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ORIGINAL RESEARCH

Level of Awareness, Perception and Screening Behavior Regarding Prostate Cancer Among Men in a Rural Community of Ikenne Local Government Area, Nigeria

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Abstract: The objective of the study was to measure the level of awareness, specific knowledge, perception and screening behavior of prostate cancer among males in a rural community of the Ikenne local government area of south-western Nigeria. The study was a cross-sectional design utilizing a pre-tested 36-item questionnaire (Cronbach's alpha of 0.62) to collect information about knowledge regarding prostate cancer, perceived susceptibility and seriousness, perceived benefits of screening and screening behavior among men in a rural community in south-western Nigeria. Three hundred and ninety eight participants were enrolled for the study by systematic random selection of men in the community of the Ikenne local government area. Results indicated that the mean age of participants was 44.24 (standard error of mean (SEM) 0.47) years. Knowledge about prostate cancer as an important disease in men measured on a 12-point scale recorded a mean score of 4.97 (SEM 0.15) and perception of prostate cancer considered in three sub-domains of susceptibility, seriousness and benefit, measured on a 30-point scale, similarly recorded a mean score of 17.65 (SEM 0.18); while screening behavior, measured on a 11-point scale, showed that participants in the study recorded a mean scored of 2.40 (SEM 0.071). Furthermore, 156 (39.2%) of the respondents reported having heard about prostate cancer while 377 (94.7%) had heard of breast cancer as a condition affecting women. The findings suggest that level of awareness about prostate cancer among men in this study was low while their level of perception was just above average and screening behavior was very low. Again, perception variables positively and significantly correlated with screening behaviour among the participants. We conclude that in order to stimulate regular screening among men, there should be an aggressive health promotion intervention designed to increase awareness and to correct impressions about prostate cancer in the community.

Keywords: prostate cancer, knowledge, perception, screening for prostate cancer

Primary Prevention Insights 2010:2 11–20

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11



Introduction and Background of the Study

Cancer, regardless of the type, is considered a fatal disease in both developed and developing countries of the world, and prostate cancer is generally regarded as one of the most common forms of cancer in men worldwide. Treatment modalities for prostate cancer are complex, and the prognosis of untreated or inadequately managed cases is often usually poor, especially in developing countries, considering the high cost of medication and surgical interventions required to treat patients with a diagnosed condition. Furthermore, deaths recorded from prostate cancer cases have been complicated by under-reporting and by cases that have not been diagnosed due to poor awareness on the part of individuals with the condition and, probably, lack of structured guidelines to deal adequately with this health condition that is now emerging in our health care system and community. A careful study of the disease shows that it is gradually taking a prominent position as an emerging epidemic in our community.^{2,3}

For a sense of perspective, we examined World Health Organization (WHO) reports on global disease burden, the Cochrane library for systematic reviews of randomized control trials (RCTs) and a number of other publications to gain an insight into the nature of prostate cancer disease burden and possible interventions, policy issues and possible outcomes. 1,3-6 It was observed that the 2004 WHO report for countries of the world with significant prostate cancer disease burden revealed that out of the top ten countries of the world with the disease, Nigeria ranked as the third highest with the total deaths in that year from the disease being 13,700, after the United States and India with 35,300 and 18,200 deaths, respectively. The reported burden of the disease for 2004 also showed that the total deaths from all cancers/neoplasm in Nigeria was 78,700 and prostate cancer recorded 13,700 (17.41%), while breast cancer recorded 10,600 deaths (13.47% in the eleventh position globally). Within Africa, the report showed that Nigeria ranked first out of the nine countries with the highest prevalence of prostate cancer. Similarly, disease burden expressed as Disability Adjusted Life Years (DALYs) lost to prostate cancer recorded for Nigeria for the same year was 86,000, with the United States and India having 240,000 and 110,000 respectively.

In sub-Saharan Africa, Nigeria ranked first, with Democratic Republic of Congo and Uganda occupying the second and third places, with 22,000 and 15,000 respectively.⁴ In that report, it was estimated that the age from which prostate cancer becomes significantly manifested is 45 years. There is a 45.3-fold increase in prostate cancer reported between the age groups of 30–44 and 45–50 for age-specific total deaths⁴ for 2005. This implies that any health promotion and preventive health intervention must target those that are under 45 years of age.

