

Effects of a nurse-led educational programme on knowledge of Prostate cancer in selected Hospitals in Cross River State, Nigeria

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Received 10 June 2017, Accepted 02 Sept 2017, Available online 08 Sept 2017, Vol.5 (Sept/Oct 2017 issue)

Abstract

Prostate cancer (PC) is a leading cause of cancer death among men in Nigeria. Available evidence suggests poor knowledge of PC as responsible for escalating mortality rate in Cross River State, yet there exists no comprehensive health promotion package on knowledge of PC. The aim of this study was to evaluate the effectiveness of a nurse-led educational programme on knowledge of PC in selected hospitals in Cross River State, Nigeria. Quasi experimental non-equivalent control group pretest-posttest study was conducted among men attending Out Patient Departments (OPD) in four randomly selected General hospitals in three senatorial districts: North, Central and South of Cross River State. A sample of 420 men: of which 210 were randomly assigned to Intervention Group (IG) and Control Group (CG) respectively. An educational intervention package of four modules on knowledge of PC was administered for four weeks only in IG. A validated structured questionnaire was used to assess knowledge of PC at pretest (PT₁), immediate post intervention (PT₂), at three months (PT₃) and six months post intervention (PT₄). Data were analyzed using chi-square and t-test. Mean age in IG (51.4 ± 8.9) and CG (54.1 ± 8.2) was comparable. At PT₁, there was a significant difference in knowledge scores in IG and CG (10.1 ± 0); (9.1 ± 4.8); (t = -2.8). At PT₂ knowledge increased only in IG (19.4 ± 2.0); CG (9.8 ± 3.6) (t = 30.0, p < 0.05). At PT₃, knowledge of PC reduced in IG (16.6 ± 2.7), while CG increased (11.3 ± 2.1) (t = -22.4, p < 0.05). At PT₄, knowledge increased slightly in IG (17 ± 2.7) and CG decreased (10.7 ± 2.3) (t = -26.8, p < 0.05). conclusively, the nurse-led educational programme improved the level of knowledge of PC over a short period. Therefore, there is need to integrate health educational programme about PC in hospitals to ensure sustenance of knowledge.

Keywords: Knowledge of prostate cancer, Nurse-led Educational programme, Prostate cancer

Introduction

Globally, the incidence of cancer has assumed an intractable proportion. The high frequency of occurrence is evidenced in developing countries that hitherto had low incidence. For instance, Okobia (2008), Ajape, *et.al* (2010), observed that the rising global incidence of malignant diseases constitutes a serious health concern, particularly in developing countries where the increase is in multiples. Cancer is the second highest cause of death in Africa and has been killing a lot of people silently to such an extent that one can safely say that it kills more people than HIV/AIDS, tuberculosis and malaria (WHO, 2011). Ogunbiyi (2013) gave credence to the findings that HIV is an additional cause of the increased incidence of cancer in Nigeria. Prostate Cancer (PC) has become the number one cancer in men with increasing incidence and morbidity in men of black ancestry (DeLongchamps, *et.al*,

2007). Its incidence and prevalence in black men is higher than among men from other races (Odedna, *et.al*, 2011).

According to Shittu *et.al* (2008), there has been a rise in the incidence of carcinoma of the prostate gland among Nigerians in recent years, and PC is becoming a leading cause of death among men. In what has been hailed as a landmark study, Osegbe (1997) as cited in Ajape, *et.al* (2010), reports a prostate cancer hospital incidence rate of 127 per 100,000 cases. He further states that PC incidence and the magnitude of the risk in the Nigerian population may have been grossly underestimated. In major cancer treatment Centres in Nigeria, it is estimated that about one out of ten cases seen will be prostate cancer (Ogunbiyi, 2013). Prostate cancer progresses more rapidly in Nigerian environment. The clinical prostate cancer rate among Nigerians may be as high as that noted in black men (or African-American) in the United States. Ogunbiyi *et.al* (2006), maintain that PC has become the number one cancer among Nigerian men and constitutes 11% of all male cancers.

