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Research paper

Gender matters: health beliefs of women as a predictor of participation in prostate cancer screening among African American men

Jean Gash PhD APRN BC
Assistant Professor of Nursing, University of Detroit Mercy, Detroit, MI, USA

Gregory V. McIntosh DO FACOS
Programme Director – Metropolitan Detroit Urology Residency Consortium, Mt Clemens; Clinical Assistant Professor, Michigan State University College of Osteopathic Medicine, East Lansing, MI, USA

What is known on this subject

- African American men are less likely to be screened for prostate cancer, and consequently are often diagnosed with prostate cancer at later stages and with a more aggressive disease than men in any other group.
- When barriers to screening are removed, differences between African American men and men from other racial/ethnic groups in the development of prostate cancer are reduced.
- Late diagnosis of prostate cancer may result in limited treatment options and poorer outcomes.

What this paper adds

- It provides information on women's health beliefs related to prostate cancer.
- Findings from this study indicate that there is no significant difference between African American and European American women in their perceived health beliefs about prostate cancer screening.
- The most important barrier to prostate cancer screening in the African American population may be access to healthcare or health education.

ABSTRACT

Studies comparing African and European American men indicate that, when barriers to prostate cancer screening are removed, mortality and morbidity rates from prostate cancer equalise. The purpose of this study was to determine first whether cultural influences affect African American men's decisions to participate in prostate cancer screening, and secondly the health beliefs of African American and white women regarding prostate cancer risks for the men in their family.

A total of 83 African and European American men and women with a mean age of 56.5 years were recruited at two community health fairs in the Detroit area. Data were collected using an adaptation of the health belief scale developed for use in prostate cancer screening. All decisions about the statistical significance of the findings were made using a criterion alpha level of 0.05. The results indicated that negative health beliefs differed between men and women regardless of ethnicity ($F(1, 112) = 18.31$, $P < 0.001$). Women (M = 2.91, SD = 1.04) had higher scores than men (M = 1.97, SD = 0.97), indicating that they were more likely to perceive that negative health beliefs were one of the reasons why men in their family did not seek prostate cancer screening. The reasons reported in the literature regarding the reluctance of African American men to participate in prostate cancer screening were not fully supported by the findings of this study. The results indicate that prostate cancer screening may be subject to problems of access to healthcare and health education, as opposed to cultural influences.

Keywords: African American, disparity, health beliefs, prostate cancer screening, women

Introduction

Prostate cancer is consistently reported to be the leading cause of cancer deaths among African American men (American Cancer Society, 2007, 2011). Between 2000 and 2003, more African American men than European American men died from prostate cancer (64.0 vs. 26.2 per 100 000) (American Cancer Society, 2007). Deaths among African American men with this condition were expected to reach 5300 in 2011 (American Cancer Society, 2011). In general, mortality rates among black men are 40.5% higher than those among white men for all comparable disease processes; moreover, these mortality rates have not improved for more than 40 years (Satcher *et al*, 2005). American Cancer Society (2007) statistics indicate that a delay in diagnosis of prostate cancer may limit the choice of treatment options and shorten life expectancy. It is estimated that the cost of disparities may reach US$ 337 billion over the next 10 years (Bovbjerg *et al*, 2009). In addition, the American Cancer Society has indicated that when barriers to screening are removed (e.g. socioeconomic inequalities, disparities in education, access to healthcare, etc.), differences between African American men and those from other groups in the development of prostate cancer are reduced. Consequently, increasing the rate of participation in prostate cancer screening among African American men has the potential to identify prostate cancer at earlier stages of the disease, resulting in improved treatment options, decreased healthcare inequalities, and improved length and quality of life. In this context, the low uptake of screening among African American men is an issue of concern. This paper reports on a study of factors that influence men's decisions to undergo screening for prostate cancer.

