Family History, Perceived Risk, and Prostate Cancer Screening among African American Men

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Abstract

Background: Many African American men have two major risk factors for prostate cancer. By ethnicity alone, they have twice the risk of Euro-American men of developing prostate cancer. Having a family history (brother or father with prostate cancer) also doubles their risk. The major hypotheses tested in this study are that men with a family history perceive their risk to be higher, are more worried about getting prostate cancer, and are more likely to have used cancer screening tests than men without such a history.

Methods: A sample of 208 African American men, ages 40 to 74 years, were recruited through relatives or friends whose prostate cancer diagnosis was reported to the California Cancer Registry during the years 1997 to 2001 and from churches and African American social groups. Following a screening interview to determine eligibility, 88 men with self-reported, first-degree family history of prostate cancer and 120 without such history were interviewed by telephone. Logistic regression was used to create models of perceived risk, prostate cancer worries, receipt of a digital rectal exam, and/or prostate-specific antigen (PSA) testing.

Results: Men with a self-reported family history of prostate cancer did not perceive their risk as higher than men without a family history, nor did they report more cancer worries. They were more likely to report having a recent PSA test, but not a digital rectal exam. Having a higher than average perceived risk was associated with younger age, a college education, and lower mental well-being, and reporting more prostate cancer worries and being more likely to have had a recent PSA test.

Conclusions: Although there continues to be controversy about PSA testing, these data suggest that African American men at above-average risk are inclined to be screened.

Introduction

It is estimated that over 232,000 men in the United States will be diagnosed with prostate cancer in 2005, and an estimated 30,350 men will die from this disease (1). Prostate cancer is the second leading cause of cancer death nationwide for men over age 60 years (2). The lifetime risk of developing prostate cancer and dying increases substantially after the age of 50 years (3). Age-adjusted prostate cancer incidence rates are >50% higher, and age-adjusted mortality rates are twice as high, among African American men as among Euro-Americans (3). Along with race/ethnicity and age, a family history of prostate cancer is also a well-established risk factor. In fact, a family history of prostate cancer has been identified as the strongest known risk factor. Men that have a brother or father with prostate cancer have a 2- to 4-fold increased risk of developing prostate cancer. A 5- to 11-fold increased risk has been noted among men with two or more affected relatives, depending on the number of relatives who have prostate cancer and whether they are first- or second-degree relatives (4-6). Relative risk is also inversely related to the person’s age and the age of the affected family members.

Thus, many African America men have two major risk factors, ethnicity and family history. Whittenmore et al. (6) considered African American as well as Asian American men in their case control study of prostate cancer risk in North America. The overall odds ratio (OR) for family history, adjusted for age, region of residence, and ethnicity was 2.5, and the OR did not differ significantly by race. Although the proportion reporting only second-degree relatives with prostate cancer did not differ between cases and controls, men reporting at least one first-degree relative were at increased risk. Relative to men with no first-degree relatives with prostate cancer, the risk among those with an affected brother was slightly higher than those with an affected father or son (OR 2.9 compared with 2.0), whereas the OR for both a brother and a father or son was 6.4 (6).

A substantial proportion of men with a family history or other risk factors remain unaware of their heightened risk (7). In a study of 139 first-degree relatives of men with prostate cancer, of the 105 men who knew about their familial risk, only 62% believed that they were at higher risk than the average man (8). A survey of African American and Euro-American men interviewed during National Prostate Awareness week in 1992 found low knowledge regarding risk factors for prostate cancer. Only 41% of African American men and 56% of Euro-American men knew that heredity could increase prostate cancer risk, whereas 53% of African American men and of 33% Euro-American men were aware that race was a risk factor (9). Two recent studies of African American men reported poor knowledge of prostate cancer with the average percentage of correct screening information being 61.9% and 68.4%, respectively. In the latter study, family history was related to screening behavior (10, 11). The Behavioral Risk Factor Survey (12) in New York found that 9% of men perceived themselves to be at “high” risk and 18% perceived that they were at “no risk.” Those that perceived themselves to be at no risk were older and had less education and lower income. However, in a special survey of African American men, 7% perceived that they were at high risk of developing prostate cancer and 16% believed themselves to be at no risk. Among African American men, being at high risk versus no risk did not vary demographically (12). Finally, a study of urban and rural men in Georgia reported that rural African American men had the lowest knowledge of prostate cancer risk factors, only 10%...
of rural and urban African American men and rural Euro-American men perceived their risks of prostate cancer to be high (13).

