Primary Care Physicians Beliefs about Prostate-Specific Antigen Evidence Uncertainty, Screening Efficacy, and Test Use

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Abstract: Background: /Purpose: Little is known about primary care physicians' (PCPs) beliefs about prostate cancer screening efficacy, evidence uncertainty, and their actual screening behaviors. We examined factors associated with PCP beliefs about screening efficacy and uncertainty and whether beliefs were associated with prostate specific-antigen (PSA) test use.

Methods: The 2008 National Survey of Primary Care Physicians' Practices Regarding Prostate Cancer Screening collected information on physicians' attitudes, beliefs, and practices related to prostate cancer and screening (n=1,256). Two factors were constructed that measured *belief in certainty of evidence for PSA testing* and *belief in screening efficacy*. These factors, along with PCP sociodemographic and practice-related factors, were used to examine associations with offering the PSA test.

Results: Most PCPs were male (70%), Caucasian (76%), under age 50 (56%), and practiced in communities with more than 50,000 residents (54%). In bivariate analysis, variables associated with PCP belief in evidence uncertainty included female gender, younger age, and lower patient volume. Variables associated with belief in screening efficacy included older age and general and family practice specialty. After adjustment, PCPs with high belief in evidence uncertainty were less likely (OR=0.19, 95% CI=0.06, 0.62) to offer PSA and more likely to practice shared decision making (OR=1.80, 95% CI=1.22-2.67). PCPs with high belief in screening efficacy were more likely (OR=2.99, 95% CI=1.15, 7.77) to offer PSA and less likely to practice shared decision making (OR=0.47, 95% CI=0.32-0.70).

Conclusion: Our data indicate that belief patterns about evidence uncertainty and the efficacy of using PSA may play a role in whether PCPs offer PSA.

Keywords: Prostate cancer■Screening■Prostate-specific antigen■Primary care

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INTRODUCTION

African American men have a greater burden of prostate cancer compared to whites and other groups. An estimated 29,530 new prostate cancer cases and about 4450 deaths were expected in 2016, with incidence rates for African American men about 60% higher and mortality rates more than twice that of white American men.[1] Recent evidence suggests that African American men reported having lower rates of the PSA test compared to white men (33% vs. 37%),[2] and less likely than white men to be provided the option of having a PSA test or be told about the benefit or uncertainty of testing.[3]

The effectiveness of prostate cancer screening using the prostate-specific antigen (PSA) test has been widely discussed.[4,5] In 2012, the United States Preventive Services Task Force (USPSTF) concluded that harms exceeded benefits for PSA testing, and recommended against routine testing for all men. Subsequently more recent studies suggest that PSA use has declined.[6,7] A 2017 revision of the USPSTF recommendation is being finalized.[8] Current guidelines and several public health organizations recommend that primary care physicians (PCPs) discuss the benefits and risks of prostate cancer screening with their patients[9–12] prior to performing the screening tests.

Physician offering of the PSA test may be influenced by a number of factors such as clinical guidelines, office or practice policies, insurance recommendations and patient preference.[13] Studies found that the use of PSA was associated with PCP social, practice-related, and clinical factors.[14–16] Medical specialty was found to be important in the use of the PSA test,[17] as were other factors such as PCP ethnicity, greater knowledge about PSA, and knowledge of higher risk for developing prostate cancer among African American men.[18] In addition, the offer of prostate cancer screening may vary by whether PCPs have discussions with patients as well as physician beliefs about lack of scientific evidence or screening efficacy.[19]

Ordering the PSA test and having pre-screening discussions were found to be associated with characterization of PCPs as either non-routine screeners or routine screeners in a qualitative study.[20] Routine screeners generally aligned themselves with screening efficacy of the PSA test while non-routine screeners typically questioned PSA screening efficacy and employed a scientific evidence approach to screening decisions. However, both groups reported high levels of PSA test use.[20] Despite national

guidelines opposed to screening based upon reviews of the scientific evidence, quantitatively the picture of actual PCP belief patterns and associated practice policies related to ordering the PSA test is less clear.

