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Prostate Cancer Screening and Health Beliefs: A Turkish Study of Male Adults

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ABSTRACT

Objective: Attitudes and beliefs of people affect health behaviors. Understanding the individual experiences with regard to prostate cancer (PCa) and PCa screening of the participants is important. Thus, researchers and health professionals can take advantage of the results obtained to make an attempt to increase the participation in PCa early diagnosis services. The aim of this research is to determine the personal attitudes and beliefs of Turkish men related to PCa and screening.

Materials and Methods: The study design was a cross-sectional survey of 650 Turkish men, 40 years old and older. Data were gathered using the Prostate Cancer Screening–Health Belief Model Scale, a knowledge test for prostate cancer screening, the International Prostate Symptom Score questionnaire, and a researcher-developed personal information form. A correlation and logistic regression analysis (LRA) were used for evaluation.

Results: It was determined that the knowledge score had a strong positive correlation with the symptom score and the seriousness perception and that it had a poor positive correlation with the susceptibility and the benefit perceptions. The prostate symptom score had a strong positive correlation with the susceptibility, seriousness, and motivation perception. It was determined that age (OR=1.057, 1.017–1.099 CI [confidence interval] 95%), a higher symptom score (OR=0.21; 0.009–0.050 CI 95%), and a history of prostate problem in the family (OR=1.086; 1.037–1.137 CI 95%) affected getting an examination in the past.

Conclusion: Age, the education level, a prostate symptom score, family history of prostate problems, and motivation perceptions have been found to be important predictors of men's PCa screening behavior.

Keywords: Prostatic neoplasms, mass screening, health belief model, men's health

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INTRODUCTION

Prostate cancer (PCa) is one of the most common cancers in men. The incidence rates for PCa have spiked dramatically both in the world and in Turkey (1, 2). PCa is the most frequently diagnosed cancer and the third-leading cause of cancer-related deaths in men in the United States (3). Similarly, PCa is the second most common cancer among men in Turkey, and the incidence is 32.9 per 100,000 (2).

Although presently routine PCa screening remains controversial, The American Cancer Society (ACS) recommends prostate-specific antigen (PSA) testing for men at high risk such as a family history, racial differences regarding the lack of access to health services, and socioeconomic conditions (1, 3). The ACS (2017) also recommends that men older than 50 years old, should be informed about PCa screenings. They should be advised at an earlier age about this risk. An early detection through screening and timely treatment provide the greatest chance for increasing the 5-year survival rate. If the cancer is diagnosed during the early stages, the PCa prognosis is more optimistic (3).

Barriers to screening and reasons for a delayed help-seeking behavior have been identified in the studies. These studies reveal the following barriers: obstacles to access, inadequate knowledge, fear of cancer, mistrust of health professionals and health care services, embarrassment, and threat to manhood (4–7). Studies have also identified the factors associated with PSA screening, higher perceived susceptibility (6, 8, 9), perceived benefits of screening (6), and worry or concern about PCa (10).

Some studies have examined the issue from various aspects within the framework of a certain model that influences the participation in PCa screenings (6, 8). One of the models is the Health Belief Model (HBM) (6, 8, 11). The HBM identifies the specific attitudes and beliefs that affect individuals in choosing preventive health care and engaging in recommended medical regimens (11). The HBM has been used in PCa screenings in men who are 40 years and older to measure perceived susceptibility, perceived seriousness, health motivation, perceived barriers and perceived benefits with regard to PCa screenings (6, 8, 11).

In Turkey, especially the group of middle aged and elderly men is often perceived as healthy, and it is not a priority group for giving the protection and improvement of health services in general. Also, most of men use quite a small proportion of primary health care services, which includes cancer screenings. Only 4.9% of all men who are entitled to a prostate examination (men over 55 years) within the past 12 months undertook one (3). Capık and Gozum (2012) have reported that in their small sample study in Turkey, 9.3%–12.8% of men or with a PSA of 6.7–8.9 underwent a prostate examination (6).

