RESEARCH ARTICLE

Evaluation of the Effect of Health Belief Model Based Training on Health Performance of Male Staff in Fasa University of Medical Science in the Field of Prostate Cancer

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ABSTRACT

Background & Aim: Prostate cancer is the most common malignant cancer in men and is the second leading cause of death in men after lung cancer. In describing the epidemiology of prostate cancer, it is considered a preventable disease. The aim of this research was to investigate and explain the preventive behaviors of prostate cancer based on the structures of the health belief model among male employees of Fasa University of Medical Sciences.

Materials and Methods: The present research is a descriptive-analytical study; we performed it on 263 male employees of medical sciences university selected by multi-stage cluster sampling in Fasa university of Medical Sciences. Data collection tool was a questionnaire including demographic characteristics, questions related to the structures of the health belief model and questions of health performance expression. We analyzed data using descriptive and inferential statistical methods (frequencies, mean, standard deviation, Pearson correlation coefficients and linear regression) in SPSS software version 22.

Results: In this research, we observed a significant relationship between the mean scores of perceived sensitivity, perceived benefits and barriers, and self-efficacy on the one hand and the performance of medical staff regarding prostate cancer prevention behaviors on the other (P <0.001). We found no significant relationship between perceived intensity and preventive performance of male medical staff (P <0.05). Among the components of the health belief model, perceived barriers and benefits and self-efficacy were the most important predictors of preventive performance of medical staff regarding prostate cancer.

Conclusion: The present study suggests that health care providers should pay attention to predictive components such as perceived barriers, perceived benefits, and perceived self-efficacy when designing and implementing health education programs about prostate cancer.

INTRODUCTION

The prostate is one of the most important glands in the male reproductive system and the prevalence of its lesions and diseases is very important [1]. Prostate cancer is the second most common cancer after skin cancer and is a deadly cancer after lung cancer in men [2-4]. It is the fourth most common cancer worldwide [5]. The high prevalence of prostate cancer is unique in middle-aged and elderly men [6]. More than 75% of new cases of the disease have been diagnosed in men over the age of 65. One in six men develops prostate cancer. Contradictory results have been reported in studies on the chances of developing prostate cancer in different age and race groups. But one thing is evident in them: with age, the chance of this disease increases considerably [7]. In the United States in 2014, prostate cancer accounted for 27% of all male cancers and 10% of all cancer deaths in men [8]. The incidence of prostate cancer varies in different parts of the world. The highest was reported in the United States with 124.8 cases per 100,000 people and the lowest in Bangladesh with 0.3 of cases [9]. According to studies, 30-50% of men of 50 years and above have this disease [10]. Studies show that men in their 50s have a 40 percent chance of developing severe prostate cancer for the rest of their lives. This figure was 2% for clinically obvious prostate cancer and 2.9% for prostate cancer deaths [11]. Worldwide, more than 670,000 men are diagnosed with prostate cancer each year, of which about 225,000 are in Europe and 240,000 in the United States [12]. In 2014, approximately 222,000 Americans were diagnosed with prostate cancer, the most common non-skin cancer among American men [13]. In Iran, hormone-related cancers have been increasing in the last 10 years, of which prostate cancer is the most common [14]. This cancer is the eighth leading cause of cancer death in Iran [15]. The death rate from prostate cancer in our country is relatively high compared to other cancers. For example, it was estimated that in 2013, approximately 1309 deaths due to prostate cancer would occur in the country [16]. According to the statistics of the national report of cancer cases in 2008 in Iranian men, prostate cancer ranked fourth among cancers with 3732 cases (8.83%) and in West Azerbaijan province in the same year ranked seventh with 69 cases (5.79% of all cancers) [17]. The average length of hospital stay for a patient with prostate cancer is between 5 and 10 days, which is costly and also a burden on the treatment system [18]. The various causes of prostate cancer are not yet well known [19]. Differences in prostate cancer incidence and mortality in different parts of the world may be related to genetic, economic and social factors that affect the disease [20]. Risk factors for prostate cancer include age, race, background in family, hormonal factors, nutritional factors, physical inactivity, occupation, vasectomy, smoking, and sex factors, some of which are preventable and changeable [21]. Given the importance of the issue and the widespread negative consequences that result from it, health professionals should adopt appropriate prevention, diagnostic and treatment strategies.