Men with a family history of prostate cancer report worries that may increase symptoms of depression and compromise function in daily life (9). At the same time, 60% of the family members of the men wanted to know what their risk was; the desire to know was related to having a son, other children, and a father whose prostate cancer treatment had a curative intent. Although cancer worries may have motivated men to seek information regarding their risk and screening for prostate cancer, higher levels of anxiety were related to reduced screening (14). In a U.S. study, Taylor et al. (15) also found that psychological distress was greater for those reporting high perceived risk. These findings are interpreted as suggesting that moderate anxiety enhances action on the part of the individual, whereas high levels of anxiety are inhibiting. However, in another study, men with a family history of prostate cancer (half of the sample of 166 men) reported greater perceived vulnerability and were more likely to report their intention to be screened and to have been screened in the past. Perceived vulnerability mediated the relationship between family history and intention to be screened (16). In summary, recent studies indicate that heightened perception of cancer risk and moderate worries are strong predictors of screening (17-19).

The primary purpose of this study is to describe the extent to which African American men are aware of prostate cancer as a serious threat to their health, are aware of their risk of prostate cancer based on their race and family history, are knowledgeable about prostate cancer, and have used early detection methods [digital rectal exam (DRE), prostate-specific antigen (PSA) testing]. The major hypotheses tested are that men with a first-degree family history of prostate cancer perceive their risk to be higher, are more worried about getting prostate cancer, and are more likely to have recently used early detection methods than men without such history.

Materials and Methods

Conceptual Framework. The foregoing argument follows from the Health Belief Model (20), which is used to understand why people accept preventive health services and why they do or do not adhere to health regimens. In general, the model suggests that individuals will take action if they believe themselves to be susceptible to what they perceive to be a serious threat to their health. Perceived susceptibility refers to one’s subjective perception of the risk of contracting a health condition, e.g., prostate cancer. Perceived severity refers to the seriousness of the condition if left untreated. The second component of the theory refers to the perceived benefits of the actions one can take to reduce the threat. Thus, if a man perceives that getting screened will reduce the threat, he will be more likely to get screened. The action that he would take must be perceived as feasible and efficacious. Finally, the potential negative aspects of a particular health action, or perceived barriers, may act as impediments to taking action. Thus, in Rosenstock’s words, “The combined levels of susceptibility and severity provide the energy or force to act and the perception of benefits (less barriers) provides a preferred path to action.” (20). With regard to prostate cancer screening, men with a family history will perceive themselves as more vulnerable so that the benefits will outweigh the barriers (sensitivity of the PSA test and consequences of cancer treatment) and they will be likely to have received a recent test. Men without a family history will not perceive themselves to be vulnerable so that the barriers will outweigh the benefits and they will be less likely to be screened.

Procedures. Eligible African American men were recruited through relatives or friends whose prostate cancer diagnosis before age 75 years was reported to the California Cancer Registry during the years 1997 to 2001. Due to difficulties reaching potentially eligible subjects without a family history of prostate cancer, we also recruited men from churches and African American social groups. Following a screening interview to determine eligibility, men with asked to refer their brother, son, or a friend/acquaintance to the study.

After gaining permission to contact the brother/son or friend, a trained interviewer ascertained eligibility and conducted a 30-minute telephone interview to assess physical and mental health status, awareness of prostate cancer risk, screening behavior, and knowledge of prostate cancer. For reasons of confidentiality a brother, son, or friend referred by a prostate cancer survivor was not informed that someone with prostate cancer had referred him to the study. We developed a closed-ended, structured telephone interview and trained the four interviewers to administer it in English in a consistent way. Periodically, they also met to discuss issues that came up regarding its administration. The Institutional Review Boards of the participating institutions approved the conduct of the study.

