Published in final edited form as:

J Health Care Poor Underserved. 2014 ; 25(3): 1262–1277. doi:10.1353/hpu.2014.0148.

Affecting African American Men's Prostate Cancer Screening Decision-making through a Mobile Tablet-Mediated Intervention

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Abstract

African American men experience a 60% higher incidence of prostate cancer and are more than twice as likely to die from it than White men. Evidence is insufficient to conclude that definitively screening for prostate cancer reduces the likelihood of morbidity or death. Patients are encouraged to discuss screening alternatives with health care providers for informed decision-making (IDM). The extent of IDM in clinical or community setting is not known. This study uses data from a community-based, computer-mediated, IDM intervention that targeted 152 African American aged 40 to 70. Pretest-posttest differences in means for prostate cancer knowledge, screening decisional conflict, and screening decisional self-efficacy were examined by two-tailed *t*-tests. Overall, the intervention significantly improved respondents' prostate cancer knowledge ($p < .0001$), significantly improved decisional self-efficacy ($p < .0001$) and significantly reduced decisional conflict ($p < .0001$). Specifically, the intervention significantly promoted IDM among men who reported more education, being married, having financial resources, and younger age.

Keywords

African American; prostate cancer; screening; informed decision-making; computer-mediated intervention; community setting

Statistical evidence shows that African American men have not benefited from the current declines in prostate cancer mortality. They experience a 60% higher incidence than White men and are more than twice as likely to die from prostate cancer.¹ Though these differences are not fully understood,² current research suggests that a number of factors might explain them. These include difficulties in accessing health care, poor patient-provider

communication, discordant patient and physician racial and ethnic identities, level of prostate cancer knowledge, attitudes about and perceptions of health care, socioeconomic differences, differences in biological manifestation, type and aggressiveness of treatment, diet, genetics, and lifestyle and environmental factors.¹⁻⁴ Apart from an increased effort to provide prostate cancer screening, there is no consistent strategy to address prostate cancer disparities. Screening and early detection are considered factors that are likely to contribute to reductions in prostate cancer mortality. However, there is little definitive scientific evidence that screening for prostate cancer reduces deaths.⁵ While the uncertainty of the effectiveness of the screening modalities for prostate cancer persists, research conclusions often encourage patients to engage their health care providers to obtain information about the risks, benefits and potential limitations of screening in order to facilitate informed decision-making (IDM) that incorporates personal values and preferences.⁶ However, along with mistrust, fear, and perceptions of discrimination and racism, poor patient-provider interaction has been found to be a barrier to adequate health care services and health care information and a factor that impedes IDM among racial and ethnic minority groups.⁷⁻¹⁰ The extent to which IDM among minority patients is facilitated in clinical and community settings is unclear.⁷⁻¹⁰ This is particularly so in four parts of IDM in prostate cancer screening: individual risk assessment, consideration of individual values and beliefs, knowledge of the risks and benefits of screening modalities, and consideration of age and lifespan health issues.

Within communities that are medically underserved, use of lay health advisors (LHAs) has been shown to be an effective method for outreach, particularly in the case of those who have poor access to health services or health information. Interventions by LHAs have been credited with observed reductions in incidences of cardiovascular disease, diabetes, and cancer, and also with evidence of improved disease management among low-income and underserved minority populations. Evaluations of the LHA intervention model have shown that LHAs provide emotional, instrumental, information, and appraisal support.^{11,12} However, the extent to which African American men who are at risk of prostate cancer and who participate in such LHA-mediated interventions were empowered to independently make informed screening decisions is not clearly demonstrated. This is mostly due to the fact that prostate cancer screening interventions often failed to include sufficient numbers of African Americans and that most of the interventions are prescriptive in nature and mostly designed to promote screening and not IDM.² Furthermore, findings in recent literature show that only a very small number of studies were conducted in community settings, and that there is little evidence of using computer technologies to promote prostate cancer screening IDM among African American men.^{2,11} These findings have four main practical implications: (a) that studies in which computer-based patient decision aids (PtDAs) are used to explore prostate cancer screening IDM should be carried out in local community settings, (b) that studies on IDM in prostate cancer screening should include sufficient numbers of African American men, (c) that studies should take into account the mistrust of the medical professions and the unique psychological predispositions and misconceptions about prostate cancer that are often observed among African American men, and (d) that studies should involve community stakeholders in research exploring prostate cancer prevention and treatment.

