

The Theory of Reasoned Action and Intention to Seek Cancer Information

Levi Ross, PhD, MPH, CHES; Connie L. Kohler, DrPH; Diane M. Grimley, PhD
Charkarra Anderson-Lewis, PhD, MPH, CHES

Objectives: To evaluate the applicability of the theory of reasoned action to explain men's intentions to seek prostate cancer information. **Methods:** Three hundred randomly selected African American men participated in telephone interviews. Correlational and regression analyses were conducted to examine relationships among measures. **Results:** All relationships were significant in regression analyses. Attitudes and subjective norm were significantly related to in-

tentions. Indirect measures of beliefs derived from elicitation research were associated with direct measures of attitude and subjective norms. **Conclusions:** The data are sufficiently clear to support the applicability of the theory for this behavioral domain with African American men and suggest several important areas for future research.

Key words: African American men, theory of reasoned action, information seeking, prostate cancer

Am J Health Behav. 2007;31(2):123-134

Prostate cancer is a serious threat to the health and well-being of men living in the United States. It is the most commonly diagnosed visceral cancer, the second leading cause of cancer-related mortality, and accounts for one third of all cancers diagnosed in American men.¹⁻³ This year approximately 232,090 men will be newly diagnosed with prostate cancer in the United States, and

about 30,350 men are expected to die from the disease.³ Taken alone, these statistics underscore the magnitude of the public health problem posed by prostate cancer. Taken with data identifying disparities in the burden of prostate cancer, these statistics establish the importance of research studying prostate cancer control in minority populations.

African American men living in the United States have the highest incidence of prostate cancer in the world. They develop the disease earlier in life than other men, and they experience prostate cancer mortality at much higher rates than their white counterparts.¹⁻³ In 2000, the prostate cancer mortality rate for African Americans was more than 2.5 times greater than that of whites.¹ Although men living in Deep South states (ie, Alabama, Georgia, Louisiana, and Mississippi) do not develop prostate cancer at higher rates than men living in other parts of the country, they experience greater mortality.⁴ Thus, African American men living in Deep South states

Levi Ross, Assistant Professor, Institute of Public Health, Florida A & M University, Tallahassee, FL. Connie L. Kohler, Associate Professor; Diane M. Grimley, Associate Professor, Chair, Department of Health Behavior, University of Alabama at Birmingham, School of Public Health, Birmingham, AL. Charkarra Anderson-Lewis, Assistant Professor, Center for Community Health Sciences, University of Southern Mississippi, Hattiesburg, MS.

Address correspondence to Dr Ross, Institute of Public Health, Florida A & M University, 203-B FSH Science Research Center, Tallahassee, FL 32307. E-mail: levi.ross@famu.edu

Intention to Seek Cancer Information

represent an important subpopulation of men with high incidence of and mortality from prostate cancer.

Public health education to facilitate informed decision making for involvement in prostate cancer control activities is important for many reasons. First, early detection and screening for the disease are possible. However, each of the 2 most commonly used screening tests—digital rectal examination (DRE) and prostate specific antigen (PSA) testing—have debatable levels of sensitivity and specificity.^{5,6} Second, none of the standard treatment therapies—surgery, radiation, or chemohormonal treatment—have been shown to extend life in randomized clinical controlled trials. Therefore, clinicians disagree about which treatments to use.⁷⁻⁹ Third, each treatment therapy is known to have serious side effects that can negatively impact health and quality of life, such as incontinence and sexual dysfunction.¹⁰⁻¹² Fourth, patients differ in their assessments of the desirability of each treatment and their expected side effects.¹³⁻¹⁵ Consequently, all men do not receive the population benefits of prostate screening and early detection, and what is considered optimal treatment for the disease varies from one individual to the next.

Helping men to become informed about the potential risks and benefits of prostate cancer control activities is no easy task. There is a complex new vocabulary to learn, and screening and treatment-related outcomes, which are often expressed in terms of the probability of their occurrences, are difficult to understand.¹⁶ The literature is fairly consistent that African American men's knowledge about prostate cancer lags behind that of white men.¹⁷⁻²¹ Despite studies which show that physicians are one of the most accurate, reliable and useful sources of health information,²²⁻²⁴ and that discussing prostate cancer-related issues with physicians is positively related to levels of understanding,^{25,26} health educators continue to struggle with producing messages to effectively influence African American men to obtain prostate cancer information from physicians. It is conceivable that one of the reasons health educators struggle to produce messages to influence prostate-cancer information seeking from physicians among African American men is that the motivational

determinants for this behavior, within this subpopulation, have not been identified.

A growing body of literature exists which documents demographic variables, situational factors, and psychosocial factors (eg, beliefs, attitudes) as correlates to participation in prostate cancer control activities.^{19,27,28} Although it is likely that many of these same factors are associated with African American men's decisions to obtain prostate cancer information from physicians, there are no empirical investigations documenting these associations.

