was obtained from Indiana University.

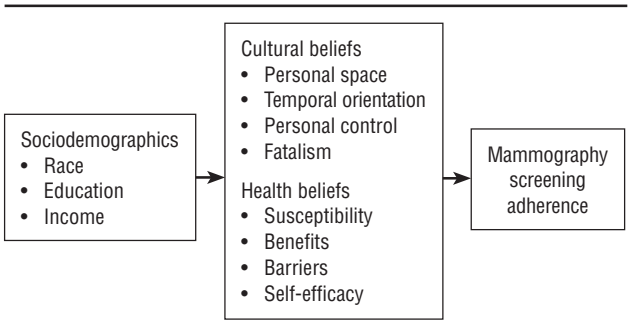

Figure 1. Theoretical Framework

Measurements

Measurements of cultural beliefs included personal space, health temporal orientation, personal control, and fatalism scales (Powe, 1995; Russell, Champion, & Perkins, 2003). Health beliefs were measured with perceived susceptibility, benefits, barriers, and self-efficacy in breast cancer and screening scales (Champion, 1999; Champion & Scott, 1997). Personal space measured the discomfort that individuals had experienced in their immediate environment during a mammography screening procedure using two subscales: physical space and interpersonal space. The physical space subscale consisted of 10 items and measured discomfort in the physical environment, including the effects of temperature, touch, and the sound of the x-ray machine, as well as temperature, lighting, and appearance of the x-ray room to the individual. The interpersonal space subscale consisted of eight items measuring discomfort with the social context of the environment, including concerns related to privacy, interactions with staff, and cultural diversity in the setting. Both subscales used a five-point Likert-type response scale ranging from 1 (strongly disagree) to 5 (strongly agree). Cronbach's alpha coefficients for internal consistency reliability in the sample were 0.88 for the physical space subscale and 0.82 for the interpersonal space subscale.

Health temporal orientation was measured with a nine-item scale addressing the perceived importance of detecting health problems early and being healthy in the future. A five-point Likert-type response scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used. The internal consistency reliability coefficient was 0.79.

Personal control was measured by a four-item internal control subscale and an eight-item external control subscale. Both subscales measured perceived control over finding health problems early and used a five-point Likert-type response scale ranging from 1 (strongly disagree) to 5 (strongly agree). Internal consistency reliability coefficients for the internal and external control early detection subscales were 0.76 and 0.82, respectively.

Fatalism measured a participant's belief in the inevitability of dying from cancer, including when specific behaviors are engaged to prevent or treat it. This 15-item scale used a five-point Likert-type response scale ranging from 1 (strongly disagree) to 5 (strongly agree). The scale's internal consistency reliability coefficient was 0.80.

Susceptibility was measured with a four-item scale asking about perceptions of the individual's chances of getting breast cancer. Three items asked participants about their chances of getting breast cancer over varying periods of time (in 5 years, 10 years, and lifetime), using a seven-point item-response scale ranging from 1 (very unlikely) to 7 (very likely). The remaining item asked participants to compare their chances of

getting breast cancer to other women their age using a seven-point item-response scale ranging from 1 (much lower) to 7 (much higher). The internal consistency reliability coefficient for the scale was 0.76.

Benefits and barriers to screening were measured using a seven-point response scale ranging from 1 (very unlikely) to 7 (very likely). The four-item benefits scale assessed perceived positive outcomes of obtaining a mammogram. Barriers were measured with a 19-item scale that assessed emotional, physical, or structural concerns related to mammography screening behavior. Cronbach's alpha coefficients for internal consistency reliability were 0.63 for the benefits scale and 0.87 for the barriers scale.

Self-efficacy included the perceived ability to obtain a screening mammogram. A 10-item scale used the same seven-point item response scale of likeliness as the previous health belief scales and had a Cronbach's alpha coefficient for internal consistency reliability of 0.80.

Sociodemographic data obtained were race or ethnicity, education, and income. Race was measured by initially asking participants if they considered their ethnicity to be Hispanic or Latino, then to identify the racial group (African American, Caucasian, other) to which they belonged. Only non-Hispanic women were included in the study. Education was measured as the number of years of school completed. Income was measured as ranges of participants' total household incomes in the past year.