The aim of this research is to determine the personal attitudes and beliefs of Turkish men related to PCa and screening. This research investigates the level of knowledge, health beliefs, and early diagnosis in a PCa screening. Therefore, better understanding of the factors that encourage men to get screened may help describe a potential educational aim that can be used to encourage PCa screenings and early detection.

MATERIALS and METHODS

Study Design and Sample
The study is a cross-sectional study, and it is investigating the attitudes and beliefs of Turkish men related to PCa and PCa screening and the factors influencing screening behavior for PCa.

The study was based on a convenience sample of 650 male participants who completed a written survey. Subjects were drawn from a large metropolitan area of central Turkey. The sample was recruited through mosques, coffeehouses, and workplaces. Snowball sampling was also utilized to elicit participation. Some men who attended the research asked others if they were interested in attending and gave them the researcher's contact number or, with their permission, gave the researcher their contact information.

The study inclusion criteria were as follows: male gender, age 40 years or older, not diagnosed with PCa, able to speak and understand Turkish, the questionnaire completed with minimal or no assistance, and voluntary participation in the study.

Data Collection
A survey approach was used for data collection. The survey was self-administered by participants. The participants were informed that the participation was voluntary and anonymous, and informed consent was obtained from each participant. The researchers informed the participants that they could withdraw from the study at any time. Following participant consent, data were collected using a demographic questionnaire, knowledge test for PCa screening, Prostate Cancer Screening–Health Belief Model Scale (PCS-HBMS), and the International Prostate Symptom Score (I-PSS). The average time spent on the completion of a survey was approximately 20–30 minutes per participant.

The demographic questionnaire was designed as a document consisting of 18 questions about the men's socio-demographical characteristics (such as age, education level, marital status), and their history of PCa problems and PCa screening.

To determine the PCa screening knowledge of men, the knowledge test for PCa screening was used. This test was developed by Weinrich et al. (2004) and was adapted to Turkish by Capik and Gozum (2011a) (12, 13). The Kuder–Richardson-20 coefficient of the test ranged between 0.72 and 0.77 in all tests. This test consists of 12 questions; the answers to questions 1, 2, 4, 5, 6, 7, 11, and 12 are positive ended, and the answers to questions 3, 8, 9, and 10 are negative ended. Higher scores indicate a better knowledge about PCa and PCa screenings.

The PCS-HBMS was developed by Capik and Gozum (2011b) according to the Health Beliefs Model, with a focus on PCa screening (14). The scale consists of a 41 items and a 5-point Likert-type scale assigned to five subscales: susceptibility perception (5 items), seriousness perception (4 items), health motivation (10 items), barrier perception (15 items), and benefit perception (7 items). The increase in the scores indicates a positive state for the subscales of susceptibility, seriousness, motivation, and benefit, while indicating a high perception of barriers and a negative state for barrier perception. The total score of each subscale is used in the evaluation. The alpha value of the reliability coefficient for each subscale of the HBM varied between 0.89 and 0.94.

The International Prostate Symptom Score (I-PSS) is based on the answers to seven questions related to symptoms with regard to urinary symptoms. Each question regarding urinary symptoms allows the patient to choose one out of six answers indicating increasing severity of the specific symptom. The answers are scored from 0 to 5 for a maximum score of 35 points.

The questions of the I-PSS are same as the questions appearing on the American Urological Association Symptom Index, which currently categories symptoms as follows: mild (score range 0–7), moderate (score range 8–19), and severe (score range 20–35).

Ethical Consideration
Ethical approval was obtained from the ethical committee by the university (approval no.77082166-604.01.02/15). The participation was voluntary with concern for confidentiality and anonymity. All respondents were informed about the purpose of the study, and their oral consent was obtained before initiating the interview.