The design of this study reflected these implications. It involved a computer-based intervention to promote prostate cancer screening IDM among African American men who are at risk of the disease. The study was conducted in local community settings. It was supported by a grant from the National Institutes of Health (NIH). This paper presents data obtained during the intervention. The intervention promoted (through educational materials) and examined (through associated surveys) changes in *knowledge* about prostate cancer, prostate cancer screening *decisional self efficacy*, and prostate cancer screening *decisional conflict*. It utilized Web 2.0 technology and a mobile tablet-based PtDA that was made available to African American male respondents at select community venues by trained LHAs. To eliminate variance in messaging of research materials that could be caused by interviewer/LHA predispositions, respondents were enabled to use the PtDA independently to directly access prostate cancer educational resources and pre and post-PtDA use surveys.

Methods

Building a research infrastructure

To conduct the study, the primary investigators who secured the NIH funding for the study took a non-linear path that resulted in expanding the research team and constructing the intervention modalities. To expand the research team, the investigators secured the resources and research expertise at an NIH-funded collaborative Center of Excellence (COE) in health disparities research and interventions that is located at a major research university in south Florida. The COE is jointly operated by researchers from the university and researchers at a National Cancer Institute-designated Comprehensive Cancer Center (NCI-CCC), also located on the university campus. In addition, prostate cancer researchers and computer software and applications developers from the NCI-CCC, three researchers with expertise in evidence-based medicine, a Community Advisory Board (CAB) that is affiliated with the COE, numerous community members, two post-doctorate fellows, eight graduate research assistants, and four LHAs were recruited and brought together to establish an infrastructure for researching the effectiveness of a community-based intervention in prostate cancer screening IDM. Discussion among members of this coalition generated evidence that determined (a) the technical and substantive capabilities of the study PtDA; (b) that survey instruments to use; (c) that communities to target and that community venues to use for participant recruitment, intervention and data collection; (d) that promotional materials to use for informing the community about the study; (e) which LHAs to employ for the study; and (f) what special training should the LHAs undergo to prepare for field intervention and interview work. This approach differentiates this study from all previous studies that examined IDM in prostate cancer screening among African American men.

The main principles of evidence-based and community-based participatory research framed the organization and activities of the research infrastructure.^{13,14} First, members of a community advisory board (CAB) that is affiliated with the COE were approached by the primary investigators for partnership and, later, for recommendations of community members who could serve as LHAs in the study. Members of the CAB are known leaders who demonstrated understanding of health disparities and the importance of LHAs in improving access to care and in providing culturally appropriate health education. Their

recommendations were used to approach community members with demonstrable positive reputations and active involvement in a variety of community affairs. These individuals were interviewed to assess their interest in the study, whether their personality predispositions would contribute to the success of the study, and whether they possessed abilities to conduct the study intervention and surveys and whether they could do so without biasing the participants with their personal prostate cancer screening preferences. Thereafter, four LHAs were recruited for the study.

To organize data collection, the primary research team used the United States Census Bureau's 2010 data to determine the relative proportion of African Americans in each of the ZIP codes in the proposed geographical area of the study: Hillsborough, Pinellas, and Pasco counties (all in Florida). Eighteen census ZIP codes containing disproportionately high African American populations were identified. The percentage of African Americans in the selected ZIP code areas in two of the study counties (Hillsborough and Pinellas) ranged from 20% to 62% of the total ZIP code populations. ZIP codes selected in Pasco County contained African American populations well above the country's average of 4.5%. The LHAs and primary research team members travelled to the selected zip code areas and identified barbershops, local businesses, churches, community centers and local government agencies that are located in each area. These venues were categorized and each was assigned a random number. This was a measure to reduce participant sensitization to the study educational materials and survey questionnaires and potential response bias. All shop owners and the leaders of the other community venues were met by the investigators and LHAs in the order in which their facilities were listed. During these meetings, the primary research team members introduced the LHAs, explained the study, and solicited and received guarantees for participation. Participant recruitment, exposure to the study intervention PtDA, and interviews were conducted between January 2011 and April 2012.