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Inadequate knowledge is an important factor contributing to excessive delays between men finding a potential sign of PC and seeking medical advice early enough. Most studies conducted on men's knowledge relating to PC (Pillay, 2006; Odusanya *et.al*, 2007; Ajape, *et.al*, 2010), show that Nigerian men have poor knowledge of PC and have negative attitude towards its prevention. In Nigeria due to poor awareness, people generally present late for treatment, thus increasing the likelihood of poor treatment outcomes. According to Ogundipe *et.al* (2010), there is poor knowledge of PC among Nigerian men and this engenders a negative attitude towards prevention as most Nigerian men do not have regular medical check-ups.

Moreover, PC is a chronic debilitating disease which continues to cause extreme distress and anxiety for patients, carers and their families, and poses challenging clinical problems to nurses. The problem associated with PC is not just limited to the men, the family as a whole is affected. The economic implication of being affected with PC is enormous because it diverts the economic resources meant for family upkeep and children's education, to managing PC which is expensive.

For early diagnosis and treatment programmes of any malignancy to be effective, the general public must be aware of the disease and its impact, presentation, and potential treatments (Schulman, Kirby and Fitzpatrick, 2008). Several studies have shown that health education campaigns in developed and developing countries have dramatically increased awareness of breast and cervical cancers in women who are at risk, and have led to increased rates of early diagnosis and treatment (Schulman, Kirby and Fitzpatrick, 2008; Ogundipe *et.al* 2010). Mortality from breast and cervical cancers is now reducing, partly due to awareness and early detection measures.

According to Abdulkareem (2009), current data from most parts of the country shows PC to be the third most common cancer except in Calabar where a very high figure was recorded. Data available from records in tertiary hospital of Cross River State, show significant morbidity and mortality exist among men. Despite the recorded high incidence of morbidity and mortality among men due to PC in the state generally, there exists no comprehensive health information package for PC awareness for men at risk of developing the disease. Nurses working in the health care settings give general health information on a wide range of health promotion and disease prevention activities.

It therefore seems proper to agree with Okobia (2008), that the situation calls for urgent steps such as embarking on health educational programmes. This creation of awareness on early detection measures is essential in order to aid informed decisions on prevention and care. Ottawa Charter for Health promotion (2007) posits that health promotion principles and strategies can be applied to a variety of population groups, risk factors, diseases and various settings such as schools, hospitals,

churches, among others. Although these programmes can be carried out in different settings, the hospital is one of such settings where programmes on PC can be organised with positive results as it plays an important role in promoting health, preventing diseases and providing rehabilitation services. Hence, the need for a nurse-led educational programme on knowledge of prostate cancer among men in selected hospitals in Cross River State, Nigeria

Method and Materials

Study Design

This interventional study utilized a quasi-experimental pre-test, post-test, non-equivalent design. Participants comprised two groups: intervention and control groups. Pre-test (T_1) was administered to both intervention and control groups. The nurse-led educational programme on PC awareness [intervention package (X)] was administered to only the intervention group. All the groups were tested on post intervention test one (T_2) immediately after the educational programme (T_3), while post intervention test two (T_3) and (T_4) was administered three months and six months after the intervention to both groups.

Study Area

The study was carried out in government hospitals in Cross River State. The state has 18 local government areas. The major occupations of the people include farming, fishing, hunting and trading. The state has 11 general/cottage hospitals, one teaching hospital- the University of Calabar Teaching Hospital (UCTH) and Neuro-Psychiatric hospital to provide health care services to the citizens. In addition, there are several missions and private hospitals situated across the various towns in the state.

Study setting

The study was carried out in four selected secondary health care facilities. These are General Hospital Ogoja in the northern senatorial district, General Hospital, Ugep, in the central senatorial district, General Hospital, Akamkpa and General Hospital, Calabar, both in southern senatorial district. This selection was to ensure uniformity and equal status of health facilities selected.

Population of the Study

The population of study consists of men aged 40-70 years, who had no previous personal history of prostate cancer and attend outpatient clinics such as the ENT/Ophthalmic, Dental Clinic and General Out Patient Departments of the selected hospitals. The study population consists of men utilizing the services of the

four selected hospitals across Cross River State. Weekly attendance of men in the above hospitals is not consistent but ranges between 30 and 50 in each setting. The population of men attending various clinics in the research settings for the period of four months is: General Hospital, Ogoja 230, General Hospital, Ugep 200, General Hospital, Akamkpa 235 and General Hospital, Calabar 315 respectively.

