A Church-Based Program on Prostate Cancer Screening for African American Men: Reducing Health Disparities

Baqar A. Husaini, PhD; Michelle C. Reece, MS;
Janice S. Emerson, MS; Samuel Scales, MS;
Pamela C. Hull, PhD; Robert S. Levine, MD

Introduction: African American men have a significantly higher incidence of prostate cancer, are diagnosed at younger ages and more advanced stages, and have higher mortality rates from prostate cancer than do White men.

Methods: This community-based intervention study employed a quasiexperimental delayed-control (crossover) design with randomization at the church level. Forty-five African American churches were randomly assigned to two study groups: early intervention and delayed intervention. A convenience sample of 430 African American male volunteers (ages 40–70) was enrolled through the churches, and 350 men remained in the study through wave 3. The intervention was a culturally tailored group educational program, which included a video and a question-and-answer session with an African American physician.

Results: Within each group, knowledge, perceived threat, and screening prevalence all increased significantly. However, the magnitude of increases was similar, so the groups did not differ significantly at wave 2. Knowledge at wave 2 was associated with greater odds of having a digital rectal exam by wave 3 only for the early-intervention group. The early-intervention group was two times more likely to have talked to a physician about prostate cancer screening by wave 3.

Conclusions: The findings suggest that the delayed-intervention group did not function as a pure control and may have unintentionally received a partial intervention. This finding demonstrated that a low-cost prostate cancer awareness campaign within a church may be enough to affect prostate cancer knowledge, attitudes, and behaviors among African American men. Further research should examine the church-specific intervention elements, cultural appropriateness of the messages, and whether group sessions provide additional effect. (*Ethn Dis.* 2008;18[Suppl 2]:S2-179–S2-184)

Key Words: Prostate Cancer Screening, African American Men, Faith-Based, Community-Based Education, Informed Decision-Making, Culturally Appropriate, Health Disparities

From the Center for Health Research, Tennessee State University, Nashville, Tennessee (BAH, MCR, JSE, PCH, SS); Meharry Medical College, Nashville, Tennessee (RSL).

INTRODUCTION

Racial disparities in prostate cancer incidence and mortality are a national concern. Prostate cancer incidence rates are >1.5 times higher for African American men than for White men and are the highest in the world.[1,2] Age-adjusted death rates from prostate cancer were 2.4 times higher for African American men than for White men.[1] The death rate from prostate cancer in Tennessee is above the national rate.[1] African American men are more likely to first seek treatment at a later stage of prostate cancer,[3–5] and they are less likely to receive radical surgical or radiation treatments.[6,7]

In 2004 only 45% of African American men in Tennessee reported having a prostate-specific antigen (PSA) test in the past year, compared with >60% of White men.[8] Nationally, African American and White men (age ≥50 years) self-report similar 12-month prevalence of prostate cancer screening with the digital rectal exam (DRE) (54%), but African American men report lower prevalence of screening with the PSA blood test than do White men (52.9% vs 56.2%).[9,10] Lower utilization of prostate cancer screening among African American men likely contributes to racial disparities in prostate cancer outcomes. African American men have higher initial presenting PSA levels than do White

Address correspondence and reprint requests to: Baqar A. Husaini; Center for Health Research; Tennessee State University; 3500 John Merritt Blvd; PO Box 9580; Nashville, TN 37209-1561; 615-320-3005; 615-320-3071; bhusaini@tnstate.edu

men, which suggests more advanced disease.[11] A lower proportion of African American men are diagnosed at the localized and regional stages than are White men, and the five-year survival rate for prostate cancer diagnosed at the distant stage is lower for African American men than for White men.[12,13] African American men have earlier onset of prostate cancer than White men, and they have worse clinical prognosis than do White men with similar clinical characteristics.[14]

Some authorities recommend that all men ages 50–70 years should have a DRE and PSA test annually (starting at age 40 or 45 for higher-risk African American men and men with a family history of prostate cancer). Others recommend that men in these age ranges should practice informed decisionmaking by discussing screening pros and cons with their doctor each year, to decide about screening individually. Nevertheless, an increasing number of studies suggest that early detection and treatment of prostate cancer help reduce mortality.[15,16]

Research should focus on ways to increase informed decisionmaking about prostate cancer screening among African American men as a strategy to reduce prostate cancer disparities. The health belief model posits that in addition to knowledge, preventive behaviors may occur because of perception of threat of an illness, expectations that an action (eg, screening) will prevent illness or death, and cues to action (internal or external motivators).[17] Potentially successful approaches to promote screening and early detection of prostate cancer among African American men include peer-education and culturally competent approaches that

