ORIGINAL ARTICLE

BEYOND THE NORM: PROSTATE CANCER AWARENESS AND SCREENING PRACTICES IN PAKISTANI MEN AGED 40+ WITH AFFECTED FIRST-DEGREE RELATIVES, EMPLOYED AT A PRIVATE ORGANIZATION

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Background: Prostate cancer is the second most common cancer in men worldwide. In Pakistan, awareness and screening remain limited among high-risk men even with affected first-degree relatives. Evaluating knowledge and behaviours is essential for identifying gaps and improving early detection efforts. Objectives were to assess awareness and screening practices regarding prostate cancer, identify participants with affected first-degree relatives, explore perceived barriers and facilitators, and determine associations between awareness and screening behaviours. **Methods:** A cross-sectional exploratory study was conducted from May to September 2024 among 156 eligible male employees aged 40 years and above. Ethical approval and informed consent were obtained. Data were collected using a structured questionnaire via Google Forms and analysed using SPSS version 26. **Results**: Among 156 participants with mean age 49.81±5.61), 125 (80.15%) had inadequate awareness of prostate cancer. Secondary education was completed by 62 (39.74%), and 100 (64.10%) were permanently employed. Information sources included friends or family in 143 (91.7%) and healthcare professionals in 139 (89.1%). Only 5 (3.2%) had first-degree relatives (father) with prostate cancer, and 4 (2.6%) had a positive family history (two uncles and two cousins). Prostate screening was conducted yearly in only 7 (4.5%) participants, while out of 156, 149 (95.5%) never underwent screening due to lack of awareness 100 (64.1%) and expenses 96 (61.5%). Awareness campaigns were recommended by 99 (63.5%) and organizational support by 91 (58.3%). No significant association was found between awareness, education, family history, and screening practices. The questionnaire demonstrated good reliability (Cronbach's Alpha 0.888). **Conclusion**: Most men did not have adequate awareness of Prostate Cancer and had low screening practices. Awareness campaigns and organizational support were perceived as the main facilitators.

Keywords: Awareness; First Degree Relatives; Prostate cancer; Screening; PSA

Citation: Amjad T, Turab A, Udin ST, Iftikhar F, Ashraf S, Humayun S, *et al.* Beyond the norm: Prostate cancer awareness and screening practices in Pakistani men aged 40+ with affected first-degree relatives, employed at a private organization. J Ayub Med Coll Abbottabad 2025;37(1):29–34.

DOI: 10.55519/JAMC-01-14326

INTRODUCTION

Prostate cancer (PCa) is characterized by uncontrolled cell growth in prostate gland, impacting male reproductive health. It remains localized when confined to prostate gland but is termed "advanced" when it spreads to lymph nodes, bones, or the liver. [1] Early symptoms include difficulty urinating, frequent urination, haematuria, erectile dysfunction, and pelvic pain. [2] Benign prostatic hyperplasia (BPH) may look like an expected destiny for aging men.[3]

PCa is the second most common cancer in men globally and a leading cause of cancer death in developed countries.[4] In 2021, the American Cancer Society estimated 248,530 new PCa cases and 34,130 deaths, indicating that 1 in 8 men will be diagnosed, but only 1 in 41 will die from it[5]. The global incidence is 7.3%, with a mortality rate accounting for 3.8% of all cancer deaths. [6] Around 10–15% of PCa cases are familial.[7] Often involving patients with affected relatives.[8] The average age of diagnosis is about 67 years.[9] It is predicted that by 2040, the PCa burden will have increased to approximately 2.4 million cases and 712 000 deaths solely because of the aging and growing global population.[10] The disease is autosomal dominant, increasing the risk for first-degree relatives.[11] The inherited form of prostate cancer accounts for a significant proportion of early-onset disease but a small proportion was overall responsible for a small proportion of prostate cancer occurrence (9% by age 85).[12]