The reports published by WHO have been the basis for preliminary data synthesis, as described above, which has provided some understanding regarding prostate cancer in developing countries in view of an inadequate number of systematic reviews of RCTs, which are required to gain full insight into the situation. Nonetheless, using data derived from WHO documents, it has been possible to provide the necessary evidence for profiling prostate cancer in Nigeria as an emerging epidemic. Men are most susceptible to prostate cancer, just as women are most susceptible to breast cancer. There are a number of ways by which prostate cancer can be treated. This includes screening at the stage of the development of the disease when there are no symptoms. The rationale for screening is to reduce the possibility of developing the disease at the asymptomatic stage. This method is very evident in the breast self-examination (BSE), mammography and Pap smear tests conducted in breast and cervical cancer interventions, respectively; these have played an important role in reducing the burden of disease and mortality for females. However, in prostate cancer, screening involves physical examination to palpate the prostate by digital rectal examination (DRE), by measuring the levels of prostate specific antigen (PSA) in the blood, or by a biopsy, where a sample of prostate gland tissue is taken for histological examination. A PSA level of 4 ng/mL and above is indicative of a prostate problem; either an enlargement or tumor is involved. If screening would have benefits of improving quality of life by reducing all health consequences, then the best period to begin screening should be at the age of 30–40 years. More importantly, for such screening to be effective and to achieve the willingness to accept health promotion intervention in a setting like Nigeria, there is need to understand the dynamics of health-seeking behavior in the context of this disease and the level of awareness with respect

Primary Prevention Insights 2010:2



to specific knowledge about prostate cancer, its cause and prevention among men aged 15–45 years in the study area. Few studies have explored knowledge and screening behavior for prostate cancer in the study area. 4,7–9 Some success has been recorded with breast and cervical cancer, even though the outcomes have not been optimal; however, this can be attributed to a preventive health strategy which has emphasized stimulating awareness and encouraging screening among women of child-bearing age.

A number of interventions are available for prostate cancer diagnosis and treatment intended for primary and secondary prevention strategies. Primary prevention strategies include screening at the asymptomatic stage of the development of the disease and lifestyle adjustments that may include dietary regimen and supplements. Screening involves the use of DRE, PSA assay, trans-rectal ultrasound and biopsy. The rationale for screening is to reduce morbidity and mortality at the asymptomatic stage of any disease by early detection and treatment at a cost that is affordable rather than at a stage when the disease has been well established, requiring expensive intervention. This can be evident in the mammography and Pap smear tests conducted in breast and cervical cancers interventions, respectively, which have played an important role in reducing the burden of disease and mortality. There seems to be an ongoing debate that appears to suggest no clear benefits for such prostate cancer screening. In a study by Ukoli et al³ using an assay for PSA markers, identified 15.7% prevalence (PSA ≥ 4 ng/mL) in rural Nigeria among men aged 50 years and above who had not been previously screened. This was consistend with reports from elsewhere. The debate for and against screening seem to be at a deadlock; however, if screening would have the benefit of improving quality of life by reducing morbidity and mortality, as has been indicated by some literature, then the best period to screen should be before the age of 44 years, with aggressive health promotion and education activities as Ukoli et al³ suggested. Secondary prevention may require surgical intervention and probably radiotherapy.

Some authorities have expressed fears¹⁰ that the use of 5-alpha-reductase inhibitor drugs as chemopreventive agents may produce high-grade prostate cancer in patients undergoing screening; however, prevention is better than cure in the long term. In the

present situation, where nothing seems to be set as a guide for action, there is need for all stakeholders in the community to be involved in the process of developing an agenda that will make intervention a priority for reducing in the current trend in prostate cancer morbidity and mortality. As has been projected by WHO for 2030, it is predicted that a prostate cancer epidemic would emerge if concerted and strategic action is not put in place now to check this trend. Therefore, for such a program to be effective, baseline information needs to be established through studies like this one to assist in planning an appropriate health promotion intervention.

This study was therefore intended to assess the level of awareness, perception and screening behavior of prostate cancer among men in Ilishan Remo, a typical rural community in south-western Nigeria and to determine the extent to which their perception of the seriousness and susceptibility to the disease may contribute to present situation of poor health-seeking behavior. Data from this study would serve as a baseline for any intervention to be administered in the future.