Sample and Sampling Technique

The sample size comprised 220 men for each of the intervention and control groups. The sample size was determined using the statistical formula for two proportions sampling as shown below:

$$n = \frac{(Z_{(1-\alpha/2)}\sqrt{2P(1-P)} + z_{(1-\beta)})\sqrt{P_1(1-P_1)P_2(1-P_2)}}{(P_1 - P_2)^2}$$

Where:

n = the minimum sample size required

α = type 1 error

β = type 11 error

P_1 = is the proportion in intervention group

P_2 = is the proportion in the comparison group

if $\alpha = 0.05$, $\beta = 0.1$, $P_2 = 0.43$, $P_1 = 0.55$, $Z_{(1-\alpha/2)} = 1.96$, $z_{(1-\beta)} = 1.28$

Therefore, the minimum sample size required is 200 men per group. This was increased by 10% to 220 per group to cater for attrition.

Sampling Technique

The state was stratified into three senatorial districts of Northern, Central and Southern. The hospitals were stratified based on the three senatorial districts. The health care institutions/facilities in each of the senatorial districts were listed. In the north, there are four General hospitals and simple random sampling technique through balloting was used to select General Hospital Ogoja. In the central, the same procedure was used to select general hospital Ugep. For the south, general hospitals Calabar and Akamkpa was selected for the study.

After selecting the four secondary health care facilities, simple random sampling technique, through balloting was used to select the intervention hospitals (General hospital, Ogoja and Ugep) and the control hospitals (General Hospital, Akamkpa and Calabar).

Participants

A proportionate selection of participants was allocated to each of the selected hospitals. The breakdown of the number of participants selected shows that General Hospital, Ogoja had 118, General Hospital Ugep 102, General Hospital, Akamkpa 94 and General Hospital, Calabar, 126. Purposive sampling technique was adopted

to recruit participants who meet the inclusion criteria in both the intervention and control hospitals on a consecutive recruiting basis as they present to the outpatient departments of the various hospitals until the required sample size was attained utilizing the inclusion and exclusion criteria.

Inclusion Criteria

- Willingness to participate in the study throughout the period
- Be 40-70 years old at the time of study
- Willingness to attend the nurse-led educational programme
- Be fully conscious, in clinically stable condition and could participate in the study
- Must be adult males who can actively communicate
- Not having previous history of prostate cancer

Exclusion Criteria

- Unwillingness to participate
- Have been diagnosed with Prostate cancer
- Be a Medical doctor or a nurse by profession

Data Collection Instrument

The instrument used for data collection was validated structured questionnaire titled Knowledge of Prostate Cancer Screening (KPCS) Scale. The questionnaire was constructed in English language and translated to Efik and Lokuur languages. It consists of sections A that measures the socio-demographic variables of participants and section B elicits questions on knowledge of PC. The questionnaire was administered on both the interventional and control groups.

Validity of the Instrument

The questionnaire was face validated by the project supervisor and content validated by experts in oncology, urology and nutrition. Experts were requested to rate each item and overall instrument using a 4 point scale as follows: very relevant, relevant, relevant with item revision and irrelevant. Items identified as irrelevant were dropped and those suggested for item revision were modified and re-evaluated before inclusion.

Reliability of the instrument

Knowledge of Prostate Cancer Screening Scale: This scale contains 24 items and the content measured includes knowledge of symptoms, risk factors, side-effects from treatment and age guidelines for screening. Responses are scored as "true (Yes)", "false (No)". True is the correct response for sixteen of the questions. The correct answer for the other eight questions is false (No). The questionnaire was pilot tested by employing the use of

test-retest method based on 10% of the calculated sample size at Dr. Lawrence Henshaw Memorial Hospital, Calabar and Holy Family Catholic Hospital, Ikom, both secondary health facilities (not part of the sample). A group of men ranging from 40-70 years were asked to complete the questionnaires. Data from the pilot study was analysed for reliability co-efficient using Cronbach's alpha. The Cronbach's alpha reliability co-efficient for the overall instrument was ascertained to be 0.86, signifying that the questionnaire had a high proportion of internal consistency.

