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Prostate cancer screening: A survey of medical students' knowledge in Lome, Togo, and associated determinants in a resource-limited African context

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Abstract

Objectives: The aims of this study were to assess the knowledge of medical students in Lomé about these means of screening for prostate cancer in a context of limited resources and controversy about prostate cancer screening, and to identify the determinants associated with these results.

Methods: This was a prospective descriptive and cross-sectional study conducted in the form of a survey of medical students regularly enrolled at the Faculty of Health Sciences of the University of Lomé for the 2019–2020 academic years.

Results: Of the 1635 eligible students, 1017 correctly completed the form, corresponding to a rate of 62.20%. The average age was 22 ± 3.35 years. The sex ratio (M/F) was 2.5. Undergraduate students were the most represented (53.69%). Students who had not received any training on prostate cancer were the most represented (57.13%). Only 12.88% of the students had completed a training course in urology. Concerning the prostate-specific antigen blood test, there was a statistically significant relationship between the students' knowledge and some of their socio-demographic characteristics, namely age (p value = 0.0037; 95% confidence interval (0.50–1.77)); gender (p value = 0.0034; 95% confidence interval (1.43–2.38)); study cycle (p value < 0.0001; 95% confidence interval (0.56–5.13)) and whether or not they had completed a placement in a urology department (p value < 0.0001; 95% confidence interval (0.49–1.55)). On the contrary, there was no statistically significant relationship between students' knowledge of the digital rectal examination and their study cycle (p value = 0.082; 95% confidence interval (0.18–3.44)).

Conclusion: Medical students in Lomé have a good theoretical knowledge and a fair practical level of the digital rectal examination clinical examination and an average theoretical knowledge and a below average practical level of prostate-specific antigen, increasing however along the curriculum in the context of prostate cancer screening.

Keywords

Prostate cancer, digital rectal examination, prostate-specific antigen, medical students

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Introduction

Prostate cancer is a common but heterogeneous disease. It is the leading cancer in men worldwide with 1.3 million incident cases and 359,000 deaths.[1–4] In France, prostate cancer is the most common cancer with 16% incident cases.[5] It is a major public health problem worldwide.[1–4,6] Established risk factors for prostate cancer are advanced age, black race, family history of prostate cancer and high-fat diet.[7,8] Several other risk factors, such as obesity, physical inactivity, sexual

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activity, and smoking, have also been associated with prostate cancer risk, but their role in the aetiology of prostate cancer remains unclear.[7,8] The usual means of screening for prostate cancer are the clinical examination of the digital rectal exam and the blood test for prostate-specific antigen (PSA).[5] In addition to these two standard methods, multiparametric magnetic resonance imaging (MRI), coupled with PSA testing, can be used to optimize prostate biopsies in order to avoid over-diagnosis and under-diagnosis of prostate cancer.[9,10]

In Togo, an African country with limited resources, where universal health coverage and a targeted screening programme are not yet available and where access to MRI is limited, prostate cancer is already a health burden because it is the leading cancer in men and the second most common cause of death from cancer.[6,11] It is the most frequent cancer in elderly subjects with 21.59% of cases, ahead of stomach and breast cancer.[12] It remains the main urological cancer with 74.63% of cases, ahead of bladder and kidney cancers.[13] Due to the ageing of the population, the risk factors involved and population growth, the numbers will increase in the coming years.[8] Screening and early diagnosis of prostate cancer is therefore of paramount importance for public health. Currently, there is no national scientific consensus on effective strategies to reduce the risk of prostate cancer, but two accessible means of prostate cancer screening in a resource-limited setting, namely PSA blood test and clinical digital rectal examination (DRE), are widely used for prostate cancer screening, although their use is often controversial for several reasons.[14–17]

Indeed, in 2018, the US Preventive Services Task Force suggested that for all men aged 70 years and above, prostate cancer screening based on PSA blood test should be suspended; for men aged 55–69 years, individual screening based on informed discussion with the physician and no screening for men under 55 years.[14,18] Conversely, the American Urological and Cancer Societies recommend that PSA blood testing, with or without a clinical DRE, should be offered annually to all men aged 50 years and above with an estimated life expectancy of more than 10 years.[14,16,17] In routine practice, the guidelines are often not followed and one of the main reasons for this is the lack of knowledge about the recommendations among primary-care general practitioners.[19–21]

In Togo, about 59.80% of prostate cancers are diagnosed at an advanced stage (Gleason score >7) despite the existence of accessible means of screening.[22] This could be explained by the lack of knowledge of doctors, the lack of information of the population on prostate cancer and the unavailability of alternative therapies. The objective of this study was to assess the knowledge of medical students (future primary-care general practitioners) at the Faculty of Health Sciences (FSS) of the University of Lomé (UL) about these means of screening for prostate cancer and to highlight the determinants associated with these results.

