Prostate Cancer Knowledge, Attitudes and Screening Practices among Men in Western Jamaica

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ABSTRACT

Background: *African-Caribbean men, particularly Jamaican men, have one of the highest incidences of prostate cancer in the world. This cross-sectional study was conducted to investigate knowledge, attitudes, practices and factors associated with prostate cancer screening among men in western Jamaica.*
Methods: *A questionnaire was administered to men 40–93 years old during May to August 2007. The outcome variable of interest was previous prostate cancer screening.*
Results: *Approximately 35% of men were previously screened for prostate cancer. Men > 70 years were 93% less likely to be screened compared to men 40–49 years (95% CI: 0.01, 0.56). Men living in the parish of Trelawny were 10.5 times more likely not to be screened compared to men in St James (95% CI: 2.33, 47.17) and manual labourers were 5.5 times less likely to have been screened than non-manual labourers (95% CI: 0.97, 31.68). Men who had not been advised to have prostate cancer screening were 92% less likely to be screened than those advised (95% CI: 0.02, 0.29), and men who were not sure of how frequently screening should be conducted were 6.1 times more likely not to be screened compared to those who knew that screening should be conducted annually (95% CI: 1.10, 33.35). Men who visit healthcare providers only when they feel sick were 6.4 times more likely not to be screened compared to men who visit annually (95% CI: 1.63, 25.41).*
Conclusion: *A substantial proportion of Jamaican men ≥ 40 years had never been screened for prostate cancer. Interventions should be instituted to make prostate cancer screening readily available and to promote active participation of men in these programmes especially men ≥ 70 years, men with less economic resources, and men who do not routinely visit a physician or health facility.*

Keywords: Jamaica, knowledge attitudes and practices, prostate cancer, prostate cancer screening

El Cáncer de Próstata: Conocimientos, Actitudes y Prácticas de Investigación entre los Hombres en el Occidente de Jamaica

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RESUMEN

Antecedentes: *Los hombres afro-caribeños, especialmente los hombres jamaicanos, tienen una de las más altas incidencias de cáncer de próstata en el mundo. Este estudio transversal fue realizado para investigar los conocimientos, actitudes, prácticas y factores asociados con la detección del cáncer de próstata entre los hombres de Jamaica occidental.*
Métodos: *Se aplicó un cuestionario a hombres de 40 – 93 años durante mayo a agosto de 2007. La variable de resultado de interés fue el tamizaje previo de cáncer de próstata.*
Resultados: *Aproximadamente el 35% de los hombres habían sido examinados con anterioridad en relación con el cáncer de próstata. Los hombres > 70 años fueron 93% menos propensos a realizarse pruebas, en comparación con los hombres 40–49 años (IC 95%: 0.01, 0.56). Los hombres que viven en la parroquia de Trelawny presentaron una probabilidad 10.5 veces mayor a no dejarse examinar, en comparación con los hombres de Saint James (IC 95%: 2.33, 47.7), y los trabajadores manuales presentaron una probabilidad 5.5 veces menor de haberse realizado exámenes, que los trabajadores no manuales*

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DOI: 10.7727/wimj.2013.168

(IC 95%: 0.97, 31.68). Los hombres que no habían sido aconsejados a hacerse la prueba del cáncer de próstata presentaron una probabilidad 92% menor que los que fueron aconsejados (IC 95%: 0.02, 0.29), y los hombres que no estaban seguros de con qué frecuencia debían realizarse la prueba, presentaron una probabilidad 6.1 mayor de no ser examinados, en comparación con aquellos que sabían que debían realizarse el examen anualmente (IC 95%: 1.10, 33.35). Los hombres que visitan a los proveedores de salud sólo cuando se sienten enfermos, presentaron una probabilidad 6.4 mayor de no ser examinados, en comparación con los hombres que visitan anualmente (IC 95%: 1.63, 25.41).

Conclusión: *Una proporción importante de hombres jamaicanos ≥ 40 años, nunca se habían hecho pruebas de cáncer de próstata. Deben instituirse intervenciones para que el tamizaje del cáncer de próstata esté fácilmente disponible, y para promover la participación activa de los hombres en estos programas, especialmente los hombres ≥ 70 años, los hombres con menos recursos económicos, y los hombres que no visitan habitualmente un centro médico o de salud.*

Palabras claves: Jamaica, conocimientos, actitudes y prácticas, cáncer de próstata, detección del cáncer de próstata

West Indian Med J 2016; 65 (1): 68

INTRODUCTION

Prostate cancer is the fifth most common cancer worldwide and the second most common cancer among men (1). In autopsy results, nearly 80% of men over the age of 80 years show signs of prostate cancer (2). The clinical incidence of prostate cancer varies widely among various ethnic groups, with men in south central Asia having the lowest incidence (4.1/100 000) and men of African descent having the highest rates (1). The risk of developing prostate cancer is high in black African and black Caribbean men (3, 4). Further, the age-standardized prostate cancer-specific mortality in the Caribbean region (26.3/100 000) has been reported to be the highest in the world (5). Gibson and colleagues reported age-adjusted incidence of prostate cancer in Jamaica at 56.4 per 100 000 and age-standardized prostate cancer incidence for Kingston and St Andrew for 2003–2007 as 78.1/100 000 (6). Prostate cancer is also the leading cause of male cancer-related deaths in Jamaica [539/100 000/year] (7). Despite these statistics, the number of men who are screened for prostate cancer in Jamaica remains low (8).