The purpose of this research is to increase our understanding of motivational influences among African American men for obtaining prostate cancer information from physicians. This objective was accomplished by validating theory-based measures to assess African American men's beliefs, attitudes, and intentions to obtain prostate cancer information from physicians, with the theory of reasoned action (TRA) as a theoretical framework.^{29,30}

The TRA was selected as the framework for this investigation because of its success in predicting and explaining volitional behaviors, including exercise,³¹ oral health behavior,³² seat belt use,³³ and hormone replacement therapy.³⁴ The TRA has been useful in explaining a number of different cancer control and prevention behaviors as well.³⁵⁻³⁹ The TRA posits a series of relationships among a set of determinants leading to a particular behavior, such as asking the doctor for information about prostate cancer. Behavioral intention is the most proximal determinant of behavior and its best predictor. Individuals with stronger intentions to engage in a behavior are more likely to engage in a behavior than are individuals with weaker intentions.^{32,34,40-42}

Behavioral intention is directly influenced by an individual's general attitude toward a behavior and his subjective norm regarding the behavior. Attitude and subjective norm are directly influenced by the cross products of 2 value-expectancy style constructs. Outcome evaluation represents the valuation component underlying attitude toward a behavior. Behavioral beliefs represent its expectancy component. Motivation to comply represents the valuation component underlying subjective norm. Normative beliefs repre-

sent its expectancy component. When measured accurately, these 2 sets of multiplicative composite variables can act as indirect measures of attitudes and subjective norm and serve as the basis of interventions to foster behavior change.

A more recent explication of this model is the theory of planned behavior (TPB), which includes a third set of determinants of intention that are related to one's perceptions of control over behaviors and outcomes. This model has been useful in predicting behaviors that may not be felt by the agent to be completely volitional, such as dietary change and problem drinking.⁴³ However, because the behavior of information seeking is likely to be highly volitional, we felt there was no need to add this dimension and thus applied the TRA rather than the TPB in the current study.

Four theory-driven hypotheses were tested in this research. Hypothesis 1 was that attitudes toward obtaining prostate cancer information from physicians are related to behavioral intentions to perform the behavior. Hypothesis 2 was that subjective norm for obtaining prostate cancer information from physicians is related to behavioral intentions to perform the behavior. Hypothesis 3 was that indirect measures of attitudes (behavioral beliefs x outcome evaluations) toward obtaining prostate cancer information from physicians are positively related to direct measures of attitudes toward the behavior. Hypothesis 4 was that indirect measures of subjective norm (normative beliefs x motivation to comply) for obtaining prostate cancer control information from physicians are positively related to direct measures of subjective norm regarding the behavior.

METHODS

Research Design

Survey methodology was employed in a cross-sectional research design to identify motivational factors among African American men in Alabama for obtaining prostate cancer information from physicians.

Participants

Men were eligible for participation in this study if they (a) were African American, (b) were 40 years of age and older, and (c) resided in Alabama. All participants lived in a residence with a telephone and

were registered Democratic Party voters. A random sample of 3000 African American males statewide was taken from a list of persons affiliated with the Democratic Party; this approach was recommended as one which would provide the largest number of African American males from across Alabama. Based on the planned analytic methods, a sample of 300 respondents was required. To reach this number, it was necessary to purchase 3 random samples of 1000.

Procedures

All survey data were collected on the telephone by a local surveying firm, The Parker Group. The Parker Group purchased random samples ($n = 3000$) of the entire available population from a statewide Democratic Party affiliation list. Random sampling ensured that every record from the master list had an equal possibility to be pulled for the survey sample. All randomly selected records were loaded into a computer-assisted telephone interviewing (CATI) system and randomly generated to ensure that every record had an equal chance of being called first or last or anywhere in between. Therefore, 2 randomization procedures were conducted to provide for an increased possibility of a true random sample.

All telephone interviews were introduced by a prescribed survey preamble that was approved by the Institutional Review Board at the University of Alabama at Birmingham. This preamble was structured to allow the interviewers to (a) introduce themselves as university representatives, (b) provide a brief overview of the study purpose, (c) identify any potential risks or benefits associated with study participation, (d) inform participants of the confidentiality of their responses, and (e) obtain verbal informed consent. All telephone interviewers were trained by The Parker Group. Telephone surveys took an average of 22 minutes to complete.

A total of 2753 eligible study participants were contacted. Of these 2753 eligible participants, 1127 (41%) refused to participate, and 1626 agreed to participate or to be contacted at a later time. From this group, 456 surveys were conducted. Of these, 156 surveys were not completed, giving us an overall response rate of 11% (300/2753). The Parker Group destroyed the purchased master call list

after the sample size of 300 surveys was reached.

Data Management and Quality Control

Upon completion of all interviews, The Parker Group transferred raw ASCII formatted survey data, with randomly generated participant case numbers, to the researchers for data management and data analysis. After all raw data were labeled, frequency distributions were obtained for all variables to search for missing values and to ensure that all values for all variables fell within specified ranges. Values that did not fall within specified ranges were reexamined to determine that there were no errors in data entry. All data labeling and quality control efforts were completed with SPSS Version 10.0.⁴⁴

Measures

The survey included demographic items, prostate cancer screening history, items created specifically for this study regarding prostate cancer information seeking, and items associated with theory-based constructs related to intention to obtain prostate cancer control information from physicians. All theory-based items were constructed using guidelines specified by Ajzen and Fishbein.^{29,30}

Intention. Intention to obtain prostate cancer information from physicians was assessed with a global item. This item read, "How likely is it that you will talk with a doctor to get information about prostate cancer in the next 12 months?" This item was rated on a 5-point Likert-type scale. Response values for this question ranged from -2 (very unlikely) to +2 (very likely), with a zero (not likely or unlikely) midpoint.

