

ORIGINAL ARTICLE

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Educating Men about Prostate Cancer Screening A Randomized Trial of a Mailed Pamphlet

CONTEXT. Although evidence-based guidelines recommend that physicians inform men about prostate cancer screening, the most efficient way to do this is not known.

OBJECTIVE. To evaluate whether a mailed educational pamphlet affected men's knowledge about early detection of prostate cancer.

DESIGN. Randomized, controlled trial.

SETTING. Primary care clinic of the Minneapolis VA Medical Center.

PATIENTS. 342 men at least 50 years of age who responded to a mailed survey (overall response rate, 68%) and did not report a history of prostate cancer.

INTERVENTION. "Early Prostate Cancer" pamphlet mailed to patients in the intervention group 1 week before their scheduled clinic appointments.

OUTCOME MEASURES. Patients' responses to a survey mailed 1 week after their clinic appointments; prostate-specific antigen (PSA) testing determined from electronic medical records.

RESULTS. Respondents were predominantly elderly white men (mean age, 71 years; 90% white) with chronic illnesses (48% described their health as "fair" or "poor"). Men who received the educational pamphlet were better informed than men in the usual care group, as measured by correct responses to the following three questions about prostate cancer screening: the natural history of prostate cancer (32% vs. 24%; $P = 0.10$), whether treatment lengthens lives of men with early prostate cancer (56% vs. 44%; $P = 0.04$), and accuracy of PSA testing (46% vs. 27%; $P < 0.008$). The overall proportion of correctly answered questions was greater in the intervention group (45% vs. 32%; $P < 0.001$). Testing for PSA in the year after the index clinic appointments did not differ significantly between the intervention group and the usual care group (31% vs. 37%; $P > 0.2$).

CONCLUSIONS. Male veterans are poorly informed about the potential benefits and risks of prostate cancer screening. Although our mailed educational pamphlet enhanced knowledge only modestly, it was an inexpensive and easily implemented intervention.

Early detection and treatment of prostate cancer may reduce disease-specific morbidity and mortality. However, convincing evidence of benefit from this strategy is lacking.¹⁻⁵ Therefore, evidence-based practice guidelines recommend that "Rather than screening all men for prostate cancer as a matter of routine, physicians should describe the potential benefits and known harms of screening, diagnosis and treatment; listen to the patient's concerns; and then individualize the decision to screen."⁶⁻⁸

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While there is some agreement about the information that men need to make informed decisions,^{7,9} the most efficient way to educate large numbers of men attending primary care clinics is not known. Although instructional videotapes or educational scripts about prostate cancer have been shown to be effective, they have not been routinely incorporated in large clinical practice settings.¹⁰⁻¹² Mailed printed interventions offer a low-cost, efficient way to provide standardized, validated information to many persons from different geographic areas.^{13,14} In addition, mailed pamphlets have the practical advantage of allowing the bulk of the information to be conveyed separately from the clinical encounter.

The primary purpose of this study was to determine whether a mailed informational pamphlet, "Early Prostate Cancer," enhanced men's knowledge about early prostate cancer detection and treatment.

Methods

Design

Our study was a randomized, controlled trial comparing a mailed informational pamphlet with usual care in male veterans attending a hospital-based primary care clinic (**Figure 1**). The human studies subcommittee of the institutional review board of the Minneapolis VA Medical Center reviewed and approved the protocol.

Patients were eligible if they attended a primary care clinic at the Minneapolis VA Medical Center. This clinic provides primary care to more than 10,000 men residing in a five-state area of the upper midwestern United States. We randomly selected 550 men at least 50 years of age from a computerized list of male veterans who had scheduled clinic appointments between October 15 and November 30, 1998. A computer-generated algorithm was subsequently used to randomly assign the 550 men to receive either the mailed pamphlet (intervention) or usual care alone (control). Three hundred seventy-five men responded to the survey mailed after their scheduled clinic appointments (68% response rate); of these, 342 men without a history of prostate cancer were included in the study group (intervention, $n = 163$; control, $n = 179$).

Intervention

Seven to 10 days before their scheduled clinic appointments, men in the intervention group were mailed a two-sided printed sheet describing the potential risks and benefits of early detection and treatment of prostate cancer (**Figure 2**). The content, which was developed from validated material determined to be important in shared decision making about prostate cancer screening,^{3,4,7,9,10} was reviewed and approved by our facility's patient education specialist. The pamphlet was written

in a question-and-answer format at a Fleisch–Kincaid grade level of 7, scored 67 on the Fleisch Reading Ease Scale,¹⁵ and was pretested for readability. Participants were not told that they would subsequently be surveyed about the information.