Two tests are currently available to screen for prostate cancer in Jamaica: the digital rectal examination (DRE) and a blood test used to detect prostate-specific antigen (PSA). Although prostate screening programmes exist through the Jamaica Cancer Society and the Jamaica Urological Society, most men do not get screened.

A qualitative study conducted to explore beliefs and practices in African-Caribbean men reported that the participants lacked knowledge of prostate cancer and had misconceptions regarding the causes of the disease (9). These men did not participate in screening, and when they experienced symptoms indicative of obstructive uropathy, they either did not recognize the significance of the symptoms or were reluctant to have them evaluated (9). No studies were found which quantitatively measured African-Caribbean men's beliefs about prostate cancer.

Several factors have been identified as barriers to prostate cancer screening. These include deficient knowledge concerning the signs and symptoms of prostate cancer, risk factors, screening methods and treatment recommendations (10). Fear of bad news, inability to pay and visit to the doctor by men for acute illness only, were also identified as barriers (11, 12). Aversion to the DRE was reported to be a barrier to prostate cancer screening among African American men (13) and embarrassment was also found to be an independent barrier to screening among African American men (14). Embarrassed to have the DRE, fear of impotence and incontinence after treatment if diagnosed with prostate problems were also identified as barriers to prostate cancer screening by Parchment in 2004 (15).

Knowledge and understanding of the perceptions of prostate cancer and prostate cancer screening held by African-Caribbean men is important for development of appropriate interventions to overcome barriers to screening among these men. In this study, we used a standardized questionnaire to assess knowledge, attitudes and practices (KAP) concerning prostate cancer and prostate cancer screening among men in western Jamaica.

OBJECTIVES

The study was designed to: 1) describe prostate cancer KAP, 2) determine factors associated with uptake of prostate cancer screening among men in western Jamaica and 3) present the local health authority with meaningful data to evaluate and improve existing prostate health education programmes and prostate cancer screening promotion activities in order to increase the number of males participating in prostate cancer screening.

SUBJECTS AND METHODS

A cross-sectional clinic-based study was conducted in the four parishes of the Western Regional Health Authority (WRHA) of Jamaica (St James, Hanover, Westmoreland and Trelawny) during May to August of 2007. As of 2001, the total population of males age 40 years and older in the western region was 60 839. Parish health centres and hospitals were chosen as the

sampling unit for the study. Potential participants were identified as men who attended health centres and hospitals in the WRHA and met the inclusion criteria: 1) being male 40 years of age or older, 2) able to roughly describe the function and location of the prostate gland and 3) have no medical diagnosis of a previous prostate condition. These men were identified at the clinic and hospital sites using a medical record form to verify their age and gender. Individuals who satisfied the inclusion criteria were told of the purposes of the study and asked if they would like to participate. Upon approval, the informed consent process was explained to the men and they were asked to read and sign a copy of the consent form after all of their questions were answered. Participation in the study was voluntary and no incentives were provided. The men were first screened by asking, "*What is the prostate gland and where is it located*?" Men who did not know the answer to the question were not included in the study. However, before these men were dismissed, the study team explained what the prostate gland was, and the importance of prostate cancer screening. Participants' knowledge, attitudes and practices regarding prostate cancer and prostate cancer screening were assessed utilizing an interviewer-administered questionnaire. A questionnaire was developed to cover the following areas: demographics, general knowledge about prostate cancer and prostate cancer screening, attitudes regarding provider communications and care, screening and other health practices, barriers to care, and perceptions of overall health and well-being. The outcome variable of interest was whether or not participants had previously been screened for prostate cancer. Participants were told to forgo any questions that made them feel uncomfortable. Questions required single, multiple, open-ended, or five-point Likert scale responses (*ie* from strongly disagree to strongly agree).

Data were collected by public health nurses and trained research assistants. To improve reliability, all persons administering questionnaires were thoroughly trained on questionnaire protocol, including training in simulation activities. Protocol prompts were embedded within the questionnaire to further facilitate reliability. The Institutional Review Board (IRB) of the University of Alabama at Birmingham, the Advisory Panel of Ethics and Medico-Legal Affairs in the Jamaican Ministry of Health, and the WRHA approved the study protocol prior to its implementation.