Attitude (direct measure). Attitude toward obtaining prostate cancer information from physicians was assessed by 4 questionnaire items. The stem for these 4 items read, "Talking with a doctor about prostate cancer in the next 12 months would be ____." Each of these items was rated on a 5-point Likert-type scale. Response values for attitude item #1 ranged from -2 (very unpleasant) to +2 (very pleasant), with a zero (neither unpleasant nor pleasant) midpoint. Response values for attitude item #2 ranged from -2 (very unwise) to +2 (very wise), with a zero (neither unwise nor wise) midpoint. Re-

sponse values for attitude item #3 ranged from -2 (very useless) to +2 (very useful), with a zero (neither useless nor useful) midpoint. Response values for attitude item #4 ranged from -2 (very unsatisfying) to +2 (very satisfying), with a zero (neither unsatisfying nor satisfying) midpoint.

Subjective norm (direct measure). Subjective norm about obtaining prostate cancer information from physicians was measured with a global item. This item read, "Most people who are important to me think I ____ talk with a doctor about prostate cancer in the next 12 months." This item was rated on a 5-point Likert-type scale. Response values for this question ranged from -2 (definitely should not) to +2 (definitely should), with a zero (neither should not nor should) midpoint.

Attitude (indirect measure). Indirect measures of attitudes toward obtaining prostate cancer information from physicians were measured with 11 multiplicative weighted variables (behavioral beliefs x outcome evaluations) that were developed from elicitation research conducted earlier. This research is described in detail elsewhere.⁴⁵ The stem of each behavioral belief item read, "How likely is it that talking with a doctor about prostate cancer in the next 12 months will ____." The 11 beliefs that were assessed were (a) "help you learn more about the disease," (b) "help you learn more about prostate cancer treatment options," (c) "help you learn more about your risks for developing the disease," (d) "interfere with your free time," (e) "make you feel nervous," (f) "make you lose time from work," (g) "be scary," (h) "make you feel uncomfortable," (i) "make the doctor think you want to be tested," (j) "give you peace of mind," and (k) "be stressful for you." Each of these responses was rated on a 5-point Likert-type scale. Response values for each of these questions ranged from -2 (very unlikely) to +2 (very likely), with a zero (neither unlikely nor likely) midpoint.

To obtain a weighted behavioral belief variable, each of the 11 behavioral belief items was multiplied by a corresponding outcome evaluation. The stems of the items measuring outcome evaluations read, (a) "Learning more about the disease is _____," (b) "Learning more about prostate cancer treatment options is _____," (c) "Learning more about your

risks for developing prostate cancer is _____," (d) "Having your free time interfered with is _____," (e) "Feeling nervous is _____," (f) "Losing time away from work is _____," (g) "Being scared is _____," (h) "Feeling uncomfortable is _____," (i) "Making a doctor feel that you want to be tested for prostate cancer is _____," (j) "Having peace of mind is _____," and (k) "Feeling stressed out is _____" respectively. Each of these responses was rated on a 5-point Likert-type scale. Response values for each question ranged from -2 (very bad) to +2 (very good), with a zero (not bad nor good) midpoint.

Subjective norm (indirect measure). Indirect measures of normative beliefs for obtaining prostate cancer information from physicians were measured by 4 multiplicative weighted variables (normative beliefs x motivation to comply). The stem of each normative belief read, "Your _____ think(s) you _____ talk with a doctor about prostate cancer in the next 12 months." The referents who were referred to in these questions included: significant others (wives/girlfriends), peers (friends/coworkers), siblings (brothers/sisters), and pastor. Each of these responses was rated on a 5-point Likert-type scale. Response values for each of these questions ranged from -2 (definitely should not) to +2 (definitely should), with a zero (neither should not nor should) midpoint.

As with the indirect measures of attitudes described above, a weighted variable was created for each of the 4 indirect normative belief items. To obtain a weighted normative belief, each of the normative beliefs concerning individual or groups of specific referents was multiplied by a corresponding item assessing motivation to comply with that/those referent(s). The stem of each motivation to comply outcome item read, "When it comes to talking with a doctor about prostate cancer you generally try to do what your _____ think(s) you should do?" Each of these responses was rated on a 5-point Likert-type scale. Response values for each question ranged from +1 (very unlikely) to +5 (very likely), with a 3 (neither unlikely nor likely) midpoint.

