PROSTATE CANCER: PERCEPTIONS OF AFRICAN-AMERICAN MALES

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The purpose of this study was to determine black adult males' knowledge and perceptions of prostate cancer by using the Health Belief Model. The subjects were obtained by randomly approaching males in churches, housing projects, inner-city health clinics, and inner-city shopping centers in seven major Ohio cities. A total of 290 black males responded to the survey (58% usable response rate). The mean age of respondents was 60 years (standard deviation = 13.8). Subjects often did not identify trouble urinating, pain urinating, or blood in the urine as possible signs of prostate cancer. Less than half of the subjects knew at what age one should start to have prostate examinations. Forty percent did not believe they were more likely than most men to develop prostate cancer. Almost 60% did not know black men were more likely than white men to develop prostate cancer, whereas 45% thought that if they had prostate cancer it would kill them, and another 28% were not certain. The vast majority of respondents did not perceive any barriers to having their prostate checked, yet 19% identified cost of the examination as a potential barrier. Approximately 10% to 20% of the respondents were unsure of or did not agree with the benefits of a prostate examination. Analysis of the effects of age, education level, and income levels on the Health Belief Model variables found level of education had the most significant effect followed by level of income. (*J Natl Med Assoc.* 1993;85:941-947.)

Key words • prostate cancer • perceptions • Health Belief Model

An estimated 165 000 new cases of prostate cancer will be diagnosed in the United States in 1993.[1] Approximately one out of every 11 American men will develop prostate cancer, while one in every seven black American males will develop prostate cancer. An estimated 35 000 men will die of prostate cancer in 1993, almost 100 men a day. Furthermore, prostate cancer mortality rates are expected to increase 50% over the next 15 years.[2] Currently, prostate cancer costs more than $1 billion annually.[2]

Prostate cancer has an improved prognosis when discovered early. However, surveys indicate that only 61% of prostate cancer cases are localized at the time of diagnosis.[3] The 5-year survival rate for localized prostate cancer is 88%.[1] The incidence of prostate cancer is 50% higher for blacks than whites.[4] Nationally, prostate cancer mortality is higher in every age group for blacks than for whites. The mortality rates for prostate cancer in black males increased significantly during the 1970s and 1980s and is currently twice the rate of white males.[4] The 5-year relative survival from prostate cancer in blacks is 63% compared with whites at 76%.[1]

A major variable in explaining the survival differences between black and white men is the stage of the disease at diagnosis.[5] One study found that black men under the age of 65 had localized disease 45% of the time while white males the same age had localized disease 65% of the time.[6] The Surveillance, Epidemiology, and End Results (SEER) data indicated that black males have a 30% to 50% greater risk than white males of having regional spread of their prostate cancer at diagnosis and a 220% to 330% greater risk of having

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distant metastasis at diagnosis.[4] Patients with tumor spread beyond the prostate, either local or distant, have considerably lower survival rates. Finally, at least one study has found that younger black males (<60 years of age) are significantly more likely than younger white males to delay seeking medical attention.[6]

Currently, there is considerable disagreement in the medical literature regarding the efficacy of routine screening of adult males for prostate cancer,[3,7] even though the American Cancer Society continues to recommend that every man 40 years of age and older should have a digital rectal examination as part of a regular annual physical checkup.[1] Considerably less disagreement exists regarding the usefulness of cancer screening in high-risk populations, and obviously black males are at higher risk of developing prostate cancer and dying from it than is the majority of the US male population.

A number of studies have found that perceptions play a major role in affecting cancer risk reduction and early detection behaviors,[8,9] but very little has been published on males' perceptions of prostate cancer. Brown and his colleagues used data from the 1987 National Health Interview Survey to assess variables associated with knowledge or use of digital rectal exams.[10] The sample was comprised of white and Hispanic males and females. Key variables found to be significantly related to knowledge of digital rectal exams were: race (white), income (≥$40 000/year), higher level of education, level of optimism about the preventability of cancer, and knowledge of early warning signs of cancer. All of the aforementioned except race also were significantly related to having had a digital rectal exam.