Prior to the start of participant recruitment and intervention activities, a barbershop owner and a pastor of a church in the study geographical area recruited men to participate in two focus groups to review and assess the content, graphic and pictorial presentation, and cultural and linguistic relevance of a number of PtDAs for prostate cancer screening IDM. The church focus group included 20 men. Seven men attended the focus group discussion that took place at the barbershop. Content analysis of the substantive evaluations by focus group members provided evidence that allowed for an initial determination of the graphic, linguistic, and cultural content of the PtDA to be used in the intervention.

During this time, two of the graduate research assistants and the two post-doctorate fellows completed training in (a) systematic literature reviews, (b) comparative effectiveness research methodologies in prostate cancer screening and prevention, (c) linguistic and cultural competency in prostate cancer screening interventions, (d) LHA skill clusters and competencies training modalities, (e) IDM in prostate cancer screening, and (f) CER research translation. Afterwards the primary investigators, post-doctorate fellows and graduate research assistants reassessed the initial determination of the contents of the PtDA that was made following focus group evaluations for adjustment and final approval. Consequently, software and applications developers who worked closely with the

researchers were able to assemble the study PtDA and survey instruments on the latest i-Pad technology platform.

The PtDA used in this study is an information technology-based psychoeducational intervention on prostate cancer. It was developed as an application for i-Pad tablets. Its final form contained an audiovisual video that provided a discussion of prostate cancer screening. The video is linked to pre-post viewing questionnaires that used validated instruments measuring prostate cancer knowledge, screening decisional conflict, and decisional self efficacy. The video constituted the study intervention tool. It showed, among other things, instances of an African American man discussing views about prostate cancer screening with his wife and daughter at home. It also showed instances of the man engaging his primary care physician in conversations about prostate cancer and screening during regular check-up visits to a clinic. The video conversations provided education on prostate cancer, available screening modalities and some of the attitudes and fears the man had. The survey questionnaires on “knowledge,” “decisional efficacy,” and decisional conflict” that are linked to this video solicit responses to identical questions in order to yield pre and post-viewing information that could be used to determine whether or not changes have occurred in the three IDM domains.

While the tablet applications were being developed, the primary investigators, graduate assistants, software developers, post-doctoral fellows, and other researchers recruited for auxiliary training and research functions conducted further literature reviews. Findings from these reviews were used to create a curriculum and modules for training the research LHAs specifically for this study. Development of the modules was informed by the health belief model,^{15,16} research findings on the core roles and competences of community health workers,¹⁷ and scientific research findings on the behaviors, attitudes, psychological predispositions, and interests of African American men in IDM in prostate cancer screening.^{7,9,10,18-20} Substantive lectures and interactive hands-on instruction on the use of mobile tablets were delivered to the LHAs. These lectures were designed specifically to enable a detailed understanding of the craft of social science research and the importance of research neutrality, protection of human research subjects,²¹ health and cancer outcomes disparities,^{1,3} social interaction and emotional intelligence,²² community socioeconomic and demographic profiles, and use of Internet-enabled i-Pad tablets.²³ Feedback from LHAs at the end of each technology-driven training session was used to make further adjustments to the functionality of the PtDA. Once all adjustments and LHA training were completed, field intervention and data collection were started. In the process, African American men who agreed to participate in the study were enabled to use the study tablet directly. In the case of men who were not used to navigating mobile tablets, the LHAs provided help. However, their activity was limited only to enabling respondents to view and navigate the intervention video in its entirety and answer built-in pre-post-viewing survey questions.

Data and measures

Data used in this study were obtained from 152 African American male respondents. The respondents were enabled by the study LHAs to independently use the intervention tablet to answer survey questions prior to full exposure to and navigation of the i-Pad’s video

contents (pre-test) and to subsequently answer the same survey questions once they have completed full video viewing (post-test). The respondents met the study inclusion criteria, including: (a) self identification as African American male aged 40–70, (b) residence in the study geographic area, and (c) no prior prostate cancer diagnosis. Written informed consent was obtained from each research participant prior to the intervention. All human investigations in this study were performed after documented approval by the university's Institutional Review Board. Responses to the pre- and post-tablet-use survey questions yielded data on a respondent's socioeconomic and demographic background and on his knowledge about prostate cancer and prostate cancer screening, prostate cancer screening self efficacy, and screening decisional conflict.

