

## Intention to test for prostate cancer

Gunilla Berglund <sup>a,\*</sup>, Sten Nilsson <sup>b</sup>, Karin Nordin <sup>a</sup>

<sup>a</sup> Department of Public Health and Caring Sciences, Uppsala University, Uppsala Science Park, SE-751 83 Uppsala, Sweden

<sup>b</sup> Department of Oncology, Radiumhemmet, Karolinska Sjukhuset, SE-171 76 Stockholm, Sweden

Received 4 October 2004; received in revised form 5 January 2005; accepted 27 January 2005

Available online 17 March 2005

### Abstract

The aim of this study was to assess intention among men to take a prostate-specific antigen (PSA) test, when this test was: (i) offered by a doctor or (ii) based on the men's own initiative. A further aim was to use the Theory of Planned Behaviour (TPB) to predict the most important determinants for taking a PSA test. In addition, the intention to take a PSA test among men who had the opportunity to read a PSA leaflet published by the Swedish Cancer Society was compared with men who had not read the leaflet. A total of 1000 men, age range 40–70 years, were selected randomly from a population database. The TPB model was used to measure attitudes about PSA testing. The constructed questionnaire was posted to the selected sample. Half of the sample received only the TPB questionnaire and the other half also received a PSA leaflet. The response rate was approximately 63%. The results showed that men would be less likely to request a PSA test if their doctor did not suggest the test (mean  $\approx$  3.8 (range 1–7 from not likely to very likely)). However, if they were offered the test, most would take it (mean  $\approx$  6.0 (range 1–7)). The positive 'Attitude factor' towards the test was the most salient predictor of both behaviours. In addition, the probability of requesting a test was higher among those who had already taken a PSA test. The men who did not receive the PSA leaflet reported a higher intention to take the test than those who had received it. Overall, 47% of the variance was explained concerning men's intention to take a PSA test when offered by a doctor and 25% of men's intention to request the PSA test themselves. In conclusion, the majority of men in this study had a positive attitude towards PSA testing. The results indicate that most men could be expected to accept screening. The intention to take the PSA test was lower among the men who had received the PSA leaflet.

© 2005 Elsevier Ltd. All rights reserved.

**Keywords:** PSA test; Prostate cancer; Theory of Planned Behaviour; Intention; Informative leaflet

### 1. Introduction

Prostate cancer in men is the most frequently occurring cancer in the world. In Sweden, it is the major cause of cancer-related deaths. The reported incidence of prostate cancer in Sweden increased substantially after 1997. It is reasonable to assume that this increase was largely due to the application of the prostate-specific antigen (PSA) test. The mean age at time of diagnosis in men is 73 years [1].

#### 1.1. PSA test

PSA is a natural protein found in healthy men. The PSA test is a simple blood test, carried out on a blood sample taken from the arm. A low value ( $<4$  ng/ml) is considered normal, whereas a high value indicates that something is abnormal in the prostate, though it does not necessarily mean cancer is present [2]. In a study performed in a primary care setting, male patients' ( $n = 160$ ) knowledge was assessed concerning the advantages and disadvantages of the PSA test. The majority of patients could not identify the most salient pros and cons of the test [3]. The result was somewhat better among university graduates [3]. In two studies, patients

\* Corresponding author. Tel.: +46 18 471 63 11/611 2256; fax: +46 18 471 34 90/506 404.

E-mail address: [gunilla.berglund@pubcare.uu.se](mailto:gunilla.berglund@pubcare.uu.se) (G. Berglund).

were informed about the advantages and disadvantages of the PSA test before deciding whether to take the test [4,5]. In one of these studies [4], 160 men without known prostate cancer were randomised either to a group in which information about the PSA test was given via video or to a control group. The results indicated that information about the test resulted in increased knowledge and decreased interest in taking the PSA test. In the other study [5] on the pros and cons of the PSA test, patients in an intervention group were given the opportunity to read a short informative leaflet about PSA. It was found that this type of information also decreased patients' interest in taking the PSA test.

In an Australian study 670 men between the ages of 40 and 80 years who took a PSA test were asked how they perceived the test and about the possible advantages this test had for them. The response rate was 60%. Approximately half of the men (43%) had taken a PSA test during the past 5 years. Most individuals took the test based on a doctor's recommendation or because they were influenced by the mass media [6]. More than one-third (38%) of the tested men had had no previous discussion about the test with their doctor, while 17% had received written information about the test. Half of the tested men were highly convinced about the advantages of the PSA test [7]. In another study, questionnaires that consisted of 15 items about the PSA test were posted to patients 2 weeks after having received their PSA test results. More than 50% of the participants were unaware of having taken a PSA test and had never heard of it. The only predictor of PSA knowledge was level of education [6].