Table 1. Quasiexperimental delayed-intervention design

Data Collection	Early-Intervention Group 28 church groups	Delayed-Intervention Group 19 church groups
Baseline Wave-1	GROUP MEETING: Baseline Questionnaire Education Program Video, Pamphlets, Q&A	GROUP MEETING: Baseline Questionnaire (only)
3 month follow-up Wave-2	Wave-2 Questionnaire	Wave-2 Questionnaire GROUP MEETING: Education Program Video, Pamphlets, Q&A
6 month follow-up Wave-3	Wave-3 Questionnaire	Wave-3 Questionnaire

involve community leaders, such as church-based programs.[18–20]

The objective of this study was to assess the effect of a church-based prostate cancer education program on changes in knowledge about prostate cancer, perceived threat of prostate cancer, and prostate cancer screening behaviors.

METHODS

Intervention

This study evaluated an educational intervention program with a culturally tailored curriculum based on a peer-education model, designed for a group format in a church-based setting. This low-cost program can easily be implemented and sustained by churches. The goal of the intervention program was to increase informed decisionmaking about prostate cancer screening among African American men. The educational program included viewing a 10-minute video featuring African American prostate cancer survivors and African American physicians describing prostate cancer risks, screening recommendations, the risks and benefits of screening, and making informed decisions.

After the video, an African American physician led a question-and-answer session about commonly held concerns (eg, sexual functioning following treatment). A key emphasis in the educational session was to dispel myths about screening, reduce fears and stigma, and emphasize the potential survival benefits of early detection. Participants were also given pamphlets on prostate cancer risks, screening, and treatment options produced by the American Cancer Society. The program lasted approximately one hour.

Study Design and Sample

The target population was African American males 40–70 years of age in Davidson County (Nashville), Tennessee. A list of the 206 African American churches in the greater Nashville area was used as the sampling frame. Discussions with local African American churches began during the stages of proposal development. All of the churches were mailed a letter of invitation to participate in the study, followed by telephone and personal contacts. Church recruitment was ended after 45 churches agreed to participate. The churches assisted with arranging group sessions, announcing the study sessions, and encouraging men to participate, with support from pastors, health committees, and other church leaders. Two groups were also offered on the Tennessee State University campus for African American male Tennessee State University employees who attended one of the study churches (these two groups were treated as separate church-level groups in the randomization and data analysis).

A quasiexperimental delayed-intervention (crossover) design was used with randomization at the church level (Table 1). The churches (and the two on-campus groups) were randomly assigned to two groups: an early-intervention group and a delayed-intervention group. A convenience sample of 430 eligible male volunteer participants was enrolled through the churches. Questionnaire data were collected at baseline and approximately three months (wave 2) and six months (wave 3) later. For both groups, baseline data were collected during an initial group meeting. The churches in the early-intervention group (28 churches) received the intervention program immediately after completing the baseline questionnaire, while those in the delayed-intervention group (19 churches) received the education program after wave 2 data were collected. Participants were given a total of $40 in grocery store gift cards for completing interviews. Through wave 3, 80 men were dropped and 350 men remained in the study (235 early intervention, 115 delayed intervention). Those who dropped or were dropped from the study were significantly ($P<.05$) less likely to be married (55.0% vs 77.3%) and insured (73.8% vs 92.3%) than those remaining in the study; they did not differ in terms of age, education, or employment status.

Measures

The questionnaires for each wave included self-report items on knowledge about prostate cancer, attitudes and beliefs about prostate cancer, and prostate cancer screening behaviors. Six knowledge questions (true/false) were summed to create a knowledge score (ranging from 0 to 6). Perceived threat of prostate cancer was measured with a question that asked respondents if they agreed with the statement, "I believe I

Table 2.   Demographic characteristics of African American men in a church-based prostate cancer screening education program, Nashville, Tennessee

Characteristic	All Men (*N*=350)	Early-Intervention Group (*n*=235)	Delayed-Intervention Group (*n*=115)
Married (%)*	77.3	80.4	70.8
Employed (%)	71.7	73.6	67.8
Some college education (%)	50.6	50.2	51.3
Insured (%)	92.0	92.3	91.3
Mean age, years (standard deviation)	54.9 (10.6)	54.9 (10.2)	54.9 (11.6)

* Between-group difference $P<.05$.

could get prostate cancer at some time in my life'' (yes/no).

