ORIGINAL ARTICLE

Knowledge, Attitude, and Perception of Prostate Cancer among Male University Students in Bangladesh: A Survey to Shape Future Cancer Healthcare Strategies

Md. Abu Bakar Siddique Jami[1,2], Samit Islam Rudra[1], Farhad Kabir[1], Md. Sabbir Hossain[3,4], Farhana Akter[1] and Najneen Ahmed[1*]

[1]*Department of Pharmacy, East West University, Jahurul Islam City, Dhaka, Bangladesh*
[2]*Department of Pharmacy, Bangladesh University, Dhaka, Bangladesh*
[3]*Department of Pharmacy, University of Rajshahi, Rajshahi, Bangladesh*
[4]*Department of Pharmacy, University of Information Technology and Sciences, Dhaka, Bangladesh*

Abstract

Background: Prostate cancer (PCa) is the most common cancer in men. Young adults should be educated on prostate cancer, as this is necessary so that they can take the required steps to prevent and diagnose it.

Objective: To evaluate male undergraduate students' knowledge, attitude and perceptions about prostate cancer at two leading private universities in Bangladesh.

Methods: It was a cross-sectional survey based study. Data were collected from 279 male university students, at two leading private universities in Dhaka, Bangladesh, between June 2023 and December 2023. The sample was collected through an online survey using Google Forms and face-to-face interviews.

Results: The majority of the participants were aged between 20 and 25 years. 37.6% of them were in the fourth year of their undergraduate study. Aging was recognized by 30.8% and family history by 30.1% to be risk factors of PCa. Less than half (45.2%) identified chemotherapy as a treatment. There was a lack of awareness of diagnostics, 15.8% were familiar with PSA testing, only 3.2% with TRUS, and 47.7% did not know any of the methods. Also, 73.8% would not think of visiting a urologist. Although 90.7% reported that they appreciated the value of early detection, 50.9% had no intentions of screening. There were no significant correlations observed between knowledge, attitudes, and demographic factors.

Conclusion: Male university students have a great deficiency in knowledge regarding PCa and sexual health. They are very unaware of the prevalence of PCa, modes of detection and the risk factors involved. This study has identified a sense of urgency in terms of specific educational interventions to become more aware and encourage early detection and preventive measures of prostate cancer.

Keywords: *Prostate cancer, students, cancer awareness, future healthcare, survey, Bangladesh.*

INTRODUCTION

The prostate is a small gland that is shaped like a walnut and located in the male reproductive system under the bladder. Prostate cancer (PCa) arises when genetic mutations cause abnormal cell growth within this gland, replacing normal tissue and forming malignant tumors [1, 2]. PCa imposes huge economic and social burdens such as high treatment expenses, loss of work efficiency and care, and emotional effects in the families of the patients [3]. In 2020, the global prostate cancer patient numbers were about 1.41 million with 375, 304 reported mortality rates [4]. PCa is an emerging public health concern in Bangladesh, with rising incidence and most cases detected at advanced stages due to low awareness and limited screening knowledge [5, 6].

The number of deaths that was due to prostate cancer in Bangladesh was 773 in 2018, which constitutes 1.5% of all deaths in the country [7]. The data at the Global Cancer Observatory states that in 2022, 2,335 cases of prostate cancer were diagnosed in Bangladesh, and it constituted 1.4% of the total new cancer cases [6]. Given that most healthcare-related malpractices, including casual self-medication, ignoring conditions, and over-reliance on home remedies, traditional and folklore medicine over proper medical care, are prevalent in Bangladesh as per some recent studies [8-10], there is a need to create awareness on diseases like PCa in order to ensure that the disease does not increase in a developing country like Bangladesh in the future. This awareness must entail the information on treatment methods, risk factors and the diagnostic procedures.

The incidence of PCa has been estimated to be one in every seven men, with one out of 39 dying. Risk factors are not directly related to cancer, rather they enhance the chances of PCa development [11]. In the majority of cases, having aged above 50 years is correlated with the greatest risk of developing PCa. Approximately 80 percent of cases were in men aged 65 and above.

**Corresponding author: Najneen Ahmed, Department of Pharmacy, East West University, Jahurul Islam City, Aftabnagar, Dhaka-1212, Bangladesh; Email: nna@ewubd.edu*
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The black males are also prone to PCa [12]. African-Americans are 60% more likely to have the danger than White Americans. However, it is interesting to note that the occurrence is lower among the Japanese and the Africans who remain in their native countries. It primarily targets Asian men residing in urban areas like Hong Kong and Singapore and in Northern Europe and North America [13].