In Sweden, 'wild' screening of prostate cancer is carried out, i.e., PSA tests are done on men who are free of symptoms during ordinary medical examinations. Probably because of early detection, the prevalence of prostate cancer has increased 2.7% over the past 10 years [8]. PSA testing seems to be more frequent in the south of Sweden and in Uppsala, than in the rest of the country. Those who are more active in tracing the disease are also more prone to treat it radically with surgery or radiation [9]. For example, in Gothenburg, the argument for screening is to offer many patients curative treatment. Therefore, the PSA cut-off level was decreased from 4 to 3 ng/ml. Consequently, the incidence of prostate cancer increased to 30% of the studied sample [10]. This finding is in accordance with a Dutch study performed between 1989 and 1995 ( $n = 4344$ ), showing that the prevalence of prostate cancer increased, which was due to the detection of localised tumours. In addition, treating prostate cancer with radical prostatectomy and radiation was found to increase side-effects [11]. Thus, the issue of screening for prostate cancer is controversial, owing mainly to the lack of consensus about when prostate cancer treatment is indicated.

In conclusion, PSA testing increases the incidence of prostate cancer. This is especially true if a decreased PSA value is used for screening. There is a risk of over-diagnosing. Overall survival is not improved by curative treatments such as radical prostatectomy and radiation.

Attitudes have generally been shown to be insufficient in predicting behaviour in a specific situation. Thus in 1977, Ajzen and Fishbein [12] developed the Theory of Planned Behaviour (TPB) based on the assumption that the *intention* to behave is a strong determinant of behaviour [13]. According to this view, the stronger the intention the higher the probability of the behaviour occurring. The intention could be predicted from three conceptually different independent variables: attitudes, subjective norms and perceived control.

Attitudes were assessed in two ways, both in general and as belief-based attitudes. General attitudes are conceptually independent of what specific intention to behave is considered, such as good–bad, ... e.g. PSA-test. 'Belief-based attitudes' are the imaginations of the individual concerning outcome probability of the behaviour multiplied by an evaluation of it. The imagination about possible outcomes of behaviour varies depending on the particular population being studied. Thus, imagination about potential outcomes should be assessed in a pilot study, in which some members of the population are interviewed. Subsequently, the most salient and frequent imaginations are used in the construction of a questionnaire, which is then applied to the whole population.

'Subjective norms' are perceived social pressures from significant others about the appropriateness of the behaviour multiplied by the person's own motivation to consider their opinion. 'Perceived control' focuses on possible impeding and facilitating factors. Subjective norms and perceived controls are also mapped in the pilot study in the target sample and included in the questionnaire. With TPB, it is possible not only to determine what are the attitudes about a certain subject, but also which variables are the strongest predictors of the intention to behave. This is performed using regression analyses.

The aim of the present work was to assess the intention to take a PSA test among men (age range 40–70 years) when this test is: (i) offered by a doctor or (ii) based on the men's own initiative. A further aim is to use TPB to predict which attitudes (beliefs, outcomes), subjective norms (opinions of significant others, own motivation) and perceived control (obstacles, facilitating factors) are the most important for taking a PSA test. In addition, education, PSA leaflet (yes/no), history of PSA test and age will be examined to determine whether they can explain additional variance. Finally, the intention to take a PSA test among men who had the opportunity to read the PSA leaflet, *Good to Know About PSA*, published by the Swedish Cancer Society, will be compared with men who did not have this opportunity.

## 2. Patients and methods

### 2.1. Participants

A total of 1000 men (age range 40–70 years) were selected randomly from a population-based database and sent the questionnaire. The first 500 men received the TPB questionnaire only and the second 500 also received the PSA leaflet. We applied this simple approach so that the random selection procedure indicated no systematic characteristics (e.g., order of age or regions). Hence, there was no need to randomise an already random sample.