Procedure for data collection

Six Research Assistants (RAs) who are nurses/ health educators at the continuing education unit of the selected hospitals were employed in collecting data. The RAs were trained for a period of two days on how to recruit and administer the research instruments in an ethically accepted manner. During the training, the research assistants role-play the administration of the research instruments to enable them become familiar with the instrument. The questionnaire was interviewed-administered at conference halls of the selected hospitals.

Ethical Considerations

Preceding the study, a formal application was made to obtain permission from the Cross River State Ministry of Health Institutional Review Board and also from the University of Calabar Teaching Hospital Ethical Review committee and approval was given. Also, permission was obtained from the administrative heads of the selected hospitals and various Outpatient Clinics of the selected hospitals before the study was conducted. Importantly, permission was sought from the participants before the commencement of the study.

Method of Data Analysis

Completed data from the questionnaire were checked for completion and for errors. Data entry was done using the SPSS (Statistical Package for the Social Sciences) version IBM 20. Data were double-entered to minimize errors. Descriptive and inferential statistics were employed. Results were presented in tables. Chi square analysis was used for testing relationships between variables. Paired-samples t-test was used to compare the knowledge scores at each point of contact/ visitation in the intervention and control group while Independent-samples t-test was used to test the significant differences.

Results

Table 1: Socio demographic information of participants

Variable	Options	Intervention Freq (%)	Control Freq (%)
Age	Mean	51.4	54.1
	S.D	8.92	8.17
	Minimum	40.00	40.00
	Maximum	70.00	70.00
	40-49 years	107(51.0%)	74(35.2%)
	50-59 years	62(29.5%)	82(39.0%)
Marital status	>=60 years	41(19.5%)	54(25.7%)
	Married	150(71.4%)	154(73.3%)
	Never married	17(8.1%)	12(5.7%)
	Separated	3(1.4)	8(3.8)
	Widower	34(16.2)	30(14.3)
Occupation	Divorced	6(2.9)	6(2.9)
	Civil servant	94(44.8)	98(46.7)
	Self employed	59(28.1)	60(28.6)
	Employed in a paid job	26(12.4)	14(6.7)
	Retiree/ student/ apprentice	31(14.8)	38(18.1)
Ethnic group	Efik	94(44.8)	76(36.1)
	Ekoi	53(25.2)	66(31.4)
	Yakurr	60(28.5)	40(19.0)
	Igbo	15(7.1)	10(4.8)
	Yoruba	6(2.9)	9(4.2)
Educational qualification	Hausa	4(1.9)	9(4.2)
	No formal education	37(17.6)	42(20.0)
	Primary/ adult education	62(29.5)	50(23.8)
	Secondary education	45(21.4)	33(15.7)
Income range	Diploma/ first degree	66(31.4)	85(40.5)
	<=N20,000	83(39.5)	72(34.3)
	N20,001-N50,000	69(32.9)	79(37.6)
	>N50,000	58(27.6)	59(28.1)
Religion	Christianity	205(97.6)	197(93.8)
	Non-Christians	5(2.4)	13(6.2)

Table 1 above summarizes participants' socio demographic variables. About half of the intervention group 107 (51%) and 74 (35.2%) in the control group were between 40-49 years, while 41 (19.5%) intervention group and 54 (25.7%) control participants were between 60-70 years. The mean age of the participants was 51.4 for the intervention group and 54.1 for the control group. The range of the participants was 40-70 years. Majority of the participants in intervention 71.4% versus control 73.3% groups were married. Few 8.1% versus 5.7% for intervention and control groups respectively were never married. Similar proportion of the intervention group

44.8% and control groups 46.7% were civil servant. Intervention group and 28.1% and control group 28.6% were self-employed. In terms of ethnic grouping, 44.8% of the participants in the intervention group were Efik with 36.1% in the control group. In terms of educational qualification, 17.6% intervention group and 20.0% control group had no formal education. In terms of income, 39.5% in the intervention group and 34.3% among control group had a monthly income of N20, 000 - N50, 000. Most intervention group 97.6% and control group 93.8% practice Christianity.