The measure for participant prostate cancer screening decisional conflict is constructed from responses to a revised version of O'Connor's Decisional Conflict Scale.²⁴⁻²⁹ This is a Likert-type scale constituted of the 16 statements eliciting responses that range from *strongly agree* to *strongly disagree*, with a modal *neither agree nor disagree* response category. In this study, we chose not to multiply by 25 as suggested by O'Connor, and instead calculated a respondent's mean score through simple division by 16 to obtain upper and lower limits of decisional conflict. Therefore, a respondent's mean score ranges from one (1) indicating strong agreement with statements suggesting absence of decisional conflict in making choices to five (5) indicating strong disagreement and suggesting the presence of considerable decisional conflict and inability to make informed choices. To construct a measure of decisional self-efficacy, we adapted the revised version of O'Connor's Decisional Self-Efficacy sub-scale of his 1993 Decisional Conflict Scale.²⁴ The adapted version solicits responses on an 11-question, Likert-type, three-item scale indicating whether the respondent felt *a lot confident*, *a little confident*, or *not confident*. A respondent's mean score ranged from zero (0) indicating no confidence to four (4) indicating a lot of confidence in making an informed decision. Finally, for a prostate cancer knowledge scale we used a 17-question validated knowledge scale. Questions on the scale required *yes*, *no*, or *don't know* responses or selection of an accurate statement from a list of response statements indicating accurate or inaccurate knowledge about prostate cancer. Responses to questions were dichotomized into high risk (coded 1 and indicating lack of knowledge about prostate cancer) and low risk (coded 0 and indicating accurate knowledge about prostate cancer) categories. A respondent's mean knowledge score ranged from zero (0) to one (1), with responses above 0.5 suggesting relative lack of knowledge and a higher risk status. The three scales showed good psychometric properties. Each displayed high internal consistency (Cronbach's alpha coefficient values ranging from 0.78 to 0.92), high test-retest reliability and reasonable discriminant validity.^{24,25,29}

Pre-posttest changes in the three prostate cancer screening domains (knowledge, self-efficacy and decisional conflict) were assessed in terms of four respondent variables: education, income, marital status and age. Constructing a measure for respondent's education required collapsing responses on educational attainment into two categories for educational level: less than college and college or more. To create income measures corresponding to respondents' ZIP codes, we used the definition of median household income quartiles in the 2007–2009 HCUP Nationwide Inpatient Sample.²⁶ The HCUP

geocoded median income quartiles provide proxies of the availability (*supply*) of, among other things, health care and health education resources within specific ZIP code areas. They positively correlate with the levels of supply of these resources, all of which have a potential to drive IDM. Hence, we collapsed the two lower quartiles to create a low-income category that included respondent incomes of less than \$48,000. Similarly, we collapsed the two upper quartiles to create a high-income category that included respondent income of \$48,000 or more. Respondent marital status is measured as married (coded 0) and unmarried (coded 1). And, respondent age is measured in two categories: younger than 60 years and 60 years or older. This categorization is intended to account for the likelihood of respondent economic/employment activity and potential retirement status.

Statistical analysis

As indicated earlier, pre-intervention (pre-test) and post-intervention (post-test) survey questionnaires were administered to obtain responses to identical questions at two different points in time (immediately prior to and immediately after the intervention) to determine whether the intervention has caused change in the three domains or not. As such paired *t*-tests were deemed appropriate for the data. Additionally, to understand better within-group variations, responses on the three domains were assessed by the respondent characteristic variables chosen for this study: educational level, income, marital status and age. To assess how covariates influenced the outcomes in the three domains independently at pre-test and post-test, unpaired *t*-tests were used. However, to adjust for the inflated standard errors produced by the study's clustered design (with subjects nested within venues, venues nested within ZIP codes, and ZIP codes nested within geographical area), we performed nested *t*-tests using the ANOVA function in SAS. For all tests performed in this study, *p*-values equal to or less than .05 are considered statistically significant. In this study, statistical analyses were conducted using SAS version 9.2.²⁷

Results

Of the total 152 men who participated in the study, 95 (63.8%) reported to have a university degree, 89 (59.3%) reported incomes below \$48,000, 92 (60.5%) were married, and 129 (84.9%) were younger than 60.

