Comparison of health access, lifestyle, prostate cancer knowledge and screening among black men residing in West Africa and the USA

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Abstract

Background: In Blacks, late presentation, lack of knowledge, health infrastructural deficiencies and socio-demographic characteristics, which result in poor outcomes, are the bane of cancers. This study evaluated health access and lifestyle association with prostate cancer (PCa) knowledge and screening among black men.

Methodology: This study used data from the Prostate Cancer Transatlantic Consortium familial cohort study. Data were gathered from a cross-sectional survey of 500 community-dwelling black men in Nigeria, Cameroon, and the USA. Information on socio-demographics, health care access, PCa knowledge score and screening behaviour was obtained, and the association between these variables was evaluated.

Results: The majority (81.6%) were Nigerian. The age ranges were 35–49 (55.2%) and ≥65 (8.4%). The income distribution of the respondents showed that 23.3% earned <$1,000 and 30.7% (> $2,000) monthly. Only 43% had health insurance coverage, and 12% had accessed a doctor in 12 months. Respondents relied on orthodox medicine (50.8%), neighbourhood pharmacy (10.6%), self-medication (5%) and neighbourhood nurse (24.6%). The participants had either poor (45.2%) or very poor (23.2%) dietary patterns. Most (66.67%) do not engage in physical activity and about 33.33% engage in some exercises. Moreover, 87.8% and 78.3% have never had a digital rectal examination (DRE) and prostate-specific antigen (PSA) screening in their lifetime, respectively. Furthermore, 65.2%, 19.8% and 15% of the respondents had poor, fair and good knowledge of PCa, respectively. Health care coverage ($p < 0.001$), medical care habit ($p = 0.001$), routine checkup ($p = 0.013$) were significantly associated with respondents’ PCa knowledge. Routine checkup ($p < 0.001$) and country ($p < 0.001$) were significantly related to PSA screening.

Conclusion: The study showed that PCa screening uptake was poor among the respondents and country of residence was associated with PCa screening behaviours. Health-care coverage was significantly associated with PCa knowledge.

Keywords: prostate cancer, health access, screening, black men, insurance coverage

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Introduction

Prostate cancer (PCa) is a public health concern among Black men. Studies have shown a 60% higher incidence among black men than in whites [1]. However, easy access to health care services, appropriate changes in some behavioural lifestyles, such as physical activity (PA) and good dietary patterns could be a key component for preventing or slowing the progression and improving PCa prognosis [2]. Some studies showed that PA (moderate or vigorous) is associated with slowing down PCa progression [2, 3]. It is still an understudied field; more studies on PA and cancer prevention are required [4]. In addition, dietary pattern has the potential to reduce the risk of PCa and its progression. It was reported that lowering the intake of energy-dense foods and increasing the variety of vegetables, fruits, whole grains and pulses consumed as well as the sparing use of red and processed meats could reduce the risk of chronic diseases, including PCa [3].

Access to health care refers to the ease with which an individual can obtain needed medical services. In Africa, poor health care access is the cause of morbidity and mortality from non-communicable chronic diseases, such as cancer. This high mortality could have resulted from the late presentation and diagnosis of patients in Africa predicated on poor health care access observed in countries in sub-Saharan Africa. Health care access could be an issue among Blacks, preventing them from participating in PCa screening. In addition, poverty results in inappropriate patients’ health-seeking behaviours since most health care bills are borne by the patients and caregivers who make out-of-pocket payments [5, 6], due to inadequate and lack of access to health insurance services by many sub-Saharan Africa residents. The shortage of health professionals evident by the health worker per thousand-population ratio in Africa’s health care system, especially Nigeria, is appalling and attests to this [7–9]. The long patient queue to see clinicians clearly shows the accessibility of health services to patients and their caregivers [10].