Statistical analysis

Absolute and relative frequencies (n and %) along with *p*-values obtained for the distributions of all the variables based on the outcome variable of "previous screening status" screened *vs* unscreened were calculated (Tables 1–5). Odds ratios (OR) and 95% confidence intervals (CI) were generated as measures of association for all statistically significant variables extracted from Tables 1 to 3. Both crude and adjusted measures were produced for these variables. All ORs and 95% CIs were calculated from logistic regression equations. Missing values were excluded from the analysis. The analysis was conducted with SAS software, version 9.1. All reported *p*-values are two-tailed. For the final adjusted model for previous prostate screening status in Table 5, all statistically significant variables from the primary analyses were entered into a logistic regression model. Variables with statistical significance of $p < 0.05$ were retained. Potential confounders (age, race, income and education) were also retained for analysis.

RESULTS

Of the total 410 men aged 40–93 years who were screened, 258 met the inclusion criteria for the study. The proportion of the study population from each of the four parishes is as follows: St James, 36.5%; Hanover, 11.2%; Westmoreland, 12.4% and Trelawny 37.8%; 2.0% of men were from other parishes. When there were missing or inconclusive data for the outcome variable of previous screening status (screened *vs* unscreened), these data were deleted. The final study population consisted of 253 men. The variable "age" was collapsed into categories (ages 40–49, 50–59, 60–69 and ≥ 70 years) to further investigate differences among the age groups. Variables such as race, marital status, household members, weekly income, occupation and healthcare payment were condensed into smaller categories for better analysis.

This final study sample comprised 93.3% black men of African-Caribbean descent age 40–93 years (median age 54 years; Table 1); the remaining 6.7% comprised men of "white", "Indian", "Chinese" and "other" groups.

Only 34.8% of the men had ever participated in one or more methods of prostate screening; the remaining 65.2% of men had never been screened for prostate cancer. There were significant differences ($p < 0.0007$) between the age group categories according to screening status. Among men who were screened, there was no significant difference between the number of men and the age category, however, among unscreened men, the number of men decreased with each increasing age category. Significantly ($p < 0.005$) higher proportions of both screened (69.8%) and unscreened (52.7%) men were "married" or "living as married". There was a significant difference ($p < 0.0001$) among screened and unscreened men living in the parish of Trelawny. Only 13.7% of men (13/95) living in this parish were screened for prostate cancer. There were significant differences ($p < 0.01$) between the men with regard to occupation; 54.9% of unscreened men identified their occupation as being manual labour (blue collar; construction, farmer and craftsman) compared to 40.9% of screened men. Fifty-nine per cent of screened men identified their occupations as non-manual labour (white collar; teacher, clergy, secretary and healthcare) or "other". Insurance status was significantly associated with screening ($p < 0.005$); 51.5% of men (33/64) with insurance were screened compared with 29.0% of men (55/188) who were uninsured.

Participant's knowledge of prostate cancer was assessed through several questions and a "knowledge score" was calculated based on correct responses to the questions (Table 2). Both screened and unscreened men were knowledgeable of the

Table 1: Demographic characteristics of the study population according to previous prostate cancer screening status

Variable	n = 253	Total n (%)	Screened n = 88 (34.8%) n (%)	Unscreened n = 165 (65.2%) n (%)	*p*-value
Age (years)	246				**0.0007***
40–49		91 (37.0)	15 (17.9)	76 (46.9)	
50–59		68 (27.6)	28 (33.3)	40 (24.7)	
60–69		48 (19.5)	22 (26.2)	26 (16.0)	
≥ 70		39 (15.9)	19 (22.6)	20 (12.4)	
Marital status[2]	249				**0.005***
Married/living as married		146 (58.6)	60 (69.8)	86 (52.7)	
Single		35 (14.1)	15 (17.4)	20 (12.3)	
Other		68 (27.3)	11 (12.8)	57 (35.0)	
Parish	251				**< 0.0001***
St James		92 (36.6)	47 (53.4)	45 (27.6)	
Hanover		28 (11.2)	14 (15.9)	14 (8.6)	
Westmoreland		31 (12.4)	12 (13.6)	19 (11.7)	
Trelawny		95 (37.8)	13 (14.8)	82 (50.3)	
Other		5 (2.0)	2 (2.3)	3 (1.8)	
Live[3]	252				0.12
Alone		59 (23.4)	12 (13.6)	47 (28.6)	
With spouse		34 (13.5)	16 (18.2)	18 (11.0)	
With spouse and children		116 (46.0)	46 (52.3)	70 (42.7)	
Other		43 (17.1)	14 (15.9)	29 (17.7)	
Weekly income[4]	224				0.53
< J$4399		57 (25.4)	16 (21.6)	41 (27.3)	
> J$4400		72 (32.1)	22 (29.7)	50 (33.3)	
Other		95 (42.4)	36 (48.7)	59 (39.3)	
Occupation[5]	250				**0.01***
Manual labour		125 (50.0)	36 (40.9)	89 (54.9)	
Non-manual labour		38 (15.2)	9 (10.2)	29 (17.9)	
Other		87 (34.8)	43 (48.9)	44 (27.2)	
Education	244				0.74
No formal education		29 (11.9)	13 (15.7)	16 (9.9)	
Primary		96 (39.3)	33 (39.8)	63 (39.1)	
Secondary		61 (25.0)	17 (20.5)	44 (27.3)	
Technical/vocational		37 (15.2)	11 (13.2)	26 (16.2)	
University		21 (8.6)	9 (10.8)	12 (7.5)	
Family history of prostate cancer	249				0.61
Yes		26 (10.4)	11 (12.5)	15 (9.3)	
No		142 (57.0)	53 (60.2)	89 (55.3)	
Do not know		81 (32.5)	24 (27.3)	57 (35.4)	
Insured	252				**0.005***
No		188 (74.6)	55 (62.5)	133 (81.1)	
Yes		64 (25.4)	33 (37.5)	31 (18.9)	
Healthcare payment[6]	252				0.16
Insured through employer/spouse		31 (12.3)	13 (14.8)	18 (11.0)	
Government insurance		28 (11.1)	16 (18.2)	12 (7.3)	
Out of pocket		183 (72.6)	55 (62.5)	128 (78.0)	
Other		10 (4.0)	4 (4.5)	6 (3.7)	

