

Insights into prostate cancer awareness and perceptions among men in Tshwane

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Background. Globally, prostate cancer (PCa) accounts for 6.6% of deaths, while in South Africa (SA), PCa accounts for 13% of deaths in males, with over 4 000 SA men diagnosed with PCa annually. This may be attributed to the inadequate availability of screening, early detection and possibly other socioeconomic and lifestyle factors.

Objectives. To determine the factors associated with knowledge and perceptions of PCa among men in the Tshwane district.

Methods. A descriptive cross-sectional survey was conducted between August 2022 and June 2023 in a study population of men, ≥ 18 years, residing in Tshwane district located in Gauteng, South Africa.

Results. In this study, 91.7% of the subjects responded that they had heard about PCa, while 11% thought they might be at risk for having PCa. While 93.7% of the respondents reported that they had never tested for PCa, 98.3% said that if they were offered the opportunity to test voluntarily, they would agree to test for PCa. There was a significant association between age and knowledge of PCa ($p < 0.001$). There was also a significant association between perception of PCa and smoking ($p = 0.034$), age ($p = 0.035$) and level of education ($p = 0.04$).

Conclusion. This study shows significant associations between age and level of education with knowledge, perception and awareness of PCa. Educational campaigns targeting diverse age and education groups are recommended, along with smoking cessation programmes, improved PCa screening access, tailored messaging, healthcare collaborations, and cultural sensitivity to enhance awareness and early detection.

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Prostate cancer (PCa) is a life-threatening disease that starts in the prostate when abnormal cells grow uncontrollably, go beyond their usual boundaries and invade adjoining parts of the body and/or spread to other organs. In most cases, PCa is adenocarcinoma, mainly from the peripheral region's luminal or basal cells.^[1] In men over 50 years of age, particularly those of African descent, PCa has a high prevalence.^[2-4] The predominant clinical features of PCa are urinary flow issues, pain during urination and elevated prostate-specific antigen (PSA) levels.^[3] Furthermore, age, race and family history are risk factors for PCa.^[3] Different studies have indicated the importance of early diagnosis through PSA testing.^[2-4] Currently treatments available for PCa include surgery, hormone treatment, radiation, and chemotherapy.^[2,3] Despite early diagnosis, the treatment's risk-benefit ratio is debated because of significant morbidity. According to GLOBOCAN, worldwide, PCa is estimated to be the second most common cancer and the fifth leading cause of cancer death for men in 2020, with almost 1.4 million new cases and 375 000 deaths.^[5] Almost 70% of PCa incidence occurs in more developed countries, e.g. in North America, New Zealand and Australia.^[1] In Africa, PCa, when compared with other cancers, has the highest number of cases (17.5/100 000 population), and deaths (12.5/100 000) per year.^[6] PCa frequency is comparatively high in South Africa (SA). Analysed data from Ghana indicate that it is second to liver cancer, with an incidence of about 200/100 000 per year.^[7]

In SA, PCa is the leading cancer among men; its incidence has risen from 29/100 000 men in 2007 to 68/100 000 men in 2018.^[8-10] Thus, PCa contributes to approximately 13% of male cancer-related deaths in the country.^[11] The incidence of PCa is more pronounced in black SA men, resulting in a disproportionate impact, as more black SA men are affected by PCa than men from other races.^[12]

According to the 2022 Statistics South Africa report, black SA males account for 80% of the male population group, while the

remaining 20% are Indian, mixed race, and white.^[13] Furthermore, American men are diagnosed ~5 years earlier than black African men in SA, and rural localities are diagnosed 3 years later when compared with urban residents.^[14] Causes of late PCa diagnosis are likely to intensify throughout Africa, which complicates the precise burden of disease evaluation and data analysis.^[4] It is widely understood that these variables largely comprise knowledge, attitude, ethnicity, and finances.

Several limitations in knowledge of and perceptions about PCa become evident among men in SA.^[15] One limitation is the inadequate awareness of age as a significant risk factor for PCa. This lack of awareness could lead to underestimation of susceptibility, resulting in delayed screenings and missed opportunities for early detection, particularly among older individuals. Furthermore, the limited recognition of genetic predisposition, especially within specific racial groups such as black SA men, underscores a gap in understanding the complex interplay between genetics and PCa.^[16,17] Addressing these limitations is essential to improve public knowledge of and perceptions about PCa, enhancing its prevention and management.

