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Research Article

Risk Perception and Uptake of Prostate Cancer Screening Among a Population of Civil Servants in Ibadan, Nigeria

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ABSTRACT

Prostate cancer (PCa) is the leading cancer in both incidences and mortality among men in Africa including Nigeria. Evidence suggest that African men present with more advanced disease, signifying that they are highly unscreened group for PCa. This study examined the risk perception and uptake of PCa screening among civil servants in Oyo state secretariat, Ibadan. This was a descriptive cross-sectional survey of 192 male staff of Oyo State Secretariat, selected by simple random sampling technique. Respondents' risk perception and uptake of prostate cancer screening were examined using a structured questionnaire. Pearson's chi-square was used to test hypotheses at 0.05 level of significance. Mean age of respondents was 47.44±5.36 years. Up to 140(73.3%) of respondents were aware of PCa, mainly through literature (29.5%), 53.8% had good knowledge of PCa. However, 78% perceived themselves as not at risk for prostate cancer. For 39.6%, prostate cancer is a myth. While only 15(7.9%) had ever been screened, a greater percentage (92.1%) had never been screened. There is significant association between knowledge and uptake of prostate cancer screening ($\chi^2=3.748$, $p=0.05$) as well as between perception of susceptibility and uptake of prostate cancer screening ($\chi^2=26.093$, $p=0.00$). The risk perception for Prostate Cancer is low among the study cohort. There is need for more public enlightenment to improve awareness and uptake of prostate cancer screening services.

Keywords: *Perception, Prostate Cancer, Risk, Uptake, Screening*

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INTRODUCTION

Prostate cancer (PCa) is the leading cancer in both incidences and mortality in Africa, constituting 40,000 (13%) of all male cancer incidences and 28,000 (11.3%) of all male cancer-associated mortalities (Ferlay *et al.*, 2011). In East Africa, PCa ranks third in both incidence and mortality, and leads to an estimated 9,000 (9% of all male cancers) cases and 7,300 (8.5% of all male cancer) deaths annually (Ferlay *et al.*, 2011). The incidence of prostate cancer was low in African population but recently has increased rapidly.

The early detection and treatment of patients with PCa has changed over the years. Recently, prostate specific antigen (PSA) testing has increased the diagnosis of prostate cancer leading to early detection. Majority of the patients in African sub-region present with locally advanced or metastatic disease for which several reasons have been suggested. These reasons include ignorance and poverty, absence of screening programme, inadequate diagnostic facilities, lack of health education and the assumption that lower urinary tract

symptoms are part of ageing process and poor health seeking attitude of Nigerian men (Ojewola *et al.*, 2016).

In the developed world, the probability of being diagnosed with cancer is more than twice as high as in developing countries. Less mortality (50%) are recorded in the developed countries due to early detection, while in developing countries, 80% of cancer victims are diagnosed with late stage incurable tumors, pointing to the need for much better detection programmes (Ebuehi and Otumu, 2011). Some evidence has shown that recent recorded decline in cancer mortality observed in several countries was due to early detection (Ebuehi and Otumu, 2011). The principles of screening for PCa are measurement of serum prostate specific antigen (PSA) and digital rectal examination (DRE). In a study by Ukoli *et al.* (2003) using an assay for PSA markers, identified 15.7% prevalence (PSA = or > 4 ng/mL) in rural Nigeria among men aged 50 years and above who had not been previously screened. The best period to screen should be before the age of 44 years, with aggressive health promotion and education activities and may require surgical intervention

and probably radiotherapy to manage the case at early stage (Ukoli *et al.*, 2003).

In Nigeria, quite a few studies have been done on knowledge, attitude and practices of prostate cancer and prostate cancer screening. These studies report low levels of awareness of prostate cancer and prostate cancer screening. A cross sectional study conducted in 2010 on a native African urban population showed that 78.8% had never heard of prostate cancer and 5.8% had heard of PSA (Ajape *et al.*, 2010). Majority of our patients usually present in the hospital when the disease is already advanced (Badmus *et al.*, 2010). Previous local studies on prostate cancer highlighted the need to increase awareness and surveillance for the disease.

