

Research Paper:

Health Literacy and Men's Attitudes and Practices Toward Prostate Cancer Screening



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ABSTRACT

Background: Health literacy, as a vital indicator of healthcare costs, plays an important role in facilitating effective health communication strategies. Screening is one of these strategies; thus, intervention and management can be provided ahead of schedule. The present study aimed to determine the relationship between health literacy and men's practices and attitude toward prostate cancer screening.

Methods: This was a descriptive correlational study. The sample consisted of 300 men aged over 40 years, living in the western area of Tehran City, Iran. The samples were recruited by convenience sampling method in the public places of the city. The required data were collected by Health Literacy for Iranian Adults (HELIA), and Prostate Cancer Screening questionnaire and analyzed in SPSS.

Results: The obtained results suggested that the Mean±SD score of health literacy score was at an adequate level 84.61±5.95; 82.7% had a positive attitude, and 70.3% failed to undergo prostate cancer screening. Health literacy was positively correlated with attitude and practice (P<0.001). Moreover, marital status (standard coefficient =-0.709) had the strongest association with health literacy. Additionally, occupational status (employed) (standard coefficient =0.551) and unemployed (standard coefficient =0.556) had the highest association with attitude. Eventually, marital status had the strongest relationship with practice (P<0.001).

Conclusion: Despite adequate health literacy and positive attitudes of men toward prostate cancer screening, their screening performance was poor. According to the obtained results, proper training of healthcare providers along with suitable training programs by national media, is required. The development of simple and understandable health education programs for prostate cancer screening is also recommended.

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Highlights

- Prostate cancer is the second common cancer and the second fatal cancer.
- High prevalence of prostate cancer in middle-aged and old men is unique among other cancers.
- Many undesirable health consequences result from insufficient health literacy.
- Those with lower health literacy are less familiar with health concepts which limits their understanding about the necessity of cancer screening and its advantages.
- Since local cancer can be completely treated, screening in asymptomatic men plays an important role in its early diagnosis and consequently reducing their mortality.

Plain Language Summary

Annually, more than 670,000 men are diagnosed with prostate cancer. Long-term side-effects of treatment remain very undesirable effects on the patients' quality of life. The most simple, reliable and inexpensive method for those exposed to risk of diseases is adopting preventive behaviors. This study discusses, relationship between health literacy with attitude and practice of men toward prostate cancer screening in west of Tehran. Based on the results, health literacy has a positive effect on the attitude and performance of men regarding prostate cancer screening. Accordingly promoting health literacy may lead to a positive attitude toward prostate cancer screening and improve men's practice.

1. Background

Cancer, as non-communicable disease, threatens the health of people and has remarkable effects on their biopsychosocial and, economic situation. Today, cancers are among the significant causes of mortality. Prostate cancer is the second common cancer (after skin cancer) and the second fatal cancer (after lung cancer) in men (Sarbaz Agdaee et al. 2016). Annually, more than 670000 men are diagnosed with prostate cancer; of whom, 225000 live in the USA and Europe (Didarloo et al. 2016). A seven-year follow-up study (2003-2009) on prostate cancer in the Cancer Registration Center of Iran revealed that 19910 prostate cancer cases were recorded throughout the country. The real prevalence rate of cancer is even higher because not all cancer cases are registered in Iran (Rafimenesht et al. 2016). Contradictory results have been reported about the odds of developing prostate cancer in different age groups; however, all the studies agree that the odds of developing cancer increases by age (Askari, Parizi & Rashidkhani 2013). Moreover, 30%-50% of patients aged >50 years have prostate cancer (Friedenreich et al. 2016).

The high prevalence of prostate cancer in middle-aged and older men is noticeable among other cancers (Grubb RI et al. 2007). The long-term side-effects of treatment, such as urinary incontinence, impotence, and rectum inflammation caused by radiation remain highly undesired effects on the patients' quality of life (Tiller et al. 2015). The mean hospitalization time for a patient suffering from prostate cancer is 5-10 days, imposing high costs to the patients and healthcare system (Tiller et al. 2015).