Methods

Study design and sampling

The University Campus of the FSS of the UL served as the study setting. It was a prospective descriptive and cross-sectional study that spanned a period of 3 months, from January to March 2020. The study concerned all the 1635 medical students of the FSS of the UL without distinction of sex, age, and study cycle.

Medical students who voluntarily consented to be included in the survey and were regularly enrolled for the 2019–2020 academic year were included in the study. Incorrectly completed forms and all students who did not consent to complete the form were not included.

The minimum representative sample size (n) was calculated on the basis of the following target elements

$$\mathbf{n = t2\ x\ p\ x\ (1-p)\ /^{m2}}$$

t: 1.96: value corresponding to the 95% confidence level.
p: estimated prevalence rate of prostate cancer in the general population = 0.4.
m: desired degree of accuracy = 0.05.
$n = (1.96)^2 \times 0.4(1-0.4)/(0.05)^2 = 368.79$.

The minimum representative sample size n = 368.79 or 369 students.

Study variables and data collection

The data collection technique used was a survey. It was based on an individual questionnaire containing the variables under study. The data were collected using an anonymous self-administered structured questionnaire, divided into three main parts (Supplemental Appendix 2). The physical form was used for students in Grades 1 to 6. Exceptionally, for students in Years 7 and 8 who are interns or attendants in hospitals with reduced availability, the questionnaire was put online in Google Form, https://docs.google.com/forms/d/1KrETkcuevFBWJiifJH2FOVeNMljVwnfSR3YYhvq3qMo/prefill. The survey questionnaire consisted of an introductory section detailing the objectives and methodology of the study. The second part sought information on the socio-demographic characteristics of the students, the notion of previous training or courses on prostate cancer and the experience of a placement in a urology department. The third part asked about their level of knowledge of prostate cancer screening based on the clinical examination of the digital rectal exam and the PSA blood test.

The socio-demographic section focused on personal characteristics of the students such as age, gender, study cycle, completion of a prostate cancer course or training and completion of a urology placement.

The section on the Clinical DRE consisted of three questions scored out of 3 points to assess the level of knowledge. The items were pre-survey knowledge of the DRE

Table 1. Socio-demographic characteristics.

	Value
Total	**1017**
Age (years)	
(i) Middle age	24.5
(ii) Range	17–32
(iii) ⩽25	821/1017
(iv) >25	196/1017
Sex	
(i) Male	727/1017
(ii) Female	290/1017
Study cycle	
(i) Doctorate	357/1017
(ii) Master	114/1017
(iii) Bachelor	546/1017
Training/courses	
(i) Yes	581/1017
(ii) No	436/1017
(ii1) ⩽6 months	68/436
(ii2) Between 6 months and 1 year	33/436
(ii3) >1 year	335/436
Internship in a urology department	
Yes	886/1017
No	131/1017

examination, practice of this clinical procedure on a patient, and the student's recognition of the four most common clinical aspects during a DRE examination of the prostate. These were a smooth, regular prostate consistent with normal prostate appearance, a nodular prostate consistent with prostate tumour without rectal invasion, an indurated prostate consistent with prostate tumour with rectal invasion and shielding and a soft prostate consistent with prostate abscess. Two out of three items answered correctly by the student corresponded to a good level of knowledge of the clinical DRE.

The section on PSA consisted of five questions scored out of 5 points relating to prior knowledge of PSA and its fractions, students' request for PSA testing and possible clinical reasons for this request and recognition of normal biological values during this blood test. Three out of five items answered well by the student corresponded to a good level of knowledge about PSA.

The questionnaire was pre-tested on 50 students with no particular problems before general administration to all students.

Data management and analysis

The data were entered twice in Microsoft Excel to reduce data entry errors and then exported to Epi Info version 7. A descriptive analysis was carried out in order to highlight the characteristics of the different qualitative and quantitative variables. We used percentages for the qualitative variables and means with their standard deviations for the quantitative variables. The statistical tests used were the Pearson's chi-square test for qualitative variables and the Student's t-test for quantitative variables. Univariate logistic regression was used in Tables 2 and 3 to assess the predictors of the outcomes. The significance level was set at 0.05.

Results

Epidemiological data

Table 1 presents the socio-demographic characteristics of the participants. The self-administered questionnaire was returned by a total of 1017 students, with an overall response rate of 95.3%. The average age of the subjects was 22 ± 3.35 years, with extremes of 17 and 32 years. Eight hundred and twenty-one (821) students, or 80.73%, were aged 25 years or younger. The sex ratio (M/F) was 2.51 with 727 male subjects or 71.48%. According to the university curriculum, 546 students (53.69%) were in the bachelor's degree programme (Table 1). Five hundred and eighty-one (581) or 57.13% of the students had not attended any training or course on prostate cancer and 886 or 87.12% of the students had never done a placement in a urology department.

