

# MEN'S KNOWLEDGE AND BELIEFS ABOUT PROSTATE CANCER: EDUCATION, RACE, AND SCREENING STATUS

**Objective:** African American men die from prostate cancer at higher rates than do White men, a health disparity that may result from differences in knowledge and beliefs about prostate cancer and screening. Studies conflict on whether race or socioeconomic status affects knowledge of prostate cancer and screening. This study compared education, race, and screening status to determine how each factor shapes men's knowledge of prostate cancer and screening.

**Methods:** In-depth interviews were conducted with 65 African American and White men, aged 40–64 years, with diverse educational backgrounds.

**Results:** Education, not race or screening status, was associated with knowledge about the prostate gland, prostate cancer symptoms and screening tests, and fear of prostate cancer. The exception was knowledge about the prostate-specific antigen blood test, which was associated with education and screening status.

**Conclusion:** This study suggests that education may be associated with prostate cancer and screening knowledge. Interventions should focus on all men with low education to correct their misconceptions about prostate cancer and to engage them in shared decision-making about screening. (*Ethn Dis.* 2009;19:199–203)

**Key Words:** Prostate Cancer, Prostate Cancer Screening, Health Disparities, African American

---

From the Department of Family and Community Medicine (JAW, JGG, JA, TAA), Department of Epidemiology and Prevention, Division of Public Health Sciences (SAQ), Department of Internal Medicine (DPM), Wake Forest University School of Medicine, Winston-Salem, North Carolina; Department of Urology, Vanderbilt University Medical Center, Nashville, Tennessee (PEC); Department of Internal Medicine and Prevention Research Center, University of Kentucky, Lexington, Kentucky (MPD).

Address correspondence and reprint requests to: Julie A. Winterich, PhD; Department of Sociology and Anthropology, Guilford College; 5800 New Garden Rd, Greensboro, NC 27410; 336-316-2271; winterichja@guilford.edu

Julie A. Winterich, PhD; Joseph G. Grzywacz, PhD; Sara A. Quandt, PhD; Peter E. Clark, MD; David P. Miller, MD; Joshua Acuña; Mark B. Dignan, PhD, MPH; Thomas A. Arcury, PhD

## INTRODUCTION

Prostate cancer is the most prevalent non-cutaneous cancer among men in the United States and is the second leading cancer-related cause of death. The American Cancer Society estimates that 186,320 new cases of prostate cancer will be diagnosed in 2008 and 28,660 patients will die.<sup>1</sup> Health disparities persist; incidence and death rates are higher in African American men than in White men.<sup>2–4</sup> Despite abundant research, inconclusive findings remain about why prostate cancer disparities persist and how best to decrease them.<sup>5</sup>

Previous studies have reported inconsistent findings about racial differences in beliefs and knowledge about prostate cancer and screening.<sup>6–13</sup> Many of these studies concluded that reluctance to be screened was connected to cultural issues in African American communities, such as distrust of the medical system and a lack of health messages tailored to African American men.<sup>8,9,11</sup> However, many of these studies did not separate race and education.<sup>8–10</sup> Two of the studies that did examine race and education separately were conducted only with African American men, so whether these findings are unique to African American men is unclear. Other studies that examined prostate cancer knowledge and screening by race and by educational level have found conflicting results.<sup>6,7,12,13</sup> Two studies found racial differences in knowledge, even when educational level was controlled.<sup>12,13</sup> Another study found no racial differences,<sup>7</sup> and another found only socioeconomic differences.<sup>6</sup>

---

*Despite abundant research, inconclusive findings remain about why prostate cancer disparities persist and how best to decrease them.*<sup>5</sup>

---

These inconsistent results undermine physicians' ability to anticipate the types of educational materials diverse men need to make informed decisions about prostate cancer screening. Therefore, we examined the roles of education, race, and screening status in men's beliefs and knowledge about prostate cancer. This research can inform how physicians can promote shared decision-making with diverse groups of men. To accomplish this goal, we analyzed qualitative data based on in-depth interviews with 65 African American and White men from diverse educational backgrounds.