Statistical Analyses

As recommended by Francis and colleagues,⁴⁶ a series of correlational and

**Table 1
Demographic and Risk
Characteristics**

	Characteristics # (%)
Age (years)	
40 - 49	66 (22%)
50 - 59	90 (30%)
60 - 69	76 (25%)
70+	68 (22%)
Marital status	
Married	192 (64%)
Divorced/separated/widowed	74 (25%)
Never married	30 (10%)
Employment status	
Full-time	134 (45%)
Part-time	9 (03%)
Retired	114 (38%)
Other (disabled/unemployed)	42 (14%)
Income (Household)	
<\$15 000	58 (19%)
\$15 000 - \$24 999	56 (19%)
\$25 000 - \$34 999	42 (14%)
\$35 000 - \$44 999	34 (11%)
\$45 000+	63 (21%)
DK/NS/refused	47 (16%)
Education	
Some high school or less	48 (16%)
High school graduate or more	252 (84%)
Self-reported prostate cancer risk	
Less than average man	50 (17%)
About same as average man	184 (61%)
More than average man	19 (06%)
DK/NS/refused	15 (05%)
Ever received prostate cancer information	
Yes	163 (54%)
No	136 (45%)

regression analyses was conducted to evaluate the applicability of the TRA as a model of prostate-cancer information seeking from physicians among African American men in Alabama. Using SPSS Version 10.0, simple correlations were computed to test assumptions regarding associations between TRA model components.

Multiple regression analysis was conducted to (a) test the relationship of the

Table 2
Correlations Between Weighted Behavioral Belief and Attitudes

Behavioral Beliefs and Outcome Evaluation Statements	Mean	SD	Correlation with Attitude	P-value
BB1. Help you learn more about the disease x OE1. Learning more about the disease _____.	1.26	2.15	.10	.07
BB2. Help you learn more about treatment options x OE2. Learning more about treatment options is _____.	2.10	2.40	.33*	.00
BB3. Help you learn more about your risk for developing the disease x OE3. Helping you learn more about your risk for developing the disease is _____.	2.11	2.49	.29*	.00
BB4. Interfere with your free time x OE4. Having your free time interfered with is _____.	-.25	2.33	.04	.44
BB5. Make you feel nervous x OE5. Feeling nervous is _____.	.13	2.07	.07	.25
BB6. Make you lose time from work x OE6. Losing time from work is _____.	.21	2.17	-.01	.94
BB7. Make you scared x OE7. Being scared is _____.	.15	2.11	.11*	.05
BB8. Make you feel uncomfortable x OE8. Feeling uncomfortable is _____.	.27	2.19	.02	.67
BB9. Make the doctor think you want to be tested for the disease x OE9. Having the doctor think you want to be tested for prostate cancer is _____.	.91	2.51	.10	.09
BB10. Give you peace of mind x OE10. Having peace of mind is _____.	2.03	2.67	.20*	.00
BB11. Stress you out x OE11. Being stressed out is _____.	.58	2.46	.08	.16

Note.

* $P \leq .05$; BB = behavioral belief; OE = outcome evaluation. Response options for behavioral belief items ranged from -2 (very unlikely) to +2 (very likely), with a zero (neither unlikely nor likely) midpoint. Response options for outcome evaluations ranged from -2 (very bad) to +2 (very good), with a zero (neither bad nor good) midpoint.

composite weighted scores for indirect measures of attitude (Σ behavioral beliefs x outcome evaluations) to the direct measure of attitude, (b) test the relationship of the composite weighted scores for subjective norms (Σ normative beliefs x outcome evaluations) to the direct measure of sub-

jective norm, and (c) test the relationship of the attitude and subjective norms measures to the measure of intention.

Following the regression analyses, simple bivariate correlations were computed between the direct and indirect measures of attitude and subjective norm

Table 3
Correlations Between Weighted Normative Beliefs and Subjective Norm

Normative Beliefs and Motivation to Comply Statements	Mean	SD	Correlation with Subjective Norms	P-value
NB1. Your significant other thinks you should/should not talk with a doctor about prostate cancer in the next 12 months. x	5.26	4.91	.29*	.00
MTC1. You generally try to do what your significant other thinks you should regarding talking with a doctor about prostate cancer.				
NB2. Your peers think you should/should not talk with a doctor about prostate cancer in the next 12 months. x	4.06	4.26	.28*	.00
MTC2. You generally try to do what your peers think you should do regarding talking with a doctor about prostate cancer.				
NB3. Your siblings think you should/should not talk with a doctor about prostate cancer in the next 12 months. x	4.96	4.61	.34*	.00
MTC3. You generally try to do what your siblings think you should regarding talking with a doctor about prostate cancer.				
NB4. Your pastor thinks you should/should not talk with a doctor about prostate cancer in the next 12 months. x	4.67	4.61	.40**	.00
MTC4. You generally try to do what your pastor thinks you should regarding talking with a doctor about prostate cancer.				

Note.

* $P < .05$; NB = normative belief; MTC = motivation to comply. Response options for normative belief items ranged from -2 (very unlikely) to +2 (very likely), with a zero (neither unlikely nor likely) midpoint. Response options for motivation to comply ranged from +1 (very unlikely) to +5 (very likely), with a +3 (neither unlikely nor likely) midpoint.

to confirm the validity of the indirect measures. After these correlation analyses, we performed a series of independent samples t-tests to determine which specific beliefs have the greatest influence on intentions. Based on their response to the behavioral intention item, respondents were divided into intenders and nonintenders of information seeking. Participants responding very unlikely, unlikely, or not likely nor unlikely were considered nonintenders ($n = 74$). Those responding likely or very likely were classified as intenders ($n = 220$).