A second study by Urich and his colleagues reported a study on knowledge of prostate cancer and use of digital rectal exam in a convenience sample of 165 adult males; 95% of the sample were white.[11] Fifty-four percent of the respondents indicated they were unsure about whether there are signs and symptoms of early prostate cancer, and 52% claimed they were not aware of anything a doctor could do to check for prostate cancer. Although 84% reported having had a digital rectal examination in the past, less than 20% indicated they had ever talked with a doctor about prostate cancer or about having a prostate examination. To date, there have not been any studies published that specifically examine the perceptions of black males regarding prostate cancer.

The purpose of this study was to assess black adult males' perceptions of prostate cancer using the Health Belief Model. This model claims that a variety of factors impact on an individual's decision about an illness or condition resulting in behavior change. These factors include cues to action, perceived susceptibility and severity of the disease, perceived barriers and benefits of action, and health motivation.[12,13] Modifying variables also are incorporated in the model (eg, demographics, knowledge, and interpersonal relations). The Health Belief Model was chosen for this study because research has found that the use of this model with black populations is valid and reliable.[14] Because of space constraints in the questionnaire, health-care motivation and interpersonal relations were not assessed in this study.

METHODS

Subjects

The subjects for this study, African-American males, were obtained from the seven largest cities in Ohio (Columbus, Cincinnati, Cleveland, Toledo, Dayton, Akron, and Canton). A total of 500 surveys were sent to these cities. Data were collected with the assistance of members of the state committee on the economically disadvantaged of the Ohio Chapter of the American Cancer Society. A series of four places were identified as potential places for surveying: African-American churches, housing projects, inner-city health clinics, and inner-city shopping center areas. A total of five churches, four shopping areas, three housing projects, and two health clinics served as data collection sites.

Questionnaire

A 15-item elicitation questionnaire on prostate cancer was developed based on the components of the Health Belief Model. This instrument was given to African-American males at a shopping area and a health clinic. A total of 75 African-American males completed the survey. The males were divided into three economic status categories to examine possible differences in perceptions of prostate cancer. The most salient beliefs regarding prostate cancer were found to be basically the same across income categories, although the specific order of the beliefs varied to some degree. Items identified by 10% or more of the sample were included on the final instrument. The final page of the questionnaire included a diagram that identified the location of the prostate gland. This diagram assisted those who were uncertain about its location or function.

The final instrument was a 45-item questionnaire assessing perceptions of prostate cancer based on the components of the Health Belief Model. The instrument contained 14 knowledge items (risk factors and signs of

prostate cancer), six cues to action items, four perceived susceptibility items, five perceived severity items, four perceived benefits, five perceived barrier items, and seven background/demographic questions (eg, "Have you ever had your prostate checked?" and "Have you ever been told by a doctor that you have prostate cancer?"). The responses to the knowledge and belief items were obtained with five-point Likert-type scales (ie, strongly agree, agree some, not sure, disagree some, strongly disagree; or for two questions, unique response categories of "white men much more/black men much more" to "gay men much more/straight men much more" were used). Other background questions on the survey requested the respondents to select from a list of options. The questionnaire was designed to require no more than 10 minutes to complete.

A readability analysis was conducted on the instrument using the SMOG technique.[15] The grade level was assessed at a junior high school reading level (± 1.5 grades). The final instrument also was pilot tested with a group of eight males to identify difficulties or problems with the survey. No changes were required.

Reliability for the questionnaire was established by internal reliability and stability reliability measurements. Cronbach alpha coefficients for the subscales were calculated for the final sample and were found to range from 0.32 to 0.90. The low internal reliability coefficient for the perceived susceptibility subscale was not surprising since the 4-item scale measured a wide variety of perceptions (ie, age, sexual orientation, and race). Test–retest 1 week apart for stability reliabilities was established for the subscales with a sample of 23 males and was found to range from 0.75 to 0.87.

RESULTS

Demographics

Of 500 surveys sent out, 321 (64%) were returned. However, data analysis was completed on only 290 surveys because 19 subjects belonged to other races and 12 subjects indicated they had been diagnosed with prostate cancer. Data from all seven cities were compared for demographic differences in age, education level, and income level using Student's *t* tests and chi-square analysis. No significant differences were found for any of the three variables; therefore, the subjects from the various cities were collapsed into one group for final data analysis.

The black males ranged in age from 30 to 78 years (mean [M] = 60, standard deviation [SD] = 13.8). Education levels ranged from 6th grade to 5 years of college (M = 12.9, SD = 2.6). Income was assessed as one of three categories: <$18 000/year (45%), $18 000 to $50 000/year (36%), and >$50 000/year (15%).