In the case of a family member or any other relative having PCa, there is a higher relative risk of having PCa as a result of certain hereditary factors. The American Cancer Society states that the risk is doubled in case the brother or father is affected [14]. It has been found that the exposure to certain chemicals increases the risk of PCa [12]. Nevertheless, it is impossible to control such risk factors as age, race, or family history, hence nothing concrete can be done to prevent PCa. The risk may be mitigated by keeping a healthy weight by engaging in physical exercise. Supplements minimize the risk of minerals, vitamins, and all sorts. Vitamin E shows positive results. Aspirin and 5-alpha-reductase-inhibitors have been shown to reduce risk of PCa in individuals taking them [15, 16].

Prostate cancer is not usually characterized by early symptoms. But there are instances when it can show symptoms like frequent urination, pain or burning during urination, urine flow was interrupted, it contains blood or seminal fluid, and some pain felt because of the enlarged prostate [1]. Treatment of prostate cancer is done using a number of options such as radical prostatectomy, which is a surgical intervention to excise some or all of the prostate gland, chemotherapy and other types of radiation therapy, such as external beam radiation and brachytherapy [17]. Prostate cancer can be treated depending on its stage. In localized cases, it can be either active monitoring of the low-risk patients or curative measures such as radical prostatectomy and radiotherapy. A combination of treatment, like hormone therapy together with radiotherapy or chemotherapy is usually necessary in more advanced or high risk cancer [1, 17]. The 2002 TNM Classification of Adenocarcinoma of the Prostate classifies the disease in terms of T (primary tumor), N (regional lymph nodes), and M (distant metastases) stages which are determined through clinical examination, imaging, biopsies, and biochemical tests [18]. Although screening of PCa is highly encouraged among men who have attained the age of 50, it is preferable to initiate screening to those who have predisposing risks. Age and family history are the two primary risk factors of PCa development. Besides these risk factors, there are other factors that have been cited to cause the disease such as ethnicity, food and hormones [19].

The higher education segment in Bangladesh has developed so fast in the last 20 years and has more than 50 public and more than 110 privately owned universities [20]. Nevertheless, health education is largely centered in the medical field with students in other fields having little knowledge about the prevention of diseases and health literacy. Although there are national awareness programs on infectious diseases and maternal-child health, there have been less programs on non-communicable diseases such as cancer [21]. Consequently, university students in non-medical subjects are a significant group that is not well studied and therefore requires awareness in the prevention of health-related behaviors. In addition, the recent research studies in Bangladesh indicated high levels of ignorance, lack of knowledge and control of breast cancer, cervical cancer, diabetes, and other severe diseases [22-24]. Minimal studies have been done to quantify PCa awareness among general male population in Bangladesh. Such missing information makes it difficult to evaluate the national screening practices and points to a major gap in the research. Nonetheless, the majority of patients are diagnosed at advanced stages because of missing the symptoms and the awareness of risk factors and screening types [5].

The level of awareness of PCa and participation in screening programs is still unevenly distributed in the world with the lowest levels being reported in South Asia regions in comparison to Western regions. Research conducted in India and Pakistan has revealed that majority of men have little idea about prostate health, risk factors, and screening procedures [25, 26], as compared to the higher awareness rates between America and Europe [27]. These differences indicate that the same situation is observed in Bangladesh, which presupposes the necessity to evaluate the level of current awareness and invest in early health education among young people. The purpose of this study was to find out the awareness of male students of two private universities of Bangladesh on PCa. It also aims at obtaining an insight into the knowledge, attitude and perception of PCa among young adults in these institutions. University students are the future social activists and leaders in society and therefore their assessment is important to the future healthcare system in the country. Their awareness and knowledge of health conditions can have a tremendous influence on health-related efforts by people and the process of adopting new technologies and healthcare strategies.

MATERIALS AND METHODS

This was a survey-based cross-sectional study. The study was conducted at two private universities in Dhaka, East West University and Bangladesh University, from June 7, 2023, to December 22, 2023. The study received formal approval from the Bangladesh University Research Ethics Committee (BUREC) (Ref: DPT/BUREC/2025-07/127). The permission was taken from the two universities as well.