Early detection through screening is crucial for effective management. A 2023 meta-analysis estimated a 5.20% prevalence of PCa in Pakistan, with an increase from 3.88–5.80% between 2000–2010 and 2011–2023 respectively.[13] Despite the benefits of early detection, few countries have implemented national screening programs, mostly utilizing Prostate-Specific Antigen (PSA) testing.[14] Research indicates that differences in PSA assays affect diagnostic outcomes and the cost-effectiveness of early detection programs.[15]

In Pakistan, the lack of standardized screening contributes to increased mortality, as benign conditions often progress to malignancy. [16] PSA screening has led to more early-stage PCa detections, [17] but many men avoid screenings due to cost and resource limitations. Screening with PSA and Digital Rectal Exam (DRE) is economically justified for men aged 40–69. [18] However, awareness and participation in screening remain low, particularly in Pakistan.

This study seeks to identify the barriers and enabling factors associated with prostate PCa screening, particularly among men who have first-degree relatives (father, brother, sons) diagnosed with the disease. Understanding their awareness and behaviours is key to addressing gaps and developing targeted interventions. The findings could update strategies to improve early detection, reduce mortality, and guide organizations and policymakers in implementing health promotion and screening campaigns, ultimately enhancing community health and reducing late-stage diagnoses.

MATERIAL AND METHODS

This cross-sectional exploratory study was conducted from May to September 2024, over five months, using total population sampling. A sample size of 76 participants was also determined using Rao soft Sample size calculator software, with a 95% confidence level and a 5% margin of error with a prevalence of 5.2% 13, all 156, who were currently employed at various institutes of Fauji Foundation located at Islamabad. The eligible employees from Foundation University School of Health Sciences (FUSH) administration, Foundation University Medical College (FUMC), Foundation University College of Dentistry and Hospital (FUCD&H), Foundation University College of Physiotherapy (FUCP) and Foundation University College of Nursing (FUCN) were selected. Employees who did not consent and those already diagnosed with PCa were excluded. Ethical approval was obtained from the Institutional Ethical Review Board vide letter no FF/FUMC/215-410 Phy/24 dated 3rd May 2024.

The self-developed questionnaire was pre-tested on 15 men 40 and above and revised before final use. Translated in Urdu and content validation was carried out by a panel of experts, including public health specialists, oncologists, surgeons, researchers, and a biostatistician. The data collection tool had four sections that covered demographics, prostate cancer awareness, first-degree relatives (Father, Son, and Brother) with PCa, and other family members (excluding First-Degree relatives) like grandfather, uncles, cousins, etc with a history of PCa, screening practices, and perceived barriers and facilitators. Employment-related items were covered in the demographic section. The awareness section had 15 items about PCa general information, symptoms, and risk factors. For each correct response, one score was given and a total score of 15. Education had extreme values from Primary to master's level that could have influenced the PCa awareness, therefore the median value of eight was taken instead of the mean value The scores were then categorized as Adequate awareness at Median ≥8 Median) and inadequate awareness at Median <8. The prostate cancer screening practices of employees were assessed through structured questions for being ever screened for PCa. Respondents who answered affirmatively were explored for the frequency of screening and the screening methods (PSA, DRE, Ultrasound, or any other) they had undergone. This comprehensive approach allowed for a detailed understanding of the screening practices among the target population.

Data collection involved in-person, interview-based sessions after obtaining informed consent. Responses were recorded on Google Survey Forms, and Excel output sheets were imported to SPSS version 26. Confidentiality and anonymity were ensured, and biases were eliminated. Descriptive and inferential statistical analysis was done. Frequencies, percentages, and mean /SD were computed. The chi-square test was applied to determine the association between Awareness level and Screening practices. Cronbach's Alpha for reliability was calculated. Data were presented using frequency tables, graphs, and charts. The statistical significance level was set at p-value <0.05.