Mammography screening adherence was measured as the participants' past use of screening mammograms in relation to the American Cancer Society guideline of annual screening for women aged 40 and older (Smith, Cokkinides, Eyre, & American Cancer Society, 2004). Adherence was determined by asking participants if they had ever had a mammogram and the length of time since their last mammogram. Women at least 40 years old at the time of the study and who had a mammogram were included in the adherent group.

Procedure

Two methods of data collection were used. The principal investigator or one of five trained research assistants read the questionnaire to each participant, either in person or by phone. Because the questionnaire was lengthy and some women may have had difficulty reading it alone because of lower educational levels, the research team read the questionnaires to all women for consistency in administration. An in-person interview was conducted with the women from public housing because some in this group did not have easy access to a telephone. Also, the physical presence of the research team helped develop a sense of trust, and team members were available to answer questions about items that were unclear to the participants. The research team interviewed all women recruited from community organizations by phone.

The interviews took approximately 40 minutes to complete, and data were collected over a five-month period. Each participant received a $20 grocery store or shopping mall gift certificate upon completion of the questionnaire. Also immediately following data collection, referral information about obtaining a free screening mammogram, diagnostic follow-up procedures, and transportation through a state health department program and local community agencies was offered to each woman who did not adhere to screening guidelines and did not have financial access to screening.

Statistical Analyses

Data were analyzed using SPSS® version 11.0 (SPSS Inc., Chicago, IL). T tests and chi-square tests were used to compare demographic information between women who had in-person interviews and women who had phone interviews. Chi-square tests were used to test respective associations between mammography compliance and race or ethnicity, education, and income. Race or ethnicity included two groups: non-Hispanic African Americans and non-Hispanic Caucasians. Education was categorized into three groups: fewer than 12 years, 12 years, and more than 12 years. Income also was categorized into three groups: less than $10,000, $10,000–$30,000, and more than $30,000. T tests were performed to test for significant difference between race or ethnicity and cultural and health beliefs. The authors used analysis of variance (ANOVA) to test for significant differences between education and income, respectively, with cultural and health beliefs. If the overall F test from an ANOVA model was significant, Tukey's Honestly Significant Differences test was performed to assess which specific means were significantly different from each other (Munro, 2001). To determine the ability of the demographic, cultural, and health belief variables to predict mammography screening adherence, two binary logistic regression models were developed with adherence as the dependent variable. Race or ethnicity, education, income, and cultural beliefs were included as the explanatory variables in the first model; in the second model, health beliefs were added to the variables in the first model. Using this approach, the relationships of cultural beliefs to screening could be compared when controlling and not controlling for health beliefs. Interactions among race or ethnicity, education, and income as well as cultural and health beliefs were investigated by testing each interaction separately in the second model. Because 33 interactions were possible, significance was assessed at a more stringent 0.01 level.

Findings

Sample

Table 1 highlights the demographic characteristics of the sample. The participants consisted of 111 African American and 64 Caucasian women ranging in age from 40–97 years, with a mean age of 60.2 years (SD = 12.3 years). A large majority (78%) of the women were unmarried or separated. Twenty-four percent had fewer than 12 years of education, 35% had 12 years of education, and 41% had more than 12 years of education. Forty-seven percent of the women had total household incomes of less than $10,000, 25% had incomes ranging from $10,000–$30,000, and 24% had incomes higher than $30,000. Most participants were unemployed (71%), with 36% retired, 20% disabled and not working, and 29% working full- or part-time outside the home. The women in the in-person interview group differed from the phone group on marital status and education. The former group was less likely to be married or live with a partner and had less education than the latter group. However, no differences were found between the two groups for age.