Inadequate health literacy has many undesirable health consequences (Reyesi et al. 2010). Based on the American Cancer Society, people with low health literacy are less likely to understand the written and verbal information provided by healthcare team; therefore, they fail to act according to their orders, leading to poor health status (JCNHES 2007). Those with lower health literacy are less familiar with health concepts, which limits their understanding of the necessity and advantages of cancer screening (Sarbaz Agdaee et al. 2016).

Health literacy is the capability of understanding and acting according to the medical recommendations of health professionals to preserve health. Health literacy is accessibility, understanding, evaluating, and transferring information through which health promotion and preservation, and will occur throughout life (Panahi et al. 2017). Health lit-

eracy depends on the literacy and includes the knowledge, motivation, and capability of people to access, understand, evaluate, and use the health information in daily judgments and decision-making about their health care and promotion and prevention of diseases, to preserve or improve the quality of life (Vozikis et al. 2014). Health literacy is a social health component (Keleher & Hagger 2007).

Research has suggested that health literacy could be predicted based on education, socioeconomic status, occupation, and race or gender (Wharf Higgins, Begoray & MacDonald 2009). Health literacy results from synergy between social and individual factors and concerns health and literacy (Barati et al. 2016). Moreover, it is considered as a vital indicator of the results and costs of healthcare. Achieving optimal health literacy is a necessity of healthcare systems' effectiveness (Arabzade et al. 2016). The primary objective of promoting health literacy is facilitating effective health communication strategies and health information technology to improve health consequences, quality of healthcare, and achieving health equity (Panahi et al. 2017).

Health literacy relates to increasing awareness and screening behaviors and plays a decisive role in this regard. The most simple, reliable, and inexpensive method for those exposed to the risk of diseases is adopting preventive behaviors (Didarloo et al. 2016). Local cancer can be completely treated; therefore, screening in asymptomatic men plays an important role in its early diagnosis and consequently reducing their mortality rate (Larranaga et al. 2010). In addition, screening and early diagnosis of diseases provide the possibility for the intervention and disease management and reduce mortality rate (Bouchardy et al. 2008).

Community health nurses play a key role in health promotion by emphasizing on the three levels of prevention; they are responsible for health promotion, disease prevention, and disease severity reduction in patients to improve their health (Mohamadi 2011). Nurses can provide better access to healthcare services and play an essential role in the reduction of chronic diseases' symptoms, reduction of treatment costs, and improvement of people's expectancy from healthcare services. In addition, health-promoting behaviors by nurses can lead to positive consequences, such as tracking health status, improving the quality of life, awareness of diseases, and self-management (Kemppainen, Tossavainen & Turunen 2013). Cancer is highly prevalent in Iran, especially prostate cancer has significantly increased during the past years. Thus, the current study aimed to determine the relationship between health literacy and the attitude and practice of men toward prostate cancer screening.

2. Materials and Methods

This was a descriptive correlational study. The study population included 300 men aged >40 years. They were selected by convenience sampling method and from public places, parks, cinemas, cultural centers, mosques, and shopping centers in the west of Tehran City, Iran, in 2018. After obtaining the consent from the Ethics Committee of Iran University of Medical Sciences (IUMS) and Tehran Municipality, the researcher explained the study objectives to the study participants. Moreover, we assured them of the confidentiality of data and received their informed consent.

Data were collected by a demographic information form, Health Literacy of Iranian Adults questionnaire (HELIA), and Prostate Cancer Screening Attitude and Practice questionnaire (Rezaeian et al. 2017). The demographic data form investigated age, education, marital status, and occupation. HELIA questionnaire was used to measure the health literacy of adults. Montazeri et al. have validated this questionnaire on the Tehran urban population. It contains 33 main items, including access (6 questions), reading skills (4 questions), comprehension (7 questions), evaluation (4 questions), decision-making, and the application of health information (12 questions).