Median age and range = 54.0 (40.0–93.0) years
[2] Marital status "Other" variable includes divorced, widower and other
[3] Live with "Other" variable includes multiple family homes and other
[5] Occupation "Other" variable includes unemployed, retired and other
* Indicates statistically significant variable at the 95% confidence interval

Table 2: Knowledge of study population according to previous prostate cancer screening status

Variable	n = 253	Total n (%)	Screened n = 88 (34.8%) n (%)	Unscreened n = 165 (65.2%) n (%)	*p*-value
Frequency that a man ≥ 40 years should visit healthcare provider for a medical check-up	250				**0.01***
More than once per year		154 (61.6)	57 (64.8)	97 (59.9)	
Once per year		48 (19.2)	21 (23.9)	27 (16.7)	
Only when I feel sick		26 (10.4)	4 (4.5)	22 (13.6)	
Other		22 (8.8)	6 (6.8)	16 (9.9)	
Advised to have screening	250				**0.0001***
Yes		71 (28.4)	54 (61.4)	17 (10.5)	
No		167 (66.8)	33 (37.5)	134 (82.7)	
Do not remember		12 (4.8)	1 (1.1)	11(6.8)	
Aware of tests available	247				**0.0001***
Yes		127 (51.4)	78 (89.7)	49 (30.6)	
No		120 (48.6)	9 (10.3)	111 (69.4)	
Learned about screenings†	96				**0.0005***
Doctor		46 (47.9)	39 (65.0)	7 (19.4)	
Nurse		4 (4.2)	**	4 (11.1)	
Family member		13 (13.5)	5 (8.3)	8 (22.2)	
Church		2 (2.1)	2 (3.3)	**	
At health clinic		4 (4.2)	1 (1.7)	3 (8.3)	
Radio/television/newspaper		18 (18.7)	9 (15.0)	9 (25.0)	
Other		9 (9.4)	4 (6.7)	5 (13.9)	
Name or describe test available†	124				0.99
Cannot name		8 (6.5)	5 (6.5)	3 (6.4)	
1 test named		79 (63.7)	48 (62.3)	31 (66.0)	
2 tests named		33 (26.6)	21 (27.3)	12 (25.5)	
3 tests named		4 (3.2)	3 (3.9)	1 (2.1)	
Are tests available at health clinic†	124				0.24
Yes		55 (44.4)	38 (49.3)	17 (36.2)	
No		22 (17.7)	15 (19.5)	7 (14.9)	
No sure		47 (37.9)	24 (31.2)	23 (48.9)	
Which test(s) is/are available†	54				0.95
Prostate-specific antigen (PSA)		14 (25.9)	9 (25.0)	5 (27.8)	
Digital rectal examination (DRE)		33 (61.1)	22 (61.1)	11 (61.1)	
Cannot remember		7 (133.0)	5 (13.9)	2 (11.1)	
Frequency of screening for a man ≥ 40 years of age	249				**0.0006***
Once per year routinely		154 (61.8)	64 (73.6)	90 (55.6)	
Only if he has prostate symptoms		9 (3.6)	3 (3.4)	6 (3.7)	
Not sure		53 (21.3)	4 (4.6)	49 (30.2)	
Other		33 (13.3)	16 (18.4)	17 (10.5)	
Knowledge score⊥	252				0.32
High > 75		216 (85.7)	72 (81.8)	144 (87.80)	
Average 50–75		33 (13.5)	14 (15.9)	20 (12.2)	
Low < 50		2 (0.8)	2 (2.3)	**	