Sample. Of 899 prostate cancer cases reported to the registry, 134 did not have a phone number and 49 did not have a phone number or an address. Six cases were excluded because their physicians advised against contacting them, 21 did not fit the sampling criteria, 42 had died, 25 were too ill, 247 refused, 59 could not be reached after 20 attempts, and 8 had not been interviewed by the end of recruitment. The 308 men who were reached and screened for having eligible family members or friends (if no eligible family members) referred 199 potential participants (Fig. 1).

Of the 199 referrals from prostate cancer survivors, 96 agreed to participate and completed the survey (70 brothers/sons and 26 without a self-reported first-degree family history), 26 refused, 9 did not have a phone number, 8 were not eligible or too ill, 25 could not be reached after 20 attempts, and 35 were not interviewed by the end of the study.

Of 222 referrals from African American community groups (including churches), 112 completed the survey (18 brothers/sons of men with prostate cancer and 94 without a family history of prostate cancer). Of the remaining, 7 were ineligible, 3 did not have a phone number, 8 refused, 14 could not be reached after 20 phone calls, and 78 were not interviewed as recruitment was complete. The final sample included 208 men, ages 40 to 74 years, 88 men with a self-reported first-degree family history of prostate cancer, and 120 without such a history. This sample size provides 80% power to detect at the 0.05 level (two sided) a difference of 20 percentage points between men with and without a family history of prostate cancer in the proportion with higher than average perceived risk.

Measures. The interview consisted of the following measures used in other surveys of men with prostate cancer:

1. Screening behavior. Men were asked if and when they had a digital rectal exam (DRE) and a PSA test. These questions have been asked in studies of prostate screening by others (6, 37). A recent exam was defined as one that took place in the year of the interview or the previous calendar year. Because a PSA test and DRE are often done in different settings and have different barriers, receipt of a PSA test and a DRE were treated as separate variables in the analysis.

2. Knowledge. Men’s knowledge of prostate cancer, including risk factors, symptoms, and the natural history of the disease, was assessed. The nine items included, “If you are having problems urinating, then you probably have
prostate cancer;” “If you have a family member who had prostate cancer, then you are more likely to get prostate cancer;” “Most men with untreated early-stage prostate cancer will not die from it.” The measure was the number of correct answers (21).

3. Sociodemographic information. Participants were asked their age, years of education, marital status, employment, and existence and type of health insurance. Self-identified race/ethnicity was ascertained during eligibility screening.

4. Family history. Men were asked whether they had a family history of prostate cancer and, if so, which relatives had been diagnosed with the disease. Because perceptions of a family history may be related to actual behavior, self-report is the appropriate measure. The self-report was validated by the tumor registry for men whose father or brother was recruited through the tumor registry.

5. Social support was measured using the Social Network Index (22). The index assesses the amount and frequency of social contacts. The index has been widely used to explore the social networks in both patient and community samples. It is predictive of initial utilization of cancer screening services as well as morbidity and mortality in community samples (23, 24).

6. Health status was assessed using the MOS SF-12 (25, 26). These questions have been widely used to determine levels of functional health in the general population as well as with cancer patients (25). Measures include questions on mental health, vitality, physical functioning, pain, role limitations due to physical health, role limitations due to emotional problems, social functioning, and general health. The measures were combined to form composite measures of physical health and mental health. The 2-week test-retest correlations for physical and mental components were 0.89 and 0.76, respectively; the validity of these scales have been reported elsewhere (26).

7. Other health-related variables included the presence of chronic diseases and the number of urinary tract symptoms. They also reported whether they had seen a physician for a check-up in the past year.

