

Knowledge and Attitudes of Primary Care Physicians Regarding Prostate Cancer Screening

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Introduction: We report the results of a questionnaire administered to primary care physicians to determine their baseline knowledge of prostate cancer and their attitudes on prostate cancer screening.

Materials and Methods: A 27-item questionnaire designed to assess prostate cancer knowledge and screening attitudes was administered to primary care physicians in Duval and Alachua counties. Completed surveys were returned, entered into the master database and analyzed.

Results: Mean initial knowledge score was 66%. In multivariate regression analysis, there were no covariates independently associated with knowledge scores. In multivariate regression analysis, there were no covariates independently associated with attitude scores. Lastly, knowledge scores were not associated with attitude scores ($p=0.85$).

Conclusions: Our findings imply that physicians' knowledge is not an important predictor of their screening behavior. Thus, this study raises the possibility that factors other than educational programs must be assessed as a means to increase screening in specific communities.

Key words: prostate cancer ■ screening ■ prostate-specific antigen ■ knowledge, attitudes and beliefs ■ primary care physician

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Various communities throughout the United States still report a high rate of advanced prostate cancer at initial diagnosis and a high mortality rate from prostate cancer.^{1,2} Specifically, we reported in a study of inner-city men being screened for prostate cancer that men of African descent presented with higher median serum prostate-specific antigen (PSA), had higher median Gleason scores and were four times

more likely to present with advanced disease than their white counterparts.³ This disparity has been attributed to biologically more aggressive tumors,² lack of healthcare access,³ cultural factors,⁴ less-aggressive therapy⁵ and diagnosis at a higher stage.⁴ Diagnosis at a higher stage may result from lack of, or ineffective screening. Physician recommendation is perhaps the most powerful factor in promoting screening compliance.⁵⁻⁷

Reasons why physicians do not recommend prostate cancer screening may be due to several factors, ranging from lack of prospective randomized trials demonstrating the benefit of screening, to misconceived notions on prostate cancer screening and treatment, to outdated knowledge of prostate cancer screening and treatment. Adding further confusion is the near-polar stance various agencies have in regards to prostate cancer screening. Both the American Cancer Society and the American Urologic Association recommend considering screening for prostate cancer under appropriate conditions for men aged >50 years.⁸ On the other hand, the American College of Physicians, American College of Preventive Medicine, Canadian Task Force on Preventive Health Care and U.S. Preventive Services Task Force all have concluded that the evidence is insufficient to recommend for or against routine screening.⁹ Yet, all of the above-named organizations agree that patients should be counseled about the risks and benefits of screening and the decision to screen should be the individual's.

Previously, we assessed prostate cancer knowledge and screening attitudes in 100 men presenting to our outpatient urology clinic for complaints unrelated to prostate cancer. After obtaining a baseline knowledge score, men were given a brief educational intervention followed by assessment of knowledge and screening attitudes after the intervention. The intervention proved useful in increasing one's knowledge. Overall screening attitudes did not change. On multivariate regression analysis, only having had a serum PSA within the past 12 months was the only variable associated with higher knowledge level. With regards to screening attitudes, being of Caucasian race, having a higher educational level and having had a serum PSA within the past 12 months were indepen-

dently associated with aggressive screening behavior. Lastly, participants who scored poorly (<40%) on the knowledge survey generally had less-favorable attitudes toward prostate cancer screening. We concluded that educational programs may improve men's overall prostate cancer knowledge and increase screening in communities where prostate cancer continues to be a major healthcare issue.¹⁰ However, other factors must be taken into account when addressing prostate cancer screening rates in the inner city. A factor to consider may be the primary care physician's knowledge and attitude toward prostate cancer screening. Herein, we report the results of a questionnaire administered to primary care physicians to determine their baseline knowledge of prostate cancer and their attitudes on prostate cancer screening. We hypothesize that physicians having less contemporary knowledge on prostate cancer detection and treatment would report lower levels of routine prostate cancer screening in their practice.

