

The Epidemiology of Prostate Cancer in Western Jamaica: Risk Factors, Knowledge, Attitudes and Practices

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ABSTRACT

Objectives: To investigate the epidemiology of prostate cancer (PCa) in western Jamaica and describe the health-seeking behaviour of at-risk men.

Methods: This study contained both quantitative and qualitative components. The quantitative portion consisted of a retrospective, matched case-control study of two hundred and four men attending outpatient clinics who completed an interviewer-administered questionnaire. The qualitative component consisted of two focus group discussions designed to further investigate health-seeking behaviour and preferred educational channels regarding PCa.

Results: Four risk factors were identified: family history of PCa (OR 3.39, 95% CI 1.73, 6.66), age (OR 1.97, 95% CI 1.41, 2.74), any sexually transmitted disease (STD) history (OR 2.02, 95% CI 1.07, 3.83) and alcohol consumption (OR 1.86, 95% CI 1.00, 3.47). Knowledge of primary risk factors was low, especially for race (37%). Although 81% of controls knew tests were available, a stigma was associated with testing. The screening rate was higher than previously reported but still low (56% of controls), and PCa in the western region is discovered by symptoms 61% of the time. Focus group participants blamed a "male mentality" that is antagonistic to routine medical care and preventive testing.

Conclusions: Family history, age, STDs and alcohol consumption were identified as risk factors for PCa in western Jamaica. Sexually transmitted disease history and alcohol consumption are interesting results that merit further investigation. Prostate cancer continues to be diagnosed primarily by symptoms, indicating that routine testing is not widespread enough to catch the disease in its early stages when treatment is most effective. A negative image of prostate screenings persists, and targeted educational interventions are needed to improve outcomes.

Keywords: Epidemiology, health-seeking behaviour, Jamaica, prostate cancer

La Epidemiología del Cáncer de Próstata en Jamaica Occidental: Factores de Riesgo, Conocimientos, Actitudes y Prácticas

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RESUMEN

Objetivos: Investigar la epidemiología del cáncer de próstata (CaP) en Jamaica occidental y describir el comportamiento de búsqueda de atención a la salud de los hombres en riesgo.

Métodos: Este estudio contiene componentes tanto cuantitativos como cualitativos. La porción cuantitativa consistió en un estudio de caso-control pareado, retrospectivo, de doscientos cuatro hombres que completaron un cuestionario administrado por el entrevistador, como parte de la atención que recibían en clínicas ambulatorias. El componente cualitativo consistió en dos discusiones de grupos focales, diseñadas para investigar el comportamiento de búsqueda de atención a la salud y los canales educativos preferidos en relación con el CaP.

Resultados: Se identificaron cuatro factores de riesgo: historia familiar de CaP (OR 3.39, 95% IC 1.73, 6.66), edad (OR 1.97, 95% IC 1.41, 2.74), antecedentes de cualquier enfermedad de transmisión sexual (ETS) (OR 2.02, 95% IC 1.07, 3.83), y consumo de alcohol (OR 1.86, 95% IC 1.00, 3.47). El conoci-

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miento de factores de riesgo primarios era bajo, especialmente respecto a la raza (37%). Aunque el 81% de los controles sabía que había pruebas disponibles, había un estigma asociado con las pruebas. La tasa de detección fue mayor que la reportada previamente, pero todavía baja (56% de los controles), y el CaP en la región occidental era descubierto por los síntomas el 61% de las veces. Los participantes del grupo focal culpaban a la “mentalidad machista” – antagónica a la atención médica de rutina y las pruebas preventivas.

Conclusiones: Los antecedentes familiares, la edad, las enfermedades de transmisión sexual y el consumo de alcohol, fueron identificados como factores de riesgo del CaP en Jamaica occidental. Los antecedentes de enfermedad de transmisión sexual y consumo de alcohol arrojan resultados interesantes, y merecen más investigación. El cáncer de próstata sigue siendo diagnosticado principalmente por sus síntomas, lo cual indica que la prueba de rutina no está suficientemente generalizada para detectar la enfermedad en sus etapas iniciales, en las que el tratamiento sería más efectivo. Persiste una imagen negativa de los exámenes de próstata, y se necesitan intervenciones educativas dirigidas a mejorar los resultados.