The aim of this study was to determine the knowledge and perceptions of men regarding PCa in the Tshwane Metropolitan Municipality. In this study we describe the sociodemographic profile of respondents and determine any factors that may contribute to gaps in PCa knowledge and perception.

Methods

Study design and setting

In this study, a descriptive cross-sectional survey design was conducted between August 2022 and June 2023. The study population comprised men, ≥ 18 years old, residing in Tshwane Metropolitan Municipality district, Gauteng, SA. The metro is the third largest in SA, stretching about 121 km from east to west and 108 km from north

to south. As of 2022, Tshwane had a population of 4 040 000, of whom 50.1% were males.

Study population, sample size, and sampling plan

In this study participants were recruited from clinics in the Tshwane Metropolitan Municipality. Potential participants were men ≥ 18 years old, identified at the clinics. The men were approached and requested to participate in the study. The study information was shared with those who agreed to participate, including the link to the survey. The participants of the study were reasonably spread across a wide variety of age groups, levels of education and population groups. A total of 316 men participated in the study.

Data collection tool

The data were collected using an electronic survey using the Qualtrics XM platform. Questions were piloted first to evaluate reliability and internal validity. The survey instrument was piloted with 10 trained field workers. Following the pilot study, the questions were refined and simplified to enhance understanding. Both open- and close-ended questions were used. The questionnaire covered the following areas: biographical history, sociodemographic information, knowledge of symptoms and causes of PCa, attitudes, and knowledge on screening and PCa treatment. Variables of interest were, age, level of education, smoking status, and scores of knowledge of and attitude to PCa. The respondents of this study were given different statements to test their knowledge of PCa (Table 1) and their perceptions (Table 2) about PCa.

Data analysis

Participants were asked to respond to each statement (Tables 1 and 2) by rating the statement on a rating score from 1 to 4. Scores 1, 2, 3 and 4 represent 'Strongly agree', 'Agree', 'Disagree' and 'Strongly disagree' respectively. A descriptive analysis was performed to report and summarise the findings. Frequency counts, percentages and 95% confidence intervals were reported for categorical variables. Summary statistics such as mean, standard deviation, and range were reported for quantitative variables. Frequency distribution tables and appropriate charts were displayed to show differences in the relative frequencies of variables. A χ^2 test was done to determine whether there was a significant relationship between categorical variables. A p -value < 0.05 was considered statistically significant.

Ethical consideration

Ethical approval was obtained from the Faculty of Health Sciences Research Ethics Committee, University of Pretoria (ref. no. 735/2022).

Results

Data management

Data were extracted from the questionnaires, cleaned and exported to STATA software (StataCorp, USA) which was used during the analysis phase. Access to equipment and storage media was limited. All electronic files were protected with login and passwords. Files were backed up and stored in multiple secure locations. All completed data sheets were stored in a lockable cupboard for further reference and safekeeping. These records will be kept for 15 years in a safe, secure location.

Sociodemographic profile of respondents

A total of 316 individuals residing in Tshwane, aged ≥ 18 years, successfully completed the survey. The age of the respondents ranged between 18 and >60 years old, with 55.7% of the respondents

Table 1. Knowledge statements scored by the respondents

Key for knowledge statements
1. Routinely testing for prostate cancer does not reduce the chances of dying from it.
2. Having prostate cancer is not the end because there are treatments available.
3. Taking a prostate cancer test requires that you pay a private doctor.
4. Starting prostate cancer treatment late is not a problem.
5. It is important to go for a prostate cancer test to make sure cancer does not spread.
6. Difficulty in erection is not associated with symptoms of prostate cancer.
7. There is limited information about prostate cancer.
8. Weak or interrupted urine flow or the need to strain to empty the bladder is a sign/symptom of prostate cancer.
9. Pain in the back, hips, thighs, shoulders, or other bones can be a sign/symptom of advanced prostate cancer.
10. I would like to know what the risks and treatments are.