When asked whether a physician had ever checked their prostate, 63% answered affirmatively. However, 42% of the respondents claimed they did not know how a doctor checks for prostate cancer, including one in every six who claimed their physician had checked their prostate. The number of men who had a prostate examination was not affected by level of education, level of income, or age.

Knowledge of Prostate Cancer

Respondents were asked to identify their level of agreement with seven statements that were identified as possible risk factors for developing prostate cancer, six possible signs of prostate cancer, and the decade when prostate screening should start. The majority of items were responded to correctly by 20% to 60% of the respondents (M = 5.7, SD = 3.2). At least one in five of the respondents incorrectly believed that straining, drinking too much alcohol, and men having sex with men were risk factors for prostate cancer (Table 1).

Approximately one third of the respondents did not identify trouble urinating, pain urinating, or blood in the urine as possible signs of prostate cancer. Furthermore, less than half (41%) of the subjects knew at what age a man should start to have his prostate checked.

Analysis by Student's *t* test of knowledge level by the two age categories of respondents found no significant difference ($P \geq .05$) between the mean subscale scores (Table 2). However, knowledge of prostate cancer was found to be significantly different ($P \leq .01$) by Student's *t* test for level of education, with those with more education being more knowledgeable. Analysis of variance (ANOVA) indicated a significant difference ($P \leq .05$) in knowledge of prostate cancer by income, with the subjects in the highest income category knowing almost twice as much knowledge as those in the lowest income category.

Health Belief Model Variables

Respondents were queried regarding what might cause them to go to their physician (cues to action) to be checked for prostate cancer. Two thirds to three fourths of the men claimed that any of the six cues would cause them to seek help (Table 3). However, 10% claimed blood in their urine would not cause them to seek medical care, and another 20% were not sure if it would. Again, Student's *t* tests and ANOVAs found that cues to action were affected by age (older subjects were more likely to respond to the cues), but were not affected by

TABLE 1. KNOWLEDGE OF RISK FACTORS AND SIGNS OF PROSTATE CANCER*

Item (Answer)	Strongly Agree/Agree	Not Sure	Strongly Disagree/ Disagree
Possible Risk Factors for Prostate Cancer			
Straining (false)	20	43	37
Too much sex (false)	10	33	57
Sex with female with sexually transmitted disease (false)	19	31	50
Drinking too much alcohol (false)	30	30	40
Father or brother had it (true)	33	32	35
Sex with male (false)	28	37	35
Eating fried foods (true)	24	41	35
Signs and Symptoms of Prostate Cancer			
Trouble urinating (true)	39	32	29
Pain urinating (true)	21	35	44
Blood in urine (true)	39	31	30
Swelling penis (false)	25	40	35
Penis drainage (false)	25	35	40
No way to tell (false)	13	25	62
Age to Begin Checking for Prostate Cancer		**N (290)**	**%**
20s		35	12
30s		49	17
40s (True)		119	41
50s		64	22
60s		14	5
70s		9	3

*Indicated in percentage (N = 290).

education or level of income (Table 2).

As for perceived susceptibility, almost two of every five respondents did not believe they were more likely to develop prostate cancer than were most men (Table 3). Furthermore, three of every five respondents did not know black men were more likely than white men to develop prostate cancer, whereas three of five respondents did believe that men their age were at higher risk of developing prostate cancer. When age, education level, and income level were examined by Student's *t* tests and ANOVA, age did not affect perceived susceptibility, but education level increased perceived susceptibility, as did level of income (but only for the highest income level) (Table 2).

When considering perceived severity of prostate cancer, most thought it would cause problems urinating (57%), almost half thought it would kill them (45%), and more than another one fourth (28%) were not certain if it would kill them (Table 3). Approximately one half of the respondents were not certain whether having prostate cancer would cause inability to get erections, sterility, or decreased interest in sexual activity. The effects of age and level of education (Student's *t* tests) and level of income (ANOVA) were examined for their effects on perceived severity of prostate cancer. Age and income had no effect on perceived severity of prostate cancer. However, level of education did impact on perceived severity: those with less education perceived it as more severe (Table 2).