Scoring of the questionnaire is based on a 5-point Likert-type scale (always =4; often =3; sometimes =2; seldom =1; never =0). Health literacy scores of 0-100 are classified into 4 levels (0-50= inadequate literacy; 50.1-60= borderline literacy; 66.1-84= adequate literacy; 84.1-100 high literacy) (Montazerri et al. 2014). Rezaeian's questionnaire was used to assess the participants' attitude and practices toward prostate cancer screening. It is a five-point Likert-type scale, including 10 questions. The questions related to positive attitude (strongly disagree, disagree, none, agree, strongly agree) are scored from 0-4, and questions related to negative attitude (strongly disagree, disagree, none, agree, strongly agree) are scored from 0-4. The scores 0-30 represent a negative attitude, and scores 30-60 indicate a positive attitude. The internal consistency reliability of the questionnaire was equal to 0.89. A single question measures the respondent's practice regarding prostate screening. Those with a specific Prostate-Specific Antigen (PSA) test have an appropriate practice, and those without this test are considered as poor (Rezaeian et al. 2007).

In the present study, the calculated internal consistency reliabilities (Cronbach's alpha) were 0.732 and 0.712 for HELIA questionnaire and Prostate Cancer Screening Attitude and Practice questionnaire, respectively. The

Table 1. Mean±SD of health literacy and its dimensions

Health Literacy & its Dimensions	Mean±SD	Min/Max
Reading skill	72.6±16.36	43.75/100
Accessibility	81.47±11.31	70.83/100
Understanding	87.88±12.87	60.71/100
Evaluation	81.25±9.38	68.75/100
Decision-making & health information application	89.38±8.35	72.92/97.92
Total Health literacy	84.61±5.95	77.27/96.97

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obtained data were analyzed by frequency, Mean±SD, Paired Samples t-test, Independent Samples t-test, Chi-squared test, and regression analysis in SPSS.

3. Results

The achieved results suggested that the Mean±SD age of samples was 46.7±6.31. More than half of them aged <45 years (53.3%), 83% were married, 41.3% and 41% had bachelors and associate degrees. Moreover, 56% (35.7%) were employed, and their most crucial information source was the internet.

Health literacy of all the subjects was at an adequate level (Mean±SD: 84.61±5.95). Decision-making and health information application with the mean scores of 72.6 and 89.38, respectively had the lowest and highest mean scores among health literacy dimensions. The mean score in all dimensions was higher than the calculated median (50) (Table 1). The collected results indicated that 82.7% of the subjects had a positive attitude toward prostate cancer screening. Most of the subjects

(70.3%) failed to undergo a prostate cancer screening test. Health literacy had a significant relationship with practice (P<0.001); the relevant mean score was significantly higher in those who took the test, compared to the others.

Furthermore, all dimensions of health literacy had a significant relationship with practice (P<0.001) (Table 2). Health literacy score of the research subjects was adequate (Mean±SD: 84.61±5.95); including reading skill (Mean =72.6), accessibility (Mean =81.47), understanding (Mean =87.88), evaluation (Mean =81.25), and decision-making and health information application (Mean =89.38). Among the health literacy dimensions, reading skill had the lowest mean score, and decision-making and health information application had the highest mean score (Table 1).