Among these strategies, the adoption of disease-preventing behaviors by people at risk has been and is the simplest, cheapest and safest method. But the use of these behaviors by people is not very desirable. Therefore, scientists in behavioral sciences, social sciences and health sciences, especially health education, use theories and patterns of behavior change to understand and explain why few people follow health advice and behaviors and why most people in society do not follow these health behaviors [22-24]. Choosing a model for health education is the first step in the planning process for behavior change education [25]. One of these models is the health belief model, which is effective as a valuable tool in understanding and explaining health behaviors and educational evaluation. It includes several basic structures that predict why people take preventative action, why they seek screening, and how they control their illness. This model focuses mainly on the prevention of diseases and behaviors adopted to avoid the chain of diseases and illnesses [26]. The constructs of this model include perceived sensitivity, perceived intensity, perceived benefits, perceived barriers, and self-efficacy. Another construct known as action guide is internal and external events that can activate a person's readiness for action and stimulate acceptable behavior [27]. This model is one of the most accurate and important models that tries to predict health-related behavior [28].

The aim of this study was to determine the health performance status of male staff of university of medical sciences aged 40 years and above in the field of prostate cancer based on the structures of the health belief model. We hope that the results of this study can be useful in planning men's health promotion.

METHODOLOGY

We performed this descriptive-analytical cross-sectional study on 263 male employees of university of medical sciences affiliated with the Education Department Schools of District 2 of Fasa. Inclusion criteria for the participation in study include the following:

1- Having an age condition of at least 40 years 2- Providing written consent to participate in the study 3- Not having other problems (other cancers) which are reflected in prostate cancer. Exclusion criteria included unwillingness of the samples to participate in the research. Sampling in this study was multi-stage cluster sampling, then according to the number of male employees with 40 years and above, we selected medical staff and included in the study.

The data collection tool of this study was a questionnaire consisting of the following sections. The first part includes the demographic characteristics of medical staff, the second part includes questions about constructs of perceived sensitivity, for example: "I am more likely to develop prostate cancer than other men of my age;" Perceived intensity: "Physical complications of prostate cancer can be painful and

unbearable for me;" perceived benefits: "Early detection of cancer increases the chance of treatment;" and perceived barriers: "I do not tend to do a prostate finger examination because of the embarrassment." We gave the score 5 for the option I totally agree, score 4 for I agree, score 3 for I have no opinion, the score 2 for I disagree and the score 1 for I completely disagree. The third part consisted of 6 self-efficacy questions on prostate cancer prevention behaviors: "I am sure I can control smoking or harmful substances like it", which was designed as a 5-option Likert scale. Part 4 included a question about the types of guides for the chapter, and the fifth part included questions that measured the performance of medical staff in adopting the right behaviors to prevent prostate cancer (17 questions). In the questions related to the performance section, which was a 4-option Likert scale, the option at all was given the score of zero, rarely the score of 1, mostly the score of 2, and always the score of 3.

To determine the validity of the researcher-made questionnaire, based on the study of its valid sources [29], we applied the qualitative method of content validity, ie the use of experienced experts (including specialists in health education, urology, oncology, and preventive medicine). We asked them to evaluate the samples of the questionnaires in terms of simplicity, clarity, relevance and necessity of their comments and suggestions. After receiving feedback and news suggestions, we made the necessary corrections in the study tools; finally the validity of the tools was confirmable.