The purpose of this study was to examine PCP belief patterns about PSA and to ascertain if their belief patterns were associated with offering the test. The current study examined PCP beliefs about screening efficacy, evidence uncertainty, and their actual screening behaviors, and if their behaviors were associated with race/ethnicity and other factors.

Building on the qualitative work of Cooper et al,[20] the current analysis used a national sample of PCPs to explore the relationship among measures of evidence uncertainty and screening efficacy with offering the PSA test. Using existing data collected prior to the 2012 USPSTF recommendation, we sought first to identify correlates associated with PCP beliefs about PSA scientific evidence uncertainty as well as correlates of their beliefs in PSA screening efficacy. We then examined how the belief patterns were associated with offering the PSA test to age appropriate male patients as part of their health maintenance examination. Results from this study may help to better understand the role of individual belief patterns and offering the PSA test to age appropriate men. Data may also set a baseline for comparisons of trends in contemporary physician beliefs and screening behaviors.

METHODS

Data analyzed were from the Centers for Disease Control and Prevention's (CDC) Survey of Primary Care Physicians' Practices Regarding Prostate Cancer Screening (2008). Data were collected prior to organizational screening recommendation updates after 2008. The questionnaire measured PCP-reported attitudes, beliefs, and behaviors related to prostate cancer screening. The study used disproportionate stratified sampling of PCPs in family medicine, general practice, and general internal medicine. After adjusting for surveys that were undeliverable, returned as ineligible, or deceased, the overall survey response rate was 57% (1256/2219). African American (AA) PCPs were oversampled to provide reliable estimates for this group. A more detailed description of the study can be found in Hall et al.[15] Briefly, the survey was developed from previous qualitative analyses of data from PCP focus groups and interviews[20] and relevant questions determined through literature review. Qualitative data elicited from physician focus groups formed the basis for a draft instrument which was then revised to include: 1) existing questionnaire items identified through a comprehensive literature review including reviews of previous physician surveys; and 2) appropriate input by experts in the field, and finalized through a pilot testing process. The intent of these methods was to maximize the relevance to primary care physicians and ensure adequate validity and reliability.

Measurement of variables

Four PCP sociodemographic variables were used: gender, race/ethnicity, age, and community size. Data from African American, Caucasian American, and Asian American PCPs only were considered in the analysis because numbers of Hispanic American PCPs along with PCPs of other ethnicities (n = 38) were too small for reliable estimates. Age was recoded at the 50th percentile into 32−49 years (younger) and 50−84 years (older). Community size was dichotomized (50,000 or fewer residents, greater than 50,000 residents).

PCP practice-related variables were: who decided whether the patient should be screened (PCP decided or mostly decided, PCP/patient/family decided or mostly decided, patient/family decided or mostly decided), clinical specialty (general and family practice were combined vs. internal medicine), weekly patient volume (<100 patients vs. >= 100 patients), and whether discussions were conducted to involve patients in the decision to screen (no or restricted discussion vs. yes, discussion with all patients).

The primary study outcome was "do you routinely offer PSA testing for asymptomatic male patients as part of their health maintenance examination?," (no = 0, and yes = 1). Missing values were excluded from the analysis.

Statistical analyses

Data were analyzed using Stata Survey Version 14.0 (Stata Corporation, College Station, TX) to account for the stratified sampling design. Final sample weights were adjusted for disproportionate stratified sampling and differential rates of eligibility and non-response among physician subgroups. We examined weighted percentages of PCP sociodemographic and practice-related variables with the two factors (belief in evidence uncertainty, belief in screening efficacy), and the primary study outcome (offer screening using PSA).

Factor analysis

We used factor analysis, a method of data reduction that allows several questions or statements that measure a given construct to be reduced into one or more dimensions, factors, or composite variables.[21,22] For additional information on the assumptions for and use of factor analysis, see Kim and Mueller.[21] Two factors were constructed for use in this analysis. The first factor