The response rate was 63% among the informed group and 62% among the non-informed group. All data reported hereafter are based only on responders. The mean age of the informed group was 53.5 years (range 39–70 years) and 54.3 years (range 39–70 years) for the non-informed group. Most responders (67%) were married: 15% were cohabitants, 14% were single (widowers included) and 4% had a partner living separately. The most common level of education was elementary school (33%), followed by university studies (25%), junior secondary school (22%) and upper secondary school (20%). A minority of the men (13%) had taken a PSA test sometime in the past, whereas 76% had never taken the test and 11% were unaware of whether they had ever taken the test. There were no significant differences between the groups ( $\chi^2$  test and  $t$ -test) in these variables.

### 2.2. Statistical methods

Differences between two means for parametric data were assessed using Student's  $t$ -test for unpaired data [14]. Statistically significant differences were assumed when  $P < 0.05$ .

In order to facilitate data analysis, items were grouped together by a statistical method known as explorative factor analysis and combined into three new items (factors) representing belief-based attitude indexes, attitudes and perceived behavioural control. All items in a factor had loadings  $\geq 0.4$  on a scale of 0–1 and all factors had eigenvalues of at least 1.

Correlation and stepwise forward regressions were used to determine the association between the belief-based and the direct measures of attitude, subjective norms and perceptions of behavioural control. Intention to take a PSA test if: (i) offered by a doctor or (ii) based on the men's own initiative was predicted by the following independent variables: attitudes, belief-based measures of attitudes and subjective norms.

### 2.3. The questionnaire based on TPB [16] (see Appendix A for an overview)

#### 2.3.1. Intention to behave

Two intentions to behave (degrees of probability scored on a 7-point scale) were examined: accepting a PSA test when it is offered by a doctor and requesting PSA testing oneself. The former intention refers to when a doctor, e.g., in connection with a regular medical examination proposes a PSA test. The latter refers to when men themselves request the test without any suggestion from health professionals.

#### 2.3.2. Attitudes/salient beliefs

Seven direct 'Attitude' items: good/bad multiplied by necessary/unnecessary formed the 'Attitude factor'.

In addition, the instrument comprised 13 study-specific 'belief-based attitudes'. Each item was rated on two dimensions (probable/improbable multiplied by good/bad). The products were grouped in four factors: (i) feelings of *insecurity* (4 items); (ii) opinion

Table 1

Exploratory factor analysis of participants' *belief-based attitudes* (probability<sup>1</sup> × evaluation<sup>2</sup>)

| Items                    | Insecurity Eigenvalue = 3.2 | Prognosis Eigenvalue = 2.4 | Consequences Eigenvalue = 1.3 | Diagnosis Eigenvalue = 1.1 |
|--------------------------|-----------------------------|----------------------------|-------------------------------|----------------------------|
| Incorrect test           | <b>0.70</b>                 | 0.13                       | 0.16                          | −0.10                      |
| Distressing              | <b>0.64</b>                 | −0.08                      | 0.01                          | −0.18                      |
| False security           | <b>0.67</b>                 | 0.06                       | 0.07                          | 0.06                       |
| Insurance problems       | <b>0.76</b>                 | 0.02                       | 0.09                          | 0.03                       |
| Become cured             | −0.05                       | − <b>0.70</b>              | −0.09                         | −0.14                      |
| Early diagnosis          | −0.06                       | − <b>0.56</b>              | 0.09                          | −0.39                      |
| Safe if low PSA value    | −0.005                      | − <b>0.75</b>              | 0.09                          | −0.00                      |
| Free choice of treatment | −0.05                       | − <b>0.76</b>              | 0.10                          | 0.06                       |
| No cure                  | 0.38                        | 0.10                       | <b>0.47</b>                   | −0.30                      |
| Impotence                | 0.06                        | −0.13                      | <b>0.91</b>                   | −0.09                      |
| Incontinent              | 0.15                        | −0.07                      | <b>0.89</b>                   | −0.09                      |
| Know diagnosis           | 0.05                        | −0.17                      | 0.13                          | − <b>0.88</b>              |
| Doubtful diagnose        | 0.12                        | −0.17                      | 0.11                          | − <b>0.87</b>              |
| Variance                 | 0.16                        | 0.16                       | 0.15                          | 0.14                       |

**Bold values** indicate the items included in that factor.

<sup>1</sup>7 point scale from probable to improbable.

<sup>2</sup>7 point scale from good to bad; 61% of the variance was explained.

regarding *prognosis* (4 items); (iii) fear of *consequences* (3 items); (iv) attitude towards *early diagnosis* (2 items) (Table 1).