Methodology

The study was a cross-sectional survey utilizing a pre-tested 36-item questionnaire (Cronbach's alpha of 0.62) to collect information about awareness, perception of susceptibility to prostate cancer, perceived seriousness of the disease, and perception of benefits of screening and screening activities of men in the community. Informed consent was sought from all who accepted to participate. Three hundred and ninety eighty randomly selected males aged between 30 and 72 years from the community of Ilishan Remo, a rural community of the Ikenne local government area in Ogun State, located in the tropical rainforest of Southwestern Nigeria participated in the study. The participants were served the questionnaire constructed in both English and the local Yoruba language, and was self-administered with some guidance from trained research assistants

Instrument development and measures

Some of the questions that guided the present study were: (1) how much do men in the rural community know about the disease and how do they perceive prostate cancer in the light of morbidity and mortality,



and (2) what should be done for primary prevention and screening? The study sought to measure certain demographic characteristics of the participants, their level of awareness and specific knowledge regarding prostate cancer, and their perceived susceptibility and seriousness of the diseases, and the perceived benefits of screening and screening behavior among men in the Ilishan Remo community. Measures for the study were conceptually derived from the health belief model construct,11 in which modifying factor variables such as knowledge, perception variables and screening behavior options were incorporated in the instrument designed for the study. Awareness and specific knowledge variables were measured on a 12-point scale where scores below 4.0 points were considered to reflect general awareness and scores above 4 points indicated specific knowledge regarding prostate cancer. The perception variables were measured on a 4-point Likert-type scale with responses such as Strongly Disagree, Disagree, Agree and Strongly Agree coded so that a low value on the perception domain represented little or no perceived susceptibility, seriousness of the disease and benefits of screening. The perception items were aggregated to create a scale of measurement on a 30-point scale. On the other hand, screening behavior was measured on a maximum 11-point scale consisting of items regarding screening within the last two years, the nature of the outcome of any of the screening, any intentions of a future screening and a brief description of what was required to perform the screening. A low aggregate score was assigned to little or no screening whereas the maximum score was assigned to represent recent and regular screening experience, including a negative screening result within the last two years. The reliability of the 36-item semi-structured questionnaire was enhanced through a re-test with a sample (N = 8) of men from a neighboring community and the correlation coefficient of r = 0.58 was computed. A review of the questionnaire was extensively undertaken by co-researchers and some senior colleagues to provide face validity. Areas of difficulties were identified and adjusted to remove ambiguity observed during pre-testing and a Cronbach's alpha of 0.62 computed for the questionnaire. Furthermore, the questionnaire was strengthened by incorporating major conceptual themes expressed in the Health

Belief Model (HBM). Data analysis was conducted using Statistical Package for Social Sciences¹² version 12. Descriptive statistics such as frequency distributions and means were used to evaluate personal characteristics, age, perception variables and screening behavior. The significance level was set at $(P \le 0.05)$ for all statistical procedures.

Results

The basic results of the study are presented here in the form of descriptive statistics and tables for demographic characteristics of the participants, their level of awareness, the perception domain and the screening variable. Data for sub-domains of perception such as perceived susceptibility to and seriousness of prostate cancer and the benefits of screening were also determined and have been presented.

Demographic characteristics of the respondents

Three hundred and ninety eight men living in Ilishan Remo, a rural community of Ogun state, participated in the study. The mean age of participants in the survey was 44.24 years (SEM 0.47). Most of the respondents (308 (77.4%)) reported being married and 209 (52.5%) respondents had high school education as their highest level of education, while 20 (5.0%) had no formal education. There were 253 (63.6%) Christians, 138 (34.7%) Muslims and 7 (1.8%) affiliated to traditional religion among the participants.

Awareness and specific knowledge about prostate cancer

Exploring the various dimensions of knowledge variables describing general awareness and specific knowledge about prostate cancer among men in Ilishan Remo showed that on a 12-point scale pertaining to knowledge about prostate cancer, the respondents recorded a mean score of 4.97 (SEM 0.15), a well below average score. The result further showed that 156 (39.2%) respondents had heard about prostate cancer, while 66 (16.6%) were able to identify where the prostate gland is located and 42 (10.6%) participants reported knowing someone who had had prostate cancer before. In response to a questionnaire item that required listing the major symptoms associated with prostate cancer and factors that may make a person develop prostate cancer, 6 (1.51%) and 32 (8.0%)



participants, respectively, were able to provide the correct responses. Only 21 (5.3%) respondents in the study reported to have received information from their doctors or physicians regarding prostate cancer. Importantly, only 2 (0.5%) of the respondents reported that they have been told by their physicians that they have a prostate condition, while 185 (46.5%) respondents indicated some awareness of screening for prostate cancer; a majority (377 (94.7%)) of the respondents had heard of breast cancer as a condition affecting women.