Patient Survey

Development and Administration

Seven to 10 days after their scheduled clinic appointments, all patients were mailed a survey to complete, along with a stamped, preaddressed return envelope. The survey was pretested for readability and content validity and was developed according to a modified Dillman method.¹⁶ It was written at a Fleisch–Kincaid grade level of 6.4 and scored 71 on the Fleisch Reading Ease Scale. Forms-on-Command software (Scanning Concepts, Inc., Minneapolis, MN) was used to create, print, and scan responses to the survey. Nonrespondents were sent up to two follow-up surveys. Participants returned completed surveys in the envelopes provided.

Measures

We assessed knowledge about early detection and treatment of prostate cancer by asking questions about 1) the natural history of prostate cancer, 2) the accuracy of prostate-specific antigen (PSA) testing, and 3) treatment efficacy. The primary outcome was the proportion of these three questions answered correctly.

We also asked three questions about 1) whether men had spoken with their physician about prostate cancer screening, 2) whether they believed men should be screened, and 3) what kind of treatment they would choose if they were to receive a diagnosis of prostate cancer. The choices of surgery and radiation were collapsed into an "early intervention" category for analysis and were compared with watchful waiting. We also asked respondents to provide demographic and clinical characteristics and to rate their health status.

Prostate-Specific Antigen Testing

We used the Veterans Information System and Technology Architecture (VISTA) database to determine whether patients had had PSA tests in the year before their scheduled appointments and in the year after the intervention. The PSA level closest to the scheduled appointment date was retained for analysis.

Statistical Analysis

We calculated sample size by detecting differences in the proportion of three knowledge questions answered correctly in the intervention and control groups. Assuming a 26% correct response rate per question (the rate report-

ed for the same questions in a previous study¹⁰) we sought to detect a 50% relative increase in knowledge (i.e., an increase in the rate of correct responses from 26% to 39% in the intervention group). To achieve a power of 80% and a significance of 0.05 (assuming a survey nonresponse rate of 25%), we calculated a sample size of 275 participants per group.

Baseline demographic and clinical characteristics of the participants in the two study groups were compared by using *t*-tests for continuous measures and Pearson chi-square tests for categorical measures. Pearson chi-square tests were used to examine the effect of the intervention on correct responses to each of the individual knowledge-related questions as well as patient beliefs about