The respondents were also asked to indicate how long ago, if ever, they had a PSA test or a DRE. This information was used to code dummy variables for whether the respondent was ''up-to-date'' on each type of screening (or both) at each wave; ie, the variable was coded as 1 if the respondent had the screen within the past 12 months and as 0 if he did not have the screen within the past 12 months (or never had it). Thus, the percentage of respondents up-to-date at each wave represents the 12-month prevalence of screening at each wave (not a cumulative percentage of old screens and new screens). In wave 3, they were also asked if they had talked to their doctor about prostate cancer screening since the intervention session (yes/no), which was coded as a dummy variable.

Statistical Analysis

Bivariate analyses included χ^2 tests, t tests, and difference of proportions tests. Since the unit of randomization was the church (including the two on-campus groups), and participants were clustered within these units, multilevel regression (linear or logistic versions, depending on the dependent variable) was the appropriate multivariate analysis to test the church-level intervention effect and the effects of other variables on individual-level outcomes while controlling for background variables.[19] Analyses were performed on the 350 men who were retained in the study through wave 3 by using the SPSS (SPSS, Inc., Chicago,

Ill) and HLM (Hierarchical Linear Models) (Scientific Software International, Inc., Lincolnwood, Ill) statistical packages.

RESULTS

The early-intervention and delayed-intervention groups were similar in terms of employment status, education, insurance status, and age. A significantly greater percentage of the early-intervention group was married (Table 2).

Bivariate Analysis

The two study groups did not differ significantly on knowledge, perceived threat, or prostate cancer screening behaviors at baseline (Table 3). Approximately three fourths of men reported at baseline that they had ever had a prostate exam. Approximately 4 in 10 men reported a PSA test in the last 12 months, and slightly more reported a DRE. Slightly more than half were up-to-date on screening, having had either a PSA test or DRE in the past year.

Within each group, knowledge, perceived threat, PSA screening, DRE screening, and PSA or DRE screening all increased significantly. However, the magnitude of increases was similar, so the groups did not differ significantly at waves 2 or 3. At wave 3, participants reported whether they had discussed prostate cancer screening with their doctor after the intervention, which serves as an indicator of informed decisionmaking. The percentage of

men who practiced informed decision-making was significantly higher in the early-intervention group than in the delayed-intervention group ($P<.05$).

Multivariate Analysis

Table 4 presents multilevel regression estimates of the effect of the intervention and other variables on wave 2 and wave 3 outcomes. In the top section of the table, each model includes the baseline value for the wave 2 dependent variable, significant demographic control variables, and at the church level a dummy variable for study group (early=1, delayed=0) to test for group differences (intervention effect). The study group variable was nonsignificant in all three models, so the two groups did not differ at wave 2 on knowledge, odds of perceiving threat, or odds of up-to-date on screening. This confirms the findings of the bivariate analyses.

In the bottom section of Table 4, the first model tested the effect of wave 2 knowledge and study group on the outcome of wave 3 DRE screening, while controlling for significant demographic variables. The significant cross-level interaction term (OR 1.73) indicates that wave 2 knowledge was associated with greater odds of reporting a DRE at wave 3 only for the early-intervention group. This interaction effect was not found for wave 3 PSA or wave 3 PSA/DRE (results not shown). The second model reports that participants in the early-intervention group were two times more likely to have talked to a physician about

Table 3. Prostate cancer screening behavior, perceived threat, and knowledge among African American men in a church-based prostate cancer screening education program, Nashville, Tennessee

Variable	Early-Intervention Group (*n*=235)	Delayed-Intervention Group (*n*=115)
Mean knowledge score (SD) (range 0–6)*		
Baseline	4.98 (1.0)	4.90 (.9)
Wave 2	5.30 (.8)	5.18 (.9)
Wave 3	5.35 (.8)	5.33 (.8)
Perceived threat (%)*		
Baseline	80.9	80.9
Wave 2	92.8	93.0
Wave 3	96.2	94.8
Ever had PSA or DRE screen (%)		
Baseline	77.9	73.9
PSA test (12-month prevalence) (%)*		
Baseline	43.0	40.9
Wave 2	61.3	60.9
Wave 3	67.2	61.7
DRE (12-month prevalence) (%)*		
Baseline	47.2	45.2
Wave 2	63.4	57.4
Wave 3	70.2	61.7
Either PSA or DRE screen (12-month prevalence) (%)*		
Baseline	57.0	53.9
Wave 2	71.9	67.0
Wave 3	76.6	67.8
Talked to doctor about screening after intervention (%)†		
Wave 3	68.6	51.3

SD = standard deviation, PSA = prostate-specific antigen; DRE = digital rectal exam.

* In both early-intervention and delayed-intervention groups, change from baseline to wave 2 and from baseline to wave 3 significant at *P*<.05.