RESULTS

Out of 159, a total of 156 male employees from a private organization participated in the survey yielding a 98.11% response rate. The questionnaire demonstrated good reliability (Cronbach's Alpha 0.888). The mean age was estimated to be 49.81±5.61, and age groups ranged from 40–49 years, 50–59 years, and 60 years or above. The sociodemographic attributes of participants are listed in Table 1. Most respondents completed secondary education 62 (39.74%), and a small percentage held a master's degree or higher 3 (1.9%). Most of the participants, 25 (16.1%) were employed as Clerks / Computer Clerks. (Table 1)

In this study, 125 (80.15%) participants lacked adequate awareness of prostate cancer. The mean awareness score was 5.63±4.16 and One Sample t-test didn't show any significance with p-value 0.266. Only 7

participants (4.5%) underwent annual screening, while 149 (95.5%) had never screened. (Table-2). Of the 4 participants with health insurance coverage, only one underwent screening. The main source of information was Physicians and family. (Figure 1). Prostate screening practices varied by age group. Out of 79 participants aged 40-49, 75 (48.0%) had never undergone screening. (Table-2) The chi-square test (p=0.749) showed no significant associations between age and screening practices (Table-3).

Among respondents, five first-degree relatives (father) had prostate cancer. The Chi-square (p=0.384) (Table-3) Fisher's Exact (p=0.340), and linear-by-linear association (p=0.386), showed no significant associations. No significant association was found between awareness levels and screening practices. (Table-3) Barriers to screening included lack of awareness 100 (64.1%) and Screening cost 96 (61.5%). Perceived facilitators for screening included healthcare professional recommendations 100 (64.1%), increased awareness 99 (63.5%), and availability of free or subsidized screening 99 (63.5%) (Table-4). These findings underline the need for targeted education and interventions to address barriers and enhance screening practices.

Table-1: Demographics of employees

Characteristics	Frequency n=156	%
Age Groups distribution (years)	**Mean Age:** 49.81±5.61	
40–49	79	50.64
50–59	66	42.31
60 or above	11	7.05
Marital status (Married)	156	100
Employment Category		
Contractual	56	35.90
Permanent	100	64.10
Most Frequent Job Tiles		
Attendant / Dissection Hall attendant / Assistant Storekeeper	19	12.2
Accountant / Admin / Office Superintendent /Assistant	14	9.0
Driver	19	12.2
Clerk / Computer Clerk	25	16.1
Darogha	21	13.5
Dental Surgery, Radiology Assistant/ Technician	11	7.1
Electrician/ Painter/ Plumber/ sanitary worker/Gardner	9	5.8
Lab Technician / Attendant	16	10.3
Mean years of Employment	8.11±5.84	
Place of Employment in the organization		
FUMC	122	78.21
FUCD	24	15.38
FUCP	2	1.28
FUCN	2	1.28
Administration	6	3.85
Educational level		
Primary Education	28	17.95
Secondary Education	62	39.74
Higher Secondary Education	39	25.00
Bachelor's Degree	24	15.38
Master's Degree and Above	3	1.9

Table-2: Prostate cancer awareness and screening practices among the employees

Awareness level *		Frequency	Percent
Inadequate Awareness (<Median Score 8)		125	80.1
Adequate Awareness (≥Median Score 8)		31	19.9
Screening Practices			
Never		149	95.51
Once a year		7	4.49
Screening Practices among age groups. n%		**Never**	**Once a year**
40-49 yrs	79 (50.6%)	75 (48.0%)	4 (2.6%)
50-59 yrs	66 (42.3%)	63 (40.4%)	3 (1.9%)
60 yrs and above	11 (7.0%)	11 (7.0%)	0
Screening Methods		**Frequency**	**%**
Digital Rectal Examination (DRE)		1	0.6
PSA Laboratory Test		8	5.1
Ultrasound		1	0.6
First Degree Relatives with history of PCa (Father, son, brother)		5 (Father)	3.6
Other family members with history of PCa (Grandfather, Uncle, Cousins etc)		4 (2 Uncles and 2 Cousins)	2.6

*A total of 15 items to evaluate awareness regarding symptoms, risk factors, and screening methods, each correct answer scoring one, with a total score of 15. Awareness Levels categorized by taking the median score value of eight.

