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Assessment of individuals' knowledge in the most risky age group for prostate cancer about risk factors and the importance of early screening

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Abstract

Notably, one of the most prevalent male cancers is prostate cancer (PCa) which considered the second leading reason of globally cancer-associated deaths among males. This study investigated the knowledge about risk factors especially age, and the importance of early screening of PCa among male participants. A cross-sectional questionnaire study was carried on 306 males of whom the majority was between 50–59 years old (41.5%) from January 2025 to March 2025. Around 63.4% of participants were working. The urban participants constitute 78.1%. Most of participants are of university education level (34.3%). Bivariate data were analyzed and relations were deemed significant if the p-value was ≤ 0.05. The obtained results revealed that 20.9% of participants or their relatives have suffered from a prostate condition. The prostatic enlargement was the most condition reported among the concerned participants (50.0%). On other side, 4.6% had prostate cancer. Family history of prostate conditions was reported in 14.7%. Notably, 94.4% of the participants had an inadequate level of knowledge about both the PSA test and prostate cancer and 96.4% had a negative attitude towards them. The main information source was social media and internet for 47.4% of participants, followed by healthcare providers (25.8%). It was concluded that there was a poor level of knowledge and negative attitude towards screening for prostate cancer and its risk factors among males. This could be attributed to the lack of education and shortage of healthcare providers to focus on the risks of prostate cancer.

Keywords: knowledge - prostate cancer - PSA - awareness - information - age group - risk factors.

Introduction

First: Statement of the Problem

In last decades, prostate cancer (PCa) is a growing life-threatening illness that foremost impacts middle-aged and elderly men with recorded incidences in 105 out of 185 nations (Bray *et al.* 2024). Cornford *et al.* (2024) and Shan *et al.* (2022) reported PCa as the second most prevalent cancers driving to male deaths and ranks as the 5th leading reason of mortalities among all malignant tumors worldwide and also in developing countries (Sung *et al.,* 2021). This notable high death rate can often be referred to inadequate initiatives to raise awareness and knowledge about the value of early PCa screening, which is substantial to diagnose PCa at an early stage and remarkably ameliorate patient survival rates (Rao *et al.,*

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2023). Nearly 60% of all PCa are recognized in men at the age of 65 and older (Ferlay *et al.,* 2020). Several risk factors were reported; age above 65 years, race, ethnicity, family history, in addition to less clear factors as diet, obesity, smoking, chemical exposure, prostatitis and sexually transmitted infections (Nelson *et al.,* 2020).

Second: The importance of the study

1. Scientific Importance:

Identifying knowledge gaps: The primary scientific significance relies on its ability to systematically identify particular deficiencies in knowledge among persons within the highest-risk age group concerning prostate cancer. This involves understanding their awareness of potential risk factors (e.g., age, family history, ethnicity) and, definitively, their grasping of the benefits and necessity of early screening. Recognizing these gaps is the backbone step for any targeted intervention. ii. Informing public health strategies and educational programs: By understanding what people don't know, healthcare providers, public health organizations, and policymakers can tailor their messages to address particular misconceptions and assert crucial information. This drives to more effective resource distribution and improved public health outcomes. iii. Understanding barriers to early detection: A lack of knowledge often translates into inaction. The study can shed light on why individuals in the high-risk group may not be engaging in early screening practices. Identifying the potential barriers is substantial for designing interventions that boost proactive health behaviors. iv. Baseline data for intervention assessment: The study may provide valuable baseline data which the effectiveness of future educational interventions can be measured. By performing similar evaluations after an intervention, researchers can scientifically assess whether knowledge levels have improved and whether the intervention was successful in fulfilling its goals. v. Informing clinical practice: Urologists and primary care physicians can employ the study's outcomes to better comprehends their patients' baseline knowledge. This permits them to tailor their patient education during consultations. vi. Contribution to cancer control research: Exploring the human factor in cancer prohibition and early recognition, can drive to the broader field of cancer control research. It considers the behavioral and social determinants of health outcomes, which are increasingly recognized as important for improving public health.