We examined the responses that the men gave to survey questions prior to viewing the intervention video to determine their mean scores on each IDM domain, and if mean scores differed by background category (education, income, marital status and age). Table 1, which displays estimates of pre-test means by IDM domain type and respondent characteristics, shows that men who participated in the study lacked basic knowledge about the links between prostate cancer and age, the importance of early detection, and currently available screening and treatment modalities. The mean scores of prostate cancer knowledge ranged from minimum 0.71 to a maximum 0.77. In general, these figures indicate relatively high risks of not knowing about prostate cancer morbidity, detection and treatment. Yet, although at high risk, men who reported having a college education or more have significantly more knowledge about prostate cancer than men who reported lower levels of education (*t*-value=2.53, *p*=.0133). Likewise, Men who reported annual incomes of \$48,000 or more

have significantly more knowledge about prostate cancer than those who reported lower levels of income (t -value=2.00, p =.0500). The figures in Table 1 show that there were no statistically significant differences in knowledge in terms of the respondents' marital status or age categories.

In contrast to the findings on men's lack of knowledge about prostate cancer, the estimates in Table 1 show that across background characteristics, the participants reported high levels of confidence (self-efficacy) in their ability to make informed choices. Their mean scores ranged from 3.30 to 3.62. However, the figures in the table show that there were no statistically significant differences in self-efficacy in terms of the respondents' educational level, marital status and age categories. However, the table figures show that men who reported higher levels of annual income (\$48,000 or more) have significantly higher levels of self-efficacy than their counterparts who reported lower levels of annual income (t -value=2.87, p =.0048).

Estimates in Table 1 also show that prior to the intervention the respondents were slightly less conflicted about whether or not to screen for prostate cancer. On a scale of zero to five, their mean scores ranged from 2.19 to 2.26. These are below the 2.50 pivotal point above which considerable decisional conflict is expected to be present. There were no statistically significant differences among men in terms of their level of education, income or age. Only married and unmarried men had significantly different levels of prostate cancer screening decisional conflict, with unmarried men reporting less decisional conflict (t -value=2.07, p =.0407).

At pretest, educational, income and marital status differences appear to produce some significant effects across different IDM domains. However, the most surprising finding at pre-test is that age differences have no impact on IDM domains. Older (60 years or older) and younger (younger than 60) men were equally at high risk of not knowing enough about prostate cancer, and prostate cancer detection and treatment modalities. It was also surprising that, across age categories, men reported equal but high levels of confidence (self-efficacy) in the health-related choices they make. Additionally, although younger men appeared to be more conflicted on prostate cancer screening decisions, their marital status was not significantly different from that of their older counterparts.

Prior to examining how the intervention affected men across socioeconomic and demographic categories, we examined the overall impact of the intervention on the three domains of IDM. As we expected, exposure to the intervention video improved participants' knowledge about prostate cancer and their decisional self-efficacy, and reduced their decisional conflict. Table 2 shows estimates of pre-test and post-test means by IDM domain type and results of two-tailed t -tests of means differences for the entire study sample. Overall, exposure to the contents of the intervention video resulted in significant increase in participants knowledge (t -value=3.84, p <.0001) and decisional self-efficacy (t -value=3.28, p <.0001) and significant reduction in decisional conflict (t -value=4.01, p <.0001).

Participant responses to the post-intervention questionnaire yielded data that enabled us to compare responses within each characteristic to determine whether or not the intervention

has caused change in any or all of the three prostate cancer IDM domains that are examined in this study. We found a number of significant changes. These are displayed in Table 3, which shows estimates of pre and post-intervention means by domain type and respondent characteristics as well as *t*-test statistics.

Though baseline (pre-intervention) scores (Table 1) indicated that all of the respondents were at high risk of not having sufficient and accurate knowledge about prostate cancer and prostate cancer screening and treatment options, figures in Table 3 show significant improvements in knowledge across most background categories. The knowledge mean score for men who reported having college education or more significantly changed in the predicted direction indicating lower risk (t -value=3.52, p =.0007). A similarly significant but smaller change in knowledge is also found among men with less than a college education (t -value=2.12, p =.0296). Significant changes in knowledge mean scores are also found across all income categories (t -value=2.06, p =.0453 for men who reported incomes of \$48,000 or more, and t -value=2.11, p =.0377 for men who reported lower incomes). However, only among married men is where significant change in the mean scores for knowledge is found (t -value=3.12, p =.0023). Unmarried men were not affected by the intervention. Furthermore, the intervention appears to have produced significant change in knowledge about prostate cancer only among men who are less than sixty years old (t -value=2.86, p =.0049).