Five survey questions examined barriers to having one's prostate examined. Two thirds to three fourths of the males did not perceive any barriers to having their prostate checked (Table 3). However, the most common (1 in 5) barrier identified was cost of the prostate examination. Again, age, education, and level of income were examined for their effects on perceived barriers. Age did not affect perception of barriers. There were significant differences by levels of education and income. Those with less education and those with the lowest income perceived more barriers to obtaining a prostate examination (Table 2).

Statements concerning the benefits of prostate examinations were agreed to by the vast majority of respondents (Table 3). Yet, approximately 10% to 20% of the respondents were unsure of or did not agree with the perceived benefits of a prostate examination. Analysis of the effects of age, education level, and income levels on perceived benefits of prostate examinations found no significant effects.

TABLE 2. KNOWLEDGE AND PERCEPTIONS OF PROSTATE CANCER BY AGE, EDUCATION, AND INCOME OF RESPONDENTS

		Age				Education				Income					
		30-50 yr (N=171)		51-78 yr (N=119)		High School or Less (N=154)		College/ College Grad (N=136)		Less than $18 000 (N=131)		$18 000-$50 000 (N=104)		More than $50 000 (N=43)	
Subscale*	Potential Range	M	(SD)	M	(SD)	M	(SD)	M	(SD)	M	(SD)	M	(SD)	M	(SD)
Knowledge	0-14	5.6	(3.8)	5.7	(3.2)	4.4	(3.1)	7.1	(3.7)†	4.3	(3.3)	6.0	(3.3)	8.1	(3.5)‡
Cues to action	6-30	13.1	(5.1)	9.7	(4.1)§	11.2	(4.9)	12.4	(5.1)	12.7	(5.2)	10.6	(4.9)	12.3	(4.3)
Perceived susceptibility	4-20	11.7	(2.2)	12.2	(2.6)	12.4	(2.1)	11.2	(2.4)†	12.3	(2.1)	12.0	(2.6)	10.8	(1.8)‡
Perceived severity	5-25	14.7	(3.5)	13.0	(3.9)	13.7	(3.5)	15.0	(3.8)†	13.8	(3.5)	14.4	(3.2)	15.6	(3.6)
Perceived barriers	5-25	20.3	(4.5)	20.8	(4.7)	19.6	(4.8)	21.5	(4.2)†	19.0	(4.8)	21.9	(4.0)	21.5	(4.3)‡
Perceived benefits	4-20	6.5	(3.0)	5.7	(2.6)	6.7	(3.3)	5.9	(3.0)	6.5	(2.9)	6.2	(3.6)	6.3	(3.0)

*Higher scores for all the subscales except knowledge implies less susceptibility, severity, barriers, and benefits.
†$P \leq .01$ for Student's *t* tests.
‡$P \leq .05$ for ANOVA.
†$P \leq .001$ for Student's *t* tests.

DISCUSSION

If one believes that prostate cancer is more curable when found in an early localized stage and that prostate screening efforts should be concentrated in subjects who are at higher risk, then black males seem to be an important group for directing secondary prevention efforts. While age remains the most strongly correlated risk factor for prostate cancer (those 65 and older have rates fourfold those younger than 65), and males who have a first-order relative with prostate cancer have a threefold increase, black males still have a 50% greater risk than white males.[16]

The black males in this study reported a similar level of prostate cancer screening (63%) reported by Brown et al[10] (60%), but less than that reported by Urich et al[11] (84%). The higher rate of screening found in the Urich et al study is possibly due to the fact that these white males were recruited from clinics and doctors' offices. Thus, they were subjects who obviously had access to health care. Forty-two percent of our subjects did not know how a doctor checks for prostate cancer, whereas 52% of the Urich et al subjects claimed they were not aware of anything a doctor can do to check for prostate cancer. Yet the knowledge of signs and symptoms were similar between this study and the Urich et al study (eg, trouble urinating [39% versus 35%], painful urination [21% versus 19%], and blood in the urine [39% versus 9%]). The Brown et al study assessed knowledge of signs and symptoms of cancer in general.