2. Applied importance:

Tailored health information programs: The study's outcomes directly mark the design and implementation of information programs. If, for instance, the study reveals that men in the risky age group are unaware of the obesity predisposition for prostate cancer, informative materials can be particularly developed to confirm this risk factor. This permits for more efficient use of resources by focusing on known knowledge gaps rather than broadly disseminating generic information. ii. Improved screening uptake: By understanding what motivates or prevents individuals from seeking screening (e.g., lack of awareness, fear, misinformation), health campaigns can be designed to overcome these barriers. Higher screening rates mean more early diagnoses, which are crucial for effective treatment. iii.

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Enhanced shared decision-making in clinical settings: Clinicians can use the study's insights to improve their communication with patients. Doctors can adjust their counseling to explain the complexities and empower patients to make informed decisions about their prostate cancer care. iv. Development of culturally sensitive interventions: If the study identifies differences in knowledge levels or attitudes across various cultural or socioeconomic groups within the high-risk age bracket, it highlights the need for culturally sensitive interventions. v. Reduction in advanced-stage diagnoses and mortality: By increasing knowledge about risk factors and the importance of early screening, individuals are more likely to seek timely medical attention, leading to earlier diagnosis when treatment is most effective.

Third: Objectives of the study

Determine the current level of knowledge among individuals in the most risky age group regarding prostate cancer risk factors. 2. Evaluate individuals' understanding of the importance and benefits of early screening for prostate cancer. 3. Identify specific knowledge gaps or misconceptions related to prostate cancer risk factors and early screening within this high-risk population. 4. Explore the sources of information individuals use to learn about prostate cancer. 5. Identify socioeconomic factors associated with varying levels of knowledge. 6. Assess individuals' attitudes and feelings towards prostate cancer screening. 7. Provide baseline data for the development and evaluation of targeted health education programs.

Fourth: Study Questions

How does the individual aware about risk factors such as age, family history, potentially dietary or lifestyle factors as smoking? 2. How does the individual know about the purpose of screening (e.g., early detection, improved prognosis), available screening methods (e.g., PSA test, DRE), and the potential outcomes of early diagnosis? 3. Seeking of pinpoint areas where information is lacking or misunderstood. 4. Understanding where people get their information? (e.g., healthcare providers, internet, friends/family, media) can help optimize future educational efforts. 5. Determining if knowledge levels differ based on age, education, income or other relevant characteristics.

6. How individuals feel about screening, including any fears, anxieties, or perceived barriers that might influence their willingness to undergo screening?

7. How the findings will serve as a foundation for designing effective interventions and improving knowledge and screening behaviors?

Fifth: Literature

1. The relationship between risk factors and prostate cancer

Age, family history, race and genetic predisposition are well-established non-modifiable risk factors for PCa, while obesity, metabolic syndromes, and smoking have been recognized as potential modifiable risk factors. Furthermore, an abundance of environmental, infectious, lifestyle, as well as dietary risk factors may be implemented in the incidence of

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PCa (Bergengren *et al.,* 2023). Age is a well-instituted risk factor for PCa. Recent US cancer statistics pointed that the possibility of PCa elevates from 1.8% in men 60–69 yr to 9.0% in men 70 yr and older. Autopsy studies expose that 40% of unscreened men elder than 60 years manifest PCa (Siegel *et al.,* 2022). Numerous studies have been performed to investigate the relation between dietary factors and prostate cancer, however occasionally opposed data were obtained. Dairy products, red meat, and processed meat consumption were reported to be linked with the increased prostate cancer risk. On other side, green tea soybeans, and tomatoes might diminish the risk of prostate cancer incidence (Sun *et al.,* 2021). Moreover, further studies are required to investigate the relation between specific dietary supplements and prostate cancer risk. Also, future studies should light on the benefits of nutritional epidemiology and the prostate cancer prevention.

2. Available screening methods (e.g., PSA test, DRE Exercise for prostate cancer

In 2018, concerning prostate-specific antigen (PSA) screening update, the U.S. Preventive Services Task Force recommended periodic PSA-based screening for PCa for men aged 55–69 years (Force *et al.,* 2018).