Data Analysis
The data were analyzed using the statistical package SPSS version 15.0 (SPSS Inc., Chicago, IL, United States). The continuous variables were presented as mean±standard deviation, and frequent variables were presented as rates. The relationship between the I-PSS, Knowledge Test for Prostate Cancer Screening Score, and PCS-HBMS Subscale Score was evaluated by the correlation analysis. The logistic regression analysis (LRA) was used to calculate odds because the logistic regression is the appropriate regression analysis to conduct if the dependent variables are dichotomous (binary) and independent variables in the different features (nominal, ordinal, etc.) (Field, 2009). In this study dependent variables (getting examined in the past and intention to get different features) are dichotomous, and independent variables are consist with categorical (education, marital status, a PCa history in the family, being friends or relatives with PCa, having complaints about prostate, using alcohol, using cigarette) and also constant (age, susceptibility, seriousness, health motivation, barrier and benefit perceptions with regard to PCa screening; I-PSS; knowledge score about PCa and PCa screening) variables. A chi-squared and logistic regression analysis with a single variable were used for the selection of variables, and all variables having been <0.015 p-value were included in the logistic regression model. A stepwise forward (Wald) model

was used to create an independent variables model which affects the categorical dependent variables (15, 16). A p-value less than 0.05 was considered statistically significant.

RESULTS

The mean age of the participants was 50.4±7.92 years, and 41.5% of men were high school graduates, 35.2% university, and the majority (89.1%) were married.

A majority of participants (82.4%) determined that they did not have a prior prostate problem, and 76.2% did not have a prostate examination. Only 23.8% of participants underwent a prostate examination, 34.5% complained about the prostate, and 22.2% of family encouragement were effective in getting examined. The percentage of those who took the PSA test was low (21.2%), and a suggestion from health care personnel (31.9%) and complaints about prostate (30.7%) were effective in taking the PSA test. It was seen that 15.5% of people that took part in the research had families or relatives diagnosed with PCa, and these were the first degree relatives such as the father or a brother. It was determined that only 39.6% of men thought of getting a prostate examination in the future, and a majority of participants (71.2%) did not have knowledge about the prostate examination. When asking the participants for opinions related to the PCa examination, their answers were, respectively,

embarrassing (32%), distressing (19.3%), and painful (17.3%).

It was found that the I-PSS score average of participants was 7.02±6.91, and the average of the PCa screening knowledge score was 6.34±1.71. The mean values of the subscales score of PCS-HBMS were as follows: susceptibility perception 13.12±4.14; seriousness perception 12.90±3.60; motivation perception 33.26±6.74; barrier perception 41.90±9.49; and benefit perception 26.06±5.94.

It was shown that in the correlation analysis (Table 1), the knowledge score average about the prostate had a strong positive correlation with the prostate symptom score (r=0.159; p<0.001) and the seriousness perception score (r=0.166), and had a poor positive correlation with the susceptibility perception score (r=0.092) and the benefit perception score (r=0.105). It was found that the relation of the barrier perception score with both the knowledge score and I-PSS was negatively oriented, but statistically not significant (p>0.05). The age has a positively oriented strong correlation with the I-PSS score (r=0.236; p<0.001) and susceptibility perception score (r=0.228; p<0.001).

It was determined that the intention to get examined in the future for those who had primary education and were high school graduates was respectively OR=0.792- and 0.431-fold less than

Table 1. Correlations[1] of the I-PSS, knowledge test for prostate cancer screening score, and PCS-HBMS subscale score

		PCS-HBMS sub-scale					
	I-PSS	Knowledge test for prostate cancer screening score	Susceptibility perception	Seriousness perception	Motivation perception	Barrier perception	Benefit perception
Knowledge test for prostate cancer screening score	159**	–	.092*	157**	.082	-.004	.105*
I-PSS	–	159**	361**	166**	112**	-.024	-.015
Age	.236**	.066	228**	.930*	.078	-.036	.036

[1]Spearman correlation coefficient; I-PSS: International Prostate Symptom Scor; PCS-HBMS: Prostate Cancer Screening–Health Belief Model Scale; *p<.05; **p<.01