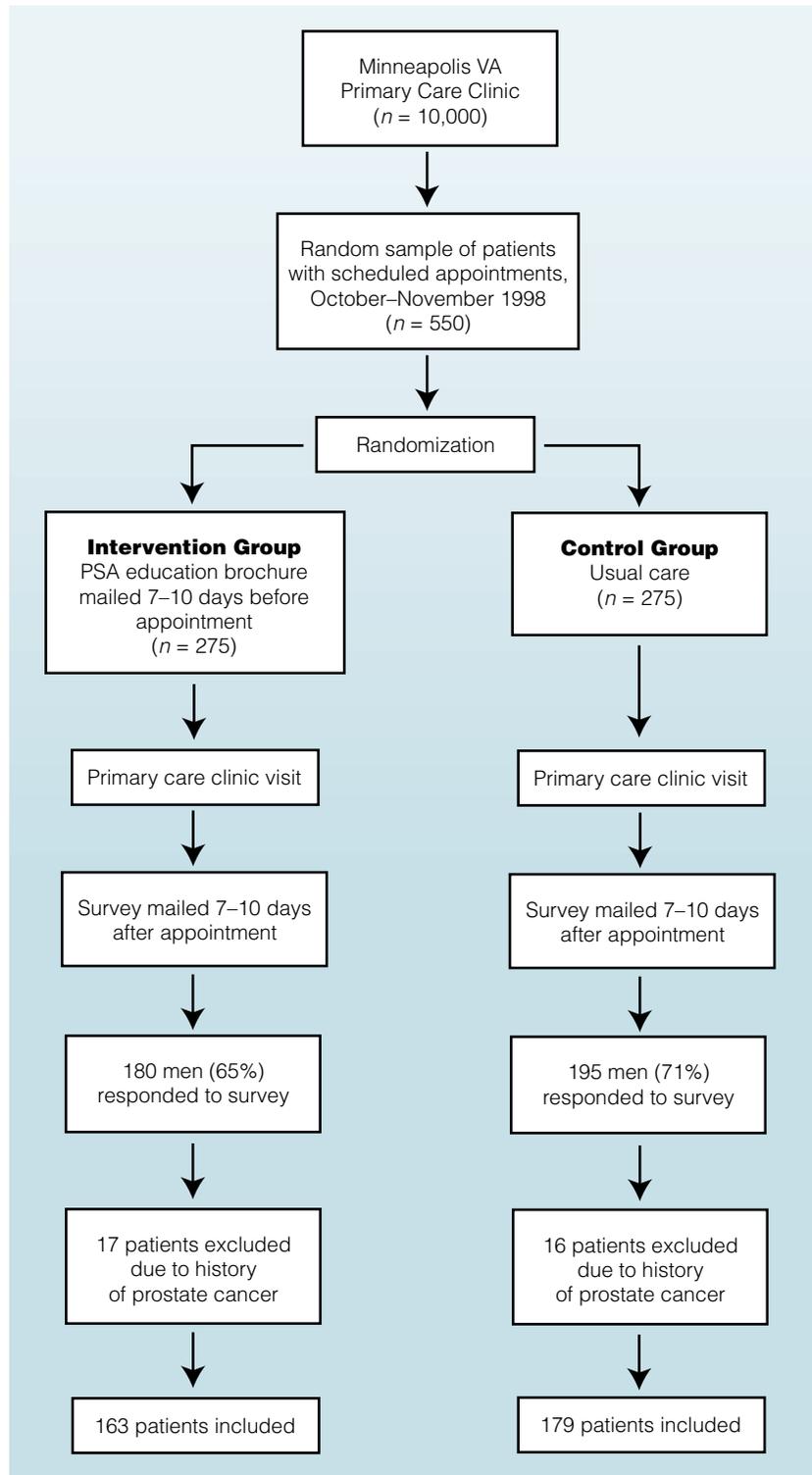


FIGURE 1. Study design.

PSA screening, PSA testing in the year after the intervention, and preferred treatment options.

Results

Patient Characteristics

Patient characteristics are described in Table 1. Participants were predominantly white and elderly. Most (68%) had at least a high school education. Many reported chronic conditions, and one half reported their health status as fair or poor. Almost one third had had a PSA test in the year preceding the index visit.

Men in the intervention group were 2.4 years older (mean age, 72.8 vs. 70.4; $P = 0.01$), were more likely to

report a history of benign prostatic hyperplasia (39% vs. 25%; $P < 0.01$), and reported somewhat worse health status (53% vs. 43% with "fair" or "poor" health; $P = 0.06$) than men in the control group. There were no other significant differences between the groups.

Knowledge

Table 2 shows that participants had limited knowledge about prostate cancer screening. Knowledge modestly improved in men who received the educational pamphlet (for perspective, Table 2 also summarizes the results of the 1996 videotape study by Flood and colleagues¹⁰). More men in the intervention group than in