Prevalence of prostate cancer as reported by different researchers across Nigeria is between 2% and 11% (Ikuerowo *et al.*, 2013). Risk perception is described as a complex cognitive process which is influenced by factors that are unique to individuals, therefore can drive an individual's decision to undertake preventive health action (Murthy *et al.*, 2011 & Sivell *et al.*, 2008). In the Health Belief Models (HBM) which is the theoretical basis for this current study, in which risk perception is a major construct. Accordingly, a person's risk perception which is derived from threat appraisal can be the most significant determinant of a changing health behaviour. Some studies have also linked an elevated risk perception to family history of disease (Hopwood *et al.*, 2003 & Warner *et al.*, 2003) suggesting that persons with family history of a disease are more likely to engage in preventive behaviours (Bloom & Stewart, 2006). This study sought to evaluate the risk perception and uptake of prostate cancer screening among male staff in Oyo State Secretariat, Ibadan, Nigeria.

MATERIALS AND METHODS

Study Design: The study adopted a descriptive cross-sectional design among male staff in Oyo State Secretariat, Ibadan. The secretariat is located in Agodi which is a under Ibadan North local government area of Oyo State.

Ethical Approval: This study was approved by the UI/UCH ethics board with approval no UI/EC/17/0454.

Study Population: The study population includes adult male staff of at least forty years of age in Oyo State Secretariat, Agodi, Ibadan total number being 334, from which a calculated sample size of 182 plus 10% attrition rate making 202 using Taro Yamane's formula (Yamane, 1973).

Data Collection: A total of 202 respondents participated in the study. Multi-stage sampling technique which is a probability sampling was used in this study, 11 ministries out of 22 were selected using simple random sampling. In each ministry, all men who were 40years and above were included in the study and respondents were selected using simple random technique.

A validated structured instrument, with Cronbach alpha of 0.73 was used for data collection. The questionnaire has five sections, the content of each section are listed as follows: Section A: Socio-Demographic Data, Section B: Respondent's Knowledge of Prostate Cancer and Screening,

Section C: Perceived Susceptibility to Prostate Cancer, Section D: Perceived barrier to uptake of prostate cancer screening, Section E: Utilization of prostate cancer screening.

Respondents were met at their various offices and questionnaires distributed. Completed questionnaires were retrieved on the spot.

Data Analysis: Data analysis was carried out using IBM Statistical Package for Social Science (SPSS) version 20 software. Knowledge level had an overall score of 10 and categorized into two levels. High knowledge (5 – 10) & low knowledge (<5). Descriptive information was presented in frequencies and percentages. Chi-square test was used to investigate hypotheses at 0.05 level of significance.

RESULTS

Data was collected from a total of 202 respondents out of which 192 were retrieved and found suitable and analyzed giving response rate of 95%.

Socio-demographic Information of Respondents: Respondents were within the age bracket of 40-60yrs. The mean age was 47.44±5.36 years. Most respondents (39%) had tertiary (HND) qualification. Most respondents (43.6%) earned between 41,000 naira and 60,000 naira, 60% of were practicing Christianity as seen on Table 1.

Table 1:
Respondents' Socio-demographic Information

Characteristics	Levels	Frequency	Percentage
Age Group	40-45 Years	78	49.6
	46 – 50 Years	64	33.3
	51 – 55 Years	32	16.7
	56 – 60 Years	18	9.4
	Mean age	47.44 ± 5.36	
Educational Qualification	O' Level	17	8.9
	OND	17	8.9
	HND	74	38.7
	B.Sc.	63	33.0
	M.Sc.	18	9.4
	Ph.D.	2	1.0
Occupation	Secretary	22	11.5
	Health Worker	32	16.8
	Educationist	52	27.2
	Environmentalist	30	15.7
	Engineer	31	16.2
	Others (Artisan and Technician)	24	12.6
Income	<20,000	18	9.6
	21,000-40,000	55	29.3
	41,000-60,000	82	43.6
	>60,000	33	17.6
Religion	Christianity	115	59.9
	Islam	73	38.0
	African Traditional	4	2.1
Marital Status	Single	13	6.8
	Married	154	80.2
	Divorced	8	4.2
	Separated	14	7.3
	Widowed	3	1.6