According to the study results, age was significantly correlated with health literacy (P<0.001); where the mean score of 45-55 years older men was significantly lower than that of 45-year-olds and higher than 55 years old men. Health literacy of the single men was signifi-

Table 2. Relationship between health literacy and its dimensions and prostate cancer screening practice

Health Literacy & Dimensions Screening Practice	Mean±SD		Independent Samples t-test
	No	Yes	
Reading skill	66.58±13.23	86.86±14.31	t=11.879; df=156.175 P=0.27
Accessibility	78.75±9.28	87.92±13.02	t=6.026; df=127.31 P<0.001
Understanding	84.95±13.79	94.82±6.32	t=8.491; df=296.02 P<0.001
Evaluation	78.76±4.73	87.14±13.98	t=5.525; df=96.621 P<0.001
Decision-making & health information application	88.02±9.16	92.62±4.61	t=5.753; df=289.089 P<0.001
Total health literacy	81.96±3.07	90.87±6.25	t=16.187; df=105.201 P<0.001

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Table 3. Relationship between health literacy and demographic characteristics

Variable	No.	Mean±SD	Results
Age (y)	<45	160	82.05±3.42
	45-55	95	89.69±7.23
	>55	45	82.94±2.14
Marital status	Married	249	82.43±3.03
	Single	51	95.23±4.43
Education	Diploma & lower	21	85.49±6.09
	Associate degree	123	87.14±6.49
	Bachelor's degree	124	81.75±3.45
	Master's degree & higher	32	85.32±6.78
Occupation	Employed	168	82.36±4.14
	Unemployed	89	89.64±7.01
	Retired	43	82.96±2.19
Information source	Asking physician & health care personnel	65	85.82±6.42
	Internet	107	84.65±4.98
	Radio & TV	81	84.41±7.65
	Book, booklet, & instructional pamphlet	47	83.17±3.18

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cantly higher than the married ones. Education was also significantly associated with health literacy. The mean score of men with an associate degree was significantly higher than those with a high-school education, bachelor's degree, and master degree. The occupation had a significant relationship with health literacy. The mean health literacy score of unemployed men was significantly higher than that of the employed and retired men.

Linear Regression Enter method was used to determine the demographic variable with the strongest relationship with health literacy. The obtained results indicated that age had a significant relationship with health literacy. The attitude of single men was stronger than those who were married. The mean score of health literacy in men with a bachelor's degree was significantly lower than that of those with associate and master's degrees. The mean score of the retired men was significantly higher than employed and unemployed men (Table 3).

Linear Regression Analysis Enter method was used to determine which demographic variable has the strongest relationship with attitude. The collected results

indicated that occupation (employed with a standard coefficient of 0.551, and unemployed with the standard coefficient of 0.565) had the highest effect on the attitude. Additionally, there was a significant relationship between age ($P<0.001$), education ($P<0.001$), job status ($P<0.001$), and marital status, and attitude ($P<0.001$) (Table 4). Moreover, age, marital status, and occupation had a significant relationship with prostate cancer screening practice.

Of the 45-55 years older men, 49.5% reported taking prostate cancer screening; while 18.8% of men under 45 years old and 26.7% of men above 55 years old took this test. Among the single men, 86.3% did this test; however, only 18.1% of married men had taken it. About half of unemployed men (50.6%) reported taking a screening test; while 18.5% of employed men and 30.2% of retired men underwent this test. Marital status was the only significant variable in the regression model. There were significant relationships between prostate cancer screening practice and age, occupational status, and marital status ($P<0.001$) (Table 5). In addition, marital status (standard coefficient = -0.1709) had the most ro-

Table 4. Relationship between attitude toward prostate cancer screening and demographic characteristics

Variable	No.	Mean±SD	Results
Age (y)	<45	160	44.8±6.09
	45-55	95	45.83±3.69
	>55	45	27.93±6.96
Marital status	Married	249	42.01±8.73
	Single	51	45.5±5.11
Education	Diploma & lower	21	42.71±8.88
	Associate degree	123	46.84±2.15
	Bachelor's degree	124	38.32±9.91
	Master's degree & higher	32	42.79±8.10
Occupation	Employed	168	44.11±6.71
	Unemployed	89	46.76±4.86
	Retired	43	28.04±7.10
Information source	Asking physician & health care personnel	65	46.84±2.30
	Internet	107	44.1±7.53
	Radio & TV	81	38.05±8.86
	Book, booklet, & instructional pamphlet	47	41.13±10.35

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but relationship with health literacy. Moreover, occupational status (employed with the standard coefficient of 0.551 and unemployed with a standard coefficient of 0.565) had the strongest relationship with attitude. Eventually, marital status ($P<0.001$) had the closest relationship with practice.