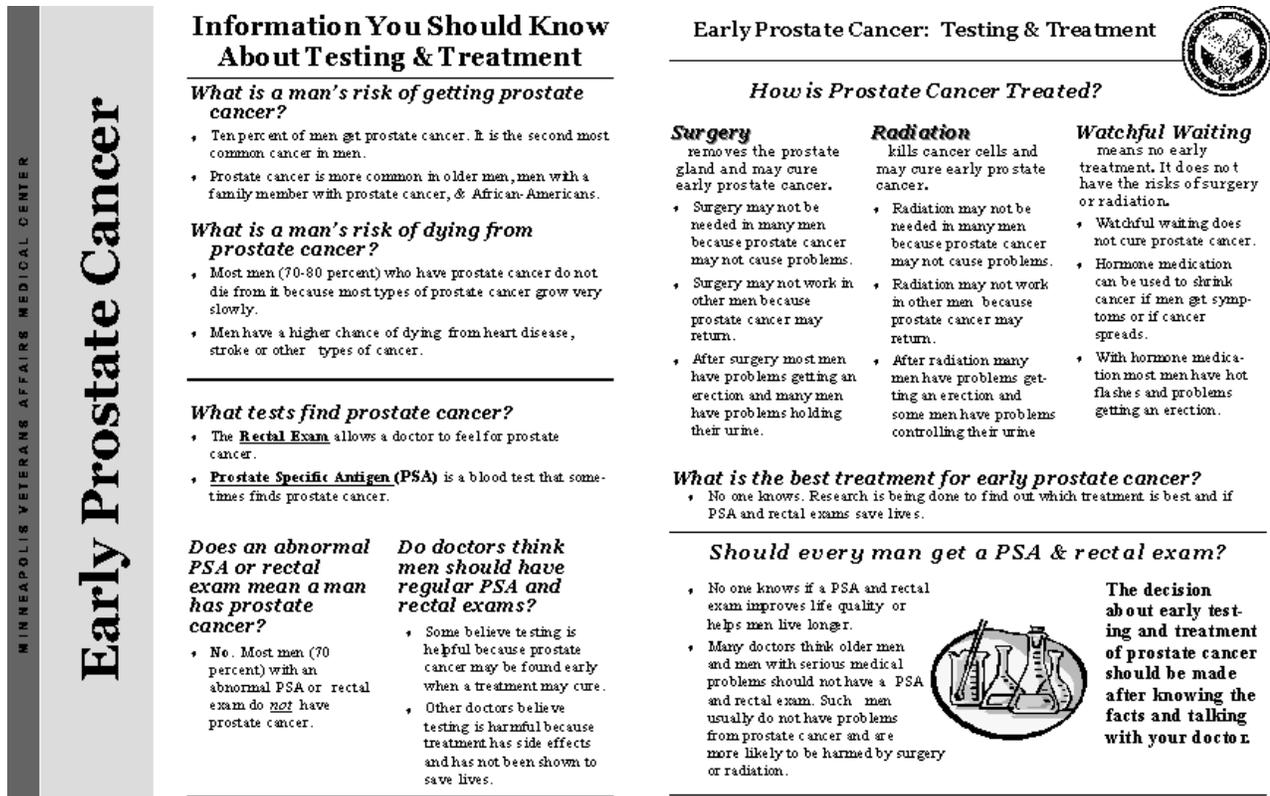


FIGURE 2. Informational pamphlet about early prostate cancer detection and treatment.

the control group correctly indicated that most men with untreated early prostate cancer will not die of the disease (32% vs. 24%; $P = 0.10$). More men in the intervention group were appropriately “not sure” whether surgery or radiation lengthened the lives of men with early prostate cancer (56% vs. 44%; $P = 0.04$). Finally, more men in the intervention group knew that most men with high PSA values do not have prostate cancer (46% vs. 27%; $P < 0.01$).

In terms of overall performance, 11% of men in the intervention group answered all three questions correctly compared with 4% of men in the control group (absolute increase, 7 percentage points [95% CI, 2 to 13 percentage points]). Similarly, the overall proportion of questions answered correctly was higher in the intervention group than in the control group (45% vs. 32%; absolute increase, 13 percentage points [CI, 6 to 19 percentage points]).

Screening Preferences and Counseling

Men’s preferences regarding screening and treatment are summarized in **Table 3**. Men in the intervention group were slightly less certain about recommending screening, slightly more likely to talk with their physicians about screening, and somewhat more likely to choose watchful waiting if they received a diagnosis of prostate cancer. Although most men in both the intervention group and control group “agreed” or “strongly agreed” that all men should undergo annual prostate

cancer screening (63% vs. 69%), more men in the intervention group were “not sure” about recommending screening (34% vs. 26%). These differences were not statistically significant ($P > 0.2$). Slightly more men in the intervention group reported talking with their physicians about prostate cancer testing at the index clinic visit (22% vs. 15%; $P > 0.2$). When asked the hypothetical question about what treatment they would choose if they ever received a diagnosis of prostate cancer, men in the intervention group were more likely to choose watchful waiting (46% vs. 35%; $P = 0.07$).

Prostate-Specific Antigen Testing Patterns

The percentage of men receiving a PSA test in the year after their index clinic visits did not differ significantly between the intervention and control groups (31% vs. 37%; $P > 0.2$). Overall, PSA testing did not change during the 2-year period. Thirty-one percent of men received a PSA test in the year before their index clinic visit, while 35% of men were tested in the year after the index visit ($P > 0.2$).

Because of their limited life expectancy, men who are in poor health or who are older than 70 years of age are less likely to benefit from screening (if a benefit exists). Thus, we were interested in learning whether knowledge, preferences, or PSA testing differed by age or health status.