RESULTS

Descriptives

Three hundred African American men participated in telephone surveys. Sample demographic and prostate-cancer risk factor characteristics are included in Table 1. A majority of participants (64%) were married, completed high school

(84%), and worked full-time (45%) or were retired (38%). Participants reported nearly even distributions across different levels of household income. Most participants (88%) rated their levels of risk for developing prostate cancer as about the same or less than those of the average man. Nearly half of participants (45%) reported never getting information about prostate cancer from any source.

Correlations Among TRA Model Components

The first stage of our analytic strategy was to assess relationships among the model components of the TRA. Consistent with theory, all TRA model components were associated with intention to seek prostate cancer information from physicians. The strongest correlations were between intention and attitude ($r = .27$, $P < .05$) and intention and the indirect measure of attitude ($r = .26$, $P < .05$). Sig-

Table 4
Behavioral Beliefs and Outcome Evaluations Differentiating Intenders from Nonintenders

	Behavioral Beliefs			Outcome Evaluations		
	Nonintenders N = 74	Intenders N = 220	t	Nonintenders N = 74	Intenders N = 220	t
Learn more about the disease	.50	.80	-1.82	1.24	1.61	-1.40
Learn more about treatment options	.39	1.53	-7.34*	1.39	1.69	-2.71*
Learn more about your risk for developing the disease	.14	1.55	-8.86*	1.20	1.65	-3.66*
Interfere with your free time	-.47	-.73	1.27	.28	.45	-.96
Make you feel nervous	-.70	-.73	.15	-.27	-.20	-.42
Make you lose time from work	-1.03	-1.06	.18	-.46	-.16	-1.78
Will be scared	-.66	-.80	.73	-.53	-.29	-1.47
Make you feel uncomfortable	-.55	-.90	1.83	-.58	-.27	-1.91
Make the doctor think you want to be tested	.07	.62	-2.59*	.78	1.23	-3.16
Give you peace of mind	.42	1.30	-4.75*	1.35	1.71	-3.33*
Stress you out	-.53	-.87	1.80	-.66	-.85	1.12*

Note. * = $\leq .05$

nificant, yet weaker, correlations were found between intention and subjective norms ($r = .19, P < .05$) and intention and the indirect measure of subjective norm ($r = .13, P < .05$).

Hypothesis-testing Results

Four theory-driven hypotheses were stated regarding the relationships between predictor and outcome variables within the TRA model. Two hypotheses were tested to determine relationships between the 2 indirect measures of attitude and subjective norms and the direct measures of these constructs. Two additional hypotheses were tested to examine relationships between attitudes and intentions and between subjective norms and intentions. These 4 hypotheses were tested in 3 separate regression models.

Results from the first regression model, in which information-seeking intentions were regressed on the direct measures of attitude and subjective norms, suggest that both variables are important to the prediction of intentions. However, attitude ($\beta = .23, P < .05$) was a stronger predictor of intention than subjective norm ($\beta = .13, P < .05$). Combined, these 2 variables accounted for a modest ($R^2 = .08$) amount of the variance in behavioral intention.

The results of the second regression model, in which the direct measure of attitude was regressed on the sum of the weighted indirect measure of attitudes, was also significant ($\beta = .33, P < .05$). The sum of the weighted behavioral beliefs and outcome evaluations for the 11 indirect attitude items explained 11% of the variance in the direct measure of attitude.

The results of the third regression model, in which the direct measure of subjective norms was regressed on the sum of the weighted indirect measure of subjective norms, was significant ($\beta = .40, P < .05$). The sum of the weighted normative beliefs and motivation to comply for the 4 indirect subjective norm items explained 16% of the variance in the direct measure of subjective norms.

Bivariate correlations between indirect and direct measures. The correlation coefficients for the associations between each weighted belief item and its corresponding direct measure are listed in Tables 2 and 3. Four of 11 weighted behavioral beliefs were significantly associated with the direct measure of attitude (Table 2). Correlations between attitude and the 4 significant weighted behavioral beliefs ranged from .11 to .33. All

Table 5
Normative Beliefs and Motivation to Comply Differentiating
Intenders from Nonintenders

	Normative Beliefs		t	Motivation to Comply		
	Nonin- tenders N = 74	In- tenders N = 220		Non- tenders N = 74	In- tenders N = 220	t
Significant others	.97	1.48	-3.39*	3.45	3.70	-1.13
Peers	.82	1.24	-3.65*	3.00	3.15	-.67
Siblings	.92	1.38	-2.93*	3.41	3.47	-.29
Pastor	1.05	1.34	-3.36*	3.42	3.30	.49

Note. * = $\leq .05$

4 weighted normative beliefs were significantly associated with the direct measure of subjective norm (Table 3). Correlations between subjective norm and the 4 significant weighted normative beliefs ranged from .28 to .40.

Differences between intenders and nonintenders. The results of a series of t-tests to determine which specific beliefs have the greatest influence on intentions are listed in Tables 4 and 5. The mean values for 4 of the 11 behavioral beliefs and all of the 4 normative beliefs differed significantly between intenders and nonintenders of information seeking.