## METHODS

### Sample and Interviews

In-depth interview data were collected from 65 men, aged 40–64 years, from diverse socioeconomic backgrounds. None of the respondents had ever been diagnosed with prostate cancer. The project was framed by the Kleinman explanatory model of illness. Explanatory models are the ideas people use to make sense of a condition or illness and to evaluate possible treatment or prevention strategies.<sup>14,15</sup> Explanatory models provide information on 6 aspects of illness: naming the

condition, etiology, precipitating circumstances and mode of onset of symptoms, an explanation of pathophysiology, course of sickness and appropriate patient behavior, and available treatments. People vary in the content of their explanatory models, which are usually only partly articulated and may be inconsistent or even self-contradictory. Individual models share common features to the extent that people share a common cultural and social orientation.<sup>16</sup>

This study is part of a larger project on African American and White men's beliefs, knowledge, and screening for prostate and colorectal cancer. The larger study consisted of 2 in-depth interviews for each man for a total of 130 interviews. During the first interview, topics on beliefs about health, illness, cancer, and general cancer screening tests were discussed. The first meeting allowed the interviewer to develop rapport for the second meeting, which covered potentially sensitive topics on men's beliefs, knowledge, and screening practices for prostate and colorectal cancer. In this article, we focus on data collected from the second interview.

We received approval from the Wake Forest University Health Sciences institutional review board before conducting interviews. Two male researchers conducted the interviews and gave men a choice of locations to meet. Some men preferred their own homes, while others chose conference rooms in churches or in the department where the researchers work; all interviews were private to help ensure privacy and encourage open discussion. Each interview lasted 1–2 hours, was tape-recorded, and was transcribed. Men were asked what they know about the prostate, prostate cancer, prostate cancer prevention and screening, digital rectal examinations (DREs), prostate-specific antigen (PSA) blood tests, and barriers to screening. Before they were asked questions on specific screening tests, a description of prostate screening was

read to each man, regardless of their level of knowledge. As is standard in qualitative interviews, follow-up questions were used to clarify vague responses. We assigned each man an identification number to preserve anonymity.

The sample was recruited from counties in North Carolina, including small and medium-sized towns and urban areas. Interviewers worked with groups in each area, such as churches, social services, and men's groups, to locate and recruit men aged 40–64 who had not had prostate cancer. The goal in recruitment was to obtain a balance of screened and unscreened African American and White men from rural and urban areas across 3 educational levels: low education, defined as high school graduate or less; medium education, defined as some college; and high education, defined as college graduate or higher.

The initial goal of sample recruitment was to obtain a balance between men who had never had a DRE and those who had. However, most men had had a DRE when they enrolled in the military or in their youth as part of an examination. Therefore, we focused on recruiting men who had not had a DRE specifically for cancer screening. We defined screened as

those respondents who had a DRE or a PSA for cancer screening. We defined unscreened as those men who had not had a DRE for prostate cancer screening and had not had a PSA. Overall, the sample consisted of 65 men, 35 African American and 30 White. The race, educational level, and screening status of the recruited sample are described in Table 1.

**Data Analysis**

Through discussion and consensus, the research team developed a coding dictionary. Each transcript was coded and then coded again by a different investigator. Discrepancies between the first and second coding were discussed and resolved at team meetings. As new issues arose, the team collectively agreed to add or collapse codes. ATLAS.ti (Berlin, Germany), a qualitative analysis software program, was used to code and to analyze the data. Data analysis consisted of sorting the men into 3 groups according to educational level and by race and screening status within each group and running analysis reports based on prostate codes. The prostate codes covered discussions about the prostate gland, prostate cancer causes, symptoms, what they believe other men

**Table 1. History of prostate cancer screening\* and educational level among 65 African American and White men interviewed on their knowledge and beliefs about prostate cancer screening**

Educational Level	Screened		Unscreened		Total
	n	(%)	n	(%)	n
Low (high school graduate or less)					
African American	7	20.0	9	30.0	16
White	2	5.7	1	3.3	3
Total	9	25.7	10	33.3	19
Medium (some college)					
African American	5	14.3	1	3.3	6
White	6	17.1	5	16.7	11
Total	11	31.4	6	20.0	17
High (college graduate or higher)					
African American	6	17.1	7	23.3	13
White	9	25.7	7	23.3	16
Total	15	42.8	14	46.6	29
Total	35	100	30	100	65

\* Men were considered screened if they reported ever having had a digital rectal exam for prostate cancer screening or a prostate-specific antigen test.

fear about prostate cancer, and knowledge about screening examinations. Summaries were generated for each educational level and for screening status and racial groups within each educational level and then distributed to the team so they could identify salient themes. Through consensus, the team established themes about men's beliefs and knowledge about the prostate, prostate cancer, and screening.

## RESULTS

We found differences by educational level but not race or screening status in men's discussions about most topics, including the prostate gland, causes of prostate cancer, fears about prostate cancer, and prostate cancer screening. We found 2 exceptions. First, knowledge of prostate cancer symptoms was not associated with education. Second, men's knowledge about the PSA blood test differed by screening status in each education group.