Literature review

African American men are less likely to be screened for prostate cancer, and consequently are often diagnosed at later stages and with a more aggressive disease than any other group (American Cancer Society, 2007). The low uptake of screening is suggested to be due to a number of barriers, including fear and embarrassment (Forrester-Anderson, 2005; Friedmann *et al*, 2009), limited knowledge about prostate cancer (Allen *et al*, 2007; Forrester-Anderson, 2005; Jones *et al*, 2009), lack of resources (Friedmann *et al*, 2009), family involvement (Jones *et al*, 2009), lack of access to healthcare (Allen *et al*, 2007), mistrust of the healthcare system, threats to male sexuality, fear of cancer (Allen *et al*, 2007), and limited communication within the family (Friedmann *et al*, 2009). Despite negative health statistics in the media with regard to African American men and prostate cancer, one study found that 18 of 105 African American men (17.5%) believed that their risk of developing prostate cancer was the same as that for men in other ethnic groups of the same age (Shavers *et al*, 2009). In contrast, the same study indicated that Hispanic men perceived their risk of developing prostate cancer as being higher than average. These findings suggested that, in addition to lack of knowledge about the risk factors associated with prostate cancer, health beliefs or cultural beliefs may also influence decision making about screening.

Forrester-Anderson (2005) found that African American men's level of knowledge about prostate cancer screening methods was low. Participants (n = 104) were recruited from three counties in the Metropolitan Baltimore area. In total, 62 men had health insurance; most were married, and had at least a high-school education. The majority (58%) had not participated in prostate cancer screening, and most of those who had been screened did not have annual checks. Several themes were identified: first, there was a need for African American men to learn more about prostate cancer; secondly, increased knowledge about prostate cancer typically resulted in better health; and thirdly, there was a need to share information about prostate cancer and African American men with others. Most participants thought that it would be important to start men's health meetings at church.

Emerson *et al* (2009) designed an educational intervention study to increase prostate cancer knowledge among African American men aged 40–70 years. A total of 345 men were recruited from churches and divided into two groups: those who were up to date with screening (n = 193) and those who were not up to date (n = 152). Among the up-to-date group, 54.9% had an associate's degree or higher, 79.2% were married and 97.9% had health insurance. Among members of the group that was not up to date, 43.7% had an associate's degree or higher, 75.8% were married and 82.2% had some type of health insurance. Of the 152 participants who were not up to date with prostate cancer screening, 32.2% were able to identify correct responses to questions related to prostate cancer, but this figure increased to 49.0% following the educational intervention. These results, although not optimal, demonstrate the need not only to educate African American men about prostate cancer but also to help them to make informed decisions about undergoing screening.

In a qualitative study, Jones *et al* (2009) identified three major themes that influenced African American men and their decision as to whether to participate in prostate cancer screening. Their 17 participants were aged 40–70 years, seven were married, seven were single, three were divorced, and 12 men were employed. The three themes identified in this study were limited

education about prostate cancer, mistrust in healthcare providers, and family involvement. The men reported that they would be more likely to seek prostate cancer screening if family members were involved in the decision-making process.

Blocker *et al* (2006) interviewed 15 African American women and 14 African American men. The women in this study asserted that African American men often put their own needs to one side in order to concentrate on the needs of the family unit. These women indicated that they had a responsibility to advocate for their husband or partner, father, sons, brothers, uncles, etc. to seek preventative medical care. Bryan *et al* (2008) assigned men and women to four focus groups that were gender and race specific. Eight African American women between the ages of 35 and 69 years participated in this study. The findings indicated that both African American men and women wished to increase their knowledge about prostate cancer. Webb *et al* (2006) interviewed 14 women about prostate cancer screening. The findings indicated that women were often the key motivators in helping African American men to decide to participate in prostate cancer screening. Consequently, mutual decision making with a female member of the family (such as a wife or partner, sister, mother or daughter) may be a significant motivator for African American men to choose to participate in prostate cancer screening. However, little is known about the health beliefs of women with regard to prostate cancer.

Aims of the study

This study had two aims: first, to ascertain whether cultural influences affect African American men's decision making about participation in prostate cancer screening, and secondly to investigate the health beliefs of African American and European American women with regard to prostate cancer risks for the men in their family.

Theoretical framework

The health belief model developed by Hochbaum (1956) was used to guide this study. This model includes four main concepts, namely perceived susceptibility (the person's perception of their likelihood of developing prostate cancer), perceived seriousness (how dangerous the person considers prostate cancer to be), perceived benefit (how effectively a behaviour such as prostate cancer screening will reduce the threat of prostate cancer) and perceived barriers related to negative perceptions of the prostate cancer screening procedure.