Perception of prostate cancer

The results from this study showed that for aggregate perception variables measured on a 30-point scale, the respondents scored a mean of 17.65 (SEM 0.18). For perception sub-variables such as perceived susceptibility and seriousness of prostate cancer, measured on a 15-point and 12-point scales, respectively, the participants in this study recorded a mean score of 8.85 (SEM 0.14) and 6.218 (SEM 0.09), respectively. However, perception of the benefits of screening, measured on a three-point scale, recorded a mean score of 2.59 (SEM 0.03). Some of the opinions expressed by respondents reflecting their perceptions regarding prostate cancer included that not being aware of prostate cancer can prevent them from having it and that prostate cancer can be transmitted sexually 196 (49.2%); 157 (54.5%) of the respondents agreed that any male of advancing age can have prostate cancer, whereas, 220 (55.3%) perceived that prostate cancer affects only Caucasians and 227 (57.1%) admitted that all men are at risk of having prostate cancer. For perception of seriousness, 257 (64.6%) admit that prostate cancer is a deadly disease, 135 (33.9%) believe that prostate cancer has no cure, 222 (57.7%) admitted that prostate cancer cannot make them infertile and 140 (35.2%) believe that prostate cancer does not kill. Perception variables correlated positively and significantly with screening behavior (r = 0.21); P < 0.0001).

Screening behavior

Screening behavior variables, measured on an aggregated 11-point scale, recorded a mean score of 2.40 (SEM 0.071). Eight participants reported having been screened within the last two years and 2 (0.5%) were

able to identify what procedures were carried out, while 6 (1.5%) were not able to recall all that was done during the screening. When asked if they had any intentions of going for prostate cancer screening in the near future, 258 (68.8%) participants indicated that they would like to be screened.

Discussion

The study reported here was undertaken to ascertain the levels of awareness, specific knowledge, perceived susceptibility, the perceived seriousness of the disease and the perceived benefits of screening for early detection and treatment of men in a rural community of south-western Nigeria with regards to prostate cancer. Furthermore, the study also measured screening behavior among the participants because few studies have been conducted recently regarding prostate cancer. The health belief model provided, to a significant extent, the theoretical context for designing the instrument so that the results obtained may provide some understanding of screening behavior and implications for health promotion intervention.

Global disease burden, as reported by WHO for 2004, seem to demonstrate that prostate cancer is becoming an emerging epidemic in Nigeria and a number of other countries of the world. Furthermore, the report showed that the total death from all cancers/neoplasm in Nigeria was 78,700 and prostate cancer recorded 13,700 death (17.41%), while breast cancer recorded 10,600 (13.47%, putting Nigeria in the eleventh position globally). The implication of this observation is that prostate cancer appears to be more prevalent than breast cancer and should be given some prominence than it is receiving now. Within Africa, the report showed that Nigeria ranked first out of the nine countries with the highest prevalence.

The results obtained in this study suggest that awareness and specific knowledge related to prostate cancer is low, a similar observation made by Ukoli et al³ (2003) in their study. Symptom identification, location of the prostate gland and possible factors most likely to cause the disease were used to test specific knowledge of the participants regarding prostate cancer. Surprisingly, only 1.5% were able to identify specific symptoms associated with prostate condition and 16.6% were able to correctly identify the location of the prostate gland. This could either



mean that participants are not aware of these because they do not have the condition or because they have a condition and are not able to link the symptoms to the condition. Incidentally, more participants (94.7%) were able to identify breast cancer as condition affecting females than prostate cancer as condition affecting males (39.2%).