† Between-group difference significant at *P*<.05.

prostate cancer screening by wave 3 (informed decisionmaking) than men in delayed-intervention group (OR 2.01). The third model reports that participants who talked to their physician about screening by wave 3 (in either study group) had more than three times greater odds of up-to-date screening at wave 3 (OR 3.78).

DISCUSSION

Given the delayed (crossover) design of this study, we expected to observe a difference at wave 2 between the early group and the delayed group (which was intended to serve as a control through wave 2). Instead, we found an increase of similar magnitude in the target outcomes within both study groups from baseline to wave 2 and wave 3 followups. Therefore, we saw no

direct evidence of an intervention effect by comparing the two groups.

However, the increases in prostate cancer knowledge, perceived threat, and prostate cancer screening behaviors in both groups were significant and substantial. The 12-month prevalence of PSA and DRE screening started below the Tennessee and national averages for African American men but well exceeded these averages by wave 2 in both groups. Rather than concluding that the church-based intervention had no effect at all, these findings suggest that perhaps the intervention had an effect but that the delayed-intervention group did not function as a pure control. Instead, the delayed group may have unintentionally received what could be considered a partial intervention.

Reflecting on the health belief model, several elements of recruitment and data collection may have influenced

the delayed group's perception of threat and expectations about prostate cancer screening, and may have functioned as cues to action to seek screening. The pastors and church leaders actively encouraged men in the congregations to participate in the study through announcements at the pulpit, in church bulletins, a poster and sign-up sheet, and individual contacts. They likely emphasized the importance of learning more about prostate cancer and its disproportionate effect on African American men, which in itself could influence men to think that they are at risk and that prostate cancer screening is important and effective. This encouragement within the church, attending the baseline group meeting (even though educational information was not provided), discussing the study with fellow church members, and numerous phone contacts with participants to schedule the wave 2 interview and the group meeting for the intervention could have also served as external cues to action to remind men about prostate cancer screening and may have motivated them to get screened before attending the intervention session. It may have also motivated them to seek out more information on their own, which would have influenced the knowledge scores.

At the same time, the multilevel regression analyses of wave 3 outcomes suggested that the educational intervention session may have had an added effect beyond the encouragement at church and the phone contacts. Only in the early-intervention group did wave 2 knowledge (which had increased after the educational session) predict increased odds of obtaining DRE screening by wave 3. Also, the early-intervention group showed greater odds of informed decisionmaking at wave 3 (talking to the physician about screening). In turn, informed decisionmaking was associated with greater odds of obtaining PSA or DRE screening by wave 3, which was also marginally

Table 4. Multilevel regression estimates of effects on wave 2 and wave 3 outcomes among African American men in a church-based prostate cancer screening education program, Nashville, Tennessee

	Wave 2 Dependent Variables		
	Knowledge Score	Perceived Threat	PSA/DRE in Last 12 Months
Variable	b	Odds Ratio	Odds Ratio
Individual-level			
Intercept	3.75*	3.85	.17*
Baseline DV	.24*	7.42*	11.82*
Married	−.03	1.91	.85
Insured	.30	.69	3.87*
College	−.03	.73	1.88*
Church-level			
Study Group (Early=1)	.10	.84	1.28
	Wave-3 Dependent Variables		
	DRE in Last 12 Months	Talked to Doctor After Intervention	PSA/DRE in Last 12 Months
Variable	Odds Ratio	Odds Ratio	Odds Ratio
Individual-level			
Intercept	.02*	.10*	.01*
Age	1.06*	1.02*	1.05*
Insured	7.48*	3.41*	6.16*
W2 knowledge	.87		
W3 talked to MD			3.78*
Church-level			
Study group (Early=1)	.08	2.01*	
Cross-level interaction			
Early group × W2 Know	1.73*		

* Coefficients significant at *P*<.05.

higher in the early-intervention group at wave 3. Informed decisionmaking was specifically emphasized in the educational session, and by wave 3 the early-intervention group had been exposed to the intervention for a longer time than had the delayed group.

Implications for Improving Health Disparities

Despite possible contamination of the control group, this study suggests that churches may be an effective setting to promote preventive health behaviors such as informed decisionmaking about prostate cancer screening. Further research should examine more specifically the influence of pastors and other church leaders and the existing social networks within churches on expectations, perceptions of threat, and cues to action regarding prostate cancer screening. The delayed-intervention group demonstrated that a low-cost prostate cancer awareness campaign (eg, informational posters,

announcements by leaders and in bulletins, phone reminders) within a church may be enough to improve prostate cancer knowledge, attitudes, and behaviors among African American men. These specific intervention elements should be examined in further research, as well as the cultural appropriateness of the messages and whether group sessions provide additional improvement.