Table 2:
Awareness on Prostate Cancer and Sources of Information

Awareness on Prostate Cancer	Yes	%	No	%
Ever heard of prostate cancer	140	73.3	51	26.7
Aware of anyone diagnosed of Prostate Cancer	79	42.7	106	57.3
Aware of prostate cancer screening	100	53.5	87	46.5
Aware of someone who has utilized prostate cancer screening test	68	35.8	122	64.2
Sources of Information on Prostate Cancer		Frequency	%	
Read about it (Literatures)	46		29.49	
TV	42		26.92	
Friend	30		19.23	
Radio	14		8.97	
Doctor	9		5.77	
Relative	8		5.13	
Nurse	1		0.64	
Others	6		3.85	

Table 3:
Respondents' Knowledge of Prostate Cancer

	Frequency	Percent
Symptoms of Prostate Cancer		
Difficult or frequent urination*	84	34.85
Painful sex	51	21.16
Blood in urine	36	14.94
Loss of sex drive	36	14.94
Infertility	18	7.47
Bone pain	16	6.64
Stage at which Prostate Cancer is Curable		
Early Stage*	113	65.3
Anytime treatment is commenced	17	9.8
Late Stage	13	7.5
Don't Know	30	17.3
Methods of Treatment of Prostate Cancer Known		
Surgery, drugs & radiotherapy*	42	35.0
Chemotherapy/Drugs	40	33.3
Radiotherapy and Surgery	24	20.0
Radiotherapy	9	7.5
Surgery	5	4.2
Frequency of Prostate Cancer Screening		
Yearly*	67	36.4
Every two years	27	14.7
Every three years	19	10.3
Don't Know	71	38.6
Common Age for Occurrence of Prostate Cancer		
40 years and below	14	8
41-50 years	52	29
51 – 60 years	30	16
61 years and Above *	51	28
Don't Know	34	19

* Correct options

Awareness of prostate cancer and Screening: Findings on Table 2 indicated that 73% had heard about PCa, 42.7% were aware of someone who had been diagnosed of PCa and yet 53.5% only are aware of prostate cancer screening and only 35.8% were aware of someone who has utilized prostate

cancer screening test. Their main sources of information were literature (29.5%) and television programs (27%) as seen in Table 2.

Knowledge of Prostate Cancer: Table 3 shows the common symptoms of prostate cancer as identified by respondents, 35% indicated, difficult or frequent urination, painful sex (21%), blood in urine (15%), loss of sex drive (15%), infertility (7.5%). Most (65%) respondents indicated prostate cancer is only curable at the early stage. Up to 35% of the participants were aware that surgery, drugs and radiotherapy are the most common methods of treatment for prostate cancer, 36% of the respondents indicated that screening should be done on yearly basis. The age in which prostate cancer is most common as identified by 29% of respondents as ages 41 – 50 years and 28% chose above 60 years. Figure 1 shows that 100 (53.8%) had high knowledge level while 86(46.2%) had low knowledge level.

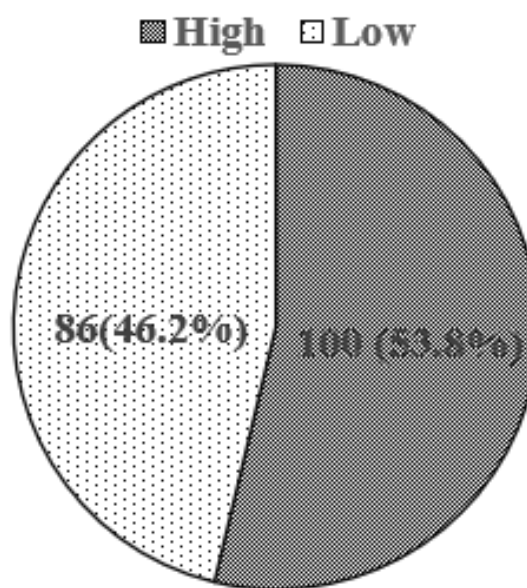


Figure 1:
Level of knowledge of prostate cancer

Table 4:
Respondents' Perception about Risk and Seriousness of Prostate Cancer and Barriers to Screening