Cultural and Health Belief Differences by Race or Ethnicity, Education, and Income

Bivariate analyses were performed for each of the sociodemographic variables with each cultural and health

Table 1. Sample Demographics

Characteristic	n	%
Race or ethnicity		
African American	111	63
Caucasian	64	37
Age (years)		
40–49	39	22
50–59	50	29
60–65	24	14
66–75	41	23
> 76	21	12
Marital status		
Married or living with partner	38	22
Not married	137	78
Education		
< High school	42	24
High school	61	35
> High school	71	41
Missing	1	1
Income ($)		
< 10,000	86	47
10,000–30,000	38	25
> 30,000	47	24
Missing	4	4
Employment		
Retired	63	36
Employed full- or part-time	50	29
Disabled and not working	35	20
Unemployed	21	12
Full-time homemaker	5	3
Student	1	1

N = 175

Note. Because of rounding, percentages may not total 100.

belief variable and mammography adherence. Of the total group, 114 (65%) were adherent to the American Cancer Society's guidelines for mammography screening. More African Americans were adherent than Caucasians (68% versus 61%), although the difference was not significant. Nor did the adherence rates differ significantly by level of education or by income group, although the differences were in the direction expected. Of participants with fewer than 12 years of education, 60% were adherent. Among those with 12 years of education, 66% were adherent, and among those with more than 12 years of education, 70% were adherent. Of participants having incomes of less than $10,000, 62% were adherent. For women with incomes from $10,000–$30,000, 66% were adherent; and for those with incomes greater than $30,000, 70% were adherent.

African American women had a significantly higher mean fatalism score ($p = 0.001$) than Caucasian women, as displayed in Table 2. None of the other health beliefs and cultural beliefs measures differed significantly between the African American and Caucasian women.

Comparing responses on the cultural beliefs items by level of education (see Table 3) indicated significant differences for perceptions related to physical space ($p = 0.001$), health temporal orientation ($p < 0.0005$), internal control ($p = 0.011$), external control ($p < 0.0005$), and fatalism ($p < 0.0005$). Women with fewer than 12 years of education had more discomfort with physical space and scored lower for health temporal orientation, indicating they were less future or prevention oriented. Also, women with less than 12 years of education scored higher on external control items than women who had a high school education and those who had more than a high school education. Women with fewer than 12 years of education also had significantly lower perceptions of internal control than those with more than 12 years of education but did not differ significantly from those with a high school education only. Women with more than 12 years of education had significantly lower fatalism scores than either of the other two groups. For the health beliefs, women with less than a high school education reported more barriers and less self-efficacy on average than women with a high school education or more than high school education.

Significant differences for cultural beliefs were found by income level, health temporal orientation, internal control, external control, and fatalism as shown in Table 4. Women with incomes greater than $30,000 reported significantly more future orientation and internal control than women with incomes less than $10,000 on average but were not different from those with incomes ranging from $10,000–$30,000. Those with incomes from $10,000–$30,000 also were not significantly different from those with incomes less than $10,000 for the two measurements.

Women with incomes greater than $30,000 reported significantly fewer perceptions of external control and fatalism than those with incomes less than $10,000 and those with incomes from $10,000–$30,000 on average. Women with incomes less than $10,000 and those with incomes from $10,000–$30,000 were not significantly different for the two measurements. No other significant differences were found for any of the health belief variables.

Cultural and Health Beliefs Predicting Mammography Screening Adherence

Multiple logistic regression analysis was performed to determine the relationships of cultural and health beliefs to mammography adherence adjusting for race or ethnicity, education, and income. Mammography adherence was coded as a

Table 2. Analysis of Cultural and Health Beliefs With Race or Ethnicity

	African American (N = 111)		Caucasian (N = 64)			
Beliefs	$\bar{X}$	SD	$\bar{X}$	SD	t	p
Cultural						
Physical space	26.07	8.78	25.73	8.14	0.252	0.802
Interpersonal space	21.08	6.32	20.52	5.65	0.592	0.555
Health temporal orientation	40.40	4.39	39.48	5.07	1.250	0.213
Internal control	17.12	2.33	16.83	2.04	0.825	0.411
External control	17.67	5.74	16.69	5.96	1.076	0.283
Fatalism	41.09	11.05	35.16	10.51	3.483	0.001
Health						
Susceptibility	10.96	5.84	11.23	4.77	−0.325	0.746
Benefits	24.00	4.32	25.17	3.53	−1.947	0.053
Barriers	37.87	18.98	36.02	14.89	0.717	0.474
Self-efficacy	62.11	62.11	62.66	7.43	−0.400	0.69

Note. One value was missing for physical space and external control for the African American group.