Table-3: Perceived barriers and facilitators to prostate cancer screening. n=156

Perceived Barrier	Yes n (%)	No n (%)
Delay in seeking care	82 (52.60)	74 (47.40)
Lack of awareness	100 (64.10)	56 (35.90)
Cost of screening	96 (61.50)	60 (38.50)
Fear of diagnosis	65 (41.70)	91 (58.30)
Stigma	58 (37.20)	98 (62.80)
Misinformation	51 (32.70)	105 (67.30)
Cultural or Religious Beliefs	62 (39.70)	94 (60.30)
Lack of access to health care	6 (3.80)	150 (96.20)
Perceived Facilitators		
Support from the organization	91 (58.30)	65 (41.70)
Recommendation from a healthcare professional	100 (64.10)	56 (35.90)
Support from family members	91 (58.30)	65 (41.70)
Increased awareness about the importance of screening	99 (63.50)	57 (36.50)
Availability of free/subsidized screening	99 (63.50)	57 (36.50)
Any other (No response, Relaxation in duty, job security, mandatory screening etc)	34 (21.80)	122 (78.20)

Table-4: Cross-tabulation of variables

Independent and dependent variable	Pearson chi-square test Value	Significance (p-value <0.05) *
Age groups and prostate cancer awareness level	3.407	0.182
Age group and Screening practices	0.578	0.749
Educational level and Awareness level	8.624	0.071
Prostate Cancer history in first-degree relatives and Awareness level	0.757	0.384
Awareness level and screening practices	0.095	0.757
Screening practices and Prostate Cancer history in first-degree relatives	2.900	0.089
Health insurance coverage by organization and prostate cancer screening practices	4.030	0.045*

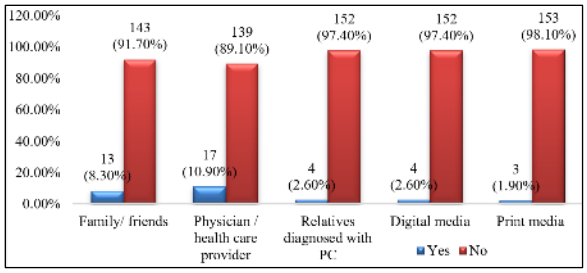

Figure-1: Sources of information for prostate cancer screening

DISCUSSION

Prostate cancer is a major health concern for Pakistani men 40 and above with first-degree relatives. This study explores awareness and screening practices among private organization personnel to recognize gaps and inform health authorities.

In this study, there was no significant association between awareness and screening practices, though a trend indicated that higher awareness was linked to better screening outcomes. This suggests that awareness alone might not be a strong enough driver of screening behaviour without additional influences, such as targeted recommendations from healthcare providers. In contrast, the 2018 study conducted in Karachi found significant associations between awareness and screening practices with age (p=0.008), highlighting that demographic factor, particularly age, played a crucial role in influencing screening behaviours. The observed differences between the two studies may stem from variations in participant sociodemographic, healthcare provider involvement, and organizational influences.[19] Also, in this study awareness of symptoms was comprehensive with all respondents naming almost all the symptoms unlike Kenian research, where only 57.3% of people were aware of symptoms and risk factors.[20]

In our study, prostate screening practices showed no significant association with age (p=0.749), as most participants, especially those aged 40–59, had never undergone screening. In contrast, a Nigerian study found that good knowledge (p<0.001) and a positive attitude (p=0.003) significantly influenced screening practices, with doctor recommendations being the most common reason for screening. These findings highlight that improving knowledge and attitudes towards screening may be more effective than focusing solely on demographic factors like age, emphasizing the need for comprehensive educational interventions to boost screening rates.[21]

In this study, there is a significant linear trend (p=0.010) suggesting a borderline association where awareness levels are influenced by educational levels which suggests that higher educational attainment might improve awareness. This is consistent with findings from Ghana, where 97.5% recognized the importance of prostate cancer screening and majority were willing to be screened. Ghana soldier's research on prostate cancer reveals that soldiers with postgraduate education were more likely to be aware of PCa compared to those with only secondary education. The discrepancy between the studies may stem from differences in sample populations and access to healthcare information. Military personnel likely receive more structured health education and targeted awareness initiatives, enhancing their knowledge. In contrast, our study indicates that higher education alone may not ensure sufficient awareness among private organization employees, emphasizing the need for targeted educational interventions across all levels.[22]