	Perception	Agree	Undecided	Disagree
Perceived Susceptibility to Prostate Cancer	At a risk of having prostate cancer	17 (9%)	25 (13.2%)	147(77.8%)
	Prostate cancer is not very common in Nigeria.	102(54.3%)	33(17.6%)	53(28.2%)
	Screening is necessary if there is family History	116(61.4%)	31(16.4%)	42(22.2%)
	Prostate cancer is a myth.	68(36.9%)	26(14.1%)	90(48.9%)
	All men are at risk of getting prostate cancer.	108(57.1%)	45(23.8%)	36(19%)
	Men should go for screening as they are at risk.	129(68.2%)	31(16.4%)	29(15.4%)
	Prostate cancer a serious disease	157(89.7)	-	18(10.3)
Perception of seriousness of Prostate Cancer	Prostate cancer is curable	153(84.1)	2(1.1)	27(14.8)
	Aware of method of treating prostate cancer	74(43.0)	-	98(57.0)
	Survival after diagnosis is less than 5 years	51(27.7)	2(1.1)	131(71.2)
	Treatment is late once prostate cancer is diagnosed	36(19.6)	2(1.1)	146(79.3)
Perceived Barrier to Screening Uptake	Acquiring more knowledge on PCa is important	173(92.5)	-	14(7.5)
	Fear of the unknown.	80(42.1%)	17(8.9%)	93(48.9%)
	Prostate cancer screening is embarrassing.	61(31.9%)	31(16.2%)	99(51.8%)
	Nothing can be done to prevent prostate cancer.	57(29.8%)	27(14.1%)	107(56%)
	Not aware of any health facilities for screening	80(41.9%)	24(12.6%)	87(45.5%)
	Facilities are not located close to where I live.	72(37.7%)	36(18.8%)	83(43.5%)
	Screening tests are quite expensive.	70(36.6%)	69(36.1%)	52(27.2%)
	Health care personnel waste a lot of time.	57(30.5%)	65(34.8%)	65(34.8%)
	Attitude of health workers discouraging screening	64(33.7%)	61(32.1%)	65(34.2%)
	Afraid of having a positive result.	59(31%)	43(22.6%)	88(46.4%)
	The tests are very painful.	34(17.9%)	85(44.7%)	71(37.3%)
	Aware of specific prostate cancer screening test	27(14.4)	-	160(85.6)

Respondents Perception about Risk of Prostate Cancer and Barriers to Screening: Table 4 on prostate cancer risk perception indicated that, only 9% of the respondents affirmed that they were at risk of having prostate cancer, 54% responded that prostate cancer is not very common in Nigeria, 37% believed that prostate cancer is a myth. On the other hand, 55% agreed that all men are at risk of getting prostate cancer, 61% of the participants agreed that they would need prostate cancer screening if they have family history of the disease. Also, 68% of the respondents agreed that men should go for screening due to potential risk of prostate cancer.

Information on respondents' perception of seriousness of Prostate Cancer on table 4 showed that, 90% believed that prostate cancer is a serious disease, 84% think that prostate cancer is curable, 28% assented that an average prostate cancer patient will not live beyond 5 years from start of the disease while 71.2% disagreed. Similarly, 20% agreed that at point of diagnosis, it is already too late to get the desired treatment for prostate cancer while 79.3 disagreed.