The instrument also included two aspects of ‘subjective norms’; each normative subject (wife/cohabitant, children, doctors, friends and siblings) was multiplied by the motivation to comply with the referent. In the present study the subjective norm index was by multiplying only the strongest existing opinion about taking a PSA test among the significant others with the probability of adherence to that person’s recommendation.

‘Perceived behavioural control’ consisted of issues that would facilitate taking a PSA test. They formed one single factor. Thus, perceived behavioural control was defined as the sum of the eight items.

Several demographic variables were also included in the final version of the questionnaire, comprising age, education level, civil status and whether the person had previously taken a PSA test.

#### 2.4. PSA leaflet

The first 500 men received the PSA leaflet, *About the PSA Test*, published by the Swedish Cancer Society [2]. This is the information most usually available in all Swedish Urology clinics. This brief leaflet is impartial, providing an overview of the prostate and its function, prostate cancer, PSA testing, early detection, and pros and cons involved in taking the test. The two pros were ‘good to know if the value is low’ and ‘prostate cancer can be detected early, treated and cured or controlled. Lives can be saved or extended’. The three cons were: ‘lulled into false security’, ‘increase the cancer anxiety in spite of a normal result’ and ‘early detection might en-

force treatment and lead to a deterioration in quality of life even when the man doesn’t notice his disease. There are no precise analyses or methods to decide whether treatment is needed’.

#### 2.5. Procedure

Pilot studies were performed along the lines of the TPB model. Firstly, an interview guide was elaborated upon regarding current research issues. Secondly, four men selected from the target population were interviewed about their salient belief-based attitudes and perceived behavioural control associated with taking the PSA test. Two of the men were instructed to read the PSA leaflet before the interview, whereas the other two received only a brief description of the PSA test before it was administered. Thirdly, a preliminary questionnaire was constructed based on the four interviews and then tested on 20 men between 45 and 65 years of age. Fourthly, these data were used in constructing the final questionnaire. This instrument was posted to participants, followed by two reminders and with the reward of a lottery ticket for replying.

### 3. Results

#### 3.1. Intention to behave (range 1–7)

The probability of a person taking a PSA test if offered was high (mean = 6.1, SD = 3.4). The probability scale ranged from 1 to 7. In contrast, men’s mean intention to request a PSA test was found to be only 3.4

Table 2

The results of the stepwise multiple regression analysis in predicting attitude from factors of salient belief based attitudes (probability × evaluation)

| Belief factors | BETA  | R <sup>2</sup> | R <sup>2</sup> change | F-value  |
|----------------|-------|----------------|-----------------------|----------|
| Prognosis      | 0.36  | 0.19           | 0.19                  | 144.46** |
| Diagnosis      | 0.18  | 0.21           | 0.02                  | 18.90*   |
| Insecurity     | −0.05 | 0.21           | 0.00                  | ns       |

\*  $P < 0.05$ .

\*\*  $p < 0.01$ .

Table 3

Final step (4) of hierarchical regressions predicting the participants’ intention to take a PSA test when they are offered the test

| STEP 4             | BETA  | R <sup>2</sup> | R <sup>2</sup> change | F-value |
|--------------------|-------|----------------|-----------------------|---------|
| Attitude           | 0.57  | 0.42           | 0.42                  | 425.1** |
| Subjective norm    | −0.18 | 0.45           | 0.03                  | 34.2**  |
| Education          | 0.11  | 0.46           | 0.01                  | 12.4**  |
| Perceived control  | −0.09 | 0.47           | 0.01                  | 8.2**   |
| PSA leaflet yes/no | 0.07  | 0.48           | 0.00                  | 5.0*    |

\*  $P < 0.05$ .

\*\*  $P < 0.01$ .

Table 4

Final step (5) of hierarchical regressions predicting participants' intention to request a PSA test themselves

| STEP 5          | BETA  | R <sup>2</sup> | R <sup>2</sup> change | F-value |
|-----------------|-------|----------------|-----------------------|---------|
| Attitude        | 0.29  | 0.13           | 0.13                  | 92.78** |
| History of PSA  | 0.28  | 0.23           | 0.09                  | 70.30** |
| Age             | 0.11  | 0.24           | 0.01                  | 7.97*   |
| Subjective norm | −0.09 | 0.24           | 0.01                  | 5.42*   |

\*  $P < 0.05$ .\*\*  $P < 0.01$ .