4. Discussion

The study results revealed that the health literacy of most research subjects was adequate. A prior study reported Mean±SD health literacy as borderline 58.26±22.1. Moreover, regarding the dimensions of health literacy, access to information (61.14), understanding the information (66.74), information reading skill (62.87), information evaluation (54.68), and decision-making and information behavior (45.87) were lower than the results of this study (Naghbi et al. 2017).

A study investigated health literacy and its related factors in the older people of Ilam. They indicated that 50.4% of the elderly had inadequate health literacy (Borycki 2015).

In other studies, 54.6% of people had borderline and inadequate health literacy (Ghanbari et al. 2011) and 56.6% had adequate health literacy (Tehrani Bani Hashemi et al. 2007). Another study in England indicated that 88.6% of the subjects had adequate health literacy (Von Wagner et al. 2007).

Furthermore, 82.7% of the subjects had a positive attitude toward prostate cancer screening. In a study, 39.8% of the subjects had a positive attitude toward prostate cancer screening, which is inconsistent with the present study (Rezaeian et al. 2007). Other studies unrelated to prostate cancer screening reported different results. Almutairi et al. (2018) argued that people's attitude toward colorectal cancer was poor. The results of a study about the intention of colorectal cancer patients' first-degree relatives to screening based on planned behavior theory revealed a poor attitude in them (Baghiani Moghadam et al. 2011). The attitude score results were also poor in other studies (Rakhshani et al. 2018; Haji Rasul, Cheraighi & Behboodi Moghadam 2016).

Despite the positive attitude of the studied subjects, most of them had a poor practice regarding prostate can-

Table 5. Relationship between prostate cancer screening practice and demographic characteristics

Variable	No. (%)		Test Results
	No	Yes	
<45	130 (81.3)	30 (18.8)	t=27.195 df=2 P<0.001
45-55	48 (50.5)	47 (49.5)	
>55	33 (73.3)	12 (26.7)	
Married	204 (81.9)	45 (18.1)	t=94.366 df=1 P<0.001
Single	7 (13.7)	44 (86.3)	
Diploma & lower	17 (81)	4 (19)	t=3.841 df=3 P=0.279
Associate degree	80 (65)	43 (35)	
Bachelor's degree	89 (71.8)	35 (28.2)	
Master's degree & higher	25 (78.1)	7 (21.9)	
Employed	137 (81.5)	31 (18.5)	t=28.755 df=2 P<0.001
Unemployed	44 (49.4)	45 (50.6)	
Retired	30 (69.8)	13 (30.2)	
Asking physician & health care personnel	49 (75.4)	16 (24.6)	t=5.979 df= 3 P=0.113
Internet	66 (61.7)	41 (38.3)	
Radio & TV	61 (75.3)	20 (24.7)	
Book, booklet, & instructional pamphlet	35 (74.5)	12 (25.5)	

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cer screening (70.3%), and only 29.3% had an appropriate practice. In another study, the practice of people toward prostate cancer screening was poor (93.3%) (Rezaeian et al. 2007). Other studies also have reported their subjects' practice toward prostate cancer screening as poor (Khosravi et al. 2018; Ghodsbin et al. 2014; Abuadas, Petro-Nuștas & Albikawi 2015).