Meanwhile, some USA authorities council annual screening beginning at age 40 years for increased PCa incidence and mortality men groups as Black men (Nyame *et al.,* 2021). In December 2022, the recommendations stated by EU Council drove their member states to assess the effectiveness and feasibility of PSA testing implementation in combination with magnetic resonance imaging (MRI) scanning as a follow-up test in organized screening programs for PCa (Bergengren *et al.,* 2023). In summary, screening for PCa is acquiring acceptance and is anticipated to increase in the future.

3. Benefits of early detection

Meanwhile, prostate cancer is ideal disease for early detection. In general the neoplasm is considerably slow growing; permitting an adequate lead time for cancer to be recognized prior to it becomes incurable. The benefits are primarily constituted improving in prognosis and decreasing cost of treatment (Littrup *et al.,* 1993).

Methodology

A cross-sectional study was carried on 306 males of whom the majority was between 50–59 years old (41.5%) from January 2025 to March 2025. Self-administered questionnaire was employed to gather data. Bivariate data were analyzed statistically via chi-squared using SPSS software package version 26. A threshold p value of < 0.05 was set as the marker for statistical significance.

Study limitations comprise the use of a self-administered questionnaire that could drive to response alignment in which some participants may provide inaccurate responses.

Results

A total of 306 males completed the questionnaire, of whom the majority were between 50–59 years old (41.5%). Around 63.4% of participants were working, and 32% were retired. The high-rated urban participants constitute 46.4%, followed by low-rated urban

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(31.7%) and then rural region (21.9%). Most of participants are of university education level (34.3%) while the least groups are the non-educated and the intermediate education as 10.5% and 8.8% respectively table (1).

Table 1: Demographic features of participants

Feature	Number	Percentage %
Age		
40-49	78	25.5
50-59	127	41.5
60-69	86	28.1
70-79	12	3.9
≥80	3	1.0
Region		
High-rated urban	142	46.4
Low-rated urban	97	31.7
Rural	67	21.9
Education		
Non- educated	32	10.5
Preparatory school	44	14.4
Intermediate school	27	8.8
Secondary school	61	19.9
University	105	34.3
Higher level	37	12.1
Occupation		
Working	194	63.4
Not working	14	4.6
Retired	98	32.0

Around twenty percent (20.9%) of participants or their relatives have suffered from a prostate condition. The prostatic enlargement was the most condition reported among the concerned participants (50.0%). On other side, 4.6% had prostate cancer. Family history of prostate conditions was reported in 14.7% table 2.

Table 2: Personal and family history of prostate conditions

Question	Number	Percentage %
Have you or any of your family members had suffer from prostate conditions?		
Yes, I had	19	6.2
Yes, my family member	45	14.7
No	242	79.1
Who is the affected family member?		
Brother	9	20.0
Father	31	68.8
Other	5	11.2
What was the condition?		
Prostate enlargement	32	50.0
Prostate inflammation	20	45.4
Prostate cancer	3	4.6

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According to table (3), 47.4% of participants had gained their information about prostate cancer mainly through social media and internet, followed by healthcare providers (25.8%), the television and radio media (18.3%), and finally heard from friends or family member (8.5%).

Table 3: Source of information about prostate cancer

Question	Number	Percentage %
How participants get their information?		
Healthcare providers	79	25.8
Social media and internet	145	47.4
The television and radio media	56	18.3
Friends / family member	26	8.5

Extracting from table (4), the most well-known risk factors among the participants were age over 50 years (63.1%) and family history (44.1%). Moreover, fewer participants were aware of smoking (20.3%), obesity (17.6%), and alcohol (9.8%). The dietary behavior constituted high fat diet (21.9%) and meat consuming (12.7%). On the other side, 67.6% of participants believed that physical activity is the prime protective factor versus prostate cancer, persuaded by a high intake of fruits and vegetables (42.8%), then a low-fat diet (24.5%) and vitamin D/E supplementation (14.5%).