Conversely, the PCa knowledge and screening could induce behavioural change, as reported by previous studies [11, 12]. Those with PCa knowledge were found to be more favourably disposed to participate in screening [13]. However, knowledge may not necessarily lead to behavioural changes like PA and dietary patterns [14]. It is not yet established that knowledge of the disease would change PA and dietary patterns. Although if proper education and recommendation are based on specific procedures and models, change towards PA and diet might be achieved.

On the other hand, PCa is the most common cancer among men of African descent in North Americans and Africans [15]. However, knowledge and screening behaviours could differ across countries, translating to the incidence and prevalence of PCa with higher figures attributed to the developed countries. This high prevalence can be attributed to better health insurance coverage and health care access in developed countries [16]. In North America, an incidence of 73.7 per 100,000 population, followed by Europe (62.1), was reported. In contrast, Africa and Asia have lower incidence rates of 26.6 and 11.5, respectively, compared to the developed countries [15, 17]. The difference in variables might be due to variations in screening between developed and developing countries. Studies have suggested poor screening uptake in developing countries [18]; this could be responsible for the low incidence and prevalence [17]. For example, the USA is the second in accounting for cancer (9.5%) of 164,690 PCa cases registered in 2018 [19]. While Europe is number one, accounting 24% of all new cancer (450,00 PCa cases) reported in 2018 [17].

Thus, this study aimed to assess health care access and knowledge of PCa associated with screening behaviour and lifestyle factors, including moderate-intense exercise and dietary patterns among black men in Nigerian, Cameroon, and US populations. From the objective of the study, there were two hypotheses. First, there is more knowledge of PCa among the U.S. community-dwelling men than in Nigeria and Cameroon. Second, PCa screening behaviour is associated with health care access and moderate-intense exercise and good dietary pattern.

Methods

This study was a retrospective analysis that used the cross-sectional survey of the Prostate Cancer Transatlantic Consortium (CaPTC) familial cohort, carried out among 500 community-dwelling male respondents between 35 and 70 years old. The data collection method has been previously published [20]. The socio-demographic characteristics, health care access, PCa knowledge and screening behaviours of respondents were assessed. In addition, respondents’ physical activities and dietary patterns were evaluated. Respondents were asked if they had access to a medical doctor in the last 12 months, go for a routine health checkup. They were also asked to state how medical bills were paid and their first response to medical challenges. Moreover, respondents were asked if they engaged in a vigorous-intensity activity that increases their breathing or heart rate, such as lifting heavy loads, digging or construction work. They were further asked the frequency of these physical activities per week. The answer option was a Yes and No for the first question and they stated the number of days per week
Research for the second question on physical activities. The same question model was repeated for moderate-intensity exercises, such as activities that cause a small increase in breathing or heart rate, such as brisk walking. Furthermore, we evaluated how regularly participants exercised in their free time, ranging from 0 to 7 days in a week. Knowledge of PCa was assessed using a 20 points scale, which was scored and categorised. Poor knowledge was categorised as a score of 0%–39%, while 40%–69% was moderate knowledge and ≥70% as good.

The dietary pattern of the participants was assessed using a food frequency questionnaire, in which they were asked to indicate how often and the forms in which foods and drinks were taken per week. To calculate the food variety score, we adapted the scoring procedure and categories of the food variety checklist by Keflie et al [21]. A score of 1 was given for each food item eaten. The aggregate food variety score was totalled and categorised as ≥54% very good, 45%–53% was good, 36%–44% fair, 18%–35% poor and <18% was very poor. Data were analysed for descriptive and inferential statistics using SPSS version 20. Continuous variables were presented as means and standard deviation, while categorical variables were presented as frequency counts and percentages. Associations between categorical variables were determined using chi-square, while variations in numeric variables were determined using analysis of variance. The significant level for all variables was set at p-values < 0.05.