Knowledge of prostate cancer screening

All study cycles taken together, 523 students (51.43%) had no knowledge of the blood test for PSA, and the majority of them were undergraduates (501 students, i.e. 91.75% of undergraduates) (Table 2). Four hundred and forty-four (444) students, regardless of study cycle, knew the total PSA component before the survey (43.66%), and of these students, 399 were able to specify the normal value of this component of PSA, which is equal to or less than 4 ng/mL.

Four hundred and seventy-two (412) or 46.42% of the students had ever ordered the PSA blood test in a patient. Two hundred and thirty-three (233) or 22.91% of the students had requested it in elderly patients with signs of urinary dysfunction, 141 or 13.86% had requested it in the face of an abnormal clinical examination of the prostate rectal exam and 98 or 9.64% in the face of cancerous metastases, particularly bone and lung. Univariate analysis revealed a statistically significant relationship between students' knowledge of PSA blood testing and some of their socio-demographic characteristics, namely age (p value = 0.0037; 95% confidence interval (CI) (0.50–1.77)), gender (p value = 0.0034; 95% CI (1.43–2.38)), study cycle (p value < 0.0001; 95% CI (0.56–5.13)) and whether they had completed a traineeship in a urology department (p value < 0.0001; 95% CI (0.49–1.55)) (Table 2).

Regarding knowledge of the DRE as a means of screening for prostate cancer, seven hundred and twelve (712) or 70.01% of the students in all divisions gave a positive response. However, six hundred and forty-two (642) or 63.13% of the students had never performed a digital rectal exam on a patient. One hundred and twenty (120) or 11.80% of the

Table 2. Socio-demographic characteristics versus knowledge on prostate-specific antigen (PSA) assay.

Socio-demographic characteristics	Univariate analysis (knowledge of PSA)				
	n/N	%	OR	95% CI	p value
Sex					0.0034
Male	356/727	49	1	–	
Female	138/290	47.6	0.38	[1.43–2.38]	
Age (years)					0.0037
⩽21	223/524	42.6	1	–	
>21	489/493	99.2	0.94	[0.50–1.77]	
Study cycle					<0.0001
Bachelor	45/546	8.2	1	–	
Master	96/114	84.2	2.41	[1.17–5.13]	
Doctorate	353/357	98.9	1.43	[0.56–3.88]	
Follow-up on your latest prostate cancer training/courses					0.084
<6 months	64/68	94.1	1	–	
Between 6 months and 1 year	29/33	87.9	0.78	[0.31–1.92]	
>1 year	330/335	98.5	2.33	[1.77–3.34]	
Any	71/581	12.2	4.01	[2.03–6.17]	
Effectiveness of an internship in a urology department					<0.0001
Yes	130/131	99.2	1	–	
No	364/886	41.1	0.88	[0.49–1.55]	

PSA: prostate-specific antigen.

Table 3. Socio-demographic characteristics versus digital rectal knowledge.

Socio-demographic characteristics	Univariate analysis (knowledge of digital rectal examination)				
	n/N	%	OR	95% CI	p value
Sex					0.0045
Male	525/727	72.2	1	–	
Female	187/290	64.5	1.81	[1.43–2.37]	
Age (years)					<0.0001
⩽21	223/524	42.6	1	–	
>21	489/493	99.2	0.55	[0.18–2.34]	
Study cycle					0.082
Bachelor	244/546	44.7	1	–	
Master	113/114	99.1	1.5	[1.09–3.44]	
Doctorate	355/357	99.4	0.4	[0.18–1.02]	
Follow-up on your latest prostate cancer training/courses					<0.0001
<6 months	68/68	100	1	–	
Between 6 months and 1 year	33/33	100	0.66	[0.25–1.32]	
>1 year	333/335	99.4	1.29	[1.05–1.57]	
Any	278/581	47.8	2.12	[1.59–3.56]	
Effectiveness of an internship in a urology department					<0.0001
Yes	131/131	100	1	–	
No	581/886	65.6	0.89	[0.17–1.28]	

students were able to recognize the four clinical aspects of the prostate gland on the DRE selected for evaluation. Univariate analysis revealed a statistically significant relationship between students' knowledge of the DRE and some of their socio-demographic characteristics, namely age (p-value < 0.0001; 95% CI (0.18-2.34) gender (p-value = 0.0045; 95% CI (1.43-2.37) attendance of a course or training on prostate cancer (p-value < 0.0001; 95% CI (0.25-3.56) and the

effectiveness of a placement in a urology department (p-value < 0.0001; 95% CI (0.17-1.28)) (Table 3).

Discussion

Our study, the first of its kind on prostate cancer screening in Togo, a country with limited resources, first of all made it possible to highlight the epidemiological issues and the problematic of prostate cancer screening. Next, to assess the degree of knowledge of medical students on the accessible means of detecting this cancer in order to correct the deficiencies of these future doctors to better prepare them to face the health challenge prostate cancer already represents in Togo for the general well-being of the population.