Figures in Table 3 show that confidence in making proper decisions (self-efficacy) about prostate cancer screening significantly increased only among certain categories of the men who participated in the study. These included men who reported college education or more (t -value=2.77, p =.0063), lower income levels (t -value=2.15, p =.032), who were married (t -value=2.58, p =.0107), or who were younger than sixty years of age (t -value=2.45, p =.0150).

As noted earlier, before their participation in the study, men reported (at pre-test) below average levels of internal conflict about whether or not to screen for prostate cancer. Preliminary findings in Table 2 suggest that the intervention produced statically significant reduction in their decisional conflict. However, results of further analysis (in Table 3) reveal that the intervention did not produce change in the levels of decisional conflict across all background characteristics. Rather, the observed reductions in screening decisional conflict were significant only among men who reported higher levels of education (t -value=1.93, p =.0549) who were married (t -value=2.34, p =.0204) and who were younger than 60 (t -value=2.64, p =.0088).

Discussion

This study adds to the body of literature on prostate cancer screening IDM among African American men, and details a process for building a research, community outreach, and participant recruitment infrastructure. Overall findings of this study indicate that use of Internet-enabled mobile tablet technology for delivery of information on the etiology and screening and treatment modalities of prostate cancer at community settings is an effective intervention to produce desirable changes in the various IDM domains. Specifically, the overall study findings suggest that, as designed, the intervention produced significant improvements in knowledge about prostate cancer and confidence in decision-making skills,

and significant reductions in internal conflict over whether or not to screen for prostate cancer. Thus, the intervention and the way it was delivered appear to suit the psychological predispositions of African American men.^{7,8} The nonlinear pathway that was taken to arrive at the design of the various components of the intervention might also account for the nature of its observed overall impact on IDM.

Examinations of the data in terms of respondents' socioeconomic and demographic background variables suggest that the intervention produced significant results only among certain categories of African American men. Men at varying levels of education and income gained significant knowledge about the etiology of prostate cancer and its screening and treatment modalities. This is the same case for married and younger men. However, the improvements in knowledge appear to be greater among men who were socially advantaged: having higher levels of education and income, were married and younger (younger than 60) and likely to be in the labor force. It is possible that despite an observed low pre-intervention knowledge profile, men who were socioeconomically and demographically advantaged (having higher levels of education and income, being married and were younger) were better resourced and mentally prepared to effectively absorb and understand the information provided through the intervention to enhance their knowledge about prostate cancer.

Though pre-intervention mean scores for confidence were very high among all men, significant improvements in this dimension of IDM occurred among men who reported education, marital status and age advantages. However, unlike improvements in knowledge that seemed to correlate with socioeconomic and demographic advantages, the greatest benefits in decisional self-efficacy were found among men who reported lower incomes (less than \$48,000). It seems that among men who possessed the high levels of confidence typically associated with being financially-resourced (i.e., having incomes of \$48,000 or more), an intervention that attempts to affect increases in self-efficacy has little impact among them. Men who are relatively deprived economically seem to take full advantage of the intervention tools and messages that were designed to enhance confidence in individual decision-making skills. The educational component of the intervention appears to have worked as a resource that these men had no means to access prior to the study.

The intervention video and other educational materials provided respondents with information on the potential advantages and disadvantages of screening for prostate cancer. Yet, reductions in mean scores for screening decisional conflict were observed among men across all socioeconomic and demographic categories. However, significant reductions in decisional conflict were found only among men who reported educational, marital status (married), and younger age advantages. We assume that these advantages may embody preparedness to better grasp and understand the educational messages of an intervention with resulting significant changes in IDM. Yet, the observed statistically nonsignificant reductions in the mean scores among men who were in relatively disadvantaged socioeconomic and demographic categories suggest that the provision of competing educational messages on prostate cancer screening does not heighten internal conflict. The observed pre-intervention lack of knowledge may account for this. Though disadvantaged, the pervasive lack of knowledge that was observed among these men in the pre-test/ intervention data may have stimulated them to carefully weigh the information that was

made available to them (and to which they may not have had ready access prior to the intervention). It seems that among socioeconomically and demographically disadvantaged African American men, a thoroughly vetted and trusted community-based intervention and health-related educational materials are taken very seriously as scarce resources. This is a notable finding that stands in total contrast to the findings of the very few studies that examined decisional conflict in the context of low pre-intervention knowledge.²