Intenders were significantly more likely than nonintenders to report that seeking prostate cancer information from physicians would help them learn more about treatment options ($t(292) = -7.34, P < .05$), help them learn more about their risks for developing the disease ($t(292) = -8.86, P < .05$), make the doctor think they want to be tested for disease ($t(292) = -2.59, P < .05$), and give them peace of mind ($t(292) = -4.75, P < .05$).

Intenders were significantly more likely to indicate that their significant other ($t(292) = -3.39, P < .05$), peers ($t(292) = -3.65, P < .05$), siblings ($t(292) = -2.93, P < .05$), and pastor ($t(292) = -3.36, P < .05$) wanted them to obtain information about prostate cancer from physicians than were nonintenders.

DISCUSSION

By evaluating the applicability of a well-defined theoretical model—the TRA—as

a model of intention among African American men in Alabama to seek prostate cancer information from physicians, this study sought to increase our understanding of motivational influences among African American men for obtaining prostate cancer information from physicians. The findings presented in this study support all the relationships posited by the TRA as a model of intention to perform the behavior, thus supporting all 4 hypotheses stated for this research.

The test of the first hypothesis, that there was a direct positive relationship between measures of attitudes toward obtaining prostate cancer information from physicians and behavioral intention, was supported. The second hypothesis, that there would be a direct positive relationship between subjective norm regarding obtaining prostate cancer information from physicians and behavioral intention, also was supported.

Taken together, these findings suggest that the TRA does provide a useful framework for understanding motivational influences for obtaining prostate cancer information from physicians among African American men. Ajzen and Fishbein²⁴ state that different behaviors are differentially influenced by attitudes and subjective norm regarding the behavior. Studies found in the literature have demonstrated that attitude tends to be a stronger predictor of intention to perform a number of different cancer-related health behaviors, including seeking medical care for a breast cancer symptom,⁴⁷ doing testicular self-examination,⁴⁰

participating in mammography,⁴⁸ and obtaining a pap smear.⁴⁹ In the current study, the Beta weight for attitudes was greater than the Beta weight for subjective norm. Placed within the context of theory, our findings suggest that among African American men in the Deep South, attitudes about what might happen when they obtain prostate cancer information from physicians is a better predictor of their performing this behavior than any social pressure they perceive from important others.

Hypothesis 3 was that indirect measures of attitudes (behavioral beliefs x outcome evaluations) toward obtaining prostate cancer information from physicians would be positively related to direct measures of attitudes toward the behavior. Hypothesis 4 was that indirect measures of subjective norm (normative beliefs x motivation to comply) for obtaining prostate cancer control information from physicians would be positively related to direct measures of subjective norm regarding the behavior. Hypotheses 3 and 4 were both supported.

Compared with studies that examine direct associations between the proximal determinants of behavioral intention (attitude and subjective norm), far fewer published studies have examined associations among belief-based measures, attitudes, subjective norm, and intentions. Morrison et al⁵⁰ argued that one possible reason studies using the TRA exclude the dimensions of beliefs is that identification of beliefs requires an additional formative research phase. Although the additional formative research required to identify beliefs is resource consuming, knowing which beliefs underlie significant predictors of intention is important for studies like the present one, which aims to use its research findings to inform health education/promotion interventions.

As predicted by theory, all of the associations in the behavioral beliefs to attitude to behavioral intention path were significant in this study. In this study, 3 positive behavioral beliefs weighted by their outcome evaluations were associated with attitude toward obtaining prostate cancer information from physicians. These beliefs were "to help them learn more about their risk for developing the disease," "to help them learn more about prostate cancer treatment options," and

"to give them peace of mind." One negative behavioral belief also was associated with the direct attitude measure: "it would be scary."

Because the item "to help them learn more about the disease" is positive and associated with gaining knowledge, we were surprised to find this item did not emerge as a salient behavioral belief with the items listed above. It appears that African American men find general information about prostate cancer (eg, what it is, how it progresses) easier to understand than information involving probabilities (eg, risk for developing the disease, risk associated with different treatment options). The implication of this finding for intervention research is quite clear. Physicians and other cancer-control professionals should seek to find ways to present prostate cancer information involving probabilities to African American men in ways that they can better understand, possibly by combining graphic representations with verbal explanations and/or using interactive media.

CONCLUSIONS

Ensuring that African American men obtain prostate cancer information from physicians is an important prostate cancer control activity. Results from this study suggest that the theory of reasoned action and the associated behavioral and normative beliefs elicited from intended audience representatives can be applied as a predictive and an explanatory model for information-seeking intentions. Further, based on the fact that the elicited beliefs are associated both with direct measures of attitude and with direct measures of subjective norm, interventions to influence African American men's intentions to obtain prostate cancer information from physicians should focus on the specific behavioral and normative beliefs.