Table 2. The logistical analysis of the examination intention with the independent variables in the future

	ß	SE	Wald	OR	CI (%95)	p
Education						
Higher education	1					
Primary school	-.233	.265	.776	.792	.472–1.330	.378
High school	-.842	.230	13.384	.431	.274–.676	.001
Family member diagnosed with PCa						
Yes	1					
No	-.767	.267	8.243	.464	.275–.784	.004
History of prostate problems						
Yes	1					
No	-1.320	.305	18.758	.267	.147–.485	.001
I-PSS	.056	.017	10.934	1.057	1.023–1.093	.001
Motivation perception	.060	.015	15.294	1.062	1.031–1.095	.001

ß: Beta; SE: Standard error; OR: Odds ratio; CI: Confidence interval; PCa: Prostate cancer; I-PSS: International Prostate Symptom Score; Overall percentage, 71.8%; Chi-squared, 115,052 (p=0.000); Nagelkerke R^2=0.280; Hosmer and Lemeshow Test, p=0.548

Table 3. The logistic regression analysis of having a previous prostate examination with independent variables

	ß	SE	Wald	Expß	p	OR (%95 CI)
History of prostate problems						
Yes	1					
No	-3.874	.450	73.972	.021	.000	.009–.050
Age	.056	.020	7.905	1.057	.005	1.017–1.099
I-PSS	.083	.023	12.464	1.086	.000	1.037–1.137

ß: Beta; SE: Standard error; OR: Odds ratio; CI: Confidence interval; Expß: Experimental beta; I-PSS: International Prostate Symptom Score; Overall percentage, 90.5%; 001; Chi-squared=280,263 (p=0.000); Nagelkerke R²=0.609; Hosmer and Lemeshow Test, p=0\84

for those who were university graduates (Table 2). The difference in the primary education graduates was statistically not significant (p>0.05), but it was important in the high school graduates (respectively, OR=0.792, CI 95% [0.472–1.330], p=0.378; OR=0.431, CI 95% [0.274–.676], and p<0.001). It was determined that having no one in the family with PCa reduced the intention to get examined in the future with OR=0.464, CI 95% (0.275–0.784), and p=0.004. While each increase in the prostate symptom score also increases the intention of getting examined in the future with OR=1.057 and CI 95% (1.023–1.093), this increase was significant p=0.001. It was found that the each 1-point increase in the motivation perception resulted in the increasing of the examination intention OR of 1.062 with CI 95% (1.031–1.095), and the difference was statistically significant (p=0.001). It was determined that the percentage of total variance explained by the logistic regression model was 71.8, the chi-square value was 115,052 (p=0.000), Nagelkerke R²=0.280, and for the Hosmer and Lemeshow test, the p-value was 0.548.

It was determined that the prior examination was related with not having problems regarding PCa, and the situation of being examined was lower (Table 3) in those who did not have previous problems with an OR of 0.021 and CI 95% (0.009–0.050) and p=0.001. Getting examined in the past was related with an increase in the age and prostate symptom scores. While the age increases the possibility of getting examined increase with OR of 1.057 and CI 95% (1.017–1.099) and p=0.001, also the prostate symptom score increases with OR of 1.086 and CI 95% (1.037–1.137) and p=0.001. The percentage of total variance explained in this logistic regression model was 90.5, the model chi-square value was 280.263 (p=0.000), Nagelkerke R²=0.609, and the p-value for the Hosmer and Lemeshow test was 0.484.

DISCUSSION

Despite the fact that the effect of PCa early detection programs is a questionable subject, it has been accepted that an early detection of the disease will decrease deaths and increase the life duration and quality. Supporting early detection services and protecting and promoting health are essential and easier and more reasonable than managing the treatment process after the progress of illness and preventing complications.