However, this study has limitations. Though we attempted to randomize at the community venue setting, the study sample is still very small to allow for generalization. Additionally, when compared with census data pertaining to the study geographic area (Hillsborough, Pinellas, and Pasco counties), the data that were obtained through field interviews suggest selection bias. The education and income levels, marital status and age statistics are significantly different from the census estimates and indicated men who were more educated, had more financial resources, and were more likely to be married and younger. As seen in one of the few studies that resemble ours,² men who agreed to participate in this study had interest in prostate cancer screening modalities and were mentally prepared to absorb the educational materials provided through the intervention. Another limitation is that we are reporting immediate pre-intervention and immediate post-intervention data. Research findings suggest that though event recall could be accurate (at approximately 97%) over a year, there is a strong likelihood that information received during interventions or interactions is slowly forgotten as time passes.²⁸ Though the design of this study requires two-week and six-month follow-up surveys, we have not completed analysis of the new data and cannot at the moment make a final argument that the observed improvements in IDM domains are lasting.

However, a notable result of this study is that the intervention did not increase decisional conflict or reduce knowledge or decisional self-efficacy among the respondents. Even among categories of men whose mean scores did not show statistically significant differences, the observed changes in their scores were in the desirable (lower risk) direction. Without exception all post-test mean scores indicated improvement in the three IDM domains. Thus, the study findings constitute support for previous research that found positive impacts of PtDA interventions on dimensions of IDM in prostate cancer screening.² However, as can be seen in the data presented in this manuscript, this study differs from some of the previous studies that reported mixed results on PtDA effects on IDM domains.² It does not report mixed or contradictory findings.

Policy and practice implications

Our findings on the promotion of prostate cancer screening IDM at community settings have implications for educational policy and practice to reduce prostate cancer mortality among African American men. The findings of this study suggest that a carefully designed and vetted intervention might have a tremendous potential as a tool to enhance African American men's capacity for IDM in matters pertaining to prostate cancer etiology, screening, and treatment modalities. The study findings also suggest that accommodating the interests of African American men in dialogue and learning about prostate cancer in familiar community settings is a productive IDM enhancement policy strategy. The evidence we

presented indicates that if given the opportunity to learn about prostate cancer disease, these men— regardless of their socioeconomic or demographic background characteristics—are ready to take advantage of learning resources if they are made available. The findings justify investments in educational interventions in resource-poor minority communities, especially among older men, men with lower incomes and less education, and men who are unmarried.

What we have presented so far shows promise that Internet-enabled i-Pad-based PtDAs could be effective intervention tools to empower African American men to make informed decisions. The data we presented also imply that there is a readiness among African American men to accept interventions that are vetted by their community leaders and carried out within familiar community settings by researchers they trust. The findings of this research also suggest that this readiness is present among men from all socioeconomic and demographic backgrounds. Yet, these are men who, according to prior research, typically demonstrate reticence when it comes to scientific health research. Given the data we presented, we now believe that research activity involving African American men is unlikely to yield good or conclusive results unless its infrastructure is carefully built to accommodate both the community environment in which the men live and their psychological predispositions.

Acknowledgments

This work was supported by a grant from the National Institutes of Health '(grant number 3P20MD003375-02S1)'.

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Table 1

ESTIMATES OF PRE-TEST MEANS BY RESPONDENT CHARACTERISTICS AND IDM DOMAIN TYPE

Variable	N	Pre-Test Mean (SD) t-value (p)		
		Prostate Cancer Knowledge	Prostate Cancer Screening Self Efficacy	Prostate Cancer Screening Decisional Conflict
Education				
College+	95	0.72 (0.11)	3.52 (0.68)	2.36 (0.79)
< College	54	0.77 (0.13)	3.30 (0.68)	2.35 (0.86)
t-value (p)		2.53 (0.0133)	1.91 (0.0592)	0.04 (0.9699)
Income (\$)				
48,000+	61	0.71 (0.11)	3.62 (0.63)	2.42 (0.86)
< 48,000	89	0.75 (0.12)	3.31 (0.70)	2.32 (0.78)
t-value (p)		2.00 (0.0500)	2.87 (0.0048)	0.75 (0.4555)
Marital Status				
Married	92	0.73 (0.11)	3.46 (0.71)	2.46 (0.87)
Unmarried	60	0.74 (0.13)	3.41 (0.64)	2.19 (0.70)
t-value (p)		0.08 (0.9374)	0.47 (0.6370)	2.07 (0.0407)
Age (years)				
60+	23	0.72 (0.13)	3.44 (0.63)	2.28 (0.79)
<60	129	0.74 (0.12)	3.44 (0.69)	2.37 (0.82)
t-value (p)		0.69 (0.4956)	0.01 (0.9940)	0.46 (0.6455)