Table 2. Perception statements scored by the respondents

Key for perception statements
1. I feel prostate cancer only affects wealthy individuals.
2. I feel that prostate cancer tests should be done by people who feel ill and suspect that they might have prostate cancer.
3. I feel that the age of an individual cannot increase the chances of developing prostate cancer.
4. I feel that taking a prostate cancer test is embarrassing; I would rather wait until I become sick.
5. I do not view prostate cancer as a concern.
6. I feel that a healthy lifestyle is necessary to reduce the chances of developing prostate cancer.
7. I think that prostate cancer is a serious disease, and I am afraid that I may develop it later in my life.
8. I think that knowing about prostate cancer will not benefit me.
9. I am afraid my partner would not understand why I am going for prostate cancer test.
10. I think it is important that family/partners know about prostate cancer so that they understand the risks and treatments.

Table 3. Demographic data of respondents who successfully completed the survey

Demographics (N=316)	n (%)
Age (years)	
18 - 25	73 (23.1)
26 - 35	111 (35.1)
36 - 45	82 (25.9)
46 - 60	19 (6.0)
>60	31 (9.8)
Parental status	
Biological parent	176 (55.7)
Not a biological parent	140 (44.3)
Level of education	
Bachelor's degree or higher	167 (52.8)
Post-matric diploma	22 (7.0)
Matric	117 (37.0)
High school (Grades 8 - 11)	10 (3.2)

being parents to at least one biological child (Table 3). More than half of the respondents were either formally employed or studying, and 52.8% of the respondents had a bachelor's degree.

Physical activity and smoking

In this study, 77.0% of the respondents indicated that they took part in some form of exercise or recreational activity. Jogging or running was the most frequent exercise reported. Gardening and hiking were among the most frequent recreational activities. Most of the respondents (92.1%) reported that they do not smoke.

General level of awareness of PCa

In this study, 91.7% of the respondents said that they had heard about PCa. However, 11.0% of the respondents did not think they might be at risk of having PCa. While 93.7% of the respondents reported that they had never tested for PCa, 98.3% of the respondents reported that if they were offered the opportunity to test voluntarily, they would agree to test for PCa. Only 3% of the respondents reported that they had a family member who had been diagnosed with PCa.

Cancer history and diet

When asked if anyone else in the family had had any other type of cancer, 32.8% did not know, 29.4% indicated that someone else in the family had been diagnosed with cancer before, while 27.8% indicated not. Most participants eat red meat at least once a week (49.3%); 96% of the participants eat chicken more than once a week. Almost half (46.0%) of the participants eat fruit only once or twice a week; 59.7% of the respondents eat vegetables every day.

Knowledge regarding PCa

Age and knowledge

In the age groups between 25 and >60 years, 79.8% of respondents reported that routinely testing for PCa reduces the chances of dying from it, while only 34.2% reported that testing made no difference to health outcome. Only 28.2% of the respondents in age categories 18 - 25 and 36 - 45 did not agree that taking a PCa test requires that you pay a private doctor. While 51.6% of respondents in the age category >60 agreed that difficulty in erection was not associated with symptoms of PCa, respondents in the rest of the age bands generally disagreed (<48.6%). All age groups thought that information regarding PCa is limited and would like to know the risks and treatments for PCa (Table 4).

Knowledge and level of education

Respondents at all levels of education strongly agreed that routinely testing for PCa reduces the chances of dying from it. All age groups

agreed there are PCa treatments available. Respondents' level of knowledge regarding the symptoms of PCa varied with their level of education (Table 5).

Knowledge and smoking

There were no significant associations between smoking status and the knowledge of respondents ($p=0.092$).

Perceptions about PCa

Age and perception

All age groups disagreed that taking a PCa test is embarrassing and that they would rather wait until they become sick; however, those aged between 25 and 45 were more confident while the rest of the age groups responded with less confidence. Confidence about the perception that PCa is a serious disease and that they are afraid that they may develop it later in life decreased with increased age. Respondents from all age groups strongly perceived that knowing about PCa would benefit them. Older respondents were more confident that their partner would understand why they are going for a PCa test than those of younger age (Table 6).