### Prostate Gland

Overall, few men knew the prostate's function, but many knew its location. The low education group had the least knowledge; most did not know anything about the prostate, although a few knew its general location. Most men with medium educational attainment had some knowledge about what the prostate is and where it is located, such as "it's a gland" (#6, African American, screened) or "it's around the urethra" (#27, White, unscreened). Most in the high education group knew that the prostate is a gland and knew its location. A few also explained its function: "It's a small gland in the pelvic area that basically is responsible for the production of semen" (#2, African American, unscreened).

### Prostate Cancer Causes

Overall, as education increased, so did men's knowledge about prostate

cancer causes. No men with low educational attainment knew what causes prostate cancer. Most with medium educational attainment provided at least 1 cause, and aging was the most common: "From what I understand, if you live long enough, every male's going to get some form of prostate cancer" (#57, African American, screened). Two men also identified family history: "could be genetics" (#27, White unscreened). Other causes given were pesticides, infection, diet, and unsafe sexual practices.

Most men with high educational attainment named aging or aging and genetics as the most common prostate cancer causes. The only man who explicitly said that race is a risk factor was a screened, White man (#39): "I think there's a racial factor...if you're African American, you're more likely to get it." As in the other groups, some men did not know, and others believed that high-fat diet, toxins, and infections can cause prostate cancer.

### Prostate Cancer Symptoms

This theme was the only one that men across education groups discussed similarly. The most common symptoms identified were sexual and bladder problems. For example, a man with low educational attainment said, "I know it mess with [a man's] urine [and] probably having sex" (#13, African American, unscreened). Similarly, "[Prostate cancer] makes you not be able to empty your bladder because the gland swells up around the urethra" (#6, African American, screened, medium educational attainment) and "seems like it would mess up the reproductive organs first" (#29, White, unscreened, high educational attainment).

### Prostate Cancer Fear

The 2 most prevalent fears about prostate cancer that men believed that other men held were sexual problems and death, and men in the low-education group only named those 2

fears. As education increased, men cited more fears. Men with medium educational attainment discussed cancer spreading and fear of treating the rectum: "[My fear would be that the cancer] could have the potential for spread" (#61, White, unscreened) and "I think they would have to go up through your rectal area to do it [treat the cancer]; that would be my biggest fear there" (#7, White, screened). In addition to sexual problems and death, most with high education discussed other fears, including castration, masculine vulnerability, and knowing they have cancer. Two African American men and 1 White man, all screened, said that "castration" is men's biggest fear. Fear related to masculine vulnerability was illustrated by an unscreened, White man's (#16) explanation that "men don't like to think about themselves as being vulnerable and the...fact that it is locating close to the rectum." Those who fear cancer itself were represented by an unscreened, African American man (#37) who said, "The knowledge of having cancer...worrying yourself and your family."

### Screening Knowledge

Men's knowledge about the DRE and PSA test increased with education, similar to other topics. However, men's knowledge about the PSA blood test was also affected by their screening status within each educational group. Men across all groups knew more about the DRE than the PSA.

Men with low educational attainment were least likely to know any screening tests. Those who knew something about the DRE called it a "finger test" or "rectum test"; many were confused by the word "digital." Some with medium education did not know any screening examinations, but most had some knowledge, and those who had the most knew why doctors use the DRE: "A doctor...probes your anus...[to] see if he feels any abnormalities, lumps" (#38, White man,

screened). Most with high education identified the DRE as a screening examination and provided the most detailed descriptions; some even explained that the DRE is not definitive by itself: "I know that the [DRE]...is the initial check-point to see if there may be a problem...and there's further exams that need to be done" (#55, African American man, unscreened).

While most with low education did not know about the PSA test, those who did had all been screened. They knew it is a blood test but did not know the term "PSA." The 1 exception was a screened, White man (#44): "PSA [is] a blood test for a certain antigen." Most men with medium and high educational attainment knew that doctors use PSA tests for screening, but those who did not were almost all unscreened. Some screened men explained the blood test's purpose: "To see if you have antigens in your blood that signify...something's wrong" (#10, African American, screened, medium education). Others knew that the PSA test is not definitive: "The specific antigen in the blood is a marker...for cancer....It's not 100% accurate, but it can indicate the possibility of problems" (#36, White, screened, high educational attainment).