MATERIALS AND METHODS

We surveyed 100 men in Duval County as to their prostate cancer knowledge and prostate cancer screening attitudes. We sought to assess prostate cancer knowledge and screening attitudes in primary care physicians serving the inner city. Due to the anticipated low response rates, primary care physicians in neighboring counties were contacted. Contact information, including e-mail addresses, from 264 random primary care physicians in Duval and Alachua counties in northeast Florida was identified through local medical societies. All physicians were e-mailed an invitation letter describing the nature of the study. The letter had a direct link to the online survey hosted by www.zoomerang.com. Only 20 (8%) physicians responded to the online invitation. Physicians who did not log onto the website were sent another e-mail invitation. Physicians still not responding to the e-mail invitation were personally visited to inquire about their interest in the study. Additional hard copies of the invitation letter and surveys were delivered during these visits. Another 85 physicians completed the survey after the personal visit. Completed surveys were returned, entered into the database and analyzed.

A 27-item questionnaire (Appendix A) was administered to these primary care physicians. The questionnaire sought to determine the baseline prostate cancer knowledge as well as the attitudes and practices of primary care physicians in regards to prostate cancer screening. Prior to distribution to the primary care physicians, the questionnaire was tested among a small, diverse group of experienced physicians from family practice, internal medicine, radiation oncology and urology. The questionnaire was subsequently modified before the final version was sent to the study group. Institutional review board approval was obtained prior to contacting primary care physicians.

The first nine items in the questionnaire (four were multiple choice and five were true/false) assessed knowledge regarding risk factors for developing prostate cancer, prevalence and presentation of prostate cancer, and treatment options for prostate cancer. These questions were formulated based on current, accepted literature. Blank responses were coded as wrong responses. The next nine items in the questionnaire (seven were multiple choice and two were true/false) assessed the attitudes and current screening practices for prostate can-

Table 1. Characteristics of 104 primary care physicians responding to prostate cancer knowledge and screening attitude survey

Characteristic(s)	Participants	%
Degree		
MD	91	87%
DO	7	7%
N/A	6	6%
Specialty		
Internal medicine	36	35%
Family practice	60	58%
General practice	8	8%
Age		
<30	15	14%
30-45	30	29%
45-60	45	43%
>60	14	13%
Race		
White	71	68%
Black	4	4%
Other	29	28%
Practice Setting		
Solo	14	13%
Group/private	18	17%
Group/university	52	50%
Other	7	7%
N/A	13	13%
Office Setting		
Rural	14	13%
Urban	85	82%
N/A	5	5%
Medicare Patients in Practice (%)		
<25%	18	17%
25-50%	54	52%
>50%	20	19%
N/A	12	12%
Medicaid Patients in Practice (%)		
<25%	49	47%
25-50%	37	36%
>50%	6	6%
N/A	12	12%
Minorities Patients in Practice (%)		
<10	7	7%
11-25%	40	38%
26-50%	24	23%
>50%	24	23%
N/A	9	9%

N/A, not answered

cer among the primary care physicians. Finally, the survey asked about personal demographic and practice characteristics.

Statistical Analysis

Average score for nine knowledge questions and average score for first eight attitude questions were computed for each participating primary care physician. The association between the average score and covariates in Table 1 was assessed by univariate and multivariate regression analysis. Backward elimination method was used in multivariate regression analysis. All reported P values were two sided, and those P values <0.05 were considered to be statistically significant. All data were analyzed using SAS® version 9.1.3 software.

RESULTS

Two-hundred-sixty-four physicians were invited to participate in the study. One-hundred-four (39%) returned the questionnaire. Table 1 depicts the demographics of the physicians who completed the questionnaire.

Nine knowledge questions were asked of each physician (Table 2). Seventy-five percent correctly reported family history and being of African decent as risk factors for developing prostate cancer. More than 89% of physicians responded correctly to knowing: 1) the incidence of prostate cancer increases with age, 2) prostate cancer is the second most commonly diagnosed cancer in American men age >45 years, 3) men of African decent with prostate cancer have a higher mortality rate than whites, and 4) there are excellent treatment options for localized prostate. However, only 14% of responders knew what these treatment options for localized prostate cancer were. In addition, only 37% of the physicians knew that men <65 years with a serum PSA 2.5–4.0 ng/ml have approximately a 30% chance of harboring significant prostate cancer on prostate biopsy. Furthermore, 39% noted that serum PSA possesses a high sensitivity and a low specificity in detecting prostate cancer, a very important fact when counseling men about the pros and cons of prostate cancer screening. Even though the majority of prostate cancers seen today are nonpalable

(i.e., T1c) and thus not symptomatic, 55% of physicians believe voiding symptoms are one of the first symptoms of prostate cancer. Together, the overall mean score of the knowledge survey was 66%. Interestingly no demographic factors in Table 1 (age, degree, race, practice type, etc.) could independently predict prostate cancer knowledge in our cohort by multivariate regression analysis. It was found in univariate regression analysis that physicians with an urban office setting had higher knowledge scores than those with a rural office setting (mean score 63 vs. 67, p=0.042), and physicians with more minority patients had higher knowledge scores than those with fewer minority patients (p=0.026).