Perception sub-variables measured in the study showed a consistent average level of perception of susceptibility, seriousness and benefits of screening (see Table 1). The study incorporated these sub-variables from the Health Belief Model (HBM) developed by Rosenstock¹¹ because it directly accounts for the likelihood of individuals adopting preventive health behavior. The core tenets of HBM show that the behavior exhibited is determined by whether the individual believes that he/she is susceptible to a particular health problem, regards this problem as serious, and is convinced that there is benefit in undertaking treatment or prevention activities. In exploring the extent to which perception may influence screening behavior, data derived in the study showed a positive correlation between perception and screening behavior that was significant (r = 0.21; P < 0.0001).

The results in this study clearly demonstrate that improved perception would produce a corresponding improvement in screening because, according to the conceptual modeling that guided the study, a high level of perceived personal susceptibility and seriousness would require only minor stimuli to trigger the recommended behavior. Again, knowledge and certain demographic variables may serve as a very important modifying factor that would awaken consciousness of the threat to life posed by prostate cancer and facilitate the role perception may play in the dynamics of influencing likelihood of seeking screening. Therefore, we are suggesting that men

aged between 30 and 40 should be targeted for health promotion intervention, emphasizing knowledge, perception of susceptibility, seriousness and benefits in order to influence the desired health-seeking behavior.

HBM research has been used to explore a variety of health behaviors in diverse populations. Researchers have applied the model to studies that attempt to explain and predict a variety of health behavior responses.¹³ With the advent of HIV/AIDS, the model has been used to gain a better understanding of sexual risk behaviors^{14,15} and condom use behavior.^{16,17} Its application in AIDS risk-reduction research among intravenous drug users has shown that HBM variables are conceptually linked to how people who exhibit high-risk behaviors perceived HIV/AIDS disease. 16,18 Furthermore, several studies have suggested the validity of the model in predicting compliance to condom use¹⁷ and HIV needle risk practices among intravenous drug users. Therefore, for prostate screening among men, the model has value in predicting how individuals are likely to respond if an intervention is designed to stimulate screening behavior among men through innovative health education strategies emphasizing intensive cognitive and health promotion activities to improve their knowledge of the disease and the of benefits of screening. We conclude that in order to stimulate regular screening among men, there should be an aggressive health promotion intervention designed to increase awareness and to correct impressions about prostate cancer in the community. Importantly, the outcome of such screening would guide management of conditions throughout life, including the decision-making process, in which the individual would be an important part. We need to begin to talk about prostate cancer in our community now.

Table 1. Summary of descriptive statistics for major variables in this study among males surveyed.

Variables	Maximum point scale	Mean score	Standard error of mean (SEM)
Age	_	44.24	0.47
Perception of prostate cancer*	30	17.65	0.18
 Perception of susceptibility 	15	8.85	0.14
Perception of seriousness	12	6.22	0.09
 Perception of benefits 	3	2.59	0.03
Prostate cancer screening	11	2.40	0.07

Note: *This variable is a composite aggregate of sub-variables of perceived susceptibility, seriousness and benefits.

Primary Prevention Insights 2010:2



Disclosure

This manuscript has been read and approved by all authors. This paper is unique and is not under consideration by any other publication and has not been published elsewhere. The authors and peer reviewers of this paper report no conflicts of interest. The authors confirm that they have permission to reproduce any copyrighted material.

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APPENDIX

A QUESTIONNAIRE ON THE AWARENESS, PERCEPTION AND SCREENING BEHAVIOR OF PROSTATE CANCER AMONG MEN IN ILISHAN COMMUNITY

Dear Respondent,

This questionnaire is an attempt to gather important information about the **knowledge and awareness**, **perception and screening practices of** men in Ilishan community regarding prostate cancer.

As the main intention behind the survey is **not** to **identify** any **individual's** response, but **group** responses, YOU SHOULD **NOT** WRITE YOUR NAME anywhere on the questionnaire. As seen on this first page, at the top left-hand section, a **CODE NUMBER** is provided for each individual; this is to conceal any individual's identity. Your participation in this study is very important as it would help the researcher to better understand the health behavior process, particularly prostate cancer awareness and screening among men of the community. There are no **right** or **wrong** answers to the questions asked or the statements made; instead, what is desired of you is your **truthful** and **honest** responses.

The time needed to complete the questionnaire is approximately 10 minutes. Please note that the completion of this questionnaire is entirely **voluntary**. All information gathered as a result of your participating in this study will be treated with utmost confidentiality. Your willingness to complete the questionnaire implies you have given consent to participate. Thank you for cooperating.