†Variables are subsequent questions answered by participants that answered "Yes" to the variable "Aware of tests available"
⊥Knowledge score created from variables associated with risk factors and symptoms given values to generate a score for prostate cancer knowledge
*Indicates statistically significant variable at the 95% confidence interval
**Inconclusive data prohibiting analysis

risk factors and symptoms associated with prostate cancer. More unscreened men knew that men 40 years of age and older should visit their healthcare provider more than once per year for reasons other than feeling sick ($p < 0.01$). A significant difference ($p < 0.0001$) existed among participants who were advised to get screened. Two-thirds (66.8%) of participants reported that they were not advised to get screened. Among screened men, 61.4% were advised to get screened while only 10.5% of unscreened men were advised to do the same. Only half (51.4%) of participants were aware of the tests available. Predictably, there was a significant difference ($p < 0.0001$) between the number of screened and unscreened participants who were aware of the screening tests available. Of unscreened men, 69.4% were unaware of these screening methods. A sig-

Table 3: Healthcare visits and prostate screening practices of the study population according to previous prostate cancer screening status

Variable	n = 251	Total n (%)	Screened n = 88 (34.8%) n (%)	Unscreened n = 165 (65.2%) n (%)	*p*-value
Visits to healthcare provider					**0.0001***
More than once per year		110 (43.8)	53 (60.3)	57 (35.0)	
Once a year		28 (11.2)	16 (17.0)	13 (8.0)	
Only when I feel sick		92 (36.6)	14 (15.9)	78 (47.9)	
Other		21 (8.4)	6 (6.8)	15 (9.2)	
Reason for not visiting more often	231				**0.002***
Cost too much		38 (16.5)	10 (13.0)	28 (18.2)	
Do not feel sick		122 (52.8)	30 (39.0)	92 (59.7)	
Other		71 (30.7)	37 (48.0)	34 (22.1)	
Reason for getting screened †	84				
Doctor/nurse		–	50 (59.5)		
Family member		–	6 (7.1)		
Family history of prostate cancer		–	7 (8.3)		
Prostate cancer symptoms		–	5 (6.0)		
Other		–	16 (19.1)		
Number of screenings during lifetime †	85				
One screening		–	47 (55.3)		
Two screenings		–	19 (22.4)		
Other		–	19 (22.3)		
Last screening †	86				
Less than one year ago		–	36 (41.9)		
1–3 years ago		–	30 (34.9)		
4–6 years ago		–	13 (15.1)		
7–10 years ago		–	4 (4.6)		
Over 10 years ago		–	3 (3.5)		
Where screening was performed †	87				
Private doctor		–	45 (51.7)		
Hospital		–	24 (27.6)		
Health clinic		–	9 (10.3)		
Other		–	9 (10.3)		
Which type of screening method †	78				
Prostate-specific antigen (PSA) blood test		–	18 (23.1)		
Digital rectal examination (DRE)		–	54 (69.2)		
Ultrasound		–	3 (3.8)		
Other		–	4 (3.8)		
Quality of service †	84				
Good		–	64 (76.2)		
Acceptable/okay		–	19 (22.6)		
Poor		–	1 (1.2)		
Reasons for not being screened ††	95				
Fear of procedure		–	–	13 (12.6)	
Fear of finding cancer		–	–	10 (10.5)	
Too embarrassing		–	–	1 (1.1)	
Need more information		–	–	10 (10.5)	
Other		–	–	62 (65.3)	

† Variables represent subsequent questions asked of participants who answered "Yes" to 'Previous screening for prostate cancer'. Participants who answered "No" were excluded from analysis.

†† Variable is a subsequent question to participants who answered "No" to 'Previous screening for prostate cancer'. Participants who answered "Yes" were excluded from analysis.

* Indicates statistically significant variable at the 95% confidence interval

nificant number ($p < 0.0005$) of participants who were aware of screening methods learned about them from a doctor. An equal number of both screened and unscreened men learned about screening test from either the radio, television or from reading the newspaper. There was a significant difference ($p < 0.0006$) regarding the men's knowledge of the frequency of screening. A higher proportion of screened than unscreened men were more aware of the fact that men should be screened routinely once per year for prostate cancer, while 30.2% of unscreened men were unsure of the frequency of screenings.

There was a significant difference ($p < 0.0001$) among screened and unscreened men regarding visits to their healthcare provider (Table 3). A higher proportion of screened (60.3%) than unscreened (35%) men visited their healthcare provider more than once per year, and a higher proportion of unscreened than screened men (47.9% *vs* 15.9%) visited their healthcare provider only when they felt sick. The reason for not visiting more often was significantly different between the groups ($p < 0.002$). A higher proportion of unscreened men said they did not visit more often because they just did not feel sick. More screened (48%) than unscreened (22.1%) men gave a reason other than cost or not feeling sick for less frequent visits to a healthcare provider. The majority of men who had received a prostate screening (59.5%) had been advised by a doctor or nurse. Most screened men had been screened only once (55.3%) and 41.9% had been screened less than one year previously. Most had received screening by a private doctor (51.7%) and had received the DRE (69.2%).