In the study carried out in the United States, the frequency of people getting a prostate examination was reported as 63.3%, and taking the PSA test was 83.3% (17). It was indicated in the study carried out in Turkey by Capık and Gozum (2012) that the speed

of application for a prostate examination was 9.3%–12.8%, and 6.7%–8.9% for the PSA test (6). In this study, the rates for having a prostate examination (23.8%) and taking the PSA test (21.2%) were low. According to these results, it can be stated that the incidence of an early diagnosis of PCa in Turkey is quite low.

There was a significant correlation between the knowledge scores of PCa and a positive attitude to cancer screening. Previous researchers demonstrated that the behavior of information-seeking had a significantly positive effect on participation in cancer screenings (6, 12). Similarly, having information about PCa will increase the incidence of early detection. We found that only one-third of individuals who participated in this study (29.8%) had information on prostate examination. It was also found that the knowledge scores toward the PCa screenings were low (6.34±1.71). Capık and Gozum (2012) and Weinrich et al. (2004) found that the knowledge scores related to the low levels of PCa screening by participants in their studies (respectively 5.08±2.51; 6.60±3.00) (6, 12). Attitudes and beliefs toward screenings are important factors affecting the applications for the early diagnosis proceedings. The HBM is one of the models explaining the effects of the health beliefs of people on their health behaviors, and it is often used in studies researching health behaviors and as a guide for health professionals (8). The studies carried out using the HBM indicate that a high motivation perception is an important factor in participation in PCa screenings (15), and high barrier perception significantly decreases participation in the screenings (6, 7).

Health beliefs of people in the HBM are affected by some individual features known as the modifying factors and some activator factors affecting the seriousness and threat perception related to the disease. In this study, modifying factors; age, educational background, marital status and activator factors; and prostate symptoms, family history, and warnings from health professionals or media were examined. In this study, relations between dependent variables (getting examined in the past and intention to get examined in the future) and modifying factors were analyzed using the LRA stepwise forward model. The effectiveness of the model obtained in the LRA is defined by the goodness-of-the-fit model. One of the goodness-of-the-fit tests for LRA is the Hosmer and Lemeshow test. The result of the test are not meaningful; in other words, a value greater than 0.05 indicates a good fit with the model. Besides, to evaluate the adequacy of the model, pseudo R² statistics can be used in LRA. Because 1 corresponds to an excellent model fit, higher R² values indicate a better model fit. But this coefficient is generally lower in multiple regression than in linear regression. In multiple regression, the coefficient values between 0.20 and 0.40

are considered high enough (18). These results show that the LRA models in this study are adequate and fit (Table 1 and 2).

Age has already been found to be an important predictor of men's PCa screening behavior (10, 19, 20). Our results support this opinion that the sensitiveness and benefit perception point averages of the group ≥60 were higher. In this study, there was not a significant relation between age and the barrier perception point average as in the study by Capık (2013), where the barrier perception and related factors for the participation in PCa screenings were examined (7). Although the prostate symptom score increases with age, a change in the knowledge score about the prostate is not seen. This situation can be explained with a low knowledge score related to the prostate in the whole research group. The parallelism between the increase in the prostate symptom score and the increase in the sensitiveness and seriousness perception of the individual shows the effects of disease symptoms that are the activating factors mentioned in the HBM.

In the present study, it was shown that the education level influences the sensitiveness, motivation, and barrier perception score average, and the motivation perception increases and the barrier perception decreases with the increase in the education level. Similarly, it was determined in some studies that the barrier perception decreases (7) and participation in prostate examination increases (20) with the increase in the education level. Miller (2014) reported that knowledge about PCa of people increases with the higher education level (21). However, in the present study, the rate of having a prostate examination or taking the PSA test by people with a low education level was higher. The reason is related to the high education levels of the young people who participated in our study and the low education levels of advanced-age people. The symptom score related to the prostate in the advanced-age group was higher, and the factors directing people to examination were the disease symptoms rather than education.