(SD = 2.0). The difference between these two conditions is  $t(619) = 33.9$ ,  $P < 0.01$ .

### 3.2. Belief-based attitudes as the basis for formation of attitudes

A further analysis was performed using regression analysis in order to determine whether the belief-based attitudes (prognosis, diagnosis, negative consequences and insecurity) could predict Attitude. 'Prognosis' explained 19% of the variance and 'diagnosis' another 2%. 'Insecurity' and 'negative consequences' were insignificant predictors of attitude (Table 2).

### 3.3. Intention to take a PSA test if offered one

Table 3 presents the hierarchical regression analyses for the prediction of intention to take a PSA test if the doctor offers the test. As suggested in TPB, attitudes were assessed in two ways, both directly and as belief-based attitudes. Since the assessment of direct attitude explained more of the variance, the measure of belief-based attitude was not used in the final analyses. For the prediction of intentions, attitude and subjective norms were entered into the first step. Perceived behavioural control was entered into the second step. Education level was entered into the third step and history of PSA into the fourth step. The PSA leaflet of the Swedish Cancer Society (yes/no) was the sixth step and finally, age was entered into the seventh and final step (n.s.) (Table 3). The  $\beta$  values of the subjective norms and perceived behavioural control variables are negative, which is due to the direction of these scales. A higher value of subjective norms indicates that the opinions of significant others are less important as well as indicating a lower level of compliance with their opinions. Likewise, in perceived behavioural control a high value indicates no facilitation in performing that particular behaviour.

Attitude was the most important predictor, explaining 42% of the variance. The rest of the model comprised subjective norms, education (i.e., higher education was related to higher intention), perceived behavioural control and the PSA leaflet (yes/no) explained another 6% (Table 3).

### 3.4. Intention to request a PSA test themselves

Another hierarchical regression analysis was performed to predict the men's own intention to request a PSA test. The five steps in this analysis were as follows: attitude and subjective norms perceived control, history of PSA testing, education, the PSA leaflet (yes/no) and age. The variables attitude, history of PSA, age and subjective norms explained 25% of the variance. Perceived control, the PSA leaflet (yes/no) and education had no predictive value. When the participants were divided into two age groups (<55 and  $\geq 55$  years), the younger group exhibited a lower intention to request a PSA test themselves,  $t = 4.64$ ,  $P < 0.05$ ; means for the younger and older groups were 3.1 (SD = 1.8) and 3.8 (SD = 2.1), respectively. The intention to take a PSA test among men who had already taken such a test (mean ( $n = 76$ ) = 5.32) was higher than among men who did not have this experience (mean ( $n = 540$ ) = 3.15,  $t = 9.58$  (614),  $P < 0.01$ ).

### 3.5. PSA leaflet (yes/no) and intention to take a PSA test

The intention (range 1–7) to take a PSA test when it is offered by a doctor differed significantly between the PSA leaflet group (mean = 5.9, SD = 1.6) and the no PSA leaflet group (mean = 6.4, SD = 1.1),  $t = -4.6$ ,  $P < 0.05$ . This finding indicates that the informed men, in comparison with the non-informed men, had a decreased intention to take a PSA test if they were offered the test. In contrast, there was no significant difference between PSA leaflet 'yes' versus 'no' participants with respect to requesting a PSA test themselves (Table 4).

## 4. Discussion

Most of the men in this study intended to take a PSA test if the doctors offered it, but would not request it themselves. 'Attitude' was the main predictor of the intention to take a PSA test, both when offered and when requested. In contrast, 'history of PSA testing' predicted only requesting the test. The PSA leaflet decreased the intention when the test was offered.



Methodologically, the TPB model explained a reasonable amount of variance in the intention to take a PSA test when a doctor recommends such a test. However, only a small proportion of variance was explained in men's intention to request the test themselves. This means that most predictors of the latter intention were not measured in this study. It is assumed that this difference in predicting intentions is not due to the model but to its application. Thus, we interviewed participants during the pilot study about taking a PSA test without differentiating between whether the test was suggested by a doctor and whether it was men's intention to request the test themselves. We should have made additional questions concerning requests. The proneness of the intention to request could be related to several factors, including perceived personal risk, self-efficacy, knowledge, the general opinion of a doctor's role (paternalistic or not), cancer in the family, history of health behaviour and cancer anxiety.