8. A three-item measure of prostate cancer worries was used following the work of Lerman et al. (27) for breast cancer and Bratt et al. (14) for prostate cancer. Each man was asked how often in the past month (a) he had thought about his own chances of developing prostate cancer, (b) had thoughts about his chances of getting prostate cancer affected his mood, and (c) had thoughts about his chances of getting prostate cancer affected his ability to perform his daily activities. The responses to these items (1, not at all or rarely; 2, sometimes; 3, often; 4, almost all of the time) were summed to form a scale that was unidimensional and cumulative.

9. A single-item measure of perceived risk of prostate cancer was used following the work of Lerman et al. (27) and Bratt et al. (14). Each man was asked if he thought his risk of prostate cancer compared with the average man of his age was very much lower than average, somewhat lower than average, average, somewhat higher than average, or very much higher than average.

10. Barriers to screening consisted of seven items, including physical discomfort of a DRE, the cost of the PSA test, and worry about the PSA blood test results. These items were adapted to the U.S. health care system from those developed in the United Kingdom (21); for instance, the cost of a PSA test was added. Each man was asked to indicate which of the following might put him off having prostate exams or tests at his doctor’s office, with each item rated on a scale from 1 (not difficult at all) to 5 (very difficult; ref. 21).

Analysis Plan. Descriptive statistics were computed for study variables, including means and SDs for continuous variables and frequencies for categorical variables. Because the comparison of interest for cancer worries was between highly worried men and others, the scale was dichotomized at the
highest quartile in the analysis. For perceived risk, the comparison of interest was between men with higher than average perceived risk and others. Perceived risk and prostate cancer worries were treated as binary in the analyses.

Logistic regression was used to create models of perceived risk (higher than average versus other), prostate cancer worries (≥5 versus <5), corresponding to the highest quartile versus the lower three quartiles, receipt of DRE (recent versus not recent or never), and receipt of PSA (recent versus not recent or never). To ascertain the relationships among self-reported first-degree family history, perceived risk, worries, and screening following the posited order of influence, perceived risk was modeled as a function of family history (yes versus no); worries as a function of family history and perceived risk; and DRE and PSA as functions of family history, perceived risk, worries, and relevant barriers. All models controlled for sociodemographics, health-related factors, and knowledge. Sociodemographic factors in the models included age (continuous), marital status (married/partner versus single), education (college graduate versus less), employment (yes versus no), insurance (private versus public/none), recruitment source (survivor versus organization), and social network index (continuous). Health-related factors included check-up in past year (yes versus no), physical well-being (continuous), mental well-being (continuous), number of chronic conditions (continuous), and number of urinary tract symptoms (continuous). Knowledge was treated as a continuous variable. Barriers to both DRE and PSA included cost of doctor visit (yes versus no), time off work for appointment (yes versus no), and concern about side effects of prostate cancer treatment (yes versus no). The DRE-specific barrier was discomfort of the DRE (yes versus no); and PSA-specific barriers were worry about PSA results (yes versus no), cost of PSA test (yes versus no), and finding a blood test upsetting (yes versus no). A score of 3 to 5 was considered to indicate the presence of a barrier.

Results

Characteristics of the Sample. The average age of the sample was 53 years; the majority were married or partnered and employed (Table 1). The sample was also well educated with 38% being college graduates. With regard to their medical care, most had private insurance and had been to see a physician for a check-up in the past year. Among men recruited from cancer cases, 42% reported having a first-degree relative with prostate cancer, whereas 17% of men recruited from community samples reported having one. Nearly one third of these men perceived their risk as higher than average. Their average knowledge score was ~60% correct (5.32 of 9). The most common potential barriers to cancer screening were the discomfort of a DRE and concerns about the side effects of cancer treatment, followed by worry about PSA results and taking time off work to keep a doctor’s appointment. Over half the men had a DRE in the past year and approximately half had a PSA in the past year.