Results

Table 1 provides socio-demographic characteristics of 500 participants, of which 84.4% were from Nigeria, 6.0% lived in Cameroon and 7.2% lived in the USA. The majority (55.2%) of the respondents were 35–49 years old, 28.4% had postgraduate education and 21.2% had an income of 1,000,000 naira and above. Employment status showed that 50.8% were employed for wages while 22.6% were self-employed (Table 1). The occupation distribution of the respondents showed that 29.0% were professionals while 4.2% were farmers (Table 1). Location (<0.001), age (0.019), education level (<0.001), income (<0.001) and occupation (<0.001) were significantly associated with respondents’ PCa knowledge.

Table 1. Education and income status.

| Location          | Frequency | Percent | p-values | PCa knowledge | PSA screening | DRE screening |
|-------------------|-----------|---------|----------|---------------|---------------|---------------|
| Nigeria           | 422       | 84.4    |          | 0.015         | <0.001        | <0.001        |
| Cameroon          | 30        | 6.0     |          |               |               |               |
| USA               | 38        | 7.6     |          |               |               |               |
| Non-response      | 10        | 2.0     |          |               |               |               |
| Age (years)       |          |         | <0.001   |               | <0.001        | <0.001        |
| 35–49             | 276       | 55.2    |          |               |               |               |
| 50–64             | 182       | 36.4    |          |               |               |               |
| 65 and above      | 42        | 8.4     |          |               |               |               |
| Education         |           |         |          | <0.001        | 0.825         | 0.202         |
| Primary           | 2         | 0.4     |          |               |               |               |
| Secondary         | 37        | 7.4     |          |               |               |               |
| High              | 71        | 14.2    |          |               |               |               |
| Technical         | 24        | 4.8     |          |               |               |               |
| University        | 39        | 7.8     |          |               |               |               |
| Postgraduate      | 142       | 28.4    |          |               |               |               |
| Refused           | 101       | 20.2    |          |               |               |               |
| Non-response      | 84        | 16.8    |          |               |               |               |
Table 1. Education and income status. (Continued)

| Employment status               |   |   |
|--------------------------------|---|---|
| Employed for wages              | 254| 50.8|
| Self-employed                   | 113| 22.6|
| Out of work for more than 1 year| 8 | 1.6|
| Homemaker                       | 1 | 0.2|
| Student                         | 2 | 0.4|
| Retired                         | 37 | 7.4|
| Unable to work                  | 2 | 0.4|
| Non-response                     | 83 | 16.6|

| Income                          | <0.001 | 0.054 | 0.050 |
|--------------------------------|-------|------|------|
| <100,000                        | 43   | 8.6  |
| 100,000–199,999                  | 46   | 9.2  |
| 200,000–299,999                  | 21   | 4.2  |
| 300,000–399,999                  | 21   | 4.2  |
| 400,000–499,999                  | 14   | 2.8  |
| 500,000–599,999                  | 20   | 4.0  |
| 600,000–699,999                  | 16   | 3.2  |
| 700,000–799,999                  | 10   | 2.0  |
| 800,000–899,999                  | 14   | 2.8  |
| 900,000–999,999                  | 13   | 2.6  |
| 1,000,000 and above              | 106  | 21.2 |
| Refused                         | 92   | 18.4 |
| Non-response                     | 84   | 16.8 |

| Occupation                      | <0.001 | 0.976 | 0.996 |
|--------------------------------|-------|------|------|
| Professional                    | 145   | 29.0 |
| Managerial                      | 36    | 7.2  |
| Technical                       | 64    | 12.8 |
| Operator/fabricators/factory    | 13    | 2.6  |
| Service                         | 45    | 9.0  |
| Farmer                          | 21    | 4.2  |
| Artisan                         | 29    | 5.8  |
| Others                          | 55    | 11.0 |
| Refused                         | 2     | 0.4  |
| Non-response                     | 92    | 18.4 |

Respondents’ PCa knowledge showed that 15.0%, 19.8% and 65.2% of the respondents had good, fair and poor knowledge, respectively. The participants had either poor (45.2%) or very poor (23.2%) dietary patterns. Most (64.8%) respondents do not engage in PA and about 32.4% engage in some types of activity. Majority of the respondents have never undergone prostate-specific antigen (PSA) (75.6%) and digital rectal examination (DRE) (84.4%) tests (Table 2). Table 3 showed the correlation between variables and screening uptake among the respondents.
There was a strong correlation between PSA and DRE screening \( (r = 0.638) \). There is no correlation between PSA and DRE screening and dietary pattern \( (r = -0.054 \) and \(-0.049, \) respectively), and as knowledge of PCa increases, the quality of dietary pattern decreases \( (r = -0.142) \).