Methodology

Institutional review board approval

Approval for this research was granted by the ethics departments of Wayne State University, Detroit, and Botsford Hospital, Farmington, Michigan. All of the participants received written information about the project.

Settings

Data were collected at two locations in the Metropolitan Detroit area in the summer and autumn of 2010. The first site was at a health fair offered to African American elders by the Institutes of Gerontology of Wayne State University and the University of Michigan. The second site was a cancer health screening event for the community at Botsford Hospital.

Health fairs

For those who have a limited income or are under- or uninsured in the USA, health fairs provide much needed resources in the form of health promotion and early detection of disease processes (social capital). Members of underserved populations are able to use these and other means (e.g. public agencies) to gain access to healthcare and preventative healthcare information that might otherwise be beyond their reach. The first health fair that was used to collect data for this study was supported by a federal grant specifically to promote health in the African American population in the City of Detroit, Michigan. The second health fair was open to all populations; physician volunteers targeted suburban populations in the hope that participants would choose this hospital for their future healthcare needs.

Participants

The participants were men and women attending these health screening events. To be included in the study, participants had to be over 21 years of age and able to read and write English. There were no other inclusion or exclusion criteria. The mean age of the participants was 56.51 (SD = 13.91) years, with a median of 57 years. The majority of the participants were women ($n = 84$, 74.3%) and African American ($n = 61$, 53.5%). Only three men of African American origin were recruited. In total, 48 (42.1%) of the

participants described their ethnicity as white (see Table 1).

Survey instrument

An adaptation of the Health Belief Model Scale developed by Champion (1999) was used in this study. Champion developed this scale in order to examine women's health beliefs about mammography screening. The revised scale used in the present study was developed to investigate health beliefs about prostate cancer; a male/female version of the scale was developed. The scale includes 19 items that measure three components of health beliefs, namely susceptibility, benefits and barriers. The participants rated each of the items using a 5-point scale ranging from 1 ('strongly disagree') to 5 ('strongly agree'). The subscales were scored by adding the numerical responses to the items on each subscale and dividing the total by the number of items on the scale to obtain a mean score that reflected the original scale of measurement. The use of mean scores for the subscales also allowed direct comparisons across the three subscales.

Champion (1999) tested her instrument for reliability and validity. The alpha coefficients obtained for internal consistency for susceptibility (0.93), benefits (0.80) and barriers (0.88) indicated that the instrument had good reliability. The test–retest correlations for susceptibility (0.70), benefits (0.45) and barriers (0.65) indicated that the instrument had adequate stability. The instrument has also been tested for content validity, construct validity and predictive validity. The adaptations of the instrument for use with the participants in this study were tested for validity and reliability. A principal-components factor analysis with a varimax rotation was used to test the construct validity of the revised instrument. According to Osborne and Costello (2004), valid results of a principal-components factor analysis can be achieved using a subject-to-item ratio of at least 5 participants for each survey item. With 114 participants and 19 survey items, the ratio was 6:1. Four factors, namely *barriers to prostate cancer screening, negative health beliefs, benefits of prostate cancer screening* and *perceptions of health outcomes*, emerged from the analysis, explaining 54.6% of the variance. The associated eigenvalues were greater than 1.00, indicating that the amount of variance explained by each subscale was statistically significant. The results of the factor analysis are shown in Table 2. The internal consistency of the instrument was tested using Cronbach alpha coefficients. The coefficients ranged from 0.73 for benefits of prostate cancer screening to 0.79 for negative health beliefs.

The instrument was also tested for readability. The results of this analysis indicated that the instrument was at 8th-grade level and could be read by most people.