Regression Analyses. Contrary to predictions, men with a family history were more likely to get a PSA test (OR, 3.03; 95% CI, 1.13-8.10). Other factors that predicted getting a PSA test included having higher than average perceived risk (OR, 2.56; 95% CI, 1.11-5.91), age (OR, 1.10 per year; 95% CI, 1.04-1.16), having a check-up in the past year (OR, 5.62; 95% CI, 1.53-20.7), and worry about PSA test results (OR, 3.46; 95% CI, 1.12-10.7), and negatively associated with concerns about the cost of a doctor visit (OR, 0.04; 95% CI, 0.003-0.54; Table 2). Contrary to predictions, a family history did not predict having a recent DRE. Men were more likely to have had a recent DRE if they were older (OR, 1.05 per year of age; 95% CI, 1.00-1.11) or had a check-up in the past year (OR, 3.38; 95% CI, 1.21-9.44) and less likely if they reported more urinary tract symptoms (OR, 0.75 per symptom; 95% CI, 0.59-0.95) or were concerned about the physical discomfort of the exam (OR, 0.50; 95% CI, 0.20-0.99; Table 2). Thus, both family history and perceived risk of prostate cancer were independently associated with the receipt of a recent PSA test, but not a DRE.

Discussion

Screening aims to detect disease at an earlier stage when there are better options for treatment and a better opportunity to reduce morbidity and mortality (28). However, screening for prostate cancer remains controversial. First, the two major screening methods—DRE and PSA test—have low predictive values (21-35% for the DRE and 32-49% for the PSA test; refs. 29-31) and neither test has high sensitivity (72.1% and 53.2%, respectively; ref. 32). Some believe that the increasing PSA level is the most informative (33). Second, there are no completed randomized studies that show that screening reduces morbidity or mortality (34). There is a lack of consensus among agencies that develop screening guidelines (34, 35). Finally, the treatment for early prostate cancer is not
without its own set of complications, including impotence, urinary incontinence, and gastrorectal problems (36).

The major hypotheses tested were that men with a first-degree family history of prostate cancer perceive their risk to be higher, are more worried about getting prostate cancer, and are more likely to have recently used early detection methods than men without such history.

The results do not support the hypothesis that family history is associated with increased perceived risk. Rather, younger, better-educated men and men with poorer mental health perceived themselves to be at increased risk. Our findings are consistent with the findings from the 1992 National Prostate Awareness week findings that 41% of African American men interviewed perceived that heredity could increase their risk, whereas 53% were aware that race was a risk factor (9), and the Behavioral Risk Factor Survey findings in New York (12) that older men and those with less education were more likely to perceive that they were at no risk. They also suggest that awareness of risk factors for prostate cancer may not have increased among older and less educated men. The relationship between mental health and perceived risk has been found in other studies as well (37).

The results do not support the hypothesis that family history is associated with greater worries about getting prostate cancer. Perceiving oneself at risk was significantly associated with prostate cancer worries. It is not unexpected that individuals who were at higher perceived risk reported greater cancer worries. Although this finding is consistent with the literature, it has not been documented with regard to African American men (14). Although having a first-degree relative increases one’s risk of the disease by an OR of 2.5 (6), the relationship between mental health and perceived risk has been found in other studies as well (37).

Therelationshipbetweenmentalhealthandperceivedriskhasbeenfoundinthe literature which has found that screening intentions of men informed about the benefits of screening as well as the efficacy of PSA screening have been associated with family history, younger age, as well as uniformed older men (17-19). However, there was no relationship between family history and having had a digital rectal exam. We did find that the discomfort of the DRE exam was reported as a barrier. If the man finds the DRE procedure uncomfortable, he may be less likely to agree to the exam when his symptoms previously have been related to a chronic condition, such as benign prostate hypertrophy. A negative attitude to the DRE does not seem to deter some men from prostate cancer screening. A study of 13,500 healthy men undergoing PSA-only screening found that 78% would participate in a screening that included both DRE and PSA. African American men (34% of the sample) were the most willing to participate in a PSA plus DRE screening (84%; ref. 38) and, in another study, 77% reported that they would follow-up abnormal results (39). In our current study, being older was associated with having had a recent DRE or a recent PSA test. Men who had seen a physician for a health check-up were also more likely to have had a recent DRE or PSA test.