The inclusion criteria required participants to be male university students enrolled in either of the two universities. At the same time, those who declined to

participate or were unable to comply with the survey requirements were excluded. Individuals who were not students (such as teachers and administrative staff) were also excluded. Before participation, all respondents were informed of the study objectives and provided consent to take part in the survey.

Sample size was calculated using the formula for estimating a single population proportion.

$$n = \frac{Z^2 \times P(1-P)}{d^2}$$

Here, n is the required sample size, Z=1.96 corresponds to a 95% confidence level, P=0.50 was assumed based on previous literature among university students in Ghana reporting generally low knowledge (less than 50%) of prostate cancer [28], and d=0.06 (6% margin of error). Allowing for a 4% nonresponse rate, the final required sample size was 278. In this study, 279 male university students were recruited *via* convenience sampling. Of these, 150 responses were obtained *via* an online survey conducted using Google Forms, and 129 responses were collected through face-to-face interviews using the same questionnaire. The participants represented diverse age groups, academic levels, and socio-economic backgrounds within the male student population.

Data were collected using a semi-structured questionnaire specifically designed for this study. Our questionnaire was primarily developed with reference to a 2014 study conducted by Binka *et al.* [28], with modifications made to suit the study objectives. The final questionnaire consisted of 23 items **(Appendix 1)**. After making the questionnaire, we tested it on a small sample of 25 students in order to detect the confusing questions and performed a pilot study on 30 students to make the tool even more perfect. The internal consistency of the questionnaire was tested, and Cronbach's alpha value was 0.78. They were divided into four subscales, (1) sociodemographic properties (7 items; age, year of study, field of study, marital status, family cancer history; categorical responses), (2) knowledge of prostate cancer (6 items; risk factors, symptoms, diagnostic tests, treatment options, multiple-choice and single-choice responses), (3) attitudes and perceptions toward prostate cancer (6 items; beliefs about fatality, risk, prevention, cure, infertility and transmission; Agree/ Disagree/No idea responses), and (4) help-seeking behavior and The questionnaire was checked with experts and senior faculty members of the pharmacy departments to improve its validity. Simplified language was used in the final version to ensure that the semantic misunderstanding was reduced and there was a space to add more comments or make multiple responses to some questions.

Before data collection, permission was sought by the respective university authorities and all participants signed informed consent, and this would guarantee their participation was voluntary. Caution was taken to ensure that the confidentiality and anonymity of responses was maintained.

All data obtained were reviewed, organized and analyzed using Microsoft Excel 2016 and IBM SPSS 25.0. It contained the analysis of descriptive statistics, and demographic variables (age and educational level) were applied to filter the data. Tables and graphs were created to facilitate interpretation, and inferences were made on PCa knowledge and perceptions among university male students in Bangladesh.

RESULTS

The number of male students sampled in the study was 279, with an average age of 22.3 ± 1.7 years. Table **1** shows that the sample has a large representation of young adults as a higher percentage (88.9%, n = 248) of the respondents lie within the 20 - 25 year age bracket. The analysis of the undergraduate programs of these university students showed a wide representation with the most common program being Science (48.4%, n = 135), then Life Science (25.4%, n = 71) and Non-science programs (26.2%, n = 73). This distribution highlights the diversity of the sample population in terms of interdisciplinarity. The distribution by years of the undergraduate program indicated that there was a significant number of seniors in the sample (37.6% in the fourth year). This was preceded by the third, second and first-year cohorts (26.5%), (23.7%), and (12.2%). The fact that senior students are the most common is an indication of certain maturity and academic development within the sample, which can alter the views and experiences that are captured during the research. In terms of marital status, most of the participants were single (94.6%). Moreover, 80.3% (n = 224) of the respondents have no relatives with cancer.

Table 1: Demographic characteristics.

Variables	Category	Frequency	Percentage
Age group	15-20	21	7.5
	20-25	248	88.9
	25-30	10	3.6
Undergraduate Program	Science	135	48.4
	Non-Science	73	26.2
	Life-Science	71	25.4
Undergraduate Program Year	1st	34	12.2
	2nd	66	23.7
	3rd	74	26.5
	4th	105	37.6
Marital Status	Single	264	94.6
	Married	14	5.0
	Divorced	1	0.4
Cancer affected in family	Yes	55	19.7
	No	224	80.3
Family member died of cancer	Yes	77	27.6
	No	202	72.4