The attitude of the men toward prostate screening was assessed through variables that were considered to be barriers that prohibit men from seeking screening as well as through calculation of an "attitude score" (Table 4). The latter was a compilation of responses to questions that were based on a Likert scale (strongly disagree = 1 to strongly agree = 5). None of the perceived barriers listed on the questionnaire and shown in Table 4 (fear of the procedure, fear of finding cancer, too embarrassing, too expensive, distance to get tested, lack of transportation, waiting for an appointment, waiting for results, never given test results, prostate cancer screening not being offered at their health facility, not knowing where to get screened, no privacy, difficulty talking with a health provider about the procedure and needing more information) was statistically significant in the study. However, three variables (distance to get tested [$p < 0.08$], never given test results [$p < 0.07$], and no privacy [$p < 0.06$] attained borderline significance (Table 4).

The final model (Table 5), showed that men in the ≥ 70-year age group were 93% less likely to have had a prostate cancer screening compared to men aged 40 to 49 years (95% CI: 0.01, 0.56). Men living in the parish of Trelawny were 10.5 times more likely not to be screened for prostate cancer compared to men living in the parish of St James (95% CI: 2.33, 47.7). Men who were manual labourers were 5.5 times more likely not to have been screened for prostate cancer compared to non-manual labourers (95% CI: 0.97, 31.68). Men who had not been advised to have a prostate cancer screening were 92% less likely to be screened than those who were advised (95% CI: 0.02, 0.29). Men who did not know that screening tests were available were 97% less likely to be screened (95% CI: 0.01, 0.11). Men who were not sure of how frequently men ≥ 40 years should be screened were 6.1 times more likely not to be screened compared to those who agreed that screening should be conducted annually (95% CI: 1.10, 33.35). Men who visited their healthcare provider only when they feel sick were 6.4 times more likely not to be screened for prostate cancer compared to men who visited their healthcare provider once per year (95% CI: 1.63, 25.41).

Table 4: Attitude and perceived barriers to prostate cancer screening according to previous prostate cancer screening status

	Screened			Unscreened			
	n (%)	Yes n (%)	No n (%)	n (%)	Yes n (%)	No n (%)	*p*-value
At risk of developing prostate cancer	77 (32.9)	51 (66.2)	26 (33.8)	157 (67.1)	95 (60.5)	62 (39.5)	0.52
Fear of procedure	86 (34.5)	37 (43.0)	49 (57.0)	163 (65.5)	86 (52.8)	77 (47.2)	0.21
Fear of finding cancer	87 (34.8)	34 (39.1)	53 (60.9)	163 (65.2)	82 (50.3)	81 (49.7)	0.13
Too expensive	84 (34.7)	29 (34.5)	55 (65.5)	158 (65.3)	62 (39.2)	96 (60.8)	0.34
Embarrassing	86 (35.0)	23 (26.7)	63 (73.3)	165 (65.0)	45 (28.1)	115 (71.9)	0.53
Too far to travel to get test	86 (35.1)	8 (9.3)	78 (90.7)	159 (64.9)	24 (15.1)	135 (84.9)	**0.08**^
No transportation	85 (34.8)	6 (7.1)	79 (92.9)	159 (65.2)	15 (9.4)	144 (90.6)	0.95
Too long to wait for an appointment	85 (34.4)	14 (16.5)	71 (83.5)	162 (65.6)	30 (18.5)	132 (81.5)	0.68
Too long to wait for results	84 (34.7)	13 (15.5)	71 (84.5)	158 (65.3)	28 (17.7)	130 (82.3)	0.96
Never given test results	85 (35.3)	9 (10.6)	76 (89.4)	156 (64.7)	16 (10.3)	140 (89.7)	**0.07**^
Do not know where to get screened	85 (34.4)	20 (23.5)	65 (76.5)	162 (65.6)	49 (30.2)	113 (69.8)	0.76
Need more information	87 (34.9)	46 (52.9)	41 (47.1)	162 (65.1)	84 (51.8)	78 (48.2)	0.59
No privacy	85 (34.7)	12 (14.1)	73 (85.9)	160 (65.3)	26 (16.3)	134 (83.7)	**0.06**^
Difficult talking about procedure	83 (34.3)	7 (8.4)	76 (91.6)	159 (65.7)	14 (8.8)	145 (91.2)	0.42

^Indicates borderline statistically significant variable at the 95% confidence interval

Table 5: Factors associated with prostate cancer screening: crude and adjusted odds ratios and 95% confidence intervals (CI) according to prostate screening status