The major perceived barriers to uptake of prostate cancer screening seen on table 4 were fears of the unknown (42%), embarrassing (32%), fear of having a positive result (31%), being afraid of the test outcome (18%), belief to be under God's protection (27%), lack of information on the screening centers (41.9%), Not being aware of specific prostate cancer screening tests (85.6%) among others

Uptake of Prostate Cancer Screening: Figure 2 shows that only 8% of the respondents had the screening test before the study was conducted while 92 had not had the test.

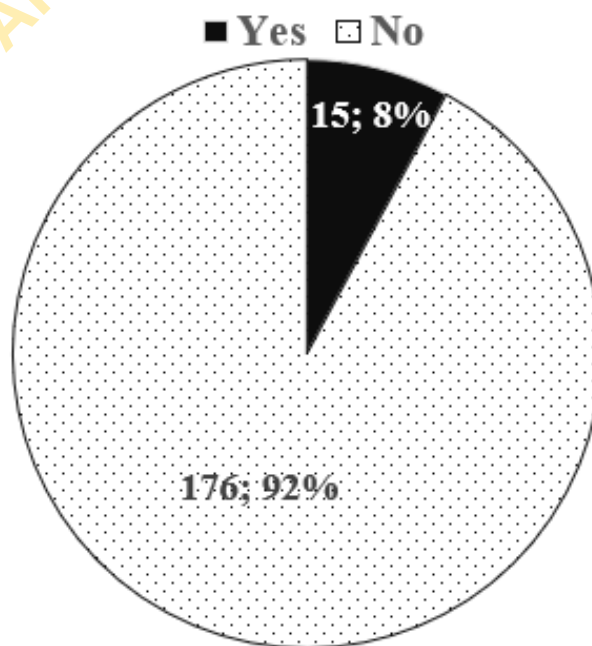


Figure 2
Uptake of Prostate cancer screening

Associations between various variables and uptake of prostate cancer screening. Table 5 presents the test of associations between various variables and uptake of prostate cancer screening. There is a significant association between perception of susceptibility and uptake of prostate cancer screening ($\chi^2= 26.093, p= 0.00$). Also, there is also significant association between knowledge of prostate cancer and uptake of prostate cancer screening ($\chi^2= 3.748, p= 0.05$).

Table 5:

Test of associations between various variables and uptake of prostate cancer screening

Hypothesis 1		There is no significant association between perception of risk and uptake of prostate cancer screening					
Perceived risk of prostate cancer	Uptake of Prostate Cancer screening			χ^2	Df	p-value	Remark
	Yes	No	Total				
High	1	114	115	26.093	4	0.00	Significant
Low	14	59	73				
Total	15	173	188				
Hypothesis 2		There is no significant association between perception of barrier and uptake of prostate cancer screening					
Perception of barrier	Uptake of Prostate Cancer screening			χ^2	Df	p-value	Remark
	Yes	No	Total				
High	4	65	69	8.216	4	0.084	Not Significant
Low	10	111	121				
Total	14	176	190				
Hypothesis 3		There is no significant association between knowledge of prostate cancer and uptake of prostate cancer screening.					
Knowledge of Prostate Cancer	Uptake of Prostate Cancer screening			χ^2	Df	p-value	Remark
	Yes	No	Total				
High	11	89	100	3.748	1	0.05	Significant
Low	3	83	86				
Total	14	172	186				

However, there is no significant association between perception of barrier and uptake of prostate cancer screening ($\chi^2=8.216$, $p=0.084$).

DISCUSSION

The current study investigated risk perception and uptake of prostate cancer screening among male staff of Oyo State Secretariat. We also examined respondents' knowledge and awareness about prostate cancer and screening services

Findings from this study indicated high awareness among the respondents on prostate cancer. The respondents were aware that prostate cancer is a prevalent disease among men and the serious effects of the disease. Also, respondents reported multiple sources of prostate cancer information with the literature and mass media being the leading sources while the least source was nurses, suggesting either that health workers are not giving sufficient information or the men do not go to health facilities regularly. These findings are similar to previous studies among Nigerian men by Oladimeji *et al.* (2010) who reported awareness levels on prostate cancer of 80% and the mass media as the main source of prostate cancer information. This study also corresponds with study by Wachira *et al.* (2018) and Amaoh *et al.* (2018), in which over eighty percent of their respondents were aware of prostate cancer existence with the mass media being the major source of the information. On the contrary, a study carried out by Ajape *et al.* (2010) in Ilorin south local government which shows that 78.8% of respondents had never heard any information on prostate cancer