Table 1 Cross-tabulation of personal characteristics by ethnicity (n = 114)[a]

Personal characteristics	African American		White European		Other		Total	
	n	%	*n*	%	*n*	%	*n*	%
Gender								
Male	3	5.0	23	47.9	3	60.0	29	25.7
Female	57	95.0	25	52.1	2	40.0	84	74.3
Male in family diagnosed with prostate cancer								
Yes	16	27.1	18	39.1	4	80.0	38	34.5
No	44	49.2	28	60.9	1	20.0	72	65.5
Aware of screening for prostate cancer								
Yes	40	67.8	30	69.8	5	100.0	75	70.0
No	19	32.2	13	30.2	0	0.0	32	30.0

[a] Differences in the number of responses and the number of participants are due to some participants choosing not to provide responses to all questions. The participants were told that they did not have to answer any questions about which they were uncomfortable.

Table 2 Principal-components factor analysis of health beliefs about prostate cancer screening

Survey item[a,b]	Factor 1	Factor 2	Factor 3	Factor 4
Barriers to prostate cancer screening				
18 I (my loved one) have had more important problems than getting a prostate cancer screening	0.71			
15 People doing prostate exams are rude	0.71			
16 I (my loved one) cannot remember to schedule a prostate exam	0.67			
17 I (my loved one) had no access to prostate cancer screening	0.65			
19 I am (my loved one is) too old to need a prostate cancer screening	0.62			
14 Prostate cancer screening takes too much time	0.59			
Negative health beliefs				
9 I am (my loved one is) afraid to have prostate cancer screening in case they find out something is wrong		0.83		
10 I am (my loved one is) afraid to participate in prostate cancer screening because I do not understand what will be done		0.81		
12 Having a prostate cancer screening is embarrassing for me (my loved one)		0.67		
11 I (my loved one) do not know how to go about getting a prostate cancer screening done		0.60		
Benefits of prostate cancer screening				
8 Having prostate cancer screening will decrease my (their) chance of dying			0.73	
7 Having the prostate exam along with the PSA blood test is the best way to find prostate cancer			0.69	
6 If prostate cancer is found early enough then the treatment may not be as bad			0.68	
5 Having prostate cancer screening will help find prostate cancer early			0.66	
4 If I (my loved one) get a PSA and prostate exam, I will not worry so much about prostate cancer			0.63	
Perceptions of health outcomes				
1 It is likely that I (my husband, partner, father, brother, son, etc.) will get prostate cancer				0.82
2 I feel that I (they) will get prostate cancer at some time in my (their) life				0.81
3 My (their) chance of getting prostate cancer is great				0.77
Percentage of explained variance	21.08	17.01	9.68	6.84
Eigenvalue	4.01	3.23	1.84	1.30
Cronbach alpha coefficient	0.77	0.79	0.73	0.75

PSA, prostate-specific antigen.
[a] The wording in the women's survey is shown in parentheses.
[b] Item 14 ('Having a prostate exam is too painful') did not load on any of the factors and was eliminated from the survey.

Data analysis

The data were analysed using IBM-SPSS version 20.0. The analyses included descriptive statistics to provide a description of the sample. The aims were tested using Pearson product–moment correlations and one-way multivariate analysis of variance (MANOVA). All decisions about the statistical significance of the findings were made using a criterion alpha level of 0.05.

Findings

The four subscales that measured health beliefs about prostate cancer screening were correlated with the age of the women in the study. One statistically significant correlation was found for *perceptions of health outcomes* ($r = 0.27$, $P = 0.02$). The positive direction of the relationship indicated that older women had more positive perceptions of health outcomes. The other correlations were not statistically significant (see Table 3).

A one-way MANOVA was used to determine whether men and women differed on the four subscales that measured health beliefs (see Table 4). A statistically significant omnibus F was obtained on the MANOVA (F (4, 109) = 6.03, $P < 0.001$). The intersubject effects were examined in order to determine which of the four scales were contributing to the statistically significant difference. Negative health beliefs differed between men and women (F (1, 112) = 18.31, $P < 0.001$). Women (M = 2.91, SD = 1.04) had higher scores than men (M = 1.97, SD = 0.97), indicating that they were more likely to perceive that negative health beliefs were one reason why men in their family did not seek prostate cancer screening. Although the difference in negative health beliefs was statistically significant, the low η^2 of 0.14 indicated that the results had low to moderate practical significance.