Variable	n	n (%)	Crude odds ratio	Adjusted[1] odds ratio	95% CI	*p*-value
Age (years)	246					
40–49		91 (37.0)			Reference	
50–59		68 (27.6)	0.31	0.43	0.10, 1.92	0.29
60–69		48 (19.5)	0.24	0.16	0.03, 0.84	0.35
≥ 70		39 (15.9)	0.21	**0.07**	**0.01**, **0.56**	**0.05***
Marital status	249					
Married/living as married		146 (58.6)			Reference	
Single		35 (14.1)	3.36	1.53	0.36, 6.56	0.51
Other		68 (27.3)	0.91	0.84	0.18, 4.04	0.64
Parish	251					
St James		92 (36.6)			Reference	
Hanover		28 (11.2)	1.04	0.83	0.14, 4.81	0.25
Westmoreland		31 (12.4)	1.65	1.53	0.23, 10.20	0.74
Trelawny		95 (37.8)	6.8	**10.49**	**2.33**, **47.17**	**0.02***
Other		5 (2.0)	1.56	2.44	0.04, 138.90	0.90
Occupation	250					
Manual labour		125 (50.0)			Reference	
Non-manual labour		38 (15.2)	1.24	**5.54**	**0.97**, **31.68**	**0.04 ***
Other		87 (34.8)	0.40	0.91	0.24, 3.49	0.18
Insured	252					
No		188 (74.6)			Reference	
Yes		64 (25.4)	0.38	1.07	0.29, 4.05	0.92
How often a man ≥ 40 should visit for a medical check-up	250					
More than once per year		154 (61.6)			Reference	
Once per year		48 (19.2)	0.76	0.35	0.08, 1.58	0.30
Only when I feel sick		26 (10.4)	1.96	0.67	0.08, 5.46	0.99
Other		22 (8.8)	3.07	0.92	0.13, 6.60	0.70
Advised to have screening	250					
Yes		71 (28.4)			Reference	
No		167 (66.8)	0.08	**0.08**	**0.02**, **0.29**	**0.001***
Do not remember		12 (4.8)	2.35	1.92	0.25, 24.15	0.14
Aware of tests available	247					
Yes		127 (51.4)			Reference	
No		120 (48.6)	0.06	**0.03**	**0.01**, **0.11**	**0.0001***
Frequency of screenings of a man ≥ 40 years of age	249					
Once per year routinely		154 (61.8)			Reference	
Only if he has prostate symptoms		9 (3.6)	1.38	0.34	0.02, 7.23	0.29
Not sure		53 (21.3)	7.30	**6.05**	**1.10**, **33.35**	**0.02***
Other		33 (13.3)	0.74	0.93	0.14, 6.03	0.77
Visits to healthcare provider	251					
More than once per year		110 (43.8)			Reference	
Once a year		28 (11.2)	0.81	1.31	0.20, 8.34	0.29
Only when I feel sick		92 (36.6)	5.37	**6.43**	**1.63**, **25.41**	**0.08***
Other		21 (8.4)	2.3	6.35	0.70, 57.63	0.28
Reason for not visiting more often	231					
Cost too much		38 (16.5)			Reference	
Do not feel sick		122 (52.8)	1.14	0.60	0.13, 2.75	0.90
Other		71 (30.7)	0.33	0.31	0.06, 1.68	0.17

[1] Adjusted for all variables in the table

* Indicates statistically significant variable at the 95% confidence interval

DISCUSSION

Our analysis suggests that a large portion of men 40 years and older who live in western Jamaica (97.7% of screened and 96.3% of unscreened participants) had a positive attitude toward prostate cancer screening. These men also have high levels of knowledge concerning the risk factors and symptoms associated with prostate cancer (81.8% of screened and 87.8% of unscreened participants). However, despite positive attitudes and high levels of knowledge regarding prostate cancer screening, only 34.8% of participants reported that they had ever been screened for prostate cancer during their lifetime. This is supported by published studies on prostate cancer screening among Jamaican men (8, 16). In particular, men 70 years and older were 93.0% less likely to have had a prostate cancer screening compared to men 40–49 years. This result could reflect a high propensity toward fatalism and the thought that "if someone is meant to get cancer, they will." Study participants 70 years and older were significantly more likely to perceive that they were at "no" risk of developing prostate cancer than men in the 40–49-year age group (17) and were less motivated to seek screening. Self-perceived risks appeared to be an important predictor in a study of women regarding breast cancer screenings (18). Contrary to the men's perception, the risk for prostate cancer increases with age. The 10-year risk for developing prostate cancer for men 70 years of age is 7.73% compared with 0.34% for men 40 years and 2.31% for men 50 years (19). Therefore, men ≥ 70 years of age need to be educated that their risk for developing prostate cancer is still very high and that they need to be even more vigilant about prostate cancer screening as they get older (19).