Table 2

ESTIMATES OF PRE-TEST AND POST-TEST MEANS, STANDARD DEVIATIONS AND *T*-VALUES FOR MEAN DIFFERENCES IN KNOWLEDGE ABOUT PROSTATE CANCER, SCREENING SELF-EFFICACY AND DECISIONAL CONFLICT FOR ALL RESPONDENTS

Variable	N	Pre-Test Mean (SD)	N	Post-Test Mean (SD)	t-value (p)
Knowledge	152	0.74 (0.11)	152	0.68 (0.08)	3.84 (<.0001)
Self-Efficacy	152	3.44 (0.72)	152	3.63 (0.63)	3.28 (<.0001)
Decisional Conflict	152	2.35 (0.80)	152	2.13 (0.75)	4.01 (<.0001)

Table 3

ESTIMATES OF PRE-TEST AND POST-TEST MEANS, STANDARD DEVIATIONS AND T-VALUES FOR EACH RESPONDENT CATEGORY BY IDM DOMAIN TYPE

Variable	N	Pretest Mean (SD)	N	Post-Test Mean (SD)	t-value (p)
Prostate Cancer Knowledge					
Education					
College+	95	0.72 (0.11)	45	0.65 (0.11)	3.52 (0.0007)
< College	54	0.77 (0.13)	40	0.71 (0.13)	2.21 (0.0296)
Income (\$)					
48,000+	61	0.71 (0.11)	30	0.65 (0.14)	2.06 (0.0453)
< 48,000	89	0.75 (0.12)	56	0.70 (0.15)	2.11 (0.0377)
Marital Status					
Married	92	0.73 (0.11)	51	0.67 (0.11)	3.12 (0.0023)
Unmarried	60	0.74 (0.13)	36	0.70 (0.14)	1.39 (0.1685)
Age (years)					
60+	23	0.72 (0.13)	13	0.65 (0.12)	1.63 (0.1146)
<60	129	0.74 (0.12)	74	0.69 (0.12)	2.86 (0.0049)
Prostate Cancer Screening Self-Efficacy					
Education					
College+	95	3.52 (0.68)	95	3.75 (0.44)	2.77 (0.0063)
< College	54	3.30 (0.68)	53	3.42 (0.82)	0.82 (0.4123)
Income (\$)					
48,000+	61	3.62 (0.63)	61	3.76 (0.40)	1.47 (0.1459)
< 48,000	89	3.31 (0.70)	88	3.54 (0.72)	2.15 (0.0326)
Marital Status					
Married	92	3.46 (0.71)	92	3.70 (0.54)	2.58 (0.0107)
Unmarried	60	3.41 (0.64)	59	3.53 (0.72)	0.96 (0.3389)
Age (years)					
60+	23	3.44 (0.63)	23	3.57 (0.64)	0.69 (0.4912)
<60	129	3.44 (0.69)	129	3.64 (0.62)	2.45 (0.0150)
Prostate Cancer Screening Decisional Conflict					
Education					
College+	95	2.36 (0.79)	95	2.14 (0.78)	1.93 (0.0549)
< College	54	2.35 (0.86)	54	2.13 (0.78)	1.39 (0.1667)
Income (\$)					
48,000+	61	2.42 (0.86)	61	2.18 (0.88)	1.52 (0.1303)
< 48,000	89	2.32 (0.78)	89	2.11 (0.70)	1.89 (0.0604)
Marital Status					
Married	92	2.46 (0.87)	92	2.16 (0.87)	2.34 (0.0204)
Unmarried	60	2.19 (0.70)	60	2.09 (0.62)	0.83 (0.4092)
Age (years)					

Variable	N	Pretest	N	Post-Test	t-value (p)
		Mean (SD)		Mean (SD)	
60+	23	2.28 (0.79)	23	2.26 (0.87)	0.08 (0.9353)
<60	129	2.37 (0.82)	129	2.11 (0.76)	2.64 (0.0088)