Table 2: Ever heard of prostate cancer

Test	Intervention		Control		χ^2	P-value
	Yes Freq (%)	No Freq (%)	Yes Freq (%)	No Freq (%)		
Pretest	55(26.2)	155(73.8)	48(22.9)	162(77.1)	23.63	0.027
Posttest 1	210(100)	0(0.0)	50(23.8)	160(76.2)	258.462	0.000
Posttest2	210(100.0)	0(0.0)	54(26.1)	153(73.9)	244.346	0.000
Posttest3	210(100.0)	0(0.0)	60(28.5)	150(71.5)	100.406	0.000

At baseline, majority of participants 155 (73.8%) intervention group and 162 (77.1%) control group had not heard about prostate cancer; significant at $P < 0.05$. At post intervention test one, all 210 (100%) intervention group and 50 (23.8%) control group had heard about prostate cancer ($P < 0.05$). Also at post intervention test

two, majority 210 (100%) intervention group and 54 (26.1%) control group agreed they heard about prostate cancer ($P < 0.05$). A similar picture showed at post intervention test three with 210 (100%) intervention and 57 (27.5) control group indicated they heard about prostate cancer respectively.

Table 3: Knowledge of risk factors and symptoms of prostate cancer (pre-test)

Variables	Intervention		Control	
	Yes Freq (%)	No Freq (%)	Yes Freq (%)	No Freq (%)
Family history of prostate cancer is a risk to other male members	46(21.9)	164(78.1)	59(28.1)	151(71.9)
A man can have prostate cancer and have no problems or symptoms	45(21.4)	165(78.6)	59(28.1)	151(71.9)
Younger men are more likely to get prostate cancer than older men.	162(77.1)	48(22.9)	169(80.5)	41(19.5)
I can have prostate cancer and have a normal PSA blood test	128(61.0)	82(39.0)	70(33.3)	140(66.7)
One can have prostate cancer and will not know about it	49(23.3)	161(76.7)	72(34.3)	138(65.7)
The most common cause of cancer in men is prostate cancer	63(30.0)	147(70.0)	113(53.8)	97(46.2)
Prostate cancer affects both males and females	136(64.8)	74(35.2)	147(70.0)	63(30.0)
Prostate cancer may grow slowly in some men.	143(68.1)	67(31.9)	139(66.2)	71(33.8)
Frequent pain often in your lower back could be a sign of prostate cancer	170(81.0)	40(19.0)	5(2.4)	205(97.6)
Blacks have a higher rate of prostate cancer than Whites	67(31.9)	143(68.1)	58(27.6)	152(72.4)
Most 70 year old men do not need a prostate cancer screening.	169(80.5)	41(19.5)	160(76.2)	50(23.8)
Some treatments for prostate cancer can make it harder for men to control their urine.	163(77.6)	47(22.4)	139(66.2)	71(33.8)
Some treatments for prostate cancer can cause problems with a man's ability to have sex.	170(81.0)	40(19.0)	79(37.6)	131(62.4)
Doing Digital Rectal Exam (DRE) or Prostate Specific Antigen (PSA) is enough to test for prostate cancer.	64(30.5)	146(69.5)	72(34.3)	138(65.7)
Doctors can tell which men may die from prostate cancer and which men will not be harmed by prostate cancer.	161(76.7)	49(23.3)	116(55.2)	94(44.8)
An abnormal prostate specific antigen (PSA) blood test means I have prostate cancer for sure.	143(68.1)	67(31.9)	145(69.0)	65(31.0)
A rectal examination is important in checking for prostate cancer.	147(70.0)	63(30.0)	107(51.0)	103(49.0)
The prostate specific antigen is a blood test that can detect prostate cancer.	147(70.0)	63(30.0)	93(44.3)	117(55.7)
Prostate cancer can be cured if detected early.	50(23.8)	160(76.2)	66(31.4)	144(68.6)
Prostate can be prevented by regular exercise.	144(68.6)	66(31.4)	139(66.2)	71(33.8)
It is recommended to have a yearly digital rectal examination beginning at age 40.	47(22.4)	163(77.6)	99(47.1)	111(52.9)
I should have a yearly blood test for prostate cancer starting at age 40.	55(26.2)	155(73.8)	105(50.0)	105(50.0)
Test for prostate cancer is needed only when one has symptoms or problems.	133(63.3)	77(36.7)	167(79.5)	43(20.5)
There is no cure for prostate cancer.	83(39.5)	127(60.5)	37(17.6)	173(82.4)

At baseline, majority 185 (88.1%) intervention group and 190 (90.5%) control group did not derived their sources of information about prostate cancer from television/radio ($P=0.430$). Few 9(4.3%) intervention group and 5 (2.4%) control group have their source of information from handbills ($P=0.227$). No participant from both the intervention and control groups indicated intervention package as source of information. Below average 2 (1%) intervention group and 1 (0.5 %) control group had their sources of information from health professionals ($P=0.640$).