One of the unique aspects of this study is that it is the only study to use a theoretical behavioral model to assess perceptions of prostate cancer. It was disconcerting to find that 10% claimed that blood in their urine would not cause them to seek medical care, and another 20% were not sure. Furthermore, 59% of the respondents were not sure if black men are more likely to develop prostate cancer, and 37% thought that gay men are more likely to develop prostate cancer than are heterosexual men. Thus, if black males are not aware that they are potentially at increased risk and they perceive gays as more susceptible to prostate cancer, and since most black males are not gay, then it creates a mindset where the male may ignore important signs and symptoms of prostate cancer. Generally, the majority of men did not perceive themselves susceptible to prostate cancer.

Unfortunately, 45% of the men perceived prostate cancer as a death sentence, and another 28% were not sure if it would kill them. When you add to this perception the fact that one in five men claimed that the cost of a prostate examination would be a significant barrier to having their prostates examined, you have a condition that helps explain why so many black males have prostate cancer diagnosed at advanced stages.

As previously noted, health behavior models have limited use; they primarily define the direction health

TABLE 3. CUES TO ACTION: PERCEIVED SUSCEPTIBILITY, SEVERITY, BARRIERS, AND BENEFITS OF PROSTATE CANCER*

Item	Strongly Agree/Agree	Not Sure	Strongly Disagree/ Disagree
Cues to Action			
Blood in urine	70	20	10
Pain at urinating	67	21	12
Draining fluid penis	67	20	13
Problem passing urine	76	18	6
Swelling penis	70	21	9
Swelling in rectum	63	24	13
Perceived Susceptibility			
I am more likely to develop it than most men	15	46	39
Men my age are at higher risk	61	23	16
Black/white more likely†	37	59	7
Straight/gay more likely†	9	54	37
Perceived Severity			
Causes sterility	23	52	25
Causes difficulty urinating	57	32	11
Prevents erection	24	48	28
Causes decreased interest in sex	15	45	40
Can be fatal	45	28	27
Perceived Barriers			
Afraid to check	9	17	74
Shame to have	10	13	77
Cost too much	19	12	69
No time	15	12	73
Uncomfortable exam	13	18	69
Perceived Benefits			
Let you know it's okay	81	12	7
Peace of mind	81	16	3
Early detection	88	9	3
Save life	83	14	3

*Indicated in percentage (N = 290).
†Scale was: black men much more (1) to white men much more (5) or straight men much more (1) to gay men much more (5).

educational interventions should take. Yet health educators must realize that unless they oversell the importance of their interventions, they may create a problem of "victim blaming."[17] In other words, black males do not engage in preventive behaviors only because they are ignorant of their risks and the signs and symptoms of prostate cancer. Such a unidimensional focus (health behavioral model) fails to appreciate how health behaviors develop and are sustained. A major portion of the higher prostate cancer mortality rate in black males is related to socioeconomic inequities and its relation to access to health care, cultural beliefs and their relationship to nutrition behaviors and other health-related behaviors, and finally, the prejudice that continues to oppress black males and hinders communication between them and a predominantly white health-care enterprise. However, even when access to medical care is a factor, it is one that relates to survival and has very little to do with explaining the increased incidence of prostate cancer in black males.

Finally, the limitations of this study should be noted. Because there was only a two-thirds response rate, there exists a potential nonresponse bias, thereby creating a threat to external validity. The reading level of the survey instrument was at a junior high school level, yet some of the respondents only completed the 6th grade. Therefore, readability of the survey may have been a threat to the internal validity of the study. However, to reduce this problem, the surveys were read to respondents who hinted they might need assistance. Also, discussions with some of the respondents as they completed the elicitation questionnaire indicated a generalized lack of knowledge of where the prostate was and what it did even though a simple diagram was attached to the questionnaire to help explain its location. Such a generalized lack of knowledge of the

prostate may have caused many of the subjects to guess what were correct answers on the knowledge section of the questionnaire. Also, the numerous questions all on prostate cancer (monothematic) may have caused a response set bias. Again, these factors would be a threat to the internal validity of the study.

CONCLUSION

The findings of this study suggest a need for increased public education directed specifically at black males. The educational intervention should be directed toward symptom recognition and more realistic assessments of the benefits of regular prostate cancer examinations. The data also indicated that whether a black male had his prostate examined was not determined by his age, education, or income level. It appears that screening for prostate cancer may be initiated solely by clinicians. Thus, increased health professional education to encourage physicians to do regular prostate examinations for men 40 years of age and older is essential if the unnecessary prostate cancer death rate in black men is to be reduced.

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