We measured the reliability of the questionnaire by Aga Kerr and Tesah test on 30 male medical staff; they had similar demographic characteristics to the population under study. Its value was 0.83 in health belief questions and 0.77 in performance questions and the reliability of the tools was also confirmed. We analyzed the collected data using SPSS software version 22 and descriptive statistics (frequency, mean and standard deviation) and inferential statistics (Pearson correlation coefficients and linear regression). In all stages of research, we observed ethical principles and regulations, including obtaining permission from the ethical committee of the University Vice Chancellor for Research, informing the samples used of the research purposes, obtaining permission from them to participate in the study and making sure that their information is confidential. In all statistical analyzes, $p < 0.05$ was considered significant.

RESULTS

In this study, the mean age and service history of the samples were 3.33±46 and 23±4.46 years, respectively. A summary of other demographic characteristics of the samples is given in (Table 1). The results of this study showed that the average performance score of medical staff in the field of observing health behaviors preventing prostate cancer, which includes 1- Adherence to a proper and preventive diet (avoidance of fatty foods, avoidance of alcohol, Daily consumption of 5 units of fruits and vegetables, use of nuts and snacks, consumption of fish and seafood, adequate vitamin D intake,

use of vegetable oils and avoidance of high consumption of red meat (1.22±0.19), 2- Complete body test (check-up) once every 6 months and appropriate BMI control (0.57±0.37), 3- Observance of sexual health behaviors (2.39±0.76), 4- Abstinence from smoking and tobacco products (1.27±0.94), 5- Exercise (0.8±0.62), 6- Avoiding exposure to harmful chemicals such as cadmium and arsenic (1.23 ± 0.67), 7- Getting advice from health care providers about self-care behaviors for prostate cancer (0.55±0.5). We should note that the dispersion of the average performance scores is calculated from zero to 3. The above-mentioned statistics show the poor performance of medical staff in various areas mentioned in the observance of principles of prostate cancer prevention.

The most commonly perceived barriers to prostate cancer prevention behaviors are: Poor ability to prepare prostate cancer prevention diets (fish, seafood, fruit and vegetable groups) due to their high cost, tendency to use too much Animal oil and red meat due to their deliciousness, lack of sense of need to see a doctor due to lack of signs of prostate cancer, ignorance of the time and place and how to perform diagnostic tests for prostate cancer, embarrassing prostate finger examination and inability to leave Cigarettes and other tobacco due to their dependence on consumption. The mean score of perceived self-efficacy in this study were 2.6±0.37 of the total score (5 points). This condition indicates moderate self-efficacy among medical staff in adopting prostate cancer prevention behaviors, exercising for 30 minutes every 4 days or more during the week, quitting smoking, reluctance to eat high-fat foods, controlling BMI (Body mass index) and the ability to allocate a portion of revenue to screening tests through cost management.

The mean score of perceived benefits was 3.89±0.35 of the total score (5 points). This means that the samples realized and believed in the importance and benefits of prostate cancer prevention behaviors. Other findings from the components of the Health Belief Model have been shown in (Table 2).

In the field of distribution of all kinds of practical guides from the point of view of medical staff, from the highest to the lowest score, specialist physicians and educational magazines were among the practical guides for adopting preventive behaviors. (Table 6) provides complete information on the distribution of guide types.

The results of the study revealed that there is a statistically significant direct relationship between perceived sensitivity, perceived benefits and perceived self-efficacy on the one hand and health performance on the other ($p < 0.001$). The results also indicate that there is a statistically significant inverse relationship between the structure of perceived barriers and health performance (preventive behavior), between perceived self-efficacy of medical staff ($p < 0.001$). Other correlations between health belief model components have been shown in (Table 3). In this study, we measured the relationship between demographic factors of the samples and

their health performance. The results showed that there was a significant relationship between the marital status of medical staff and their health performance (P <0.05).

In order to predict the health performance of medical staff based on the structures of the health belief model, we used stepwise regression analysis. Regression analysis of this study showed that among the constructs of the health belief model, the constructs of perceived barriers, perceived benefits and self-efficacy, respectively, have the highest predictive power of health behavior in order to prevent prostate cancer in this study. We have shown the results of multiple linear regression analysis in (Tables 4 and 5).