Table 4: Risk factors of prostate cancer

Question	Number	Percentage %
Have you know about the risk factors related to possibility of prostate cancer occurrence		
Age over 50 years	193	63.1
Family history	135	44.1
Smoking	62	20.3
Alcohol	30	9.8
Obesity	54	17.6
High fat diet	67	21.9
Meat consuming	39	12.7

Table 5: Protective factors against prostate cancer

Question	Number	Percentage %
Have you know about the protective factors against prostate cancer		
Physical activity	207	67.6
High intake of fruits and vegetables	131	42.8
Low-fat diet	75	24.5
Vitamin D/E	44	14.4

Majority of the participants don't hear about PSA (86.3%). More than half of the other participants sector hears about PSA from social media (52.4%), followed by internet (19.0%), then healthcare providers (17.2%), and family or friends (11.9%) as shown in Table 6.

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Table 6: Knowledge about PSA and source of knowledge

Question	Number	Percentage %
Do you hear about PSA test		
Yes	42	13.7%
No	264	86.3%
Knowledge source about PSA		
Friends/family member	5	11.9%
Social media	22	52.4%
Internet	8	19.0%
Healthcare provider	7	17.2%

Furthermore, according to data in table (7); 94.4% of the participants had an inadequate level of knowledge about both the PSA test and prostate cancer 96.4% had a negative attitude towards them. The majority of sample stated that they had never been told about the PSA test or its benefits by their physicians (92.5% and 93.5%, respectively). Only 15 participants (4.9%) had done the PSA test before.

Table 7: Knowledge and attitudes toward prostate cancer and PSA test

	Number	Percentage %
Level of knowledge		
Inadequate	289	94.4%
Adequate	17	5.6%
Attitude		
Negative	295	96.4%
Positive	11	3.6%
Have you ever been told by your doctor about PSA?		
Yes	23	7.5%
No	283	92.5%
Have you ever been told by your doctor about advantage of PSA?		
Yes	20	6.5%
No	286	93.5%
Have you had PSA before?		
Yes	15	4.9%
No	291	95.1%

The participants' age group (50-59 years), high-rated urban as well as the university and higher education levels had a statistically significant effect on the knowledge level of prostate cancer and the PSA test compared to other groups ($P < 0.001$) as given in table (8).

Discussion

Prostate cancer is frequently asymptomatic and ordinarily recognized in the geriatric population. Majority of cases are found incidentally in clinical statuses. The number of clinically diagnosed prostate cancer cases is expected to elevate with the rapid development

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of healthcare and screening progress (Hilscher *et al.,* 2022). In spite of early screening is known to influence treatment outcomes significantly, it demands high levels of awareness among the population and a positive attitude across it (Atulomah *et al.,* 2010).

Table 8: The relationship between demographic features and level of knowledge

Feature	Level of knowledge			
	Inadequate (n≈289)		Adequate (n≈17)	
	Number	Percentage %	Number	Percentage %
Age				
40-49	75	26.0	3	17.6
50-59	121	41.9	6	35.4
60-69	83	28.7	3	17.6
70-79	9	3.1	3	17.6
≥80	1	0.3	2	11.8
Region				
High-rated urban	133	46.0	9	52.9
Low-rated urban	92	31.8	5	29.4
Rural	64	22.1	3	17.6
Education				
Non- educated	32	11.0	0	0
Preparatory school	44	15.2	0	0
Intermediate school	27	9.3	0	0
Secondary school	60	20.8	1	5.9
University	100	34.7	5	29.4
Higher level	26	9.0	11	64.7
Occupation				
Working	192	66.4	2	11.8
Not working	10	3.5	4	23.5
Retired	87	30.1	11	64.7