## DISCUSSION

Physicians must understand men's knowledge and beliefs about prostate cancer and screening to engage them in shared decision-making about screening.<sup>6,7</sup> However, past literature presents conflicting findings about whether race<sup>12</sup> or educational level<sup>17</sup> influences men's knowledge and beliefs about prostate cancer and screening. This qualitative study compared education, race, and screening status across a broad range of topics. Our results indicate that men's explanatory models of prostate cancer, except for its symptoms, varied by education but not by race or screening status. Men across educational

attainment levels similarly believed that urinary and sexual problems are prostate cancer symptoms. Similar to past research,<sup>8</sup> education and screening status influenced men's knowledge about the PSA.

Our study indicates that men with low levels of education need comprehensive education about prostate cancer risks. Overall, knowledge of the prostate's function is low, similar to past research on African American men.<sup>9,11</sup> In contrast to that research, our study found that as education levels increased, so did men's knowledge about the prostate, regardless of race. Knowledge about prostate cancer causes also increased with education across racial groups. None of the men with low education knew any risk factors, unlike the other groups, which correctly identified age and genetics. Only 2 men identified race as a risk factor, unlike past research in which most African Americans named race as a risk factor.<sup>7</sup> This difference in finding likely represents sampling differences. Our study used a community sample, and the previous study used a clinical sample in which two-thirds of the African American men were screened. Those men likely had recent discussions with their physicians about prostate cancer risks.

The prevalent prostate cancer fears among all men were sexual problems and death. Past research suggests that fear of death from prostate cancer may prevent some African Americans from getting screened.<sup>18</sup> Our results suggest this belief is not unique to African Americans. Overall, men had more knowledge about the DRE than PSA test. As education increased, so did knowledge about both exams. Screening status was also associated with knowledge of the PSA test. This finding suggests that screened men may have received information about the blood test's purpose, but we did not ask men what their doctors told them. Past research suggests that men who have a

---

*...our study found that as education levels increased, so did men's knowledge about the prostate, regardless of race.*

---

PSA blood test are told about its advantages and disadvantages.<sup>19</sup> Our study supports this previous finding.

This qualitative study provides a unique comparison, but it has limitations. Although the findings can be generalized to African American and White men in the Southeast, they cannot be generalized to the whole population in the United States. We also did not examine other socioeconomic factors, such as income, access to health care, or literacy, factors that can affect prostate cancer knowledge.<sup>5</sup>

In the context of these limitations, our findings suggest the possibility that education, not race or screening status, is linked to prostate cancer knowledge. Future research could delineate how or why education contributes to prostate cancer knowledge. To the extent it is tapping other factors, educational differences in prostate cancer knowledge may reflect social disparities in health-care access. Our results about PSA testing partially support this idea because being screened was also associated with knowledge of the PSA blood test. Still, education may be reflecting other socioeconomic factors, such as income or health literacy. Future research could disaggregate these factors within larger, racially diverse samples to investigate how they independently or collectively are associated with prostate cancer knowledge, screening, and health disparities. Identifying the role of socioeconomic factors can help physicians tailor their discussions to different groups and to help men make informed decisions about screening.



Understanding how education and other socioeconomic factors affect men's knowledge will benefit interventions targeting at-risk men. Identifying whether education, income, healthcare access, or health literacy affect prostate cancer knowledge has different implications for how to correct the relative lack of accurate information. For example, if socioeconomic factors result in lack of information, media campaigns may help fill the gaps in knowledge, as others have found.<sup>20</sup> Instead, if differences by education reflect lack of health services, then interventions that use client navigators can increase screening rates.<sup>21</sup> Another possibility is that health literacy predicts knowledge, so future interventions should ensure information is understandable to low-literacy audiences.

In summary, in this large qualitative study we found that education and not race was associated with men's knowledge and misperceptions of prostate cancer and screening. Men with the lowest education have poor understanding of the prostate gland and screening, so they cannot make informed decisions about screening. Efforts to increase screening knowledge should focus on undereducated men, and physicians should ensure that all patients understand the risks and benefits of prostate cancer screening. Future research should focus on interventions with undereducated men with risk factors so that they can make informed decisions about screening.

#### ACKNOWLEDGMENTS

This research was supported by the National Cancer Institute grant CA113943.