Over 50% of the respondents in this present study had good knowledge of prostate cancer. This is in line with a study on Knowledge, Attitudes and Perceptions of Prostate Cancer among Male Staff of the University of Nigeria by Adibe *et al.* (2017) who reported that 57.8% of their respondents had a

high knowledge level of prostate cancer. Amaoh *et al.* (2018), in their study stated that the largest percentages of the participants (61.8%) had high knowledge of PCa. Most of the respondents in the study by Amaoh *et al.* (2018), reported to know the symptoms of PCa (52.6%) and the highest regularly mentioned symptoms from participants was frequent urination (65.2%) which is similar to our study. On the other hand, Ogunsanya *et al.* (2017), reported low knowledge scores among their study respondents.

Of great significance are the findings showing that 92.5% of the respondents in this present study were willing to learn more about prostate cancer screening. There is a high level of willingness for knowledge and screening for prostate cancer among male staff.

Literature suggest that risk perception prevents risk distortion, thus promote adherence to screening programs (Matthew *et al.*, 2011). It follows therefore that the level of risk perception strongly influences how individuals avail themselves for screening services. In this study, only 9% of the respondents perceived themselves to be at risk of developing prostate cancer, hence the low uptake of prostate cancer screening among the respondents. This is similar to study among Ghanaian men by Yeboah-Asiamaha *et al.* (2017) in which they did not perceive themselves as being at risk. This result is similar to previous studies among Nigerian men which showed that only 19.4% of the men perceived themselves at risk of developing prostate cancer (Sivell and Elwyn, 2008). This may explain the low level of uptake of screening services even by the respondents in our study. Using the constructs in HBM, risk perception and threat appraisal influences health promotion behaviours.

Generally, there appears to be adequate knowledge on the role of smoking, poor diet, physical inactivity as cancer risk factors. However, the significant role of other risk factors like family history are usually not brought to the fore. Even though

this was not focus in this current study, we therefore suggest future studies to examine the risk perceptions of persons with family history of prostate cancer among Nigerian men. This study differs from a study by Nakandi *et al.* (2013) among Uganda men which shows that 63.5% of the men perceived themselves to be at risk of developing prostate cancer.

Assessment of uptake of PCa screening indicated that only 8% of the study cohort had availed themselves for screening services, which appears to be in line with the level of risk perception. It confirms the assumptions in HBM that threat appraisal influences individuals' decisions to engage in any health promotion or disease preventive interventions. It is noteworthy that despite public health campaigns on smoking cessation, promotion of healthy diet and physical exercises, individuals whose risk perception to cancer is low may not ascent to behavioral changes, suggesting an inappropriate risk perception.

In line with our findings is the report of study by Ogundele *et al.* (2015) among men attending the outpatient clinics of a tertiary health center in Lagos. The findings indicated that 8.2% had some form of screening for prostate cancer. Only 10% of respondents had been screened for PCa according to Yeboah-Asiamaha *et al.* (2017). This figure is slightly different with level of 4.5% previously reported for Nigerian men (Oladimeji *et al.*, 2010). There is therefore a need to intensify campaigns on prostate cancer risk perception in order to reduce the prevalence of the disease. It is important that health care professionals explore the role of personalized medicine and integrate the concept actively into health promotion initiatives.