At post intervention test one, majority 180 (85.7%) intervention group and 188 (89.5%) control group indicated that they did not derived their sources of information about prostate cancer from television/radio ($P=0.236$). Majority 210 (100%) intervention group and few 7 (3.3%) control group had their source of information from handbills ($P=0.000$). All participants 210 (100%) intervention and none from control group had their sources of information from intervention package ($P=0.000$). Majority 210 (100%) intervention group and 1 (0.5%) control group derived sources of information from health professional ($P=0.000$).

Result from the table 3 revealed that at the pre-intervention test, few 21.9% of intervention and 28.1% of control groups are on the affirmative that the family history of prostate cancer is a risk factor to other male

members. Similarly, few participants in intervention 23.3% and 34.3% of control group agreed that one can have prostate cancer and will not know about it. Also, majority of the participants in the intervention group 68.1% and control 66.2% indicated that prostate cancer may grow slowly in some men while a few number of the participants in the intervention group 31.9% and similar number in the control group said that Blacks have a higher rate of prostate cancer than Whites.

Result from table 3 showed that majority of participants in intervention group 80.5% and control group 76.2% agreed that most 70 year old men do not need a prostate cancer screening. Similarly, above average of participants in the intervention group 76.7% and 55.2% control group are on the affirmative that doctors can tell which men may die from prostate cancer or will not be harmed by prostate cancer. Only few 23.8% and 31.4% in the intervention and control groups respectively agreed that Prostate cancer can be cured if detected early. Majority of participants 68.6% and 66.2% from the intervention and control groups respectively indicated that prostate cancer can be prevented by regular exercise. A similar picture is seen among participants in intervention group 63.3% and control group 79.5% agreed that test for prostate cancer is needed only when one has symptoms or problems.

Table 4: Knowledge of risk factors and symptoms of prostate cancer (post intervention test one)

Variables	Intervention		Control	
	Yes Freq (%)	No Freq (%)	Yes Freq (%)	No Freq (%)
Family history of prostate cancer is a risk to other male members	179(85.2)	31(14.8)	60 (28.6)	150 (71.4)
A man can have prostate cancer and have no problems or symptoms	172(81.9)	38(18.1)	60 (28.6)	150 (71.4)
Younger men are more likely to get prostate cancer than older men.	67(31.9)	143(68.1)	166 (79.0)	44 (21.0)
I can have prostate cancer and have a normal PSA blood test	114(54.3)	96(45.7)	79(37.6)	131(62.4)
One can have prostate cancer and not know about it	210(100)	0(0.0)	159(75.7)	51(24.3)
The most common cause of cancer in men is prostate cancer	167(79.5)	43(20.5)	140(66.7)	70(33.3)
Prostate cancer affects both males and females	0(0.0)	210(100)	124(59.0)	86(41.0)
Prostate cancer may grow slowly in some men.	176(83.8)	34(16.2)	151(71.9)	59(28.1)
Blacks have a higher rate of prostate cancer than Whites	181 (86.2)	29 (13.8)	78(37.1)	132(62.9)
Frequent pain often in your lower back could be a sign of prostate cancer	182(86.7)	28(13.3)	42(20.0)	168(80.0)
Most 70 year old men do not need a prostate cancer screening.	56(26.7)	154(73.3)	174 (82.9)	36 (17.1)
Some treatments for prostate cancer can make it harder for men to control their urine.	129(61.4)	81(38.6)	155(73.8)	55(26.2)
Some treatments for prostate cancer can cause problems with a man's ability to have sex.	144 (68.6)	66 (31.4)	63 (30.0)	147 (70.0)
Doing Digital Rectal Exam (DRE) or Prostate Specific Antigen (PSA) is enough to test for prostate cancer.	161 (76.7)	49 (23.3)	79 (36.7)	131 (62.4)
Doctors can tell which men may die from prostate cancer and which men will not be harmed by prostate cancer.	96(45.7)	114(54.3)	163 (77.6)	47 (22.4)
An abnormal prostate specific antigen (PSA) blood test means I have prostate cancer for sure.	124(59.0)	86(41.0)	148(70.5)	62(29.5)
A rectal examination is important in checking for prostate cancer.	210(100)	0(0.0)	149(71.0)	61(29.0)
The prostate specific antigen is a blood test that can detect prostate cancer.	182(86.7)	28(13.3)	87 (41.4)	123 (58.6)
Prostate cancer can be cured if detected early.	210(100)	0(0.0)	160(76.2)	50(23.8)
Prostate can be prevented by regular exercise.	180(85.7)	30(14.3)	143(68.1)	67(31.9)
It is recommended to have a yearly digital rectal examination beginning at age 40.	201 (95.7)	9 (4.3)	101 (48.1)	109 (51.9)
I should have a yearly blood test for prostate cancer starting at age 40.	170(81.0)	40(19.0)	68(32.4)	142(67.6)
Test for prostate cancer is needed only when one has symptoms or problems	73(34.8)	137(65.2)	145(69.0)	65(31.0)
There is no cure for prostate cancer.	131(62.4)	79(37.6)	63(30.0)	147(70.0)