DISCUSSION

In this study, we investigated the relationship between health belief model constructs and the adoption of prostate cancer prevention behaviors. The results showed a significant relationship between perceived benefits and barriers and self-efficacy on the one hand and preventive action on the other. This relationship between perceived barriers and health function was inversely. Employees' performance on prostate cancer prevention measures was appropriate in terms of proper and preventive diet; it was poor in terms of performing diagnostic tests, avoiding smoking and tobacco products, doing exercise, controlling body mass index and avoiding exposure to harmful substances. Observing sexual health behaviors was desirable. In a study conducted by Rezaian et al. on the performance of retired men in the prevention of prostate cancer, they reported poor performance, which is consistent with the results of the present study [30, 31]. The results of the study of McCOY et al. and Mercer et al. are consistent with the results of preventive performance of this study [32, 33]. Perceived sensitivity and intensity to prostate cancer prevention behaviors were moderate. This suggests that medical staff feel that they are at some (not optimal) risk of prostate cancer and the complications and problems associated with the disease. The perceived benefits in this study were overestimated. This indicates the high efficiency and usefulness of health measures to prevent prostate cancer. In a study of prostate cancer, Bynum et al. identified the benefits of preventive health behaviors as life-saving. The results of the study of Jodsbin et al. on the benefits of high prostate cancer screening tests were highly estimated, which is consistent with the results of the present study [34, 35].

The perceived barriers in this study were also high, indicating that there are more barriers to health measures such as the high cost of choosing a plant-based diet and choosing a marine and fish diet, tendency to engage in disease-prone behaviors such as smoking, tendency to use of high-fat foods and red meat, lack of exercise and lack of control over body mass index, lack of knowledge of place and time and how to perform diagnostic tests and misconceptions such as not feeling the need to see a doctor due to no symptoms and embarrassing of some diagnostic tests. This means that the

more these barriers were felt by medical staff, the less likely they were to adopt health behaviors that prevent prostate cancer. In the study conducted by Hosseini et al., bad habits such as alcohol and hookah consumption, lack of body mass control, and lack of walking were mentioned as risk factors for prostate cancer [36], which need to be considered in accordance with some perceived barriers in the present study. One study found that 10 to 30 percent of physical activity inhibits prostate cancer. In a study, Judespin has shown high-perceived barriers to prostate cancer diagnostic tests [37-39]. In one study, the cost of performing diagnostic tests, lack of knowledge and ignorance related to prostate cancer, low perceived sensitivity related to prostate cancer, lack of access to health care, racial discrimination, low socioeconomic status and painful tests are some barriers to prostate cancer prevention measures that are consistent with the results of this study [40].

The perceived self-efficacy of medical staff in dealing with obstacles and adopting preventive behaviors was estimated to be undesirable, which indicated a feeling of low ability to perform health behaviors and deal with obstacles in front of them.

In the present study, among the components of the health belief model, the most predictive power of preventive behaviors belonged to the constructs of perceived barriers, perceived benefits and self-efficacy, respectively. Therefore, in order to guide the health behaviors of medical staff in relation to prostate cancer, we should pay more attention to these components and we should consider some interventions to promote and guide the desired health behaviors [41].

In the present study, the most practical guidelines for medical staff regarding prostate cancer were specialist physicians, the Internet, and television, which are consistent with the results of the study conducted by Moore et al. They also found in their study that the most important factor accelerating cancer prevention behaviors in the samples under study was a specialist physician [42].

CONCLUSION

Given that prostate cancer is an important health issue in men, it seems necessary to plan and implement educational interventions focusing on appropriate behaviors to prevent prostate cancer. In this regard, the use of behavior change and educational models such as the Health Belief Model can be useful in appropriate need assessments and educational designs. This model in the present study revealed that structures or factors such as perceived barriers and benefits and perceived self-efficacy of medical staff play an important role in adopting prostate cancer prevention behaviors. Health professionals and physicians should consider these factors in designing and implementing health and education programs for prostate cancer.