#### REFERENCES

1. American Cancer Society. Prostate cancer. Available at <http://www.cancer.org/docroot/>

- CRI/content/CRI\_2\_2\_1X\_What\_is\_prostate\_cancer\_36.asp. Accessed December 10, 2007.
2. Hsing AW, Devesa SS. Trends and patterns of prostate cancer: what do they suggest? *Epidemiol Rev.* 2001;23(1):3-13.
3. Clegg LX, Li FP, Hankey BF, Chu K, Edwards BK. Cancer survival among US Whites and minorities: a SEER (surveillance, epidemiology and end results) program population-based study. *Arch Intern Med.* 2002;162:1985-1993.
4. Grossfeld GD, Latini DM, Downs T, Lubeck DP, Mehta SS, Carroll PR. Is ethnicity an independent predictor of prostate cancer recurrence after radical prostatectomy? *J Urol.* 2002;168:2510-2515.
5. Gilligan T. Social disparities and prostate cancer: mapping the gaps in our knowledge. *Cancer Causes Control.* 2005;16:45-53.
6. Weinrich SP, Seger R, Miller BL, et al. Knowledge of the limitations associated with prostate cancer screening among low-income men. *Cancer Nurs.* 2004;27(6):442-451.
7. McFall SL, Hamm RM, Volk RJ. Exploring beliefs about prostate cancer and early detection in men and women of three ethnic groups. *Patient Educ Couns.* 2006;61:109-116.
8. Forrester-Anderson IT. Prostate cancer screening perceptions, knowledge and behavior among African American men: focus group findings. *J Health Care Poor Underserved.* 2005;16:22-30.
9. Sanchez MA, Bowen DJ, Hart A, Spigner C. Factors influencing prostate cancer screening decisions among African American men. *Ethn Dis.* 2007;17:374-380.
10. Webb CR, Kronheim L, Williams JE, Hartman TJ. An evaluation of the knowledge, attitudes, and beliefs of African American men and their female significant others regarding prostate cancer screening. *Ethn Dis.* 2006;16:234-238.
11. Woods DV, Montgomery SB, Belliard JC, Ramirez-Johnson J, Wilson CM. Culture, Black men, and prostate cancer: what is reality? *Cancer Control.* 2004;11(6):388-396.
12. Consedine NS, Horton D, Ungar T, Joe AL, Ramirez P, Borrell L. Fear, knowledge, and efficacy beliefs differentially predict the frequency of digital rectal examination versus prostate specific antigen screening in ethnically diverse samples of older men. *Am J Mens Health.* 2007;(March):29-43.
13. McFall SL. Use and awareness of prostate specific antigen tests and race/ethnicity. *J Urol.* 2007;177:1475-1480.
14. Kleinman A. *Patients and Healers in the Context of Culture.* Berkeley, Calif: University of California Press; 1980.
15. Kleinman A. *Illness Narratives: Suffering, Healing and the Human Condition.* New York, NY: Basic Press; 1988.
16. Rubel AJ, Haas MR. Ethnomedicine. In: Sargent CF, Johnson TM, eds. *Medical Anthropology: Contemporary Theory and Method.* Westport, Conn: Praeger; 1995:113-130.
17. Bloom JR, Stewart SL, Oakley-Girvans I, Banks PJ, Chang S. Family history, perceived risk, and prostate cancer screening among African American men. *Cancer Epidemiol Biomarkers Prev.* 2006;15(11):2167-2173.
18. Ross L, Kohler CL, Grimley DM, Green BL, Anderson-Lewis C. Toward a model of prostate cancer information seeking: identifying salient behavioral and normative beliefs among African American men. *Health Educ Behav.* 2007;34(3):422-440.
19. Ross LE, Richardson LC, Berkowitz Z. The effect of physician-patient discussions on the likelihood of prostate-specific antigen testing. *J Natl Med Assoc.* 2006;98(11):1823-1829.
20. Viswanath K, Breen N, Meissner H, et al. Cancer knowledge and disparities in the information age. *J Health Commun.* 2006;11:1-17.
21. Weinrich SP, Reynolds WA Jr, Tinggen MS, Starr CR. Barriers to prostate cancer screening. *Cancer Nurs.* 2000;23(2):117-121.

#### AUTHOR CONTRIBUTIONS

*Design concept of study:* Winterich, Grzywacz, Quandt, Clark, Dignan, Arcury  
*Acquisition of data:* Grzywacz, Quandt, Acuña, Arcury  
*Data analysis and interpretation:* Winterich, Grzywacz, Quandt, Clark, Miller, Acuña, Dignan, Arcury  
*Manuscript draft:* Winterich, Grzywacz, Quandt, Clark, Miller, Acuña, Arcury  
*Acquisition of funding:* Grzywacz, Quandt, Clark, Dignan, Arcury  
*Administrative, technical, or material assistance:* Winterich, Grzywacz, Quandt, Clark, Miller, Acuña, Dignan, Arcury  
*Supervision:* Winterich, Grzywacz, Quandt, Arcury