At the post intervention test one, there is a significant increase in the number of participants 85.2% in the intervention group versus 27.1% at pre intervention test that indicated that family history of prostate cancer is a risk to other male members while figure for control, 28.6% remained relatively low like in the pre-test. A similar result showed for intervention group 81.9% that indicated a man can have prostate cancer and have no problems or symptoms as against the control group where only few 28.0% are on the affirmative to the statement. Also, all the participants 100% in intervention group disagreed that Prostate cancer affects both males and females while only few 41% are of this opinion in the control group. Majority of participants 86.2% in intervention group versus 37.1% in control group agreed that blacks have a higher rate of prostate cancer than Whites

Result from table 4 showed that only few 26.7% versus majority 82.9% of the participants in the intervention and control groups respectively are of the affirmative that most 70 year old men do not need a prostate cancer screening. Similarly, a significant number of participants 76.7% in intervention group versus 36.7% in control group indicated that doing Digital Rectal Examination (DRE) or Prostate Specific Antigen (PSA) is enough to test for prostate cancer. Also, majority of participants' intervention group 95.7% and few control group 48.1% recommended a yearly digital rectal examination beginning at age 40 and above. Majority 81% of intervention group versus few 32.4% control group agreed to have a yearly blood test for prostate cancer starting at age 40.

Table 5: Knowledge of risk factors and symptoms of prostate cancer (post intervention test two)