Education also was associated with prostate cancer knowledge (not shown). The relationship between age and education and knowledge of risk factors such as being African American is not surprising, suggesting that younger, better-educated men are more widely read and, therefore, more aware of their risk. It is not surprising that knowledge by itself did not have a direct effect on risk perception because intervention to increase knowledge often result in a reduction of one’s intention to be screened (39). This may be an age or period effect as prostate cancer was not widely publicized 10 years ago.

However, the number of nonspecific urinary tract symptoms was negatively associated with screening, because chronic symptoms with negative test results were not perceived as requiring further exams. The cost of a doctor’s visit was a deterrent for having a PSA in the past year, whereas worry about the results was not. Cost has been considered an important barrier to screening (84% of those not screened reported cost as a reason). However, the number of nonspecific urinary tract symptoms was negatively associated with screening, because chronic symptoms with negative test results were not perceived as requiring further exams. The cost of a doctor’s visit was a deterrent for having a PSA in the past year, whereas worry about the results was not. Cost has been considered an important barrier to screening (84% of those not screened reported cost as a reason). In our current study, being older was associated with lower odds of screening, whereas age and education were associated with better knowledge of risk factors such as being African American. In another study, being older was associated with having had a recent DRE or a recent PSA test. Men who had seen a physician for a health check-up were also more likely to have had a recent DRE or PSA test.

Table 2. Relationship between family history of prostate cancer, perceived risk, prostate cancer worries, and receipt of DRE and PSA test among African American men ages 40 to 74 years (n = 205)