Before their index visits, older and sicker men had rates of PSA testing similar to those of younger men or

TABLE 1
Characteristics of Study Population

VARIABLE	INTERVENTION GROUP (n = 163)	CONTROL GROUP (n = 179)	P VALUE
Demographic characteristics			
Mean age ± SD	72.8 ± 8.4 yr	70.4 ± 8.9 yr	0.01
White ethnicity	89%	91%	>0.2
High school graduate	65%	70%	>0.2
Comorbid conditions			
Heart disease	42%	41%	>0.2
Lung disease	19%	22%	>0.2
Diabetes	26%	33%	0.18
High blood pressure	43%	42%	>0.2
Any condition	82%	81%	>0.2
Self-reported health status			
Excellent, very good, or good	47%	57%	0.06
Fair or poor	53%	43%	
Prostate-related health information			
Family history of prostate cancer	14%	11%	>0.2
History of benign prostatic hyperplasia	39%	25%	<0.01
PSA test in past year	31%	31%	>0.2
Mean PSA level ± SD	2.3 ± 2.5 ng/mL	2.7 ± 4.0 ng/mL	>0.2

TABLE 2

Men's Knowledge about Prostate Screening and Treatment

QUESTIONS ASKED OF PATIENTS*	CURRENT STUDY		ABSOLUTE DIFFERENCE (95% CI)	1996 VIDEOTAPE STUDY†	
	INTERVENTION GROUP (n = 163)	CONTROL GROUP (n = 179)		VIDEOTAPE GROUP	CONTROL GROUP
Natural history of prostate cancer					
<i>How many men with early prostate cancer who do not receive surgery or radiation will die of this disease?</i>					
Most or all will	29%	43%		1%	8%
About half will	39%	33%		6%	51%
Most will not	32%	24%	8% (-2% to 19%)	93%	41%
Efficacy of prostate cancer treatment					
<i>Does treatment with surgery or radiation increase the length of life of men who have early prostate cancer?</i>					
Very or pretty sure it does	37%	50%		15%	76%
Not sure	56%	44%	12% (1% to 22%)	70%	24%
Very or pretty sure it does not	7%	5%		15%	0%
Predictive value of PSA					
<i>How many men with a high PSA level have prostate cancer?</i>					
Most or all do	17%	25%		6%	52%
About half do	38%	48%		22%	34%
Most do not	46%	27%	19% (7% to 31%)	72%	14%
Answered all three questions correctly	11%	4%	7% (2% to 13%)		
Proportion of three questions answered correctly	45%	32%	13% (6% to 19%)		

*Blue type indicates correct response. Item nonresponse was similar for each question in the intervention and control groups: natural history, 20 vs. 23 blanks; treatment efficacy, 9 vs. 10 blanks; and predictive value of PSA, 49 vs. 48 blanks.

†Reference 10.

men in better health. Thirty-one percent of men older than 70 years of age and 32% of men 70 years of age or younger received a PSA test ($P > 0.2$). In addition, 31% of men who reported their health as fair or poor received a PSA test, compared with 32% of men reporting their health as excellent, very good, or good ($P > 0.2$).

The intervention seemed to result in slightly lower rates of PSA testing in elderly patients and those reporting worse health status, although neither difference was statistically significant. Knowledge and preferences did not differ in men in poor health or men older than 70 years of age, compared with younger or healthier men.

TABLE 3

Men's Preferences and Practices for Prostate Cancer Screening or Treatment

VARIABLE	INTERVENTION GROUP (n = 163)	CONTROL GROUP (n = 179)	P VALUE
Counseling			
<i>Have you talked about early prostate cancer testing with your doctor?</i>			
			>0.2
No	33%	35%	
Yes, at my last clinic visit	22%	15%	
Yes, in the past year	16%	20%	
Yes, more than a year ago	16%	19%	
Not sure	14%	12%	
Screening belief			
<i>All men should undergo screening for prostate cancer at least once a year?</i>			
			>0.2
Strongly agree	26%	25%	
Agree	37%	44%	
Not sure	34%	26%	
Disagree	3%	5%	
Treatment preference			
<i>If you had early prostate cancer, what kind of treatment do you think you would choose?</i>			
			0.07
Surgery or radiation	55%	65%	
Watchful waiting	46%	35%	
PSA testing patterns			
<i>Had a PSA test in year after intervention</i>			
			>0.2
Men >70 years of age having PSA test	28%	37%	0.18
Men in poor or fair health having PSA test	29%	34%	>0.2