The perceived barriers to uptake of prostate cancer screening were mainly fear of the unknown, finding the process embarrassing, fear of having a positive result, belief to be under God's protection, lack of information on the screening centers and not being aware of specific prostate cancer screening tests (85.6%) among others. These findings are similar to a study on awareness of general towards prostate cancer and screening practice in Arabic communities (Arafa *et al.*, 2012) which shows that limited knowledge of the prostate cancer, lack of access to screening, beliefs and attitude influence screening. Prostate Cancer Foundation (2018) equally reported that 42% of men say fear and being uncomfortable are among the main reasons not getting screened for prostate cancer. Also, lack of symptoms makes it harder to get men to seek out prostate cancer screening.

The result of the study has strong implications for prostate cancer screening services as regards availability and accessibility. Nurses need to intensify campaigns on utilization of screening services. Every man above 40 years of old is vulnerable to myriads of health problems and prostate cancer is one of them. When vulnerable people are exposed to scientific and accurate knowledge regarding prostate cancer screening, there is a high possibility that they will adopt prostate cancer screening.

It is equally important to ensure that individuals with higher risk are encouraged to go for prostate cancer screening. The screening services should be made affordable as well as accessible. From this study <1% of the respondents chose nurses as their source of information about prostate cancer and screening. Therefore, nurses should endeavor to engage in

creating awareness about prostate cancer and its screening and take every opportunity to provide health education to their clients in order to increase the level of knowledge and thereby increasing the uptake of prostate cancer screening.

There is need for a more elaborate study on barriers to prostate cancer screening utilization in order to find ways of overcoming them. Structured and targeted health education programme should be carried out among male workers in order to increase their risk perception, awareness of need for prostate cancer screening and where to obtain the screening tests.

In conclusion, risk perception for prostate cancer among the study cohort was found to be low, which may reflect the reason for low uptake of available screening services. We suggest an urgent need to integrate the concept of personalized medicine in care, in order that individuals maybe more conscious of their personal risk for certain diseases including prostate cancer. Nurses are at vantage position for this campaign.

REFERENCES

- Adibe M. O., Aluh D. O., Isah A., & Chibueze Anosike C. (2017):** Knowledge, Attitudes and Perceptions of Prostate Cancer among Male Staff of the University of Nigeria *Asian Pac J Cancer Prev*, 18 (7), 1961-1966. DOI:10.22034/APJCP.2017.18.7.1961
- Ajape A. A., Babata A., & Abiola O. O. (2010):** Knowledge of prostate cancer screening among native African urban population in Nigeria. *Nigerian Quarterly Journal of Hospital Medicine*, 20, 94-96.
- Amoah G., Acheampong D. O., Kofi Christian G. S., Acheampong E., Azorliade R., et al. (2018):** Knowledge, Attitude and Perception of Prostate Cancer among Male Adults in the Kumasi Metropolis: A Descriptive Cross-Sectional Study. *J Urol Res*, 5(2), 1099, 1-9.
- Arafa M. A., Rabah D. M., Wahdan I. H. (2012):** Awareness of general public towards cancer prostate and screening practice in Arabic communities: a comparative multi-center study. *Asian Pacific Journal of Cancer Prevention*, 13(9), 4321-6.
- Badmus T. A., Adesunkanni A. R., Yusuf B. M., Oseni G. O., Eziyi A. K., & Bakare T. I., et al. (2010):** Burden of prostate cancer in southwestern Nigeria. *Urology*, 76, 412-6.
- Bloom J. R., & Stewart S. L. (2006).** Family history, perceived risk and prostate cancer screening among African American men. *Cancer Epidemiology, Biomarkers & Prevention*, 15(11), 2167-2173.
- Ebuehi O. M., & Otumu I. U. 2011:** Prostate Screening Practices among Male Staff of the University of Lagos, Lagos, Nigeria. *African Journal of Urology*, 17(4), 122-134.
- Ferlay J., Shin H. R., Bray F., Forman D., Mathers C., & Parkin D. M. (2011):** Estimates of worldwide burden of cancer in 2008: GLOBOCAN 2008. *International Journal of Cancer*, 127(12), 2893-2917.
- Hopwood P. & Howell A, (2003):** Do women understand the odds? Risk perceptions and recall of risk information in women with family history of breast cancer. *Community Genetics*, 6 (4), 214-223.