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Perceived risk higher than average, OR (95% CI)*</th>
<th>Prostate cancer worries, † OR (95% CI)*</th>
<th>Had DRE in past year, OR (95% CI)*</th>
<th>Had PSA test in past year, OR (95% CI)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sociodemographics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age at pretest</td>
<td>0.95 (0.90-0.99)</td>
<td>0.98 (0.93-1.04)</td>
<td>1.05 (1.00-1.11)</td>
<td>1.10 (1.04-1.16)</td>
</tr>
<tr>
<td>Married/partner</td>
<td>1.15 (0.51-2.61)</td>
<td>0.58 (0.25-1.35)</td>
<td>1.17 (0.52-2.63)</td>
<td>0.99 (0.37-2.63)</td>
</tr>
<tr>
<td>College graduate</td>
<td>2.76 (1.34-5.67)</td>
<td>0.75 (0.33-1.74)</td>
<td>2.05 (0.99-4.27)</td>
<td>1.37 (0.62-3.05)</td>
</tr>
<tr>
<td>Employed</td>
<td>0.89 (0.37-2.12)</td>
<td>1.42 (0.53-3.82)</td>
<td>1.02 (0.40-2.56)</td>
<td>0.42 (0.15-1.20)</td>
</tr>
<tr>
<td>Private insurance</td>
<td>0.89 (0.32-2.50)</td>
<td>1.43 (0.48-4.23)</td>
<td>1.51 (0.51-4.47)</td>
<td>0.39 (0.10-1.57)</td>
</tr>
<tr>
<td>Referred by survivor</td>
<td>1.35 (0.39-3.08)</td>
<td>0.40 (0.15-1.07)</td>
<td>0.68 (0.29-1.56)</td>
<td>0.45 (0.17-1.19)</td>
</tr>
<tr>
<td>Social network index</td>
<td>1.00 (0.69-1.43)</td>
<td>0.73 (0.47-1.12)</td>
<td>1.18 (0.82-1.69)</td>
<td>1.45 (0.96-2.20)</td>
</tr>
<tr>
<td>Health-related factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check-up in past year</td>
<td>1.28 (0.49-3.36)</td>
<td>0.68 (0.25-1.85)</td>
<td>3.18 (1.21-9.44)</td>
<td>5.62 (1.53-20.7)</td>
</tr>
<tr>
<td>Physical well-being</td>
<td>1.00 (0.95-1.04)</td>
<td>0.96 (0.91-1.01)</td>
<td>0.97 (0.93-1.02)</td>
<td>1.03 (0.98-1.08)</td>
</tr>
<tr>
<td>Mental well-being</td>
<td>0.95 (0.92-0.99)</td>
<td>0.96 (0.92-1.00)</td>
<td>0.97 (0.93-1.01)</td>
<td>0.97 (0.93-1.02)</td>
</tr>
<tr>
<td>No. chronic conditions</td>
<td>1.30 (0.99-1.70)</td>
<td>1.17 (0.87-1.56)</td>
<td>1.01 (0.77-1.32)</td>
<td>1.08 (0.78-1.48)</td>
</tr>
<tr>
<td>No. urinary tract symptoms</td>
<td>0.99 (0.79-1.25)</td>
<td>1.07 (0.84-1.37)</td>
<td>0.75 (0.59-0.95)</td>
<td>0.80 (0.61-1.05)</td>
</tr>
<tr>
<td>Prostate cancer knowledge</td>
<td>1.13 (0.91-1.40)</td>
<td>0.97 (0.76-1.23)</td>
<td>1.04 (0.84-1.30)</td>
<td>1.26 (0.98-1.64)</td>
</tr>
<tr>
<td>Barriers to screening</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost of doctor visit</td>
<td>NA</td>
<td>NA</td>
<td>0.60 (0.18-2.00)</td>
<td>0.04 (0.00-0.54)</td>
</tr>
<tr>
<td>Time off work for appointment</td>
<td>NA</td>
<td>NA</td>
<td>1.15 (0.46-2.86)</td>
<td>1.64 (0.58-4.66)</td>
</tr>
<tr>
<td>Side effects of treatment</td>
<td>NA</td>
<td>NA</td>
<td>0.76 (0.37-1.56)</td>
<td>0.72 (0.30-1.73)</td>
</tr>
<tr>
<td>Discomfort of DRE</td>
<td>NA</td>
<td>NA</td>
<td>0.50 (0.26-0.99)</td>
<td>0.42 (0.14-1.32)</td>
</tr>
<tr>
<td>Worry about PSA results</td>
<td>NA</td>
<td>NA</td>
<td>0.50 (0.26-0.99)</td>
<td>0.42 (0.14-1.32)</td>
</tr>
<tr>
<td>Cost of PSA test</td>
<td>NA</td>
<td>NA</td>
<td>1.23 (0.15-10.4)</td>
<td>3.03 (1.13-8.10)</td>
</tr>
<tr>
<td>Blood test upsetting</td>
<td>NA</td>
<td>NA</td>
<td>2.47 (0.57-10.8)</td>
<td>2.56 (1.11-5.91)</td>
</tr>
<tr>
<td>First-degree family history</td>
<td>1.21 (0.54-2.76)</td>
<td>2.31 (0.89-6.01)</td>
<td>1.49 (0.64-3.46)</td>
<td>3.03 (1.13-8.10)</td>
</tr>
<tr>
<td>Perceived risk &gt; average</td>
<td>NA</td>
<td>3.70 (1.72-7.96)</td>
<td>0.91 (0.43-1.90)</td>
<td>2.56 (1.11-5.91)</td>
</tr>
<tr>
<td>Prostate cancer worries</td>
<td>NA</td>
<td>NA</td>
<td>0.93 (0.43-2.05)</td>
<td>0.56 (0.23-1.34)</td>
</tr>
</tbody>
</table>

*Odds Ratio (OR) and 95% CI adjusted for all covariates in model.
†Highest quartile.
access barrier to screening for cancer and other chronic illnesses (40). These data provide additional support for cost as a barrier to access. Contrary to the literature, neither prostate cancer knowledge nor prostate cancer worries were related to screening behavior (9, 14). However, worry about the test results was positively associated with having a recent PSA test, very likely because a portion of men who had been recently tested were being monitored because of elevated PSA levels.