In our study most participants renounced screening because of lack of awareness, cost of screening and distress of diagnosis. Conversely perceived facilitators included accessibility of subsidized screening, endorsement from health care professionals and backing from family (58.3%). Similar outcomes are revealed by other research that screening procedures are highly influenced by socioeconomic status, education and access to health care globally.[23]

A recent study revealed four themes to be categorized as facilitators of Prostate cancer screening that were experience of symptoms, proximity and prominence of cancer, accessibility of screening services and community advocacy.[24] In contrast, our study showed the accessibility of subsidized screening to be the foremost facilitator with highest percentage of 63.5%.

Like some of our findings, scoping research on barriers to prostate cancer screening services also found that lack of awareness and knowledge, negative beliefs and fears and seeking healthcare, only when symptoms appear were barriers to Prostate cancer screening.[25] These results were consistent with this study which reported lack of awareness as the major barrier to screening.

Our study provides comprehensive statistics on prostate cancer awareness, screening practices, and perceived barriers and facilitators, using a quantitative approach for robust statistical analysis. By examining data across various demographics, it offers insights into how targeted interventions are crucial for awareness and screening behaviours. The study highlights an important area of concern, urging healthcare providers, particularly in private organizations, to enhance employee health care.

To improve screening rates, targeted campaigns should focus on those with affected

relatives and lower education levels, while health professionals need ongoing training. Subsidizing screening costs, enhancing health insurance coverage, and addressing cultural barriers are essential. Future research should assess the impact of educational interventions, organizational support and cultural factors on screening behaviours and address biases to support effective health strategies.

To summarize, awareness does not necessarily increase screening rates, as many participants reported never screening despite their awareness. This reveals a gap in public engagement and the need for effective health campaigns. The family history of prostate cancer was not significantly associated with screening practices. Our study identifies barriers and facilitators, recommending targeted interventions for less educated individuals and those with affected relatives. Addressing these can enhance health management and reduce the prostate cancer burden in Pakistan.

Limitations of the study

The findings of the study may not be generalized beyond private health organization employees, and self-reported data could introduce recall bias or socially desirable responses, potentially skewing results. Socioeconomic status, healthcare access, and cultural factors might also confound the findings. The study focused on a single health-related organization and administration staff only due to the constraints of their availability, duty timings, nature of employment and duration of study. Expanding to multiple organizations and inclusion of all employees, could offer broader insights. Follow-up studies may further enhance understanding of screening practices and policy needs.

CONCLUSION

The research highlights inadequate awareness and poor screening practices (PSA and DRE), with barriers like lack of awareness, delays, costs, fear, and hesitation. Information sources that facilitate screening include healthcare providers, family, and digital media, while health insurance and professional advice also play influential roles. To improve screening practices, it's essential to implement targeted campaigns, create accessible programs, and ensure effective information dissemination.

Acknowledgements

We would like to acknowledge the invaluable response of all the employees who voluntarily contributed to this study. Assistance of ChatGPT (OpenAI) is acknowledged for manuscript formatting and grammatical corrections.

Conflict of interest: No potential conflict of interest relevant to this article was reported.

Financial Disclosure: No funding received

AUTHORS' CONTRIBUTION

TA: Conceptualization, supervision, study design, analysis, interpretation, write-up. AT: Data acquisition, analysis, drafting. STD: Conceptual frame work execution, analysis, interpretation, drafting. FI: Literature search, data collection analysis, drafting. AH: Data acquisition, analysis, results. SH: Literature search, interpretation, critical review. AJ, AZ, SA, TZ, ZM, IA: Literature search, data collection, data analysis, drafting.

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Submitted: October 15, 2024	*Revised: December 5, 2024*	*Accepted: December 30, 2024*

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