Palabras claves: epidemiología, comportamiento de atención de búsqueda de la salud, Jamaica, cáncer de próstata

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INTRODUCTION

The incidence of prostate cancer (PCa) varies widely around the world. Developed nations tend to show higher incidences, and within these nations, African descendants have the highest rates and mortality, while persons of Asian descent have the lowest (1–3). Observations such as the changing incidence among migrant communities and analyses of the rates of PCa throughout areas populated by the Trans-Atlantic Slave Trade indicate that the story of PCa is likely more complex than a simple nature vs nurture (genetic vs environmental) paradigm (1, 2, 4). It is more likely that PCa risk is based on gene-environment interactions with certain races being predisposed to stronger influence from environmental factors (1, 5). The established risk factors for PCa include age, race and family history (3, 5, 6). Additionally, there is almost certainly some dietary component involved, but determining its exact nature has proven difficult (3, 6). Other proposed environmental interactions include exposure to carcinogens, alcohol, smoking and sexually transmitted diseases [STDs] (3, 6).

For a time, Jamaica was thought to have the highest incidence of PCa in the world (7). More recent and thorough measurements carried out in Jamaica and among migrant groups in the United Kingdom (UK) indicate that this is not the case (4, 8, 9). Although this observation is now understood to be erroneous, PCa still has a high disease burden on the island. Prostate cancer is the most commonly diagnosed cancer in Jamaica (8); it is diagnosed at late stages with high clinical severity (10), its incidence is increasing (9), and problems with the prostate are the leading cause of hospital admissions among Jamaican men over the age of fifty-five years (11). As the Caribbean population continues to age, PCa and other chronic diseases will likely become an even larger burden on health-care systems, caregivers and productivity (12).

Nations in the Caribbean have been struggling to create evidence-based public health policies regarding PCa screening since the United States Preventative Services Task Force recommended against the routine use of the prostate-specific

antigen (PSA) in 2011. In 2012, researchers from The University of the West Indies responded by calling for further investigations into local modifiable risk factors and barriers to detection (13). A lack of information regarding PCa risk factors in Jamaica has impeded public health efforts to improve treatment outcomes, and more studies are needed to provide such information (5, 13, 14). Reducing mortality through early detection has also proved challenging due to complex cultural and social barriers, but previous studies have found focus groups valuable in assessing attitudes and tailoring the needs of public health to the expectations and desires of the population (15, 16). The current study, therefore, included both a quantitative component for identifying risk factors and a qualitative focus group component for evaluating attitudes and preferred educational interventions.

Two previous studies on PCa through the Western Regional Health Authority (WRHA) have already been completed. The results of these studies indicate that screening is not widely utilized in the western region of Jamaica (17), and that an educational intervention with a multi-media source is a highly effective way of improving health-seeking behaviour (18). This study attempted to further explore this investigative pathway by assessing the risk factors of PCa in western Jamaica along with a deeper exploration of knowledge, attitudes and practices in the at-risk population.

SUBJECTS AND METHODS

This was a matched case-control study conducted from May to August 2012 in the four western parishes of Jamaica. The Figure provides information on the primary interview sites. Men ages 40 years and older were eligible to participate in the study if they presented at outpatient clinics at the study sites and gave informed consent.

The study protocol was approved by the Institutional Review Board of the University of Alabama at Birmingham, the Advisory Panel of Ethics and Medico-Legal Affairs of the Jamaican Ministry of Health, and the WRHA.

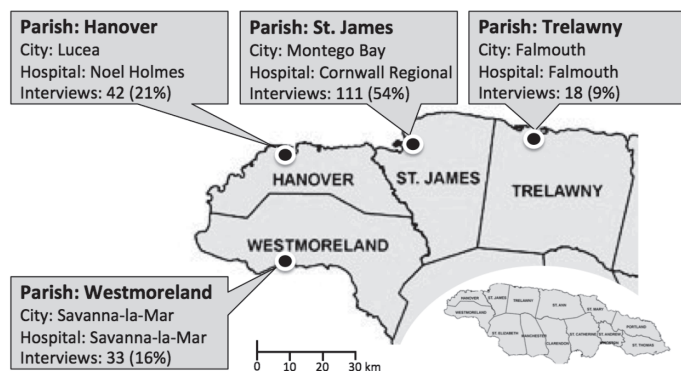


Figure: Map of western region with sampling locations.