Nine questions were asked of the physicians to elicit their attitude and current prostate cancer screening behavior (Table 3). Though 93% of physicians responded men are more likely to die with prostate cancer than of prostate cancer, 66% believed prostate cancer screening was effective. This was confirmed when the question was reworded to determine if aggressive prostate cancer screening was beneficial to their patients. Sixty-four percent of responders felt screening was beneficial. Only 53% of physicians offer screening to minorities, whereas 70% offer it to men with a family history of prostate cancer. Forty-six percent of responders stated that they recommend prostate cancer screening to >75% of their patients age >50 years. When asked how they screen for prostate cancer, 79% reported utilizing serum PSA and digital rectal examination (DRE). Thus, 21% either do not screen or do not utilize the screening methods recommended by the American Cancer Society. In the physicians who screen for prostate cancer, 88% screen on an annual basis. Interestingly enough, 46% of physicians report a lack of confidence in interpreting the DRE results of their patients. Lastly, 46% of responders stated their attitudes on prostate cancer screening were based on literature or conferences. No demographic factors in Table 1 (age, degree, race, practice type, etc.) could independently predict prostate cancer attitude in our cohort by multivariate regression analysis. In univariate regression, physicians with an internal medicine specialty had lower attitude scores than family prac-

Table 2. Primary care physicians' response to nine-item prostate cancer knowledge survey

Question	Percent with Correct Response
1. The risk of developing cancer increases with age.	98%
2. Identify the risk factors in the development of prostate cancer.	75%
3. Second most commonly diagnosed cancer in U.S. men >45 years	89%
4. Mortality rate of men of African decent with prostate cancer is higher than the mortality rate of whites with prostate cancer.	93%
5. Nearly a third of men <65 years with serum PSA 2.4–4.0 harbor prostate cancer.	37%
6. Identify treatment options for localized prostate cancer.	14%
7. Excellent treatment options are available for men with prostate cancer.	96%
8. Voiding symptoms are one of the first symptoms of prostate cancer.	55%
9. Serum PSA has a high sensitivity but a low specificity.	39%

tice physicians (mean 71 vs. 79, $p=0.014$). In addition, older physicians had higher attitude scores than younger physicians ($p=0.008$), physicians with group/university practice setting had lower attitude scores than other practice settings (mean 74 vs. 81, $p=0.032$), and physicians with urban office setting had higher attitude scores than that with rural office setting (mean 78 vs. 69, $p=0.041$). Lastly, knowledge scores were not associated with attitude scores ($p=0.85$).

DISCUSSION

With >30,000 American men succumbing to prostate cancer in 2005, it is the second most common cause of cancer-related deaths in men age >45 years.¹¹ With this said, certain groups may benefit from early prostate cancer detection and treatment. These groups include men who are at high risk of developing prostate cancer. Risk factors clearly linked to the development of prostate cancer are men with a family history of prostate cancer and men of African descent. In a previous study by our group, we reported that inner-city African-American men were four times more likely to present with advanced prostate cancer than their white counterparts.³ When these men were queried, they reported scant counseling from their primary care physician regarding prostate cancer screening. It has been previously described that physician recommendation to screen is perhaps the most powerful factor in promoting screening compliance.⁵⁻⁷

Previous researchers have demonstrated that physician knowledge of specific disease process greatly influenced screening behavior.^{12,13} We surveyed a diverse group of primary care physicians as to their contemporary knowledge and screening attitudes for prostate cancer. The mean correct score on the knowledge questions was 59%. Primary care physicians were less likely to know PSA has a poor specificity, localized prostate cancer generally does not present with any symptoms and to distinguish treatment for localized therapies compared to therapies directed towards advanced disease. Knowl-

edge of prostate cancer was higher on univariate analysis in physicians with offices in urban areas or in physicians whose practice was comprised of >50% minority patients. Interestingly enough, we then demonstrated that there was no correlation between prostate cancer knowledge in primary care physicians and their prostate cancer screening attitude/behavior. Thus, educational programs directed at primary care physicians may not increase prostate cancer screening recommendation and subsequently increase the prevalence of screening in communities at high risk of developing this disease.