Men’s knowledge of their family history was sometimes imperfect. For example, two brothers who had prostate cancer each referred the other to the study as a cancer-free individual. Eleven men known to have a family history of prostate cancer were unaware of the fact, and in this analysis were classified as having no family history of the disease. As described earlier, to protect the confidentiality of the index cases, participants were not given the names of the persons who had referred them.

There are some limitations to the study as well. Participants were highly educated with 37.5% having a college education. This compares favorably to African American men living in California. Based on the 2003 California Health Interview Survey, 30.8% of African American men ages 40 to 74 years are college graduates (41). There are some differences in education by recruitment source. Among case referrals, 32% had a high school diploma or less and 31% were college graduates; among organizational referrals, 16% had a high school diploma or less and 43% were college graduates. Thus, the registry referrals were similar in educational attainment to the general population of African American men in California. But those recruited through community organizations had substantially higher levels of education. Thus, this limits the ability to generalize the study results to all African American men ages 40 to 74 years.

A second possible limitation is also based on the method of recruitment. Most of the men with a first-degree family history of prostate cancer were recruited through a father or brother whose cancer was reported to the registry, whereas most of the men without a family history of the disease were recruited through church groups and other organizations. Given the difference in recruitment sources, it is not surprising that men without a family history had significantly larger social networks than did the relatives of cancer survivors (P = 0.0002). Thus, men without a family history may have had more access to information about PSA testing through their network of friends and relatives (23). However, the analysis controlled for social network size and found that family history increased the odds of having a PSA test in the past year 3-fold.

The importance of this study lies in its finding that family history and perceived risk were both independently associated with having a recent PSA test in African Americans. In contrast to others (16), perceived risk does not mediate the relationship between family history and screening. It is possible that physicians were more likely to refer men with a family history of prostate cancer for PSA testing, whereas men with higher perceived risk initiated screening themselves. Because a medical visit provides the opportunity for the physician to recommend or the patient to request a PSA test, the path to screening is through one’s physician.

Conclusions

From the analysis of this cross-sectional survey comparing African American men at high risk for prostate cancer due to their family history with men who did not have a family history, the following are concluded: Having a family history of prostate cancer does not necessarily increase perceived risk of the disease, but both factors may provide the motivation to obtain a PSA test, despite controversy over its benefits. Men who have had a recent physical exam are more likely to report having a PSA or DRE. Thus, having a recent check-up is the pathway to screening. However, the cost of the doctor visit may reduce access to screening among African American men.

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References

28. Lipkus IM, Rimer BK, Strigo TS. Relationships among objective and
subjective risk for breast cancer and mammography stages of change. 

examination and serum prostate specific antigen in the early detection of 
prostate cancer: results of a multicenter clinical trial of 6,630 men. J Urol 

Prostate Cancer Detection Project: results from multiple examinations using 
transrectal ultrasound, digital rectal examination and prostate specific 

31. Oesterling JE. Prostate specific antigen: a critical assessment of the most useful 

32. Mistry K, Cable G. Meta-analysis of prostate-specific antigen and digital 
rectal examination as screening tests for prostate carcinoma. J Am Board 

33. DiAmico AV, Chen MH, Roehl KA, et al. Preoperative PSA velocity and the 
risk of death from prostate cancer after radical prostatectomy. N Engl J Med 

Baltimore (Maryland): Williams & Wilkins; 1996.

detection of cancer: update of early detection guidelines for prostate, 
colorectal and endometrial cancers. CA Cancer J Clin 2001;51:38–75.


37. Lerman C, Tock B, Riner B. Psychological side effects of breast cancer 


adohere to recommended follow-up for an abnormal prostate cancer early 

race/ethnicity? An analysis in mammography among low-income women. 

41. California Health Interview Survey; 2003.
Correction: Family History, Perceived Risk, and Prostate Cancer Screening among African American Men

In this article (Cancer Epidemiol Biomarkers Prev 2006;15:2167–73), which was published in the November 2006 issue of Cancer Epidemiology, Biomarkers & Prevention (1), an author’s name was printed in the byline incorrectly as Ingrid Oakley-Girvans. The author’s name is Ingrid Oakley-Girvan.

Reference


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