An advantage of the TPB model is that it studies situation-specific salient belief-based attitudes, i.e., the perceived consequences of the behaviour. The methodology of interviewing subjects from the target population is essential in obtaining salient data for questionnaire construction. In the present study, the most salient attitude factor was the prognosis (e.g., early diagnosis, cure, safe if low PSA, free choice of treatment). Its function seems to be an assurance. However, patients generally did not believe in the negative consequences of the test. In spite of this, the leaflet published by the Swedish Cancer Society [2] decreased the participants' intention when the PSA test was offered. Such a decrease, which is due to the new information, is consistent with other studies [4,5]. Although this difference in intention appears small from a clinical perspective, it is important to distinguish between possibly insightful intentions as compared with uninformed intentions. Thus, the functions of the intentions could be different in the PSA leaflet 'yes' versus 'no'.

The PSA leaflet is 14 pages long and is vague. It concludes about pros and cons for men free of symptoms: 'treatments might deteriorate quality of life'. However, if you read all the 14 pages you will find more information, i.e., 'the risk of erectile dysfunction is considerable as a consequence of surgery and radiation.' Thus, the core issue of the problem with PSA testing is more or less avoided. For the reader this means insufficient opportunity to make an appropriate informed decision, weighing pros and cons, with respect to PSA testing. In spite of this vague information, a significant difference was found between the groups. It could be assumed that more detailed information would have implicated a major difference between groups.

Most of the men did not intend to request the PSA test themselves, even if they knew of its existence and believed in the curative effect of the treatments available. Whether this depends on a low perceived personal risk in these cases or, for example, on avoidance of a stressful situation, are questions for future research. The PSA leaflet had no effect self-initiated requests. It is probable that because the level of intention based on self-initiated request was low, obtaining a further decrease with the informative leaflet would be unlikely because of limits in the amount of change that can be reflected in the measurement device [17]. As expected, 'history of PSA testing' was a predictor of requesting PSA but not of complying with doctors' recommendations. This shows the necessity and difficulty of being very situation-specific in applying the TPB model.

In contrast, most of the men intended to take the PSA test if the doctor offered them the test. Thus, the doctor is the necessary 'cue' for the intention to take the test and probably has an important role in the increase in 'wild screening'.

There are at least two additional plausible interpretations, besides the poor quality of the PSA leaflet, as to why men believe in the benefit of treatment via PSA testing as much as they do. First, patients might make their decisions step by step. When taking the test they hope for a negative result. They might not yet have decided what they would do in case of a positive result. A second interpretation relates to the idea that the possibility of being cured outweighs any negative effects of treatment.

In conclusion, TPB was a helpful model to understand men's intention to take PSA tests. Most of the men intended to take the PSA test if the doctor offered it to them, but fewer patients would request it themselves. 'Attitude' was the main predictor of both the intention to take a PSA test when such a test is recommended by a doctor and by self-initiated request. In contrast, 'history of PSA testing' predicted only the latter intention. Patients who received the most widely available Swedish informative leaflet about the PSA test had a lower degree of intention than patients who did not receive the leaflet.

The real impact of the finding is that uninformed men could be expected to accept participation in screening to a higher degree than informed men. Therefore, it becomes a moral issue to profoundly inform prostate cancer patients of the pros and cons of PSA testing as an ignorant decision could be against their well-informed wish.

#### **Conflict of interest statement**

None declared.

## Acknowledgements

This study was made possible by a grant from the Swedish Cancer Society. The authors wish to thank Professor Lars Åberg in the Department of Psychology, Uppsala University for his generosity in explaining the Theory of Planned Behaviour, for constructing measurements and for analysing the data.

## Appendix A

### General questions:

Age

Family situation

Education level

Two intentions to take a PSA test:

1. when recommended by a doctor
2. on the individual's own request

### Seven 'Attitude' items:

*Do you consider the PSA test to be ... (7-point scale):*

1. good/bad
2. important/unimportant
3. wise/unwise
4. necessary/unnecessary
5. unproblematic/problematic
6. reassuring/worrying
7. certain/uncertain

### Belief-based attitude items:

*Probable/improbable (7-point scale)*

### Consequences of PSA testing:

*If you took a PSA test to examine whether you have prostate cancer, you would:*

1. know if you have prostate cancer
2. know that you *might* have prostate cancer
3. receive an incorrect test result
4. be cured of prostate cancer
5. be lulled into a false sense of security if the test shows that you have no increased PSA value
6. have difficulties with your health or pension insurance
7. know that you have prostate cancer long before you exhibit symptoms
8. have to live with a disease that is impossible to cure
9. be offered a treatment that can make you impotent
10. be offered a treatment that can make you incontinent
11. feel safe if you have a low PSA value

12. have a free choice between active treatment and observation if you have prostate cancer.