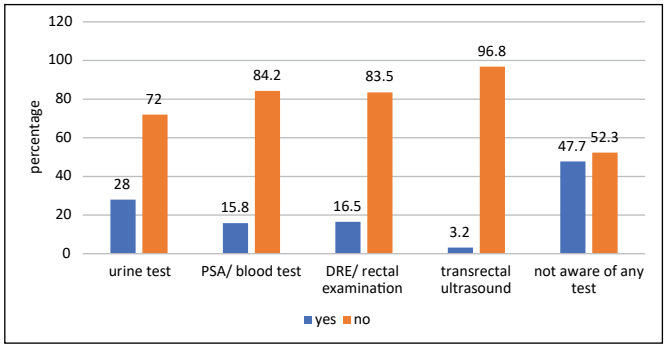

Fig. (1): Distribution of respondents based on their responses regarding their awareness of prostate cancer diagnosis tests.

The respondents had different degrees of awareness on the risk factors, detection methods, and symptoms of PCa. A review of their knowledge about the disease is provided in Table **2**. Concerning the knowledge on PCa detection tests, 28.0% of the respondents indicated that they could detect PCa through a urine test. The level of awareness concerning the PSA blood test was even lesser with only 15.8% of people being aware of the PSA blood test as a method of detection as opposed to 84.2% who were not aware of the test. On the same note, 16.5% were familiar with the digital rectal examination (DRE) as a method of detection, and 83.5% were not familiar, and only 3.2% were familiar with the transrectal ultrasound (TRUS) as a method of diagnosis. It is important to note that 47.7% of the respondents claimed that they were not aware of any PCa detection tests (**Fig. 1**). There is also a big difference in the awareness of PCa diagnosis and treatment among the respondents. Only a quarter of them, 21.5% of them had surgery as a treatment of PCa and a significant proportion, 78.5% of them were not aware of this treatment.

When it comes to radiotherapy, the awareness was not so high. 16.5% of the respondents admitted that they have been treated with it, and 83.5% of the respondents did not know about this method. The most recognized method was chemotherapy with 45.2% of the respondents appreciating it as a form of treatment, but 54.8% failed to appreciate chemotherapy as an option. It is worth noting that 35.5% of the respondents indicated

Table 2: Knowledge assessment regarding prostate cancer.

Statement/Question	Yes		No	
	Frequency	Percentage	Frequency	Percentage
What detection test, if any, are you aware of that can identify PCa?				
Urine test	78	28.0	201	72.0
PSA/Blood test	44	15.8	235	84.2
DRE/Rectal examination	46	16.5	233	83.5
Transrectal ultrasound	9	3.2	270	96.8
Not aware of any test	133	47.7	146	52.3
What are the possible treatments for this cancer?				
Surgical	60	21.5	219	78.5
Radiotherapy	46	16.5	233	83.5
Chemotherapy	126	45.2	153	54.8
Don't know	99	35.5	180	64.5
Which do you think is/are the most alarming risk factors of PCa?				
Aging	86	30.8	193	69.2
Sexually transmitted infection	149	53.4	130	46.6
Pollution	58	20.8	221	79.2
Alcohol	97	34.8	182	65.2
Family history	84	30.1	195	69.9
Smoking	91	32.6	188	67.4
Ethnicity	26	9.3	253	90.7
If you face any problem with the prostate gland, what would you do?				
Appointment with the doctor	226	81.0	53	19.0
Tell a family member	82	29.4	197	70.6
Tell your friends	23	8.2	256	91.8
Keep it a secret	6	2.2	273	97.8
Will not do anything	6	2.2	273	97.8
Which type of specialist doctor will you consult if you show any signs and symptoms?				
Urologist	73	26.2	206	73.8
Oncologist/Cancer doctor	101	36.2	178	63.8
Endocrinologist	35	12.5	244	87.5
Do not know	71	25.4	208	74.6
Do you believe that early detection improves treatment outcomes?	253	90.7	26	9.3
Have you ever discussed any of your sexual problems with others?	97	34.8	182	65.2
Do you have any plans to do a screening test soon?	137	49.1	142	50.9

Table 3: Attitude assessment regarding prostate cancer.