Manual labourers were 5.5 times more likely not to be screened for prostate cancer than non-manual labourers. It may be that manual labourers, by being less well educated, earn lower income and are less likely to have health insurance and visit health facilities for check-ups compared with non-manual workers. Lahelma *et al* explained that the effects of education on health may be partly mediated through other socio-economic indicators such as income or occupation (20). Since people with lower education usually have less economic resources, these economic barriers could help to explain the disparities observed in screening uptake. More highly educated people also have better knowledge and understanding of health and how to maintain good health, so they can make better use of screening programmes. Educational level was found to be associated with increased odds of men older than 60 years having a prostate examination in Latin American and Caribbean countries (21). Also, high income and health insurance were found to be related to cancer screening among people in Latin America and the Caribbean (22, 23).

Men living in the rural parish of Trelawny were 10.5 times more likely not to be screened for prostate cancer compared to men living in the more urbanized parish of St James. It appears that rural areas, such as Trelawny, where physicians and medical clinics are sparse, may serve as a barrier to prostate cancer screening.

Our analysis suggests that men with highly preventive attitudes were ultimately more likely to participate in prostate cancer screening. These men felt that men 40 years of age and older should have prostate cancer screening once per year routinely and were 6.1 times more likely to have had a prostate cancer screening. Similarly, men who visited their healthcare provider once per year routinely as opposed to those that sought medical attention only when they felt sick were 6.4 times more likely to be screened for prostate cancer. According to the Health Belief Model (24), participants with more preventative attitudes may have possessed increased perceived susceptibility (belief regarding the chance of getting a condition), perceived benefits (belief in the efficacy of the advised action to reduce risk or seriousness of the advised action) and self-efficacy (one's confidence in one's ability to take action).

Previous studies also reported that physician recommendations appear to be an important predictor of cancer screening (18, 25–29). In our study, only 10% of unscreened men reported that they were advised by their healthcare provider or some other person to have prostate cancer screening compared to 61% of screened men. Perhaps an increase in medical recommendation for prostate cancer screening will increase the number of Jamaican men who get screened.

There are several limitations in this study. First, each variable was categorized to include "do not know/not sure" responses and we allowed participants the option not to answer questions if they felt uncomfortable. The interpretation of "refused" and "do not know" is very subjective and few inferences can be made. Second, self-reports of prostate cancer screening, frequency of visits to a medical centre and medical recommendations for prostate cancer screenings could not be validated. Third, DREs are also performed to screen for colon cancer; some men might have been screened for that disease and not prostate cancer. Finally, parish health centres and hospitals were chosen as the sampling unit for this project. Therefore, the results are generalizable to men from the parishes who visited these facilities during the time of the study.

In conclusion, results from analysis of screening and treatment of prostate cancer have been published, and early detection had been associated with favourable prognosis (9, 30, 31). Our findings suggest that many western Jamaican men have a positive attitude toward prostate cancer screening and are knowledgeable of the risk factors and symptoms associated with prostate cancer. However, a substantial majority of men 40 years and older had never been screened for prostate cancer. Therefore, interventions need to be developed to make prostate cancer screening readily available (especially in rural areas) and to promote active participation of all men in these programmes including those with limited economic resources. A clear message needs to be sent that all men ≥ 40 years are at risk for prostate cancer and that the risk increases dramatically with age so that men ≥ 70 years understand that they are also at high risk. The benefits of prevention and the matter of sex-

ual function/malfunction need to be addressed so that men can feel comfortable about getting screened. Finally, men need to be encouraged to get an annual health check-up and healthcare providers need to recommend prostate cancer screening tests to them.

What is already known on this subject?

- Previous studies conducted on prostate cancer in Jamaica have included investigation of the general incidence of prostate cancer on the island, correlation between PSA level and Gleason score, assessment of physician attitudes concerning prostate cancer screening, investigation of familial risk of prostate cancer, and analysis of the influences of fatty acids and dietary factors.
- However, the screening rate for prostate cancer in Jamaica remains low and most cases are diagnosed at advanced stages. It is crucial to identify sociodemographic and health-seeking behavioural risk factors related to prostate cancer screening since this lack of information impedes public health efforts to increase screening and improve prostate cancer treatment outcomes.

What does this study add?

- This study has identified several sociodemographic and health-seeking behavioural factors associated with prostate cancer screening among men in Jamaica. This information can be used to design interventions to increase prostate cancer screening and decrease the considerable morbidity and mortality from prostate cancer.

ACKNOWLEDGEMENTS

We thank the patients and the staff of the Epidemiology and Research Unit of the Western Regional Health Authority for their support and for making the study possible. This research was supported by the UAB Cancer Prevention and Control Training Program grant #CA 47888 from the National Cancer Institute, and Minority Health International Research Training (MHIRT) grant #T37 MD001448 from the National Institute on Minority Health and Health Disparities, National Institutes of Health, USA. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the National Institutes of Health.

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