LIMITATIONS OF OUR STUDY

One of the limitations of this study was self-reporting of the questionnaire, which affected the under- and over-estimation of the study results. This limitation was partially controlled by anonymizing the questionnaire and assuring medical staff that information was kept confidential.

SUGGESTIONS

In order to find the factors affecting prostate cancer prevention behaviors, it is necessary to conduct such studies with a larger sample size in other provinces that have different cultural and social characteristics, among men with different occupations; based on these studies, we can achieve more original and realistic results.

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Table 1: Absolute and relative frequency of individual characteristics of research units

Individual information	status	Number	Percentage
Age group	40-45 years	131	49.8
	46-50 years	115	43.7
	Above 50 years	17	6.5
Marital status	Single	2	0.8
	Married	254	96.6
	Divorced	2	0.8
	Widowed	5	1.9
Education level	Of high school education	17	6.5
	BSc	204	77.5
	MSc & above	42	16
Total		263	100

Table 2: Mean scores of perceived sensitivity, intensity benefits, obstacles and self-efficacy regarding adopting behaviors to prevent prostate cancer

Statistic index Variable	Mean	Standard deviation	Maximum	Minimum
Perceived sensitivity	2.68	0.37	3.67	1.50
Perceived intensity	2.80	0.50	4	1.80
Perceived benefits	3.45	0.33	4.57	2.50
Perceived obstacles	3.89	0.35	4.88	2.88
Perceived self-efficacy	2.63	0.42	3.83	1.33

Table 3: Pearson correlation coefficient between the components of health belief model

ROW		Perceived sensitivity	Perceived intensity	Perceived benefits	Perceived obstacles	Perceived self-efficacy	Performance
Perceived sensitivity	r p	1					
Perceived intensity	r p	0.042 0.500	1				
Perceived benefits	r p	**0.0166 0.007	*0.131 0.034	1			
Perceived obstacles	r p	*0.136 0.027	**-0.166 0.008	0.103 0.095	1		
Perceived self-efficacy	r p	-0.055 0.378	-0.098 0.113	0.099 0.109	**-0.135 0.029	1	
Performance	r p	*0.124 0.044	0.101 0.103	**0.244 0.000	**-0.303 0.000	**0.341 0.000	1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table 4: Stage of multi-variate regression analysis in predicting health performance

Variable of criterion	Predicting variables	Correlation (R)	Explanation coefficient (R2)	Adjusted Explanation coefficient (R2 Adjusted)
Health belief model	Perceived obstacles	0.303	0.092	0.088
	Perceived obstacles and benefits	0.371	0.138	0.131
	Perceived obstacles and benefits and self-efficacy	0.414	0.172	0.162

Table 5: Regression coefficients of predicting performance regarding scores of perceived benefits and obstacles and self-efficacy in terms of stages

Stage	Source of changes	Non-Standard coefficient		Standard coefficient	t-value	Significance level
		B	Std. Error	Bata	16.28	0.000
1	Fixed value	1.690	0.104	---	-5.130	*0.000
	Perceived obstacles	-0.136	0.027	0.0303	4.876	0.000
2	Fixed value	1.291	0.147	---		*0.000
	Perceived obstacles	-0.126	0.026	-0.280	-4.840	*0.000
	Perceived benefits	0.104	0.028	0.215	3.721	*0.000
3	Fixed value	1.093	0.157	---	6.962	*0.000
	Perceived obstacles	-0.115	0.026	-0.257	-4.481	*0.000
	Perceived benefits	0.096	0.028	0.199	3.493	*0.001
	Perceived self-efficacy	0.070	0.021	0.187	3.264	*0.001

Table 6: Distribution of absolute and relative frequency of practical guides regarding adoption of behaviors to prevent prostate cancer

Type of guide	Number	Percentage
Spouse	62	23.5
Friends	88	33.5
TV	133	50.6
Radio	34	12.9
Magazine	15	5.6
Book	101	38.4
Internet	142	54
General physician	113	43
Specialist	157	59.7
Health staff	31	11.8