Statement	Agree n(%)	Disagree n(%)	No Idea, n(%)
Prostate cancer kills	163 (58.4)	29 (10.4)	87 (31.2)
All men are at risk of having Prostate cancer	115 (41.2)	83 (29.7)	81 (29.0)
Prostate cancer can make me infertile	171 (61.3)	20 (7.2)	88 (31.5)
Prostate cancer has no cure	20 (7.2)	159 (57.0)	100 (35.8)
Prostate cancer is an infection that can be transmitted sexually	88 (31.5)	69 (24.7)	122 (43.7)
If I am aware of Prostate cancer, I can prevent it	188 (67.4)	17 (6.1)	74 (26.5)

that they were not aware of any treatment management of PCa.

The perceptions of risk factors of PCa are also evaluated in this study (**Table 2**). Sexually transmitted infections were the most commonly identified risk factor with those who identified it being 53.4% (n = 149). This was followed by alcohol consumption at 34.8% and smoking at 32.6%. Aging was acknowledged by 30.8%, family history by 30.1%, and pollution by 20.8%. The least identified risk factor was ethnicity with 9.3% admitting to its association with PCa. Among the questions posed to them about how they would go about the issue of prostate problems, a large percentage of them indicated that they would consult a doctor, with just a few showing that they would not consult a doctor (19.0%).

Moreover, 29.4% told that they would report the matter to a family member, whereas 8.2% were going to share it with a friend. Only a small percentage (2.2%) indicated that they would keep the problem a secret or would take no action at all. On the topic of the specialist to consult and discuss sexual health, a huge majority (90.7%) thought that early detection would result into better treatment, with 9.3% of the respondents disagreeing. Nevertheless, only 34.8% of them had already addressed others on issues regarding sexual health, as 65.2% had not. About future screening plans, 49.1% of them said that they will screen, but 50.9% will not screen.

Table **3** illustrates the attitude of the participants towards PCa. The majority of the respondents (58.4%), were on the agreement that PCa is a fatal illness, 31.2% were not sure, and 10.4% did not agree. On the question of all men being at risk of developing PCa, 41.2% of them said yes, 29.7% said no and 29.0% said they were not sure. On effects of PCa on fertility, 61.3% felt that PCa may result in the infertile state, 31.5% were undecided and 7.2% did not agree with this. Most of the respondents (57.0%) did not support the statement that PCa has no cure, with 35.8% responding with uncertainty and only 7.2% of the respondents agreed. Also, 31.5% of all respondents wrongly assumed that PCa is a sexually transmitted disease 43.7% were unsure, and 24.7% did not agree with that fact. A majority of the respondents (67.4%) believed that awareness creation of PCa could help to prevent it, 26.5% were not certain and 6.1% disagreed.

The study analysis also focuses on the relationships between demographic factors (age group, undergraduate program, program year, marital status, and family cancer history) and the level of knowledge and attitude (**Table 4**). Results identified significant relationships with only the undergraduate program, with knowledge (p=0.013) and attitude (p<0.001). The rest of the variables tested such as age, marital status, having a cancer patient in the family, had no significant relationships with both knowledge and attitude scales.

Table 4: Comparison of knowledge and attitude across demographic factors regarding prostate cancer.

Variables	Category	Knowledge		Attitude	
		p-value	χ^2 (df)	p-value	χ^2 (df)
Age Group	15-20	0.149	3.77 (2)	0.772	1.08 (4)
	20-25				
	25-30				
Undergraduate Program	Science	0.013	8.77 (2)	<0.001	18.2 (4)
	Non-Science				
	Life-Science				
Undergraduate Program Year	1st	0.109	6.07 (3)	0.463	4.98 (6)
	2nd				
	3rd				
	4th				
Marital Status	Single	0.429	0.65 (1)	0.215	3.12 (2)
	Married				
	Divorced				
Cancer Patient in Family	Yes	0.685	0.16 (1)	0.473	1.50 (2)
	No				
A family member died of cancer	Yes	0.450	0.57 (1)	0.367	2.01 (2)
	No				

DISCUSSION

The findings of this study provide valuable insights into the knowledge, perceptions, and attitudes of the students of the private university in Bangladesh as far as PCa is concerned. It identifies considerable levels of ignorance and misunderstandings that have to be addressed with the help of specific educational interventions. In Bangladesh, there is general lack of information and awareness regarding the non-communicable diseases and sexual health disorders [29]. Demographic profile of the sample shows that, they are majorly young adults aged 20-25 years with a significant representation of science (48.4%) and life science programs (25.4%). The fact that the proportion of senior students (37.6% in the fourth year) is high indicates that the sample is mostly made up of people with a relatively high level of academic maturity. It is important to note that this demographic profile means that the results are especially applicable to the healthy young adults who have no first-hand experience with cancer making it important to educate young people on the issue early in their lives.