Cases were defined as men ages 40 years and older who had been diagnosed with PCa. They were identified primarily from the radiotherapy-oncology and medical records departments at Cornwall Regional Hospital in Montego Bay. A total of 310 potential cases were identified. Of the 100 cases that could be contacted, 4% declined to participate, 19% could not make it to an interview site, and the participation rate was therefore 77%. This response rate included nine men who participated in the case focus group (89% biopsy confirmed) and 68 men who were interviewed (74% biopsy confirmed).

Controls were men who had not been diagnosed with PCa; they were found at the same hospitals and health centres as the cases. The primary areas and clinics from which the controls were recruited were pharmacy, cardiology, medicine, radiography, accidents and emergency, and radiation oncology (excluding men undergoing treatment for PCa). Many men were also accompanying family members who had appointments. Controls were classified based on self-reported lack of a PCa diagnosis, and they were not required to have a negative PSA or digital rectal examination. Two-to-one control-to-case matching was utilized based on parish and age (± 3 years).

Interviewer-administered questionnaire

Trained interviewers administered a 51-item questionnaire regarding sociodemographic information, knowledge of PCa and screening, health-seeking behaviour and lifestyle practices. In addition to analysing potential risk factors, results were used to generate PCa knowledge, attitude and practice (KAP) scores for each participant. The questionnaire was pretested with approximately ten men, reviewed by local staff members, and revised based on the findings before it was used in the study. The interviews lasted approximately twenty minutes and were conducted in a private area of the hospital. Participants were given a \$200 JMD (\$2.35 USD 2012) phone card as a token of appreciation for their participation. A total of 252 interviews were conducted. Forty-eight controls were not included in the final dataset because no cases could be found for them. This left a total of 204 participants: 68 cases and 136 controls.

Statistical analyses

Statistical analyses were performed using SAS 9.3. Frequencies of categorical variables and means and standard deviations of continuous variables were displayed for descriptive purposes. Conditional logistic regression was used to estimate the odds ratios (ORs) and their associated 95% confidence intervals (CIs) for the association of PCa. All tests were two-tailed with a p -value of less than or equal to 0.05 considered significant. Although age was a matched variable, we elected to test for age, as age is an identified risk factor for PCa and to account for any differences that would still exist despite the tight matching window.

Focus groups

The qualitative component of this study involved two focus group sessions on matters related to PCa knowledge, screening and education. One case focus group of nine men and one control group of eleven men was conducted. A trained moderator assisted by at least two observers facilitated each focus group, and the sessions were audio recorded and transcribed. The groups lasted approximately three hours and were held at Cornwall Regional Hospital. Participants came from all four parishes, and were provided with lunch and a \$200 JMD (\$2.35 USD 2012) phone card.

RESULTS

The age range of questionnaire participants was 53 to 83 years. The mean ages of cases and controls were 67 (SD = 6.4) and 66 (SD = 6.3) years, respectively. Descriptive sociodemographic characteristics of participants are presented in Table 1.

Risk factors

The results from the statistical analysis of relevant questionnaire responses are presented in Table 2. Four primary risk factors for PCa were identified: a history of alcohol consumption (OR 1.86, 95% CI 1.00, 3.47), any self-reported STD history (OR 2.02, 95% CI 1.07, 3.83), older age (OR 1.97, 95% CI 1.41, 2.74) and a family history of PCa (OR 3.39, 95% CI 1.73, 6.66). Length of exposure to alcohol was not significant (p -value 0.14). Of cases, 40% had a relative with PCa, while only 15% of controls had a family history. In addition to these risk factors, knowledge, attitude, and combined KAP scores were significantly higher among cases (p -values < 0.01).

Knowledge, attitudes and practices

Table 3 presents the relevant questionnaire responses concerning the sample's knowledge, attitudes and practices regarding PCa. Overall, respondents reported a high rate of satisfaction with the Jamaican healthcare system (79%), although 59% reported that costs limited their access.