Table 4 provides information on health care access of the respondents, only 33.2% had health insurance cover, and 10% had accessed a doctor in the past 12 months. For a routine checkup, 60.4% never had a routine medical checkup, while 18.8% have done medical checks once in the last 12 months, 52.6% personally pay for their healthcare cost, 6.2% had their medical bills paid by insurance and 12.8% received government subsidy. Respondents' healthcare habits show that 42.4% relied on orthodox medicine for medical care, neighbourhood pharmacy (9.4%), self-medication (4%) and neighbourhood nurse (20.4%). Health care coverage \( (p < 0.001) \), medical care habit \( (p = 0.001) \), routine checkup \( (p = 0.013) \) were significantly associated with respondents' PCa knowledge. Moreover, Health care coverage \( (p < 0.043) \), routine check-up \( (p < 0.001) \) and access to a doctor in the past 12 months \( (p < 0.001) \) were found to be significantly related to the country of residence.

### Table 2. Lifestyles and screening behaviours of respondents.

|                          | N  | %   |
|--------------------------|----|-----|
| Physical activity        |    |     |
| No                       | 324| 64.8|
| Yes                      | 162| 32.4|
| Non-response              | 14 | 2.8 |
| Dietary pattern          |    |     |
| Very good                | 40 | 8   |
| Good                     | 41 | 8.2 |
| Fair                     | 77 | 15.4|
| Poor                     | 226| 45.2|
| Very poor                | 116| 23.2|
| PCa knowledge            |    |     |
| Good                     | 75 | 15  |
| Fair                     | 99 | 19.8|
| Poor                     | 326| 65.2|
| PSA                      |    |     |
| Never                    | 378| 75.6|
| Past year                | 70 | 14.0|
| Past 2 years             | 18 | 3.6 |
| Past 3 years             | 9  | 1.8 |
| Past 4 years             | 2  | 0.4 |
| 5 or more years ago      | 6  | 1.2 |
| Non-response              | 17 | 3.4 |
| DRE                      |    |     |
| Never                    | 422| 84.4|
| Past year                | 34 | 6.8 |
| Past 2 years             | 8  | 1.6 |
| Past 3 years             | 4  | 0.8 |
| Past 4 years             | 6  | 1.2 |
| 5 or more years ago      | 9  | 1.8 |
| Non-response              | 17 | 3.4 |
Table 3. Correlation between dietary pattern, PCa knowledge and screening.

| Variables          | Dietary pattern | Age group | PSA    | DRE    | PCa knowledge |
|--------------------|-----------------|-----------|--------|--------|---------------|
| Dietary pattern    | 1.000           | -0.138**  | -0.054 | -0.049 | -0.142**      |
| Age group          | 1.000           | 0.369**   | 0.306**| 0.019  |               |
| PSA                | 1.000           | 0.638**   |        | -0.113* |               |
| DRE                | 1.000           |          | 1.000  | -0.035 |               |
| PCa knowledge      | 1.000           |          |        |        |               |

* Significant at 0.05, ** Significant at 0.001

Table 4. Health access and habits of respondents.