Participants are considerably unaware of the risk factors and treatment options of PCa. Although 53.4% of the respondents identified sexually transmitted infections as

one of the risk factors, 30.8% cited aging and a small percentage of 30.1% identified family history as one of the risks. It is already known that family history of PCa is a major risk factor of the disease [30]. Having a family history of PCa alone was found to be associated with a 68% increased risk of total disease (95% CI, 1.53-1.83) and a 72% increased risk of lethal disease (95% CI, 1.25-2.38) [31]. Studies have shown that genetic polymorphisms are vital in human susceptibility to cancer and other chronic diseases [32]. The findings highlight a limited understanding of established risk factors crucial to early detection and prevention. Regarding treatment options, only 45.2% of participants were aware of chemotherapy as a possible option. Even fewer recognized surgical (21.5%) or radiotherapy (16.5%) options. According to the literature, therapeutic options for advanced PCa include radiation, bisphosphonate therapy with zoledronic acid, first- and second-line hormone therapy, and taxane-based chemotherapy [33]. Chemotherapy, immunotherapies, ablative therapies, radiation therapy, and androgen deprivation therapy (ADT) are nonsurgical treatments for PCa [34]. However, the most well-recognized treatment options for people with early-stage PCa who require intervention are radiation therapy (brachytherapy, external-beam radiation, or both) and surgery (radical prostatectomy) [17].

Regarding diagnosis, only 15.8% were aware of PSA testing, only 3.2% were aware of TRUS, and 47.7% did not know of any screening methods. However, the most reliable diagnostic test for PCa is serum PSA, which is followed by TRUS and DRE [35]. Additionally, while 53.4% incorrectly linked sexually transmitted infections to PCa risk, only 30.8% accurately identified aging as a key factor. According to earlier research, advancing age is the most frequent risk factor for PCa, followed by family history, ethnicity, insulin-like growth factor, STDs, obesity, smoking, alcohol use, vasectomy, and diet [36]. Nonetheless, evidence indicates that PCa primarily affects seniors in their 60s and 70s; the median age of diagnosis is 65-68 years [37]. Males over 50 are at a higher risk of developing advanced PCa than those in other age groups, as evidenced by the extreme predictive power of a single PSA test conducted at or before age 50 [38].

The overwhelming majority of the respondents (81.0%) would consult medical services in the case they would develop problems with their prostate. Nonetheless, a significant subsection (73.8%) would not seek the help of a urologist, whereas 25.4% were unable to identify urologists as the appropriate specialist when it comes to the issue of prostate, although urologists are the most suitable professionals in this case. Moreover, 36.2% of the respondents said they would give a thought to visiting an oncologist. Interestingly, 90.7% thought that there were benefits of early detection, but 50.9% did not have any intentions to be screened. A narrative review shows that, according to multiple randomized controlled trials, PCa can be detected early, which has increased survival [39]. This is an indication of a knowledge-action gap, which implies that there are psychosocial barriers, including stigma. This is especially alarming because 65.2% of the survey population stated that they had never discussed sexual health problems. As per a recent research, such reluctance of patients can be explained partly by the stigma surrounding PCa and concerns about the privacy [40]. The absence of a clear evidence and knowledge regarding the overall benefit of such screenings even within the low-risk groups is one of the primary factors that do not compel people to undergo PCa screening [41].

Attitudes toward PCa reveal mixed perceptions among participants. Although 58.4% of the respondents asserted that PCa is a fatal disease, 57.0% believed that it is curable, which indicates optimism given that there are gaps in knowledge. Over 67.4% of the participants believed that PCa could be prevented through awareness, which implied a possible willingness to learn more about it. Past literature has revealed that prostate cancer is fatal disease yet some health habits can be used to diminish death risk [42]. Another significant finding is that a third of participants (31.5%) wrongly think that PCa is a sexually transmitted infection.

Comparatively, 43.7% do not know this and this shows how the misconceptions surrounding it have existed to frustrate the efforts of effective prevention and treatment. Also, 61.3% connected PCa to possible infertility, which can be used as driving power of educational campaigns. Although prostate cancer does not directly affect fertility, its treatment, including surgery, radiations, or hormone treatment, can also have serious effects on fertility by having an effect on sperm production and quality, which may result in infertility [43].