Only 16% of controls could correctly identify all four of the generally agreed upon risk factors for PCa: family history, age, race, and some dietary component. Race was the indi-

Table 1: Sociodemographic characteristics of non-focus group participants

| | Total (n = 204 ^a) | % | Cases (n = 68 ^a) | % | Controls (n = 136 ^a) | % |
|---|----------------------------------|-----|---------------------------------|-----|-------------------------------------|-----|
| Age (years) | | | | | | |
| 50–59 | 28 | 14% | 8 | 12% | 20 | 15% |
| 60–69 | 105 | 51% | 32 | 47% | 73 | 54% |
| ≥ 70 | 71 | 35% | 28 | 41% | 43 | 32% |
| Parish | | | | | | |
| Hanover | 42 | 21% | 14 | 21% | 28 | 21% |
| St James | 111 | 54% | 37 | 54% | 74 | 54% |
| Trelawny | 18 | 9% | 6 | 9% | 12 | 9% |
| Westmoreland | 33 | 16% | 11 | 16% | 22 | 16% |
| Race | | | | | | |
| Black | 185 | 91% | 65 | 96% | 120 | 88% |
| Other | 19 | 9% | 3 | 4% | 16 | 12% |
| Marital status | | | | | | |
| Married or common-law union | 130 | 64% | 46 | 68% | 84 | 62% |
| Widowed or single | 74 | 36% | 22 | 32% | 52 | 38% |
| Highest educational level | | | | | | |
| No formal education | 24 | 12% | 6 | 9% | 18 | 13% |
| Primary | 136 | 67% | 48 | 71% | 88 | 65% |
| Secondary or higher | 43 | 21% | 14 | 21% | 29 | 21% |
| Occupation | | | | | | |
| Labourer | 127 | 63% | 41 | 60% | 86 | 64% |
| Skilled worker | 42 | 21% | 14 | 21% | 28 | 21% |
| Clerical or professional worker | 34 | 17% | 13 | 19% | 21 | 16% |
| Employment status | | | | | | |
| Working | 91 | 45% | 30 | 44% | 61 | 45% |
| Not working | 113 | 55% | 38 | 56% | 75 | 55% |
| Self-rated socio-economic status | | | | | | |
| High or average | 60 | 30% | 21 | 31% | 39 | 29% |
| Low or below the poverty line | 141 | 70% | 46 | 69% | 95 | 71% |
| Weekly earnings | | | | | | |
| < 53 USD per week (minimum wage) | 132 | 66% | 38 | 57% | 94 | 71% |
| Between | 39 | 20% | 17 | 25% | 22 | 17% |
| > 106 USD per week | 29 | 15% | 12 | 18% | 17 | 13% |

^a Responses and percentages may not reflect totals due to fewer responses to individual questions

Table 2: Unadjusted, matched odds ratios from conditional logistic regression on the risk of prostate cancer among Jamaican men

| | Cases (n = 68) | Controls (n = 136) | Matched OR | P-value |
|-------------------------------------|-------------------|-----------------------|-------------------|---------|
| Exposure to risk factors | | | | |
| Alcohol history | 47 | 75 | 1.86 (1.00, 3.47) | 0.05 |
| Smoking history | 40 | 99 | 0.56 (0.3, 11.03) | 0.06 |
| Family history of PCa | 27 | 20 | 3.39 (1.73, 6.66) | < 0.01 |
| Any STD history | 45 | 73 | 2.02 (1.07, 3.83) | 0.03 |
| Years of exposure: mean (SD) | | | | |
| Age | 67.10 (6.44) | 66.31 (6.34) | 1.97 (1.41, 2.74) | < 0.01 |
| Alcohol | 28.10 (14.10) | 25.56 (15.43) | 1.20 (0.99, 1.06) | 0.14 |
| Smoking | 29.60 (16.18) | 28.10 (16.00) | 1.00 (0.98, 1.03) | 0.61 |
| KAP results^a | | | | |
| K Score | 5.62 | 4.59 | 1.67 (1.30, 2.19) | < 0.01 |
| A Score | 5.29 | 4.71 | 1.38 (1.09, 1.75) | < 0.01 |
| Combined KAP Score | 14.00 | 11.28 | 1.39 (1.20, 1.61) | < 0.01 |

^a Scales: knowledge 0–7, attitude 0–7, combined knowledge attitude and practice (KAP) 0–18