| Health care coverage       | Frequency | Percent | PCa knowledge | Country |
|-----------------------------|-----------|---------|---------------|---------|
| No                          | 234       | 46.8    | <0.001        | 0.043   |
| Yes                         | 181       | 36.2    |               |         |
| Don’t know/not sure         | 3         | 0.6     |               |         |
| Refused                     | 2         | 0.4     |               |         |
| Non-response                | 80        | 16      |               |         |
| Health care payment         |           | 0.093   | 0.308         |         |
| Self                        | 263       | 52.6    |               |         |
| Family and friends          | 12        | 2.4     |               |         |
| Medical insurance           | 31        | 6.2     |               |         |
| Government subsidy          | 64        | 12.8    |               |         |
| Charity                     | 31        | 6.2     |               |         |
| Non-response                | 99        | 19.8    |               |         |
| Access to doctor/last 12 months |       | 0.426   | <0.001        |         |
| Yes                         | 50        | 10.0    |               |         |
| No                          | 352       | 70.4    |               |         |
| Don’t know                  | 9         | 1.8     |               |         |
| None response               | 89        | 17.8    |               |         |
| Routine check-up            |           | 0.013   | <0.001        |         |
| No                          | 302       | 60.4    |               |         |
| Yes                         | 94        | 18.8    |               |         |
| None response               | 104       | 20.8    |               |         |
| Medical care habit          |           | <0.001  | 0.997         |         |
| Nothing                     | 4         | 0.8     |               |         |
| Pray to God                 | 20        | 4.0     |               |         |
| Traditional/native doctor   | 6         | 1.2     |               |         |
| Self-medication             | 20        | 4.0     |               |         |
| Local pharmacy/pharmacist   | 47        | 9.4     |               |         |
| Nurse/physician assistant   | 102       | 20.4    |               |         |
| Western/medical/orthodox medicine | 212     | 42.4    |               |         |
| None response               | 89        | 17.8    |               |         |
Table 5 presents the comparison between PCa screening, PA and dietary patterns. Nigeria has the worst screening behaviour as 82.1% and 90.5% never had PSA and DRE screening. More proportion (51.6%) of Cameroonian have had PSA screening than Nigerian and US black men. However, more proportion (31.7%) of the respondents from the USA have had DRE screening. Country of residence was found to be significantly associated with PCa knowledge (p = 0.015), PSA (p ≤ 0.001) and DRE (p ≤ 0.001) screening, but not with dietary pattern (p = 0.116).

Discussion

This study assessed the knowledge and screening behaviour of community-dwelling Blacks as well as their health care access, physical activity and dietary pattern. The study found poor health care access and screening behaviour in that majority have never screened for PSA or DRE. In addition, poor dietary pattern was observed in a majority of respondents. As knowledge of PCa increases, the quality of dietary patterns decreases (r = −0.142). African Americans tend to have more DRE screening than their West African counterparts.

Many studies have identified factors associated with PCa screening, including the perceived invasive nature of DRE that might be against their cultural beliefs, as observed by James et al [22]. Their study across eight countries found that preserving masculinity (bodily invasion, losing sexuality, threatening manhood and medical avoidance) was the reason for not screening. In this study, more participants took PSA testing than DRE, which might be due to the invasive nature of DRE test. Moreover, the poor screening behaviour observed in this study might be due to poor health access and low income because most spending on health is usually out of pocket and may not be affordable [23, 24]. An earlier study by Kaninjing et al [25] found that income, health access and cultural belief could be why many African men were not screened. In addition, due to poor uptake of health insurance services in Africa, health access tends to be mainly poor, and many might not access necessary health information that might encourage screening [24, 26].

There is ample evidence suggesting that PA and exercise can be therapeutic tools for PCa patients. Also, it has been found to prevent chronic diseases, such as cancer [27, 28]. However, in this study, more than half of the participants did not engage in physical activities. A study showed that participants had improved their knowledge in exercise, but there was no significant PA engagement increase [29]. This suggests that knowledge might not necessarily lead to practice.