SECTION A: DEMOGRAPHIC CHARACTERISTICS

Instruction: Please, tick as appropriate $(\sqrt{})$

etual age in years (last birthday): years. arital status: Single () Married () Divorced () Separated () eligion: Christian () Muslim () Traditional () lucational level: Primary () Secondary () Tertiary () No formal education () ecupation: Trader () Commercial motorbike rider () Taxi driver () Businessman () Teacher ()
FION B: KNOWLEDGE AND AWARENESS
we you heard about prostate cancer before: Yes () No () here is the prostate gland located? struction: Kindly tick as many options as applied to the question. In front of the anus [] In the scrotum [] Under the bladder [] In the intestine []
o you know anyone that has had prostate cancer before? Yes () No () ostate cancer affects which gender? Men only () Women only () oth men and women () Don't know () Which of the following factors could make a person more likely to develop prostate cancer? Instruction: Kindly tick as many options as applied to the question. O Family history of the disease condition [] O Drinking alcohol [] O Age [] O Exercise []

Primary Prevention Insights 2010:2



2.6	Have you ever received information from your doctor/healthcare provider about prostate cancer?						
2 =	Yes()No()						
2.7	List three of the [pieces of] information received from your doctor or physician.						
	Instruction: If your answer in question 2.6 above is "No", tick the last option (D).						
	a)						
	b)						
	c)						
	d) No information						
2.8	Have you been told that you have a prostate condition? Yes () No ()						
2.9	Which of these conditions? Enlarged prostate () Prostate cancer ()						
2.10	Are you familiar with symptoms of prostate cancer? Yes () No ()						
2.11	Which symptoms are associated with prostate cancer?						
	Instruction: Kindly tick as many options as applied to the question.						
	a) Excessive urination at night []						
	b) Headache []						
	c) Blood in urine []						
	d) High temperature []						
2.12	Are you aware of screening for prostate cancer? Yes () No ()						
2.13	Does prostate cancer occur in females? Yes () No ()						
2.14	Have you heard about breast cancer? Yes () No ()						

SECTION C: PERCEPTION OF SUSCEPTIBILITY, SERIOUSNESS & BENEFITS

Instruction: A number of things have been said about prostate cancer. The following are some. Please tick $\lceil \sqrt{\rceil}$ as appropriate in column below indicating your views/opinion with regards to the subject matter reflected in the statement below.

No	Statement of consideration	Strongly agree	Agree	Strongly disagree	Disagree
3.1	If I am not aware of prostate cancer, I can't have it.				
3.2	Prostate cancer is a deadly disease.				
3.3	Prostate cancer is an infection that can be transmitted sexually.				
3.4	Prostate cancer has no cure.				
3.5	Prostate cancer cannot make me infertile.				
3.6	Any male of advancing age can have prostate cancer.				
3.7	Prostate cancer affects only white people.				
3.8	All men are at risk of having prostate cancer.				
3.9	Prostate cancer does not kill.				
3.10	I perceive great benefit in going to the clinic regularly for a medical check-up.				

SECTION D: SCREENING

Instruction: Kindly, tick as appropriate $(\sqrt{})$

5.1 Have you been screened for prostate cancer within the last two years? Yes () No ()

2.15 Breast cancer affects more males than females: Yes (); No ()



2.2	During the screening process, what did the	doctor do to	o you?			
	Instruction: Please tick as many options as applied to the question.					
	a) He collected my blood sample.		[]			
	b) He collected my stool sample.		[]			
	c) He inserted a gloved, lubricated finger is	in my anus.	[]			
	d) He checked my sperm count.		[]			
	e) Nothing was done.		[]			
5.3	Did the doctor explain the result after the to	est? Yes () N	No ()			
.4	What was the outcome of the screening? Po	ositive—pros	state condition () Negative—no pr	costate condition (
5.5	Do you have any intention of getting scree	ned in the ne	earest future? Yes () No ()			
6.6	What does it require to do a prostate cance	r screening?)			
	Instruction: Please, tick as many options a	as applied to	the question.			
	a) Go for an appointment with a doctor	[]				
	b) Give the doctor your urine sample	[]				
	c) Blood sample is taken	[]				
	d) Physical examination	[]				
	e) Take body temperature	[]				

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20