Previous research has demonstrated that increased prostate cancer knowledge in primary care physicians can polarize their views on prostate cancer screening utility (i.e., some knowledgeable physicians believe PSA screening is overutilized, while others believe in select patients it is a useful tool).¹⁴ We believe this may be the case in our study as well. We may benefit from conducting focus group discussions of primary care physicians to assess their concerns with prostate cancer and prostate cancer screening. Realization of their concerns may help us focus our attention on specific areas that, if improved, can result in a more favorable attitude towards prostate cancer screening.

Recent research, however, has demonstrated the benefit of early prostate cancer detection and treatment. Since the advent of PSA screening in the late 1980s, prostate cancer mortality in the United States has been steadily decreasing.^{11,15} Furthermore, in two large European studies, survival improved in men who underwent prostate cancer screening and treatment, but not in men who did not.^{16,17} Together, these findings clearly suggest that prostate cancer screening programs can significantly increase the detection of treatable cancers and thus decrease mortality.

In a companion study, we assessed the knowledge and screening behavior in inner-city men before and after a brief educational intervention. Mean initial knowledge score was 47% compared to 80% after the educational

Table 3. Primary care physicians' response to nine-item attitude and prostate cancer screening practice survey

Question	Percent with Correct Response
1. I believe that men are more likely to die with prostate cancer than to die of prostate cancer.	93%
2. I offer prostate cancer screening to minorities.	53%
3. Percentage of your male patients >50 years of age that you screen or recommend screening	45%
4. My method of screening for prostate cancer includes both serum PSA and DRE.	79%
5. I recommend annual screening.	88%
6. Lack confidence level in determining results of DRE	46%
7. I believe prostate cancer screening is effective.	66%
8. I am certain/fairly certain that aggressive prostate cancer screening is beneficial to my patients.	64%
9. My attitude on prostate cancer screening comes from literature or scientific meetings.	46%

intervention ($p < 0.0001$). In multivariate regression analysis, only having had a serum PSA within the past 12 months was the only variable associated with knowledge ($p = 0.0062$). Prior to the intervention, the majority of men (76%) were in favor of early detection. Interestingly, after the brief intervention, the attitudes did not change significantly (76% vs. 84%, $p = 0.532$). Being of Caucasian race, having a higher educational level and having had a serum PSA within the past 12 months were independently associated with aggressive screening behavior ($p = 0.0189$, 0.0300 and 0.0225 , respectively). Lastly, responders who scored poorly (<40%) on the knowledge survey generally had more favorable attitudes toward prostate cancer screening ($p = 0.0028$).

To date, this is the only study that has assessed a specific community's primary care physician knowledge and screening patterns for prostate cancer in addition to querying the inner-city inhabitants as to their prostate cancer knowledge and screening behaviors. Unlike the lay public, physicians' knowledge did not correlate to their screening attitude. The majority of physicians reported the utility in prostate cancer screening in previous reports;¹⁷⁻¹⁹ only 52% of physicians in our study report routine screening in minority men. On the other hand, there are primary care physicians who screen men with <10-year life expectancy or who are >80 years.²⁰ This aggressive screening may not be beneficial.

Our study has several limitations. First, this was a small pilot study to determine baseline prostate cancer knowledge and attitudes and patterns for prostate cancer screening in inner-city primary care physicians. This small cohort may not represent primary care physicians throughout the country. Furthermore, responders of the questionnaire may have polar views on prostate cancer screening. In addition, the current questionnaire has not been tested for validity and reliability. The main objective of the questionnaire was to report baseline knowledge and attitudes in hopes of formulating a continuing medical education series directed at primary care physicians to update their knowledge of prostate cancer. Thus, the need to test the questionnaire for validity and reliability was not needed.

In conclusion, we report the results of a 27-item questionnaire administered to primary care physicians to assess their prostate cancer knowledge and attitudes and pattern for prostate cancer screening. Our findings did not demonstrate that physicians' knowledge is an important predictor of their prostate cancer screening behavior. Thus, this study raises the possibility that factors other than educational programs must be assessed as a means to increase screening in specific communities.

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