Discussion

Our findings show that men attending a VA medical center primary care clinic are poorly informed about the potential risks and benefits of early detection and treatment of prostate cancer. A mailed pamphlet may be a low-cost way to improve knowledge, enhance informed decision making, and increase adherence to evidence-based guidelines for prostate cancer screening. Because there is insufficient evidence to make a positive or negative recommendation regarding prostate cancer screening, guidelines focus on facilitating informed decision making by enhancing patients' knowledge about the potential benefits and known harms of early detection. Therefore, improved knowledge, rather than receipt of a PSA test, was the primary measure of the intervention's effectiveness.

Effectively counseling men about prostate cancer screening can be time-consuming and complex.¹⁷⁻²³ In our study, one third of men reported never talking with their physicians about prostate cancer screening.

In many of the remaining participants, the discussion may not have fulfilled criteria for informed decision making.^{7,24} Methods that deliver most of the information about screening separately from clinical encounters and encourage discussion with providers may be more feasible and effective on a large scale.

Despite their apparent effectiveness in enhancing knowledge and satisfaction¹⁰ as well as altering patient preferences,¹¹ informational videotapes and prepared scripts are not routinely used. Barriers to broad-based implementation include provider resistance; high cost of the educational intervention; logistic difficulties in securing space, time, and personnel; or a combination of these factors. Print materials have inherent appeal as educational tools because they can be produced and updated at relatively low cost and broadly and repeatedly dispersed with relative ease and efficiency. Mailed printed information may be a particularly effective tool for educating patients about prostate cancer, since many men have heard about prostate cancer testing or know of men with prostate cancer.²⁵

The magnitude of the effectiveness of our mailed pamphlet was smaller than that seen with shared decision-making videotapes¹⁰ or reading to patients from prepared scripts.^{11,25} An educational videotape shown to men before their clinic appointments improved knowledge more than the mailed pamphlet (Table 2).¹⁰ Men who watched the videotape were more likely to correctly answer each of the three knowledge questions than those who did not (absolute increase, approximately 50%). In contrast, our pamphlet resulted in absolute increases of approximately 10 to 20 percentage points. Although 70% of the men in our study indicated that they received the pamphlet, it is possible that some did not actually read it. In addition, the mailed pamphlet, unlike the videotape and prepared scripts, did not affect PSA testing rates in the overall cohort or in specified subgroups.

Differences in patient populations and assessment methods make direct comparisons between studies difficult. In contrast to our study, patients receiving the printed script or videotape interventions were informed that they would be queried about the material presented and were questioned immediately after the intervention. In the study by Flood and colleagues,¹⁰ patients were assigned to the intervention group on the basis of their physician encounters rather than by random allocation. Unlike our intervention (written at a 7th-grade level), previously reported information sheets and educational scripts were written at the 12th-grade level and therefore are not appropriate for patients with low literacy.^{11,26}

Because of the relatively indolent course of prostate cancer and the morbidity associated with early detection and treatment, testing is generally not recommended for men with a life expectancy of fewer than 10 years.^{7,27} Despite this, we found high rates of PSA testing in men older than 70 years of age and in men with several comorbid conditions who reported their health status as fair or poor. Furthermore, as in other studies, testing rates in these groups were similar to those in younger, healthier men.²⁸ Nearly 30% of men who were older than 70 years of age, men who reported poor to fair health status, or both had had a PSA test within the past year.

In conclusion, men are poorly informed about the potential risks and benefits of prostate cancer detection and treatment. A mailed pamphlet is a low-cost method that may modestly improve men's knowledge about potential risks and benefits of early detection and treatment of prostate cancer. A mailed intervention may improve implementation of prostate cancer screening guidelines, which recommend enhancing informed decision making by educating patients about the pros and cons of early detection.

Take-Home Points

- Although guidelines recommend that physicians inform men about the potential benefits and known harms of prostate cancer screening, the most efficient way to communicate this information is not known.
- We conducted a randomized trial to learn whether an educational pamphlet mailed to men before their primary care clinic appointments improved their knowledge about prostate cancer screening.
- Although men receiving the mailed pamphlet had somewhat more accurate knowledge than men in the usual care group, both groups were poorly informed.
- A mailed educational pamphlet may be a low-cost method to improve knowledge and allow informed decision making.

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