- Ikuerowo S. O., Omisanjo O. A., Bioku M. J., Ajala M. O., Mordi V. P., & Esho J. O. (2013):** Prevalence and characteristics of prostate cancer among participants of a community-based screening in Nigeria using serum prostate specific antigen and digital rectal examination. *Pacific African Medicine J*, 15, 129.
- Matthew A. G., Paradisco C., Currie K. L., Finelli A. et al. (2011):** Examining risk perception among men with family history of prostate cancer. *Patient Educ. Couns*, 85 (2), 251-257.
- Murthy V. S., Garza M. A., Almario D. A., & Vogel K. J (2011):** Using a family history intervention to improve cancer risk perception in a black community. *Genet Couns*, 20, 639-649.
- Mutua K., Pertet A. M., & Otieno C., (2017):** Cultural factors associated with the intent to be screened for prostate cancer among adult men in a rural Kenyan community. *BioMedical Central Public Health*, 17:894.
- Nakandi H., Kirabo M., Semugabo C., Kittengo A., Kitayimbwa P., Kalungi S., & Maena J. (2013):** Knowledge, attitudes and practices of Ugandan men regarding prostate cancer, *African Journal of Urology*, 19(4), 165–170.
- Ogundele S. O., & Ikuerowo S. O. (2015):** A survey of the awareness of prostate cancer and its screening among men attending the outpatient clinics of a tertiary health center in Lagos, Nigeria. *Nigerian Journal of Surgery*, 21, 115-8.
- Ogunsanya M. E., Brown C. M., Odedina F. T., Barner J. C., Adedipe T. B., & Corbell B. (2017).** Knowledge of Prostate Cancer and Screening among Young Multiethnic Black Men. *American Journal of Men's Health*, Vol. 11(4), 1008–1018.
- Ojewola R. W., Oridota E. S., Balogun O. S., Ogundare E. O., & Alabi T. O. (2016):** Lower Urinary Tract Symptoms: Prevalence, Perceptions, and Healthcare-Seeking Behavior amongst Nigerian Men. *World J Mens Health*, 34(3), 200–208. doi:10.5534/wjmh.2016.34.3.200
- Oladimeji O., Bidemi Y. O., Olufisayo J. A., & Sola A. O. (2010):** Prostate cancer awareness, knowledge, and screening practices among older men in Oyo State, Nigeria. *International Quarterly of Community Health Education*, 30(3), 271286.
- Prostate Cancer Foundation (2018).** Public Perception of Prostate Cancer The Prostate Cancer Foundation's PCF 3P Report 2018: www.pcf.org
- Sivell S., & Elwyn G. (2008):** How is risk perceived, constructed and interpreted by clinicians in clinical genetics, and the effects on decision making: Systematic review. *Journal of Genetic Counseling*, 17 (1), 30-63.
- Yamane, T. (1973).** *Statistics: An Introductory Analysis*, 2nd Edition, New York: Harper and Row.
- Ukoli F., Osime U., Akereyeni F., Okunzuwa O., Kittles R., & Adams-Campbell L. (2003):** Prevalence of elevated serum prostate-specific antigen in rural Nigeria. *International Journal of Urology*, 10, 315-22.
- Wachira B. W., Meng'anyi L. W., & Mbugua G. R. (2018):** Knowledge, Perception and Uptake of Prostate Cancer Screening: A Cross Sectional Study at a Level III Hospital in Kenya; *Public Health Research*, 8(4), 81-87. DOI: 10.5923/j.phr.20180804.01
- Warner E., & Carroll J. C. (2003):** Educating women about breast cancer. An intervention for women with family history of breast cancer. *Canadian family Physician*, 49, 56-63.
- Yeboah-Asiamaha B., Yirenya-Tawiahb D., Baafic D., & Ackumeyd M. M. (2017).** Perceptions and knowledge about prostate cancer and attitudes towards prostate cancer screening among male teachers in the Sunyani Municipality, Ghana, *African Journal of Urology*, 23, 184–191