There was no important difference among the HBM subscale score averages according to the marital status. Similarly, it was shown that while the marital status was not effective in the participation in the screenings in the studies by Capık and Gozum (2012) (6) and Lee, Consedine, Spencer (2011) (20), it was effective in the study by Wallner (2008) (10).

In the present study, sensitiveness and motivation perception point averages of people having the intention of participating in the screenings in the future were higher. Odedina and colleagues (2008) state that the intention of participating in the PCa screenings was an important factor for participation (9). Similarly, it was found in the study by Capık (2013) that the barrier perception score averages of people having the intention of participating in the screenings were lower (7).

It was found that the sensitiveness, seriousness, and motivation perception scores were higher in people who had complaints related to the prostate, family members suffering from PCa, those who got a prostate examination before, and who had a prostate symptom score at a serious level. It was also seen that the barrier perception score averages of people who took the PSA test before and had complaints related to the prostate were lower.

Weinrich et al. (2004) (12) detected that urinary complaints were important for the participation in prostate screening, and similarly, Capık (2013) (7) detected that the barrier perception of people with previous problems related to the prostate was lower. The prostate symptom score at the serious level was also important for participation in the screenings. It has been found in the study carried out by Capık and Gozum (2012) that the symptom scores of people participating in the prostate screenings were higher (6).

Familial risk is also important for the participation in the prostate examinations. In our study, a family history was found more often using screening tests. This finding may be the result of men who had a family history of PCa more often being counseled by their physicians or family members to seek screening. Spain et al. (2008) found that people having a PCa history in their family feel under risk more than others; however, the difference was not significant in terms of tending to the protective behaviors (22). Capık (2013) found that the barrier perceptions of people who had a prostate examination and took the PSA test were lower (7). Similarly, in our findings, the prostate examination negatively affects the participation since most people believe that it is hard, distressing, embarrassing, painful, and damaging for manhood.

In the study carried out by Capık and Gozum (2012), people were informed about PCa, screenings, and treatment methods, and it was detected that the barrier perceptions of people decreased at the end of the education process (6). In the current study, high barrier perception scores of people with low knowledge scores regarding the PCa screenings are in parallel with the literature.

The participation of men in prostate cancer screenings is generally low, and the main factors affecting participation in these screenings are beliefs and attitudes related to the screenings.

Research has shown that the primary reason for which men seek cancer screening is the motivation by a health care professional. Understanding the personal experiences, beliefs, perceptions, and attitudes of participants regarding PCa and PCa screening will be a guide in forming studies that will increase the participation in PCa early detection and in developing training guides for researchers and health care professionals. Nurses who provide holistic care are not only focused on disease management, but can also build on the advocacy role essential in nursing, and encourage screening in underserved areas of the country.

CONCLUSION

Age, the education level, prostate symptom score, family history, prostate examination and the PSA test, and knowledge scores about the PCa screenings of men affect the HBM subscale score averages used in this study. Understanding the individual experiences about PCa and PCa screenings of the participants is important. Thus, researchers and health professionals can take advantage of the results obtained to make an attempt to increase the participation in PCa early diagnosis services and also develop training guides.

Although these results provide an insight regarding health attitudes and beliefs toward prostate screenings among men, future studies are necessary to determine social, psychological, and cultural factors affecting the participation in the screening.

Study Limitations

Our study has several limitations. The first limitation is inherent in the representation of participants and the nature of the study design. Since participants were a convenience sample, study results cannot be generalized to all Turkish men. In addition, this study included only those men who were interested in the study and agreed to be interviewed, whereas there was a lack of data for those individuals who were not interested in PCa screenings. Another limitation is that the assessment of study variables is by a self-administered survey, which may be biased.

Ethics Committee Approval: Ethical approval was obtained from the ethical committee by the university (approval no.77082166-604.01.02/15).

Informed Consent: Written informed consent was obtained from patients who participated in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Designed the study: NB, YK. Collected the data: NB, YK. Analyzed the data: NB, YK. Wrote the paper: NB, YK. All authors have read and approved the final manuscript.

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