PCA: prostate cancer, STD: sexually transmitted disease

Table 3: Questionnaire responses related to knowledge, attitudes and practices

| | Total (n = 204 ^a) | % | Cases (n = 68 ^a) | % | Controls (n = 136 ^a) | % |
|---|----------------------------------|-----|---------------------------------|------|-------------------------------------|-----|
| Knowledge | | | | | | |
| Risk factor identification | | | | | | |
| Thinks age a risk | 156 | 77% | 57 | 84% | 99 | 74% |
| Thinks family history a risk | 149 | 74% | 50 | 74% | 99 | 74% |
| Thinks race a risk | 74 | 37% | 29 | 43% | 45 | 34% |
| Thinks diet a risk | 149 | 74% | 54 | 79% | 95 | 71% |
| Thinks alcohol a risk ^b | 122 | 61% | 46 | 68% | 76 | 57% |
| Thinks smoking a risk ^b | 123 | 61% | 38 | 56% | 85 | 63% |
| Thinks obesity a risk ^b | 98 | 49% | 34 | 50% | 64 | 48% |
| Aware of screenings for PCa | 177 | 87% | 67 | 99% | 110 | 81% |
| Aware of blood test for PCa ^c | 146 | 82% | 61 | 91% | 85 | 77% |
| Screenings needed each year ^c | 155 | 94% | 64 | 97% | 91 | 92% |
| Attitudes | | | | | | |
| Self-rated health status ^b | | | | | | |
| Healthy | 63 | 32% | 23 | 34% | 40 | 30% |
| Average | 67 | 34% | 21 | 31% | 46 | 35% |
| Unhealthy | 70 | 35% | 23 | 34% | 47 | 35% |
| Satisfaction with healthcare system ^b | | | | | | |
| Satisfied | 159 | 79% | 60 | 88% | 99 | 74% |
| Neutral | 7 | 3% | 1 | 1% | 6 | 5% |
| Dissatisfied | 35 | 17% | 7 | 10% | 28 | 21% |
| Concerned discussing sexual health | 2 | 1% | 0 | 0% | 2 | 1% |
| Thinks PCa is a severe disease | 180 | 90% | 59 | 89% | 121 | 90% |
| Thinks PCa can be prevented | 119 | 59% | 43 | 63% | 76 | 57% |
| Screenings important for health ^c | 166 | 94% | 66 | 99% | 100 | 91% |
| Feels need to be tested ^c | 147 | 85% | 56 | 89% | 91 | 83% |
| PCa tests are embarrassing, painful, or uncomfortable ^c | 92 | 54% | 35 | 56% | 57 | 53% |
| Would worry test may find PCa ^c | 46 | 27% | 20 | 32% | 26 | 24% |
| Practices | | | | | | |
| Primary health information source ^b | | | | | | |
| Personal acquaintance | 60 | 30% | 31 | 47% | 29 | 22% |
| Media | 28 | 14% | 13 | 20% | 15 | 11% |
| Doctor | 112 | 56% | 22 | 33% | 90 | 67% |
| Costs limiting to access ^b | 119 | 59% | 46 | 68% | 73 | 54% |
| Attends yearly check-ups | 86 | 42% | 25 | 37% | 61 | 45% |
| Plans on yearly PCa testing | 140 | 71% | 57 | 92% | 83 | 62% |
| Has ever been tested ^c | 143 | 81% | 67 | 100% | 76 | 69% |
| Number of PSA tests | | | | | | |
| 0 | 86 | 44% | 4 | 6% | 82 | 62% |
| 1, 2, or 3 | 57 | 29% | 21 | 32% | 36 | 27% |
| 4 or more | 54 | 27% | 40 | 62% | 14 | 11% |

^a Responses and percentages may not reflect totals due to fewer responses to individual questions

^b Responses not included in analysed KAP scores. Presented for descriptive purposes only

^c Of those who knew tests were available

vidual risk factor least frequently recognized (37%). Explanations frequently given for excluding it included “we are all the same” and “we are one blood”.

The majority of controls (81%) knew that screening tests were available for PCa, and 63% of all controls knew about the PSA (77% of controls who knew tests were available). Of those controls who knew tests were available, 48% reported that their doctor had recommended testing. Almost all men reported that they would have no concerns discussing sexual and reproductive health with a doctor (99%). Among all controls, 56% had been tested for PCa at least once (69% of controls

who knew tests were available), and 38% had undergone PSA testing.

The mean age for diagnosis of PCa was 63 years (SD = 7.2; three cases before 50 years), and 61% of cases had been discovered by symptoms rather than routine testing. On average, the men had lived 3.9 years (SD = 3.2, range 0 to 14) since their diagnosis.