Table 3. Analysis of Cultural and Health Beliefs With Education

Beliefs	Less Than High School (N = 42) $\bar{X}$	SD	High School (N = 61) $\bar{X}$	SD	More Than High School (N = 71) $\bar{X}$	SD	F	p
Cultural								
Physical space	30.14	8.32[a]	25.48	8.81[b]	23.87	7.64[b]	7.778	0.001
Interpersonal space	22.64	6.24	20.02	5.53	20.52	6.33[b]	2.539[a]	0.082
Health temporal orientation	36.88	5.32[a]	40.49	4.22[b]	41.66	3.56[b]	16.943	< 0.0005
Internal control	16.40	1.84[a]	16.85	2.55[a,b]	17.61	1.88[b]	4.611	0.011
External control	21.43	6.25[a]	17.70	5.54[b]	14.34	3.76[c]	25.741	< 0.0005
Fatalism	43.17	10.45[a]	41.84	12.63[a]	33.72	7.92[b]	14.813	< 0.0005
Health								
Susceptibility	12.19	5.94	10.44	5.36	11.01	5.21	1.297[a]	0.276
Benefits	23.43	4.79	24.67	4.49	24.76	3.11	1.614[a]	0.202
Barriers	45.38	19.97[a]	33.18	14.42[b]	36.06	17.19[b]	6.713	0.002
Self-efficacy	58.45	10.42[a]	64.25	7.04[b]	62.90	8.37[b]	6.090	0.003

[a, b, c] Indicate which means significantly differed at the 0.05 level based on Tukey's Honestly Significant Differences procedure. Mean values with the same superscript were not significantly different from each other.

Note. Four values were missing for education of the total sample, and one value was missing for interpersonal space and external control for the more than high school group.

binary variable, with 0 reflecting nonadherent and 1 reflecting adherent behavior in accord with American Cancer Society guidelines. The results of the first model, which included the demographic variables and cultural beliefs, are shown in Table 5. None of the demographic variables was significant. When adjusting for race or ethnicity, education, and income, significant cultural belief predictors of mammography compliance were interpersonal space, health temporal orientation, and internal control. Women who were adherent to mammography screening reported less discomfort with interpersonal space, more future or prevention orientation, and fewer perceptions of internal control than nonadherent women.

The second model for mammography screening adherence, also shown in Table 5, added the health belief scales as explanatory variables. Again, none of the demographic variables was significant in the model. Interpersonal space became nonsignificant, and physical space became statistically significant. In the model, the cultural beliefs that were predictive of adherence included physical space, health temporal orientation, and internal control when other variables in the model were adjusted. Women who were screening adherent were more likely to have discomfort with physical space during the procedure, were more future or prevention oriented, and perceived less internal control over finding health problems early. Perceived barriers was the only health belief that was significantly related to mammography screening adherence when adjusting for the other terms in the model. Not surprisingly, women who had fewer perceived barriers were more likely to be adherent. No significant interactions existed among race or ethnicity, education, or income and the cultural and health belief scores at the 0.01 level (not included in the final models presented here).

Table 4. Analysis of Cultural and Health Beliefs With Income

Beliefs	Less Than $10,000 (N = 86) $\bar{X}$	SD	$10,000–$30,000 (N = 38) $\bar{X}$	SD	More Than $30,000 (N = 47) $\bar{X}$	SD	F	p
Cultural								
Physical space	27.14	8.99	25.00	7.93	24.02	7.74	2.275[a]	0.106
Interpersonal space	21.12	5.81	19.76	5.56	21.11	6.73	0.742[a]	0.478
Health temporal orientation	39.02	4.88[a]	40.21	4.70[a,b]	41.68	3.58[b]	5.297	0.006
Internal control	16.66	2.16[a]	16.97	2.61[a,b]	17.66	1.94[b]	3.096	0.048
External control	18.94	6.41[a]	17.71	4.96[a]	14.13	3.93[b]	11.682	< 0.0005
Fatalism	40.87	10.59[a]	40.76	13.49[a]	33.87	9.17[b]	6.901	0.001
Health								
Susceptibility	11.21	5.68	11.92	5.35	10.30	5.17	0.950[a]	0.389
Benefits	24.50	4.06	23.95	4.92	24.55	3.51	0.286[a]	0.752
Barriers	39.15	18.53	38.84	19.70	32.02	10.57	2.915[a]	0.057
Self-efficacy	62.31	8.54	61.03	9.25	64.28	6.61	1.721[a]	0.182