| Table 5. Comparison between respondents country of residence, screening, knowledge and dietary pattern. |
|-------------------------------------------------------------|
| **Nigeria (N%)**                          | Cameroon (N%)             | USA (N%)  | **Significance** |
| PSA screening                                         |                           |           |                |
| Never                                                 | 335 (82.1%)               | 14 (48.3%)| 23 (60.5%)     | <0.001 |
| Screened                                              | 73 (17.8%)                | 15 (51.6%)| 15 (39.4%)     |        |
| DRE screening                                         |                           |           |                |
| Never                                                 | 382 (90.5%)               | 23 (76.7%)| 26 (68.4%)     | <0.001 |
| Screened                                              | 40 (9.5%)                 | 7 (23.3%) | 12 (31.7%)     |        |
| PCa knowledge                                         |                           |           |                |
| Good                                                  | 59 (14.0%)                | 5 (16.7%) | 11 (28.9%)     | 0.015  |
| Fair                                                  | 84 (19.9%)                | 5 (16.7%) | 8 (21.1%)      |        |
| Poor                                                  | 279 (66.1%)               | 20 (66.7%)| 19 (50.0%)     |        |
| Dietary pattern                                       |                           |           |                |
| Very good                                             | 30 (7.1)                  | 2 (6.7)   | 6 (15.8)       | 0.116  |
| Good                                                  | 30 (7.1)                  | 3 (10.0)  | 6 (15.8)       |        |
| Fair                                                  | 66 (15.6)                 | 5 (16.7)  | 6 (15.8)       |        |
| Poor                                                  | 193 (45.7)                | 12 (40.0) | 18 (47.4)      |        |
| Very poor                                             | 103 (24.4)                | 8 (26.7)  | 2 (5.3)        |        |
More than half of the participants had poor dietary patterns. However, PCa screening behaviour has no association with PA and dietary patterns. Poor dietary patterns and sedentary lifestyles have been implicated in the onset of chronic diseases [4, 30]. A previous study associated all invasive cancer with poor/suboptimal diet [31]. Another study demonstrated a relationship between lack of health insurance and a high risk of chronic diseases and poor diet [32]. In addition, a study from southwest Nigeria assimilated large households with poor dietary intake as well they demonstrated a secondary level of education [33]. They implied that a high level of knowledge could positively impact and influence their nutritional uptake. These also corroborated with the results found in PCa knowledge, in which 65.2% had poor PCa knowledge, which is lower than the 86.1% poor knowledge among retired men [34]. As PCa knowledge increases, dietary pattern decreases; it could be because there might not be a specific dietary guideline for PCa. Studies have demonstrated that PCa knowledge does not necessarily mean screening and knowledge was not found to predict screening behaviour [35, 36].

Other studies from Nigeria showed that although knowledge and screening were low, those with good PCa knowledge were willing to screen more than those with poor knowledge [37]. The fact that the cost of screening was high was one of the reasons why they could not screen and lack of health insurance. Only age and location were associated with screening. As participants get older, they tend to screen more, which might be due to health challenges and doctor prescriptions. Location association might be because of poor health access and income. As a study demonstrated, older participants engage in screening because of their health insurance coverage and physician suggestions. Although, more white men (33%) than black men (25%) screened more due to differences in socio-economics level [31, 38]. Lastly, as mentioned by Taitt [38], locality was found to be significantly associated with PCa screening due to various factors like genes, socio-economic and health care access.

The study has limitations. First, the study evaluated secondary data; therefore, causal relationships cannot be confirmed. The data were from community-dwelling men in Nigeria and Cameroon with relatives in the USA; thus, the outcome might not be generalisable for blacks in the USA. Wide variations in demographics and the health care system might have impacted this study. Moreover, most of the respondents were recruited from Nigeria, making the data skewed. This might have affected the outcomes of this study. There is a need for more prospective studies of men with PCas or disorders to validate the outcomes of this study.

Conclusion

The study showed that healthcare access and screening uptake were poor among the respondents, and socio-demographic characteristics were not associated with PCa screening behaviours. There was a significant association between screening behaviour across the countries and healthcare access was significantly associated with PCa knowledge.

Conflicts of interest

There was no conflicts of interest.

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