Focus groups

The mean ages of the case and control focus groups were 68 (SD = 5.9, range 54 to 75) and 66 (SD = 8.8, range 52 to 76)

years, respectively; these ages were representative of the questionnaire sample. Concerning the reasons why men do not get screened, both groups cited a pervasive “male mentality” in the Jamaican society. This mentality was said to encompass a fear of sickness and an unwillingness to seek treatment. Representative quotes include, “*Women, they have a pain they rush to the doctor; the men, they don’t want to take the time out,*” and, “*You just sit down and bear certain things, but the women nah sit down and bear it*”. The case focus group stated that the culture of Jamaica was specifically opposed to the invasive nature of the digital rectal examination (DRE). One participant remarked, “*Jamaican men don’t like anything being inserted in their buttocks*”. Additionally, fears about the potential effects of PCa on a man’s sexual life and a fear of losing the ability to provide for one’s family were cited as motivators in delaying testing.

The control focus group also indicated that men were eager to learn more about PCa. Explaining how a man should request a test was especially important to the participants. Many men stated during their interviews that they would like to be tested, but they did not know how to proceed. Although the control focus group knew about health clinic locations, they were still confused about navigating the healthcare system and determining whom to contact for testing.

Finally, the men in both groups were asked to give recommendations for PCa education. Both groups recommended the use of multi-media such as films and radio messages. The case focus group also said that an advertisement campaign featuring an influential or famous Jamaican man who had been diagnosed with PCa would be especially effective. Both groups said discussions like the focus groups were a valuable avenue for educating men.

DISCUSSION

As previously mentioned, family history and age are well-established risk factors for PCa. Sexual activity and sexually transmitted infections have also been frequently hypothesized to have associations with PCa, but research has yielded conflicting results (19, 20). A highly publicized study has recently re-ignited this debate by proposing a connection between *Trichomonas vaginalis*, chronic inflammation and PCa (21). The evidence linking alcohol and PCa is also contradictory and not established (22–24). These results, therefore, call for a more thorough investigation into a possible connection between STDs, alcohol consumption and PCa in the western region of Jamaica.

The understanding of the risk factors for PCa and available screening methods in this population needs to be improved. Despite the evidence that African-descendant men are more likely to develop PCa, Jamaican men were far less likely to correctly identify race as a risk factor than the other primary risk factors (37% vs approximately 75%). This indicates that increasing awareness of African descendants’ unique risk for PCa may be a more difficult task than increasing awareness of other risk factors in this population.

Although 90% of men agreed that PCa is a severe disease, only 59% of all interviewees believed that it could be prevented. This may indicate a fatalistic attitude within the population that is part of the pervasive “male mentality” identified by the focus groups. This mentality is well established in the literature for Jamaica and other male populations (25–27). Methods of addressing it need to be developed to improve not only PCa outcomes but also men’s health in general (28).

Limitations

This study had several limitations that should be taken into account when interpreting and applying its results. Although the rate of biopsy confirmation was high and comparable to that in other studies, not all cases were biopsy confirmed and a normal PSA measurement was not required for controls, so it is likely that some cross-contamination occurred between cases and controls (7). The lack of required PCa screening among controls is almost certainly the most significant limitation of this study, and the resulting differential misclassification bias must be strongly considered when examining these findings. Additionally, the geographic distribution of the participants (Figure) was not precisely representative of the actual Western Region as of mid-year 2012: 15% Hanover, 39% St James, 16% Trelawny, and 30% Westmoreland (29). This discrepancy is largely due to the primary sampling location being Cornwall Regional Hospital in St James. Also, due to the retrospective case-control design used in this study, recall and reporting bias are significant limitations. For example, analysis of specific STDs was complicated by self-reporting with most men using “gonorrhoea” to signify any previous STD. For this reason, although data were collected on specific STDs, it was decided that their impact should be analysed in aggregate as a generic “STD History” variable. Finally, another limitation was potential interviewer bias. There were two interviewers and although both were trained, study participants may have responded to them differently.

CONCLUSION

Men in Jamaica are aware of the DRE, but their awareness of the PSA and the risk factors associated with PCa is poor. Further investigation is needed to confirm or explain the relationship between alcohol consumption, STDs, and prostate cancer uncovered in this study. Finally, a negative image of prostate screenings was evident in both focus groups, and education is needed to specifically address a pervasive “male mentality” that is antagonistic to routine, preventative healthcare.

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