A one-way MANOVA was completed to determine whether African American and European American participants differed in their health beliefs about prostate cancer screening (see Table 5). The results of this analysis were not statistically significant. The low η^2 for the analyses provided additional support for the low significance of the findings. Although the African American participants had lower scores on each of the four subscales, these differences were not statistically significant.

Limitations

Although the strength of this study is that very little was previously known about women and health beliefs about prostate cancer, we acknowledge that it has a number of limitations. African Americans are generally reluctant to participate in research, and consequently may not provide answers to all of the items in a survey. In addition, our sample size was small and drawn from only one geographical area. The selective nature of populations who attend health fair events may affect the generalisability of the results.

Conclusion

Little attention has been paid to the health beliefs of women about prostate cancer. The findings of this study indicate that women in general perceived that the main reason why men avoided prostate cancer screening was their negative health beliefs. This is an important finding. Directing prostate cancer education towards women may enable them to motivate male family members to undergo screening, but any educational interventions need to be culturally appropriate for both women and men. Informing individuals about prostate cancer is not enough; they also need to know how to access screening. Providing one without the other would be an exercise in futility. The results of this study can be used to develop innovative interventions that reduce or minimise healthcare inequalities related to prostate cancer, promote health-

Table 3 Pearson product–moment correlations for health beliefs about prostate cancer screening by age (women only)

Health beliefs about prostate cancer screening	*n*	*r*	*P*-value
Barriers to prostate cancer screening	72	–0.09	0.409
Negative health beliefs	72	–0.06	0.599
Benefits of prostate cancer screening	72	0.06	0.618
Perceptions of health outcomes	72	0.27	0.020

Table 4 One-way multivariate analysis of variance for health beliefs about prostate cancer screening by gender

Variable	Multivariate test	Male		Female		*F*	η^2
		M	SD	M	SD		
Health beliefs	0.16**						
Barriers to prostate cancer screening		1.90	0.78	2.10	0.80	1.31**	0.01
Negative health beliefs		1.97	0.97	2.91	1.04	18.30**	0.14
Benefits of prostate cancer screening		3.87	1.10	3.99	0.89	0.33**	0.01
Perceptions of health outcomes		3.36	1.07	3.03	0.96	2.37**	0.02

** $P < 0.001$.
Multivariate test evaluated using Pillai's trace.

Table 5 One-way multivariate analysis of variance of health beliefs about prostate cancer screening by ethnicity

Variable	Multivariate test	African American ($n = 58$)		White European ($n = 25$)		*F*	η^2
		M	SD	M	SD		
Health beliefs	0.04						
Barriers to prostate cancer screening		2.08	0.85	2.15	0.66	0.15	< 0.01
Negative health beliefs		2.83	1.04	3.13	1.05	1.43	0.02
Benefits of prostate cancer screening		3.88	0.94	4.18	0.75	2.02	0.02
Perceptions of health outcomes		2.99	1.01	3.04	0.81	0.05	< 0.01

Multivariate test evaluated using Pillai's trace.

seeking behaviour, and improve quality of life by targeting women in the educational and decision-making process.

Previous studies have established that when barriers to prostate cancer screening were removed, differences in the development of prostate cancer between African American men and men from other ethnic groups were reduced (American Cancer Society, 2007). The most important barrier to prostate cancer screening in the African American population may be access to care. This challenges reports from previous studies which highlighted factors such as threats to male sexuality, and fear of cancer (Allen *et al*, 2007; Forrester-Anderson, 2005; Jones *et al*, 2009), as barriers specific to African American men.

The implications for both nursing and medical practice are to encourage the process of developing interventions designed to include both men and women because, although disease processes may be gender specific, coping and effective decision making are more often undertaken in partnership with significant family members or friends. The development of edu-

cational modules that are gender neutral and disease specific, including information on how to access screening, can facilitate early detection of prostate cancer. This may increase life expectancy and quality of life for African American men as well as saving the healthcare services many billions of dollars.

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CONFLICTS OF INTEREST

None.

ADDRESS FOR CORRESPONDENCE

Dr Jean Gash, Assistant Professor of Nursing, University of Detroit Mercy, 4001, W McNichols Road, Detroit, Michigan 4, USA. Email: ac8624@wayne.edu or gashje@udmercy.edu

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