[a, b] Indicate which means significantly differed at the 0.05 level based on Tukey's Honestly Significant Differences procedure. Mean values with the same superscript were not significantly different from each other.

Note. One value was missing for interpersonal space for the highest income group.

Table 5. Logistic Regression Analysis of Cultural Beliefs (Model 1) and Combined Cultural and Health Beliefs (Model 2) on Mammography Screening Adherence Controlling for Race or Ethnicity, Education, and Income

	Model 1		Model 2	
Beliefs	**Odds Ratio**	**Confidence Interval**	**Odds Ratio**	**Confidence Interval**
Cultural				
Physical space	1.049	0.992–1.109	1.065	1.003–1.131*
Interpersonal space	0.906	0.845–0.972**	0.931	0.864–1.002
Health temporal orientation	1.251	1.121–1.396***	1.211	1.078–1.362***
Internal control	0.741	0.612–0.897**	0.751	0.617–0.913**
External control	1.026	0.942–1.117	1.036	0.946–1.134
Fatalism	1.025	0.984–1.067	1.021	0.978–1.067
Health				
Susceptibility	–	–	1.006	0.937–1.082
Benefits	–	–	1.062	0.960–1.176
Barriers	–	–	0.965	0.939–0.993*
Self-efficacy	–	–	0.991	0.935–1.049

* $p \leq 0.05$

** $p \leq 0.01$

*** $p \leq 0.001$

Discussion

Results from this study provide support for the importance of including cultural beliefs in the investigation of factors that are related to mammography screening behavior. Temporal orientation and perceptions of internal control and physical space were significant independent predictors of mammography screening adherence in the regression analyses.

Women who were more oriented to finding health problems early were more likely to adhere to screening guidelines. Temporal orientation previously has been found to be related to perceptions of disease susceptibility and to mammography screening behavior. In a study of women with first-degree relatives diagnosed with breast cancer, Hughes, Lerman, and Lustbader (1996) attributed decreased perceptions of breast cancer risk to their present time orientation. Brown and Segal (1996) found that present-oriented individuals perceived less susceptibility to the consequences of hypertension and believed less in the benefits of treatment with prescribed medications. In their study of urban African American women, Lukwago et al. (2003) found a negative association between present time orientation and mammography screening.

Perception of internal control was inversely related to mammography screening behavior. This finding was unexpected based on results of previous studies of internal control and mammography screening. Wehrwein and Eddy (1993) found that internal control beliefs were positively related to women's intentions to get screened. In another study of health beliefs and locus of control in mammography screening for African American and Caucasian women, Holm et al. (1999) found that women with more internal control were more likely to be adherent to screening. The studies, however, measured control over general health, whereas the current study measured control over early detection of health problems. Finding breast cancer with mammography may be considered an external control phenomenon. Therefore, if a woman believed that she could identify breast cancer herself (increased personal control), she would be less likely to be adherent. Women may perceive that only a healthcare provider or specific test can detect problems early, thus believing that they have less control over these phenomena.

Another finding that is inconsistent with cultural theory in health behavior was that higher sensitivity to physical space was related to higher mammography adherence, controlling for other factors in the model. The finding may be because adherent women have obtained a mammogram in the past year and have sharper recollections of the physical discomforts than those who are irregular users. In contrast, the interpersonal space and other constructs are more general in nature and women could relate to them regardless of whether they actually are getting mammograms.