The study findings suggested that health literacy had a significant correlation with attitude ($P<0.001$); i.e. by increasing health literacy, the attitude toward it also increased. A study regarding the effect of health literacy on the knowledge, beliefs, and behaviors of patients toward colorectal cancer screening demonstrated a significant relationship between health literacy and attitude; this finding is consistent with the results of this study (Peterson et al. 2007). A study explored the relationship between health literacy and knowledge and attitude toward the harms of smoking among university students. The results indicated a significant relationship between

attitude toward smoking harms and health literacy (Panahi et al. 2017). A study explored health literacy and its relationship with smoking preventive behaviors in the adolescents of Bushehr Province. The relevant data indicated a significant relationship between health literacy and attitude (Arabzade et al. 2016).

The results also indicated a significant relationship between health literacy and prostate cancer screening practice ($P<0.001$); where the mean score of men who had performed the test was higher than that of other men. A study investigated the relationship between health literacy and health preventive behaviors in older men. It was revealed that people with higher health literacy had higher participation in the screening tests, which is consistent with the current study (Fernandez, Larson & Zikmund-Fisher 2016). Another study in Carolina, U.S. reported a significant relationship between low health literacy and no screening tests (Miller et al. 2007). However, a

study in Japan demonstrated no significant relationship between health literacy and screening (Suka et al. 2015).

In our study, health literacy was significantly higher in single men than that of married men ($P < 0.001$). Furthermore, there was a significant relationship between health literacy and education; these findings were consistent with those of Tehrani Banihashemi & Amirkhani 2007 and Javadzade et al. (2013), respectively (Tehrani Banihashemi & Amirkhani 2007; Javadzade et al. 2013).

This study indicated a significant relationship between age, education, marital status, occupation, and health literacy. Age, education, and occupation had also a significant relationship with health literacy in another study; the health literacy score in the age group of 65-70 years old was higher than other age groups. The health literacy score in retired people was higher than other groups. Those with high-school education had higher health literacy than other groups (Borycki 2015).

In Powell, Hill & Clancy (2007) and Kandula et al. (2009) studies, there was a significant relationship between age and health literacy, which is consistent with the results of this study. In another study, health literacy had a significant relationship with age and education where literacy score increased in 18-45 years old group and decreased in 46 year-olds and above group. In addition, health literacy increased by education. Moreover, the health literacy of singles was lower than that of married people. (Saatchi et al. 2017). In Ghanbari et al. study, there was a significant relationship between education and health literacy, which is consistent with the present study; however, age and marital status had no significant relationship with health literacy (Ghanbari et al. 2017).

In this study, marital status had the strongest relationship with health literacy; while another study suggested that education has the closest relationship with health literacy (Tehrani Banihashemi & Amirkhani 2007). Another study indicated a significant relationship between education and health literacy, which is consistent with the results of the current research (Peyman, Amani & Esmaili 2016). Based on the study results, health literacy positively affects the attitude and performance of men regarding prostate cancer screening. Accordingly, promoting health literacy by conducting training courses for men at risk of prostate cancer may lead to a positive attitude toward prostate cancer screening and improve their practice in this regard. Performing periodic laboratory tests and annual PSA tests are also recommended.

Despite adequate health literacy and positive attitudes of men toward prostate cancer screening, their screen-

ing performance was poor. According to the obtained results, proper training of health care providers and along with suitable training programs by national media is required. Development, The development of simple and understandable health education programs for prostate cancer screening, is also recommended.

Ethical Considerations

Compliance with ethical guidelines

This study was ethically approved by the Ethics Committee of Iran University of Medical Sciences (IUMS) (Code: IR.IUMS.REC. 1396.9311690007). The researchers assured the study participants of the confidentiality of data and received their informed consent.

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Authors' contributions

Conceptualization: Behroz Abasi, Marhamat Farahaninia and Seyedeh Batool Hassanpour; Methodology: Behroz Abasi, Marhamat Farahaninia and Hamid Haghani; Investigation: Behroz Abasi; Writing-original draft: Behroz Abasi, Marhamat Farahaninia; Writing-review & editing: Behroz Abasi, Marhamat Farahaninia, and Supervision: Marhamat Farahaninia.

Conflict of interest

The authors declared no conflicts of interest.

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