Medical educators need to teach students about the nuances and uncertainties of prostate cancer screening, and future doctors will ultimately need to incorporate this knowledge into communication with their patients. Our study provides an overview of medical students' current knowledge of prostate cancer screening. The PSA blood test has received negative press in recent years, explaining the controversy surrounding screening.[1,2,23,24] Since a reduction in disease incidence by effective primary prevention or by the use of pharmacological treatments is not expected, at least in the short-term, secondary prevention by PSA blood test seems to remain the most appropriate instrument.[25] Furthermore, decisions about prostate cancer screening should be based on the preferences of an informed patient. The majority of the students (80.73%) were aged 25 years or younger. None of them belonged to the prostate cancer risk group. Indeed, prostate cancer is a cancer of the elderly, and screening is recommended for men from the age of 40 if there is a family history of prostate cancer in a first-degree relative, and generally from the age of 45 for all other men.[4,16,22,26] Regarding knowledge of PSA testing, 51.43% of students in all cycles had no knowledge. The low PSA knowledge scores represent important learning grounds that can be used to strengthen medical students for future decision-making regarding prostate cancer screening activities. We expected that students' knowledge of PSA would be affected by their level of education. We found this to be true, as there was a statistically significant relationship between students' knowledge of PSA testing and level of education, as well as whether they had completed a placement in a urology department. Better knowledge of prostate cancer screening is associated with higher educational attainment according to Marcella et al.[27]

The majority of participants (70.01%) in all cycles gave a positive response to the DRE as a means of screening for prostate cancer. There was a statistically significant relationship between participants' awareness of the DRE and their age, gender, having attended a prostate cancer course or training, and having completed a placement in a urology department. It has been found that education level is strongly correlated with a high level of knowledge about prostate cancer and its screening.[28,29] A similar value was also observed in another study conducted in Jamaica, where 96% of men answered questions about prostate cancer and screening correctly.[30] Furthermore, in comparison with other studies conducted in different countries, this rate is better than that reported in South Africa (45.7%) in men attending an outpatient urology clinic and in Uganda (54.1%).[31,32] In the South African study, in a univariate analysis, the level of awareness of DRE as a means of screening for prostate cancer showed a statistically significant association with education and employment, but not with age.[31] There was no statistically significant association between our participants' knowledge of the DRE and their education level. This suggests that education on prostate cancer screening should be strengthened at the faculty level.

Limitations

The occurrence of the COVID-19 pandemic with the temporary closure of universities accentuated the difficulties of collecting face-to-face data. The target population for prostate cancer screening was made up of students who represent a young proportion.

Conclusion

This study provided information on the knowledge of students in the FSS of the UL on prostate cancer screening. There is an acceptable knowledge of the digital rectal examination of all participants. However, there is a need to strengthen the knowledge of these students on PSA testing, with a statistically significant relationship with the level of study as well as the effectiveness of an internship in a urology department. To reduce these disparities in knowledge of prostate cancer screening among these future physicians, educational efforts for them should focus on improving their knowledge so that they can make appropriate decisions in the future to properly address the health burden of prostate cancer in Togo.

Author contributions

T.D. is responsible for the design of the study, undertook the field study, performed data collection, analysis and interpretation and wrote the manuscript. T.Dj., T.M.K., A.S., E.S., G.B. and E.P. participated in the design of the study, supervised the data collection and participated in the data analysis. G.N.K. is responsible for the overall scientific management of the study, the analysis and interpretation and preparation of the final manuscript.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Ethical approval

Ethical approval for this study was obtained from *Wollega University Research Ethics Review Committee prior to the study*. This study was approved by the 'Comité de Bioéthique pour la Recherche en Santé (CBRS)' (Bioethics Committee for Health Research) from the Togo Ministry of Health (Ref N0: 0101/2016/MS/CAB/DGS/DPLET/CBRS). Authorization was obtained from the Dean of the FSS of University of Lomé (Ref N° 0204/2020/FSS/UL), to whom we sent a letter of authorization request explaining the objectives and methodology of the study. Students were assured that participation in the survey was voluntary and anonymous. They were also assured of the confidentiality of the information provided and that all data should be treated anonymously. Written informed consent was obtained from all subjects or their legally authorized representatives prior to participation.

Informed consent

Written informed consent was obtained from all subjects before the study. Students were assured that participation in the survey was voluntary and anonymous. They were also assured of the confidentiality of the information provided and that all data were to be treated anonymously. Written informed consent was obtained from all subjects or their legally authorized representatives prior to participation.

Trial registration

This study was not registered because it was not a randomized clinical study but a field study.

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Supplemental material

Supplemental material for this article is available online.

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