Only one health belief predicted screening adherence. Women who perceived fewer barriers were significantly more adherent than those with higher barriers. Perceived barriers explained a large proportion of screening variance in other behavioral studies for African American and Caucasian women (Aiken et al., 1994; Champion & Miller, 1996; Champion & Springston, 1999; Holm et al., 1999).

An interesting but unexpected finding is that, except for fatalism, race or ethnicity was not related to differences in cultural beliefs. African American women held more fatalistic views about breast cancer than Caucasian women. Culture shapes individual beliefs and healthcare practices, and African Americans might be expected to have cultural beliefs about healthcare practices that differ from Caucasians (Giger & Davidhizer, 1999). However, acculturation may account for the lack of differences found between African American and Caucasian women in this study.

Limitations

A possibility exists that the generalizability of the results from the current study are weakened because the study used a convenience sample and demographic differences were found in marital status and education (although not age) between the in-person and phone interview groups. The use of self-report mammography screening provides an additional limitation, although Zapka et al. (1996) found that self-reported data were acceptable in a multiethnic population if used for mammography screening surveillance in a one-year period.

Implications for Nursing

The current study's results suggest directions for future research and practice. First, future investigations using larger, more representative samples should include measurements for cultural beliefs and acculturation, controlling for demographics. Cultural beliefs are important predictors of mammography screening in African American women. Second, the factors that may be related to health temporal orientation in regard to early disease detection need further exploration. The factors can provide direction for developing interventions for women who are less prevention oriented, either by choice or external causes. Third, the inverse relationship of internal control and adherence needs further investigation. If women who perceive less control over breast cancer do in fact become more adherent, messages to increase mammography screening should reflect this.

Fourth, a closer examination of particular barriers to screening is needed to develop personalized interventions. What is the nature of the barriers, such as socioeconomic obstacles, negative past experiences with the healthcare system, psychosocial influences, and inadequate information? Multilevel interventions may be needed that address not only individual women but also the social contextual environment that affects their screening behaviors.

When promoting mammography screening in the practice setting, nurses must consider the cultural beliefs of women. Women who are more present oriented may not seek out regular screening because screening is a future-oriented prevention behavior for the early detection of breast cancer. Nurses also may want to reinforce the fact that mammography is the best way to find breast cancer. Nurses may need to seize opportunities to discuss breast cancer screening during their interactions with women who are receiving nursing services for other health issues. By initiating conversation about early breast cancer detection, nurses can help women begin to consider the benefits of screening.

At the same time, women who have fatalistic views about cancer may avoid screening altogether. Such women, especially African American women, may believe that few—if any—benefits exist for detecting breast cancer because they perceive a cancer diagnosis as an inevitable death sentence. Women with fatalistic beliefs about cancer may delay screening, which leads to late-stage diagnosis and poorer survival rates. Nurses need to assess for fatalistic beliefs before trying to persuade women to get screened. If a belief is uncovered, nurses can listen to why individuals feel that way and determine their level of understanding of the relationship between early detection of breast cancer and health outcomes. By presenting the facts about breast cancer detection and survivorship at an appropriate health literacy level, nurses may help individuals to consider thinking about the disease in a different way.

Helping women to empower themselves to engage in early breast cancer disease detection also involves minimizing barriers to screening and engaging women in discussions about their beliefs of personal control in finding health problems early. Nurses should assess barriers to screening, such as financial, healthcare system, and social network influences, and jointly identify socioculturally appropriate strategies and resources to address these issues. Nurses can help women gain more perceived control over early disease detection by discussing their role and beliefs in managing patients' health and giving them information and skills to help them to do so.

Conclusion

Cultural and health beliefs are important factors to consider in promoting mammography screening in both African American and Caucasian women. The current study showed that a combination of theoretically based cultural and health beliefs were associated with screening behavior and that the beliefs varied by education and income. Because fatalism was the only cultural belief that differed between African American and Caucasian women, future research is needed to determine the role of acculturation levels and beliefs in mammography screening. Nevertheless, nurses in clinical practice should assess cultural and health beliefs across racial and ethnic groups and develop interventions appropriate to beliefs and health literacy.

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