*Your opinion about the consequences of taking a PSA test:*

*Good/bad on a 7-point scale:*

1. know if you have prostate cancer
2. know that you *might* have prostate cancer
3. receive an incorrect test result
4. be cured of prostate cancer
5. be lulled into false security if the test shows that you have no increased PSA value
6. difficulties with your health or pension insurance
7. know that you have prostate cancer long before exhibiting symptoms
8. having to live with a disease that is impossible to cure
9. be offered a treatment that can make you impotent
10. be offered a treatment that can make you incontinent
11. feel safe if you have a low PSA value, have a free choice between active treatment and observation if you have prostate cancer.

### Subjective norms:

*(Significant others include wife/cohabitant, children, doctors, friends and siblings).*

1. The opinion of significant others on your taking the PSA test (5-point scale)
2. How probable is it that you will consider their opinion (5-point scale).

*Perceived control: 7-point scale from 'yes, absolutely' to 'no, absolutely not'.*

*What would facilitate your taking a PSA test?*

1. it could be done during working hours
2. an appointment is made for the test
3. the test is free of charge
4. a close relative suffers from prostate cancer
5. taking the test could contribute to research in detecting and treating prostate cancer
6. the genetic risk is high
7. the test is reliable
8. the test is not physically harmful.

## References

1. *Prostatascancer – Primärregistrering 1996–2000*. Uppsala, National Board of Health and Welfare, 2001.
2. Wallskär H. *Cancerfonden: OM PSA-TEST*. Stockholm, Sweden, Tematryck AB, 2000.

3. O'Dell K, Volk R, Cass A, et al. Screening for prostate cancer with the prostate-specific antigen test: are patients making informed decisions. *J Family Pract* 1999, **48**(9), 682–688.
4. Volk R, Cass A, Spann S. A randomized controlled trial of shared decision making for prostate cancer screening. *Arch Fam Med* 1999, **8**(4), 333–340.
5. Wolf A, Schorling J. Preferences of elderly men for prostate-specific antigen screening and the impact of informed consent. *J Gerontol-Series A, Biol Sci Med Sci* 1998, **53**(3), 195–200.
6. Diefenbach P, Ganz P, Pawlow A, et al. Screening by the prostate-specific antigen test: what do the patients know. *J Cancer Educ* 1996, **11**(1), 39–44.
7. Slevin T, Donnelly N, Clarksson J, et al. Prostate cancer testing: behaviour, motivation and attitudes among Western Australian men. *Med J Australia* 1999, **171**(4), 185–188.
8. *Cancer incidence in Sweden 1997*. Stockholm, National Board of Health and Welfare, 1999.
9. Sandblom G, Mattsson E, Nilsson J, et al. Prostate cancer registration in four Swedish regions 1996. *Scan J Urol Nephrol* 1999, **33**, 306–311.
10. Lodding P, Aus G, Bergdahl S, et al. Characteristics of screening detected prostate cancer in men 50 to 66 years old with 3 to 4 ng./ml. Prostate specific antigen. *J Urol* 1998, **159**(3), 899–903.
11. Spapen S, Damhuis R, Kirkels W. Trends in the curative treatment of localized prostate cancer after the introduction of prostate-specific antigen: data from the Rotterdam Cancer Registry. *BJU Int* 2000, **85**(4), 474–480.
12. Ajzen A, Fishbein M. Attitude-behaviour relations: a theoretical analysis and review of empirical research. *Psychol Bull* 1977, **24**, 207–224.
13. Ajzen I. *Attitude, personality and behaviour*. Milton Keynes, Open University Press, 1988.
14. Howell DC. *Statistical methods for psychology*. third ed. Belmont (CA), Duxbury Press, 1992.
16. Ajzen I, Madden T. Prediction and goal-directed behavior: attitudes, intentions and perceived behavioral control. *J Exp Soc Psychol* 1986, **22**, 453–474.
17. Kazdin A. *Research design in clinical psychology*. Philadelphia, Harper & Row, 1980.