In this study, 47.4% of participants had heard about prostate cancer through mainly social media and the internet, followed by healthcare providers (25.8%), the television and radio media (18.3%), and friends or family member (8.5%). These outcomes near results obtained by Gift *et al.* (2020) that revealed that only 33.5% of participants had heard about prostate cancer. On the other hand, the result in contrast to a study performed by Benurugo *et al*. (2020), which found that 77% of their participants had heard about prostate cancer from healthcare providers and less commonly from the internet (6%) and social media (5%). In parallel, a study performed in Ghana revealed that 40.3% of participants had heard about prostate cancer from healthcare providers (Necku *et al.,* 2019). The low levels of knowledge about prostate cancer, its risk factors, signs, and screening tests in this study may contributed to low education and general awareness due to inadequacy in the role of media as well as healthcare providers and authorities. Meanwhile, acquiring knowledge from social media has its drawbacks as not all information published on the internet is precise and adequate.

Age over 50 years (63.1%) and family history (44.1%) were the most well-known risk factors among participants, while high fat diet (21.9%) smoking (20.3%), obesity (17.6%),

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meat consuming (12.7%) and alcohol (9.8%) were the least known risk factors. These findings harmonized with the results of Benurugo *et al.* (2020), who stated that family history was the most familiar risk factor among Rwandan participants. However, the results contradict Nigerian study which defined sexual activity as the most known risk factor of prostate cancer followed by age, family history, and occupation (Oladimeji *et al.,* 2010).

Concerning the protective factors; it was found that physical activity, high intake of fruits and vegetables, low-fat diets and vitamin D/E supplementation were the most familiar versus prostate cancer among study participants. Contrarily, participants in a previous study were not aware of the protective impacts of either physical activity or diet control (Benurugo *et al.,* 2020).

The current study data indicated that low percentage of participants (13.7%) hear about PSA, mostly from social media (52.4%), followed by internet (19.0%), then healthcare providers (17.2%).

These findings were consistent with other previous studies, which revealed that more than half of samples had a poor level of knowledge of both prostate cancer and the PSA test, with a negative attitude towards them (Oladimeji *et al.,* 2010 and Gift *et al.,* 2020).

Meanwhile, the findings were in contrast of that obtained by Necku *et al.* (2019), who stated that almost of their study participants (76%) knew about the PSA screening test. Also, another opposite study performed in Italy exposd that 72.7% of participants were aware of the PSA test almost from physicians (51.1%) (Morlando *et al.,* 2017).

Notably, only 15 participants (4.9%) in the current study had done a PSA test before, which is greatly lower than what was reported by other studies in Italy, Ghana, Rwanda, and Zambia. This may be attributed to the lack of education and shortage of healthcare providers' advice (Morlando *et al.,* 2017; Necku *et al.,* 2019; Benurugo *et al.,* 2020; and Gift *et al.,* 2020).

The current study exposed that the higher education levels of the participants' had a statistically significant impact on the knowledge level of prostate cancer and the value of PSA test compared to other groups ($P < 0.001$). This outcome was on line with the finding of other study addressed participants belonged to 14 Middle East countries (90.5%), (Sayan *et al.,* 2024).

Conclusion

The study has exhibited a remarkable lack of knowledge and negative attitude about PCa, as well as its risk factors and early screening significance among the participants. Furthermore, there were insufficient screening practices in the investigation highlight the urgent require to provide men with detailed information about the advantages of PCa screening. Notably most of participants have gained their information from social media not from trustable sources. This may be attributed to an inadequacy in the role of healthcare providers to inform their patients properly about PCa. Improving and expanding healthcare initiatives lighted on elevating awareness about prostate cancer and its early detection.

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Recommendations:

Relied on the findings of the present study, suggested recommendations include i. possible implementation of educational programs in governmental and private sectors especially in employee over 50 years age to improve knowledge and commitment of prostate cancer screening. ii. Health organizations and media campaigns trials to increase the awareness about prostate cancer through TV, radio, mobile massages or social media. iii. Health care professionals especially urogenital specialists should give more time and effort to advise males about the risk of prostate cancer, its risk factors, protective factors, screening tools as well as the importance and significance of early detection. iv. Encouragement of research based organizations to conduct further studies with larger numbers of participants to raise PCa awareness.

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