Limitations

Participants, especially healthy ones, may not have visited their doctor in the interim between baseline and wave 2 data collection, which would have precluded them from getting prostate cancer screening unless they obtained it at a community health screening event (eg, health fair). Study participants were recruited from those attending church, thus limiting the possible social diversity of the study sample. Additionally, giving a monetary gift to thank them for their participation may have encour-

aged not only participation but also the giving of socially desirable answers. Finally, the convenience sample limits the generalizability of the results.

REFERENCES

1. Ries LAG, Melbert D, Krapcho M, et al. SEER cancer statistics review, 1975–2004. Available at: http://seer.cancer.gov/csr/1975_2004. Accessed 6/19/2007.

2. American Cancer Society. *Cancer Facts and Figures 2007*. Atlanta: American Cancer Society; 2007.

3. Xiao H, Gwede CK, Kiros G, Milla K. Analysis of prostate cancer incidence using geographic information system and multilevel modeling. *J Nat Med Assoc*. 2007;99(3):218–225.

4. Oakley-Girvan I, Kolonel LN, Gallagher RP, Wu AH, Felberg A, Whittemore AS. Stage at diagnosis and survival in a multiethnic cohort of prostate cancer. *Am J Public Health*. 2003;93(10):1753–1759.

5. Powe BD, Hamilton J, Hancock N, et al. Quality of life of African American cancer survivors. A review of the literature. *Cancer*. 2007;109(2 Suppl):435–445.

6. Denberg TD, Kim FJ, Flanigan RC, et al. The influence of patient race and social vulnerability on urologist treatment recommendations in localized prostate carcinoma. *Med Care*. 2006;44(12):1137–1141.

7. Underwood W, Jackson J, Wei JT, et al. Racial treatment trends in localized/regional prostate carcinoma: 1992–1999. *Cancer*. 2005;103(3): 538–545.

8. Robinson KS, Corniola C, Croom F, et al. Populations of color in Tennessee: health status report. Tennessee Department of Health. Available at: http://www2.state.tn.us/health/minorityhealth/Populations_of_Color.pdf. Accessed 1/15/2007.

9. American Cancer Society. *Cancer Prevention & Early Detection Facts & Figures 2007*. Atlanta: American Cancer Society; 2007.

10. Gilligan T, Wang PS, Levin R, Kantoff PW, Avorn J. Racial differences in screening for prostate cancer in the elderly. *Arch Intern Med*. 2004;164(17):1858–1865.

11. Lacher DA, Thompson TD, Hughes JP, Saraiya M. Total, free, and percent free prostate-specific antigen levels among US men, 2001–04. *Adv Data*. 2006;379:1–12.

12. Cohen JH, Schoenbach VJ, Kaufman JS, et al. Racial differences in clinical progression among Medicare recipients after treatment for localized prostate cancer (United States). *Cancer Causes Control*. 2006;17(6):803–811.

13. Hayat MJ, Howlader N, Reichman ME, Edwards BK. Cancer statistics, trends, and multiple primary cancer analyses from the Surveillance, Epidemiology, and End Results (SEER) Program. *Oncologist*. 2007;12(1): 20–37.

14. Powell IJ. Epidemiology and pathophysiology of prostate cancer in African-American men. *J Urol*. 2007;177(2):444–449.

15. National Cancer Institute. Prostate cancer treatments. Available at: http://www.cancer.gov/cancer-topics/pdq/treatments/prostate. Accessed 8/4/2006.

16. Wong Y, Mitra N, Hudes G, et al. Survival associated with treatment vs observation of localized prostate cancer in elderly men. *JAMA*. 2006;296:2683–2693.

17. Rosenstock IM. The Health Belief Model: explaining health behavior through expectancies. In: Glanz K, Lewis F, Rimer B, eds. *Health Behavior and Education*. San Francisco: Jossey-Bass Publishers, 2000;39–63.

18. Weinrich SP, Boyd MD, Weinrich M, Greene F, Reynolds WAJr, Metlin C. Increasing prostate cancer screening in African American men with peer-educator and client-navigator interventions. *J Cancer Educ*. 1998;13(4):213–219.

19. Drake BE, Keane TE, Mosley CM, et al. Prostate cancer disparities in South Carolina: early detection, special programs, and descriptive epidemiology. *J S C Med Assoc*. 2006;102(7):241–249.

20. Hughes Halbert C, Weathers B, Delmoor E. Developing an academic-community partnership for research in prostate cancer. *J Cancer Educ*. 2006;21(2):99–103.