Limitation and Future Studies

Several limitations of this research must be addressed. The first limitation is that the full TRA model was not tested. Behavioral intention is an intermediate outcome that is hypothesized to predict an ultimate outcome—behavior. Ajzen and Fishbein³⁰ state that the relationship between intention and behavior is tenuous, with longer periods of time between

intention and behavior being less predictive of actual behavior. Thus, it is important to underscore the fact that conclusions about intention do not imply conclusions about actual behavior. Future studies should include both intentions and behavior as outcomes to see how the model operates when all model components are included.

The cross-sectional research design employed in this study was also a limitation – limiting our ability to include behavior as the distal outcome. Theory states that there is a causal relationship among TRA constructs, with belief-based measures → subjective norm and attitudes → behavioral intentions → behavior. Future studies should be conducted with longitudinal research designs, using cohorts, so that causal relationships between all TRA model components can be tested.

Another limitation was that this study relied on self-report data; therefore, the problems that are inherent in studies relying on self-reported data (eg, recall bias, social desirability) also apply here. Finally, the generalizability of study findings might be limited to men whose characteristics are similar to those of this study's population. Use of a purchased list of numbers increased the probability of reaching members of the intended population, but limited the survey to registered Democrats. Further, the survey methodology used did not provide any information about characteristics of refusers. However, the data are sufficiently clear to support the applicability of the TRA in this population and suggest several important areas for future research.

Acknowledgments

This research was supported by a developmental grant from the National Cancer Institute through the Deep South Network for Cancer Control U01-CA-86128. ■

REFERENCES

1. National Cancer Institute. Age specific prostate cancer incidence rates. Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence – SEER 9 Regs Public-Use; 2002.
2. American Cancer Society. Cancer Facts and Figures 2004. Atlanta: American Cancer Society 2004:1-56.
3. Jemal A, Murray T, Ward E, et al. Cancer statistics 2005. *CA Cancer J Clin.* 2005;55(1):10-30.
4. American Cancer Society. Cancer Facts & Figures for African-Americans 2003-2004. Atlanta: American Cancer Society 2003:1-19.
5. Auvinen A, Maattanen L, Finne P, et al. Test sensitivity of prostate-specific antigen in the Finnish randomized prostate cancer screening trial. *Int J Cancer.* 2004;111(6):940-943.
6. Khairullah QT, Pamatmat SD, Chatha M, et al. Early detection of prostate cancer in the ESRD population. *Clin Nephrol.* 2004;61(5):308-315.
7. Vicini FA, Kini VR, Edmundson G, et al. A comprehensive review of prostate cancer brachytherapy: defining an optimal technique. *Int J Radiat Oncol Biol Phys.* 1999;44(3):483-491.
8. Bukkapatnam R, Pow-Sang JM. Radical prostatectomy in the management of clinically localized prostate cancer. *Cancer Control.* 2001;8(6):532-539.
9. Boccon-Gibod L, Bertaccini A, Bono AV, et al. Management of locally advanced prostate cancer: a European consensus. *Int J Clin Pract.* 2003;57(3):187-194.
10. Grise P, Thurman S. Urinary incontinence following treatment of localized prostate Cancer. *Cancer Control.* 2001;8(6):532-539.
11. Boehmer U, Babayan RK. Facing erectile dysfunction due to prostate cancer treatment: perspectives of men and their partners. *Cancer Invest.* 2004;22(6):840-848.
12. Larson DW, Chrouser K, Young-Fadok T, et al. Rectal complications after modern radiation for prostate cancer: a colorectal surgical challenge. *J Gastrointest Surg.* 2005;9(4):461-466.
13. Saigal CS, Gombein J, Nease R, et al. Predictors of utilities for health states in early stage prostate cancer. *J Urol.* 2001;166(3):942-946.
14. Singh H, Maskarinec G, Shumay DM. Understanding the motivations for conventional and complementary/alternative medicine use among men with prostate cancer. *Integr Cancer Ther.* 2005;4(2):187-194.
15. Krahn M, Ritvo P, Irvine J, et al. Patient and community preferences for outcomes in prostate cancer: implications for clinical policy. *Med Care.* 2003;41(1):153-164.
16. Steginga SK, Occhipinti S, Gardiner RA, et al. Making decisions about treatment for localized prostate cancer. *BJU Int.* 2002;89(3):255-260.
17. Brown ML, Potosky AL, Thompson GB, et al. The knowledge and use of screening tests for colorectal and prostate cancer: data from the 1987 National Health Interview Survey. *Prev Med.* 1990;19(5):562-574.
18. Demark-Wahnefried W, Strigo T, Catoe K, et al. Knowledge, beliefs, and prior screening behavior among blacks and whites reporting for prostate cancer screening. *Urology.* 1995;46(3):346-351.
19. Barber KR, Shaw R, Folts M, et al. Differences