Perception of PCa and level of education

Respondents from all levels of education did not perceive PCa as a disease that only affects wealthy individuals; however, high-school respondents had the lowest confidence. Respondents strongly disagreed that taking a PCa test is embarrassing and would rather wait until they become sick; however, the confidence in disagreeing with the statement decreased with a decrease in the level of education. The confidence of the perception that PCa is a serious disease and that they are afraid that they may develop it later in life decreased as the level of education decreased (Table 7).

Perception and smoking

The calculated χ^2 -value ($p=0.034$) for perception statements 5 and 7 is less than the critical χ^2 -value ($p<0.05$). It appears that there is a relationship between smoking status and perception. Non-smoking respondents were more confident in their responses.

Other open-ended questions on PCa

In this study, 85% of the respondents felt that PCa tests must become compulsory for every man over 40 in SA. Respondents were asked at what age they thought they should go for their first PCa test. The mean age suggested by respondents was 17 years. Most respondents (82.6%) suggested that social media can be used to promote PCa awareness.

Table 4. Knowledge statements in relation to age of respondents

Knowledge statement	Age category (years)					Total	p-value
	18 - 25	26 - 35	36 - 45	46 - 60	>60		
1	2	3	3	3	3	3	< 0.01
2	2	2	2	1	1	2	0.15
3	2	2	2	2	3	2	<0.01
4	3	3	3	3	3	3	0.27
5	2	2	1	2	2	2	0.29
6	3	3	3	3	2	3	0.41
7	2	2	2	2	2	2	0.77
8	2	2	2	2	2	2	<0.01
9	2	2	2	2	2	2	0.41
10	1	1	1	2	1	1	0.83

Table 5. Relationship between knowledge and level of education

Knowledge statements	Level of education				Total	p-value
	Bachelor's degree or higher	Post-matric diploma	Matric	High school (grade 8 - 11)		
1	4	4	4	4	4	<0.01
2	3	3	3	2	3	0.99
3	2	2	2	2	2	0.14
4	2	2	2	2	2	0.98
5	3	3	3	3	3	0.44
6	2	2	2	1	2	0.74
7	2	2	2	3	2	0.91
8	1	2	1	2	1	<0.01
9	2	2	2	2	2	0.17
10	2	2	2	2	2	0.97

Table 6. Relationship between perception and age

Perception statements	Age category (years)					Total	p-value
	18 - 25	26 - 35	36 - 45	46 - 55	>60		
1	3	3	3	3	3	3	0.21
2	3	3	3	3	3	3	0.88
3	3	3	3	3	3	3	0.04
4	3	4	4	3	3	4	<0.05
5	3	3	3	4	3	3	0.23
6	1	2	1	1	1	1	0.99
7	2	2	2	2	2	2	0.86
8	3	3	3	3	3	3	0.25
9	3	3	3	3	3	3	0.17
10	2	1	2	1	2	2	0.43

Table 7. Relationship between the perceptions and level of education of respondents

Perception statements	Level of education				Total	p-value
	Bachelor's degree or higher	High school (grade 8 - 11)	Matric	Post-matric diploma		
1	3	3	3	3	3	<0.01
2	3	3	3	3	3	0.03
3	3	3	3	3	3	0.47
4	4	3	4	3	4	0.03
5	3	4	3	3	3	0.93
6	1	2	2	1	1	0.61
7	2	2	2	2	2	<0.01
8	3	3	3	3	3	0.81
9	3	3	3	3	3	0.99
10	2	2	1	2	2	0.31

Discussion

In terms of diet and lifestyle, the results of the study indicated that most respondents were on a frequent meat and chicken diet; however, most of them also ate fruit and vegetables at least twice a week. Fish was not eaten as frequently as meat and chicken. Our findings indicated that some but not all individuals in this population practised an active and healthy lifestyle. This underscores the need to promote a healthy lifestyle and create environments that effectively reduce the risk of non-communicable diseases.^[18]

The results indicated that respondents had a good general level of knowledge; however, most of the respondents had never been tested for PCa. There is a global trend of men being reluctant to seek healthcare, with reasons ranging from decisional confidence,

preserving masculinity, avoiding uncertainties and access to care.^[19]