The findings also show a considerable gap in terms of communication, and 65.2% of the respondents claim that they have never talked about sexual health issues with healthcare professionals or anybody. Such unwillingness to talk about sensitive issues can be attributed to the culture taboo or the ignorance of the significance of open communication when managing the symptoms of PCa. The awareness of sexual health and its influence on life quality is not developed in Bangladesh [44]. Previous study identified a number of reasons that led to this reluctance such as perceived stigma, being judged, concerns with privacy, anticipations on how others suffer, personal coping strategies and lack of support resources [45]. The only noteworthy predictor of knowledge ($p=0.013$) and positive attitudes ($p<0.001$) on PCa was science programs, which is probably due to the increased health literacy of participants. The fact that other demographic variables, including age, marital status, and personal cancer history are not associated with it points to the idea that knowledge on PCa is still low among various groups. This observation reflects why

interventions on a population-wide level are required. The findings emphasize the necessity to implement specific educational programs to fill knowledge gaps in non-science populations of young adults. Educational programs may help increase the knowledge regarding PCa risk factors and treatment options. The general level of knowledge about sexual health education can also be enhanced by implementing sexual health education in non-science classes and discussing the topic and its most common myths with the specialists.

There are some limitations of this study. We do not assure that we gathered all the information we needed on the knowledge and attitudes of the participants on PCa, since all the data was self-reported in the questionnaires. There can be bias in self-reported information based on the social desirability effect, particularly when the subject is sensitive like sexual health. This bias is difficult to remove in questionnaire-based research, and it could have affected our results. Also, the findings are on a small sample, and hence could not be applied to an entire population of Bangladesh. Rather they just give a brief overview and a direction in which more research is to be done in the future. To alleviate these weaknesses, it is necessary to enhance the representativeness of the sample with random sampling procedures in future research. The study could consider a greater number of universities, and longitudinal factual approaches could be employed to find out more about the progress of knowledge and perceptions. In this study, there were no regression analyses done and comparisons observed were just descriptive between demographic groups. Future research should cover both the urban and rural populations and might target more of the males to obtain a more thorough evaluation. Despite such limitations, the findings are important in pointing out the knowledge and perceptions of PCa among male university students in Bangladesh.

CONCLUSION

This cross-sectional research illustrates that there is a huge gap in knowledge and perceptions of PCa among Bangladeshi male university students. Although they are future professionals and shapers of the society, they have limited knowledge of PCa prevalence, detection, risk factors, and symptoms. The majority of the participants accepted the relevance of early diagnosis, there are still significant misunderstandings about the risk factors, diagnostic approaches, and treatment. The high association between science education and superior knowledge and attitudes points to a lack of urgent intervention that is necessary particularly in non-science subjects. The bridging of the knowledge-action gap identified in the current study could be achieved by addressing the cultural taboos of the sexual health discussion and encouraging consultations with urologists. Though the results are limited in terms of their external validity, they highlight the necessity to conduct countrywide educational interventions to enhance the prostate cancer (PCa) literacy levels of young adults. This would result in improved health outcomes and detection at an earlier age. Further studies ought to aim at populations that are larger, involve both male and female subjects, and also involve culturally sensitive measures to combat stigma and false information. Such interventions play an essential role in making the future generation healthier and enhancing the more informed attitude to healthcare, which would eventually positively influence the health outcomes of the population in Bangladesh. This study also notes that there is an urgent requirement of specific educational interventions to create awareness, promote timely diagnosis and prevention of PCa.

ETHICS APPROVAL

The Bangladesh University Research Ethics Committee (BUREC) granted ethical approval (Approval Ref: DPT/BUREC/2025-07/127). This study was conducted in accordance with the Declaration of Helsinki.

CONSENT FOR PUBLICATION

Permission was obtained from the relevant university authorities before data collection, and informed consent was obtained from all participants.

AVAILABILITY OF DATA AND MATERIAL

All data generated or analyzed during this study are included in this published article.

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CONFLICT OF INTEREST

The authors declare that they have no competing interests.

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AUTHORS' CONTRIBUTION

MABSJ : Study concept, study design, data curation and analysis, manuscript drafting
SIR : Data collection and analysis, manuscript drafting
FK : Study design and manuscript drafting
MSH : Manuscript drafting
FA : Manuscript drafting
NA : Study design, critical review and editing initial draft

SUPPLEMENTARY MATERIAL

Supplementary material is available on the journal's website.

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