Intention to Seek Cancer Information

- between African American and Caucasian men participating in a community-based prostate cancer screening program. *J Community Health*. 1998;23(6):441-451.
20. Weinrich SP, Weinrich MC, Boyd MD, et al. The impact of prostate cancer knowledge on cancer screening. *Oncol Nurs Forum*. 1998;25(3):527-534.
21. Steele CB, Miller DS, Maylahn C, et al. Knowledge, attitudes, and screening practices among older men regarding prostate cancer. *Am J Public Health*. 2000;90(10):1595-1600.
22. Brawn PN, Johnson EH, Kuhl DL, et al. Stage at presentation and survival of white and Black patients with prostate carcinoma. *Cancer*. 1993;71(8):2569-2573.
23. Myers RE, Hyslop T, Jennings-Dozier K, et al. intention to be tested for prostate cancer risk among African-American men. *Cancer Epidemiol Biomarkers Prev*. 2000;9(12):1323-1328.
24. Wilson J, Romano RM, Stein J. Public perception of cancer risk and prevention: implications for physicians. *Md Med J*. 1985;34(1):63-66.
25. Meissner HI, Potosky AL, Convisser R. How sources of health information relate to knowledge and use of cancer screening exams. *J Community Health*. 1992;17(3):153-165.
26. Smith GE, DeHaven MJ, Grundig JP, et al. African-American males and prostate cancer: assessing knowledge levels in the community. *J Natl Med Assoc*. 1997;89(6):387-391.
27. Weinrich SP, Reynolds WA, Tinggen MS, et al. Barriers to prostate cancer screening. *Cancer Nurs*. 2000;23(2):117-121.
28. Agho AO, Lewis MA. Correlates of actual and perceived knowledge of prostate cancer among African Americans. *Cancer Nurs*. 2001;24(3):165-171.
29. Fishbein M, Ajzen I. *Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research*. Reading: Addison-Wesley 1975:1-578.
30. Ajzen I, Fishbein M. *Understanding Attitudes and Predicting Social Behavior*. Upper Saddle River: Prentice-Hall 1980:1-278.
31. Carroll LJ, Whyte A. Predicting chronic back pain sufferers' intention to exercise. *British Journal of Therapy & Rehabilitation*. 2003;10(2):53-58.
32. McCaul KD, O'Neill HK, Glasgow RE. Predicting the performance of dental hygiene behaviors: an examination of the Fishbein and Ajzen Model and self-efficacy expectations. *J Appl Soc Psychol*. 1988;18(2):114-128.
33. Thuen F, Rise J. Young adolescents' intention to use seat belts: the role of attitudinal and normative beliefs. *Health Educ Res*. 1994;9(2):215-223.
34. Lauer DR, Settersten L, Marten S, et al. Explaining women's intentions and use of hormones with menopause. *Res Nurs Health*. 1999;22(4):309-320.
35. Abrams L, Jorgensen CM, Southwell BG, et al. Gender differences in young adults' beliefs about sun screen use. *Health Educ Behav*. 2003;30(1):29-43.
36. Trumbo CW. Mass-mediated information effects on testicular self-examination among college students. *J Am Coll Health*. 2004;52(6):257-261.
37. Kleier JA. Nurse practitioners' behavior regarding teaching testicular self-examination. *J Am Acad Nurse Pract*. 2004;16(5):206-218.
38. Doukas DJ, Localio AR, Li Y. Attitudes and beliefs concerning prostate cancer genetic screening. *Clin Genet*. 2004;66(5):445-451.
39. Ham OK. The intention of future mammography screening among Korean women. *Community Health Nurs*. 2005;22(1):1-13.
40. Brubaker RG, Wickersham D. Encouraging the practice of testicular self-examination: a field application of the theory of reasoned action. *Health Psychol*. 1990;9(2):154-163.
41. Martin SC, Jacobsen PB, Lucas DJ, et al. Predicting children's sunscreen use: application of the theories of reasoned action and planned behavior. *Prev Med*. 1999;29(1):37-44.
42. Furnham A, Lovett J. Predicting the use of complementary medicine: a test of the theories of reasoned action and planned behavior. *J Appl Soc Psychol*. 2001;31(12):2588-2620.
43. Ajzen I. Theory of planned behavior. *Organ Behav Hum Decis Process*. 1991;50(2):179-211.
44. SPSS Inc. *SPSS for Windows, Rel. 10.0.0.* [computer program]. Chicago 1999.
45. Ross L, Kohler CL, Grimley DM, et al. Toward a model of information seeking: identifying salient behavioral and normative beliefs for obtaining information from physicians among African American men in the Deep South. *Health Educ Behav*. In press
46. Francis JJ, Eccles MP, Johnston M, et al. *Constructing questionnaires based on the theory of planned behaviour: a manual for health services researchers*. Newcastle: UK, 2004:1-42.
47. Timko C. Seeking medical care for a breast cancer symptom: determinants of intentions to engage in prompt or delay behavior. *Health Psychol*. 1987;6(4):305-328.
48. Montano DE, Taplin SH. A test of an expanded theory of reasoned action to predict mammography participation. *Soc Sci Med*. 1991;32(6):733-741.
49. Jennings-Dozier K. Predicting intentions to obtain a pap smear among African American and Latina women: testing the theory of planned behavior. *Nurs Res*. 1999;48(4):198-205.
50. Morrison DM, Golder S, Keller TE, et al. the theory of reasoned action as a model of marijuana use: test of implicit assumptions and applicability to high-risk young women. *Psychol Addict Behav*. 2002;16(3):212-224.

Copyright of American Journal of Health Behavior is the property of PNG Publications and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.