In this study, most respondents were willing to be tested should they be offered an opportunity to do so, which is similar to other studies in Africa.^[15,20,21]

The results indicated that PCa knowledge is statistically dependent on age. Responses indicated that younger ages (<45) had more knowledge about PCa than other age groups. These results are consistent with studies conducted in Saudi Arabia and Ethiopia.^[22,23] The study in Ethiopia reported that in contrast to men aged between 40 and 59, of whom 42.4% had adequate knowledge, only 14% of those aged 60 - 69 and only 0.6% of those >70 had adequate knowledge.^[23] In contrast to ages >45, respondents <45 did not agree that taking a PCa test requires one to pay a private doctor. The reason for these

results could be that those aged <45 make use of technology and are more proactive in attaining information.^[24,25] Poor health-seeking behaviour contributes to lack of the information given during the clinical testing session.^[20]

Most respondents' family members had never had PCa; therefore, their exposure to possible treatments was low. Similarly to other studies, respondents >60 generally lacked adequate knowledge of the symptoms of PCa.^[23,26] The social association of masculine superiority and the connection of illness with cultural or spiritual beliefs may contribute to low health-seeking behaviour of men.^[14] As found in studies in Zimbabwe and Nigeria, the cultural beliefs of African society, especially at older ages, increased ignorance of the effect of PCa on their ability to use their sexual organs.^[25,26]

Results indicated that the lower the level of education, the less assured respondents were about the importance of testing for PCa. This is in line with the Nigerian study findings.^[26] Respondents with high-school education and above are more likely to be at tertiary institutions or workplaces, consequently increasing the chances of receiving PCa information. Early testing for PCa can significantly reduce the burden of disease and improve quality of life for men.^[27] The results also indicated that there is a lack of information on the symptoms and the availability of services of PCa.

A larger proportion of the respondents felt that PCa does not only affect wealthy individuals, similar to published findings in a study on social determinants on PCa that reviewed 17 studies from different parts of the world.^[28] When presented with the PCa perception statements, respondents had better perceptions of PCa, such as strongly agreeing that healthy lifestyle and nutrition reduces risk of PCa. This is in contrast with a study in Ghana, where those aged 30 - 39 had poorer PCa perception scores when compared with those aged ≥40.^[29] Similarly to other studies,^[21] this study found that respondents disagreed that taking a PCa test is embarrassing and would rather wait to get tested until they become sick. However, those aged between 25 and 45 were more confident while the rest responded with less confidence.

Most of the respondents felt that PCa tests should not only be done by people who feel ill and suspect that they might have PCa. This indicates the willingness of respondents from all age groups to go for PCa screening.^[27,29] The level of confidence in recognising PCa as a significant health concern and the fear of its potential development diminished as age advanced. This trend might stem from variations in information-seeking habits and social media usage patterns between younger and older demographics.^[30,31] Similarly to a study conducted in Kenya,^[20] this study found that older respondents were more confident that their partner would understand why they were going for a PCa test than younger ones. This indicates the need to educate not only men about PCa but women too.

There is a strong relationship between the level of education and the perceptions of respondents about PCa. Individuals with tertiary education were more confident in their responses and had better perceptions about PCa symptoms and health seeking behaviours, similar to other studies.^[15] Comprehensive programmes are needed to close the gaps in the perceptions about PCa among individuals with low education.

Study limitations

A limitation of the study was the self-reporting nature of the questionnaires through online surveys, which could limit the quality of the results. Another limitation is that open-ended questions could not be used in data analysis; as a result, some of the variables that were crucial to be statistically analysed could not be analysed and discussed.

Conclusion

This study found that knowledge and perceptions are significantly dependent on education, age, and smoking. Higher levels of education are associated with better knowledge and perceptions. Different age groups perceive PCa differently. Smokers had had better perceptions about PCa symptoms and health seeking compared with non-smokers. PCa screening was low among participants. There is a willingness to learn more about PCa; however, participants do not know how to get PCa information. Further research on the relationship between lifestyle and the gaps in knowledge, attitudes and perceptions is crucial.

Declaration. None.

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