Variables	Intervention		Control	
	Yes Freq (%)	No Freq (%)	Yes Freq (%)	No Freq (%)
Family history of prostate cancer is a risk to other male members	185 (88.1)	25(11.9)	67 (31.9)	143 (68.1)
A man can have prostate cancer and have no problems or symptoms	154 (73.3)	56 (26.7)	54 (25.7)	156 (74.3)
Younger men are more likely to get prostate cancer than older men.	61(29.2)	148(70.8)	131 (62.4)	79(37.6)
I can have prostate cancer and have a normal PSA blood test	134(64.1)	75(35.9)	127(54.1)	95(45.9)
One can have prostate cancer and not know about it	181 (86.2)	29 (13.8)	57 (27.1)	153 (72.9)
The most common cause of cancer in men is prostate cancer	34 (16.2)	176 (83.8)	114 (54.3)	96 (45.7)
Prostate cancer affects both males and females	0(0.05)	210 (100)	111(60.5)	83 (39.5)
Frequent pain often in your lower back could be a sign of prostate cancer	186 (88.6)	24(11.4)	183(87.1)	27(12.9)
Prostate cancer may grow slowly in some men.	158(75.6)	51(24.4)	132(63.8)	75(36.2)
Blacks have a higher rate of prostate cancer than Whites	190 (90.5)	20 (9.5)	79 (37.6)	131 (62.4)
Most 70 year old men do not need a prostate cancer screening.	148(70.5)	62(29.5)	125 (59.5)	85(40.5)
Some treatments for prostate cancer can make it harder for men to control their urine.	88 (41.9)	122 (58.1)	58 (27.6)	152 (72.4)
Some treatments for prostate cancer can cause problems with a man's ability to have sex.	171 (81.4)	39 (18.6)	71 (33.8)	139 (66.2)
Doing Digital Rectal Exam (DRE) or Prostate Specific Antigen (PSA) is enough to test for prostate cancer.	135 (64.3)	75 (35.7)	75 (35.7)	135 (64.3)
Doctors can tell which men may die from prostate cancer and which men will not be harmed by prostate cancer.	52(24.8)	158 (75.2)	160 (76.2)	50(23.8)
An abnormal prostate specific antigen (PSA) blood test means I have prostate cancer for sure.	184 (87.6)	26 (12.4)	95 (45.2)	115 (54.8)
A rectal examination is important in checking for prostate cancer.	169 (80.5)	41 (19.5)	68 (32.4)	142 (67.6)
The prostate specific antigen is a blood test that can detect prostate cancer.	183 (87.1)	27 (12.9)	156 (74.3)	54 (25.7)
Prostate cancer can be cured if detected early.	197 (93.8)	13 (6.2)	145 (69.0)	65 (31.0)
Prostate can be prevented by regular exercise.	197 (93.8)	13 (6.2)	145 (69.0)	65(31.0)
It is recommended to have a yearly digital rectal examination beginning at age 40.	135 (64.3)	75 (35.7)	67 (31.9)	143 (68.1)
I should have a yearly blood test for prostate cancer starting at age 40.	176 (83.8)	34 (16.2)	60 (28.6)	150 (71.4)
Test for prostate cancer is needed only when one has symptoms or problems.	87 (41.4)	123 (58.6)	142 (67.6)	68 (32.4)
There is no cure for prostate cancer.	123 (58.6)	87 (41.4)	67 (31.9)	143 (68.1)

At post intervention test two, majority 88.1% intervention group and few 31.9% control group agreed that family history of prostate cancer is a risk factor to other male members. Also, majority 73.3% of intervention group versus few 25.7% of the control group indicated that a man can have prostate cancer and have no problems or symptoms. Similarly, 100% participants in the intervention group versus 60.5% in the control group accepted that prostate cancer affects both sexes. Also, majority 90.5% intervention group versus 37.6 control group agreed that blacks have higher rate of cancer than whites.

Result in table 5 revealed that 64.3 % of the intervention group versus 35.7% of the control group agreed that doing digital rectal examination or prostate

specific antigen test is enough to detect prostate cancer. Majority 80.5% of the participants in intervention group versus 32.4% control group affirmed that a rectal examination is important in checking for prostate cancer.

Also, most of the participants in the intervention group 93.8% as compared to control group 69% indicated that prostate cancer can be cured if detected early. Below average 41.4% and majority 67.7% of the participants in the intervention and control groups respectively agreed that test for prostate cancer is needed only when one experiences symptoms or problems. Importantly, majority 83.8% of intervention group versus few 28.6% of the control group agreed that one should have a yearly blood test for prostate cancer starting at age 40.

Table 6: Knowledge of risk factors and symptoms of prostate cancer (post intervention test three)

	Intervention		Control	
	Yes Freq (%)	No Freq (%)	Yes Freq (%)	No Freq (%)
Family history of prostate cancer is a risk to other male members.	189(90.0)	21(10.0)	53(25.2)	157(74.8)
A man can have prostate cancer and have no problems or symptoms.	141(67.1)	69(32.9)	59(28.1)	151(71.9)
Younger men are more likely to get prostate cancer than older men.	73(34.8)	137(65.2)	136(64.8)	74(35.2)
I can have prostate cancer and have a normal PSA blood test.	167(79.5)	43(20.5)	97(46.2)	113(53.8)
One can have prostate cancer and not know about it.	188(89.5)	22(10.5)	163(77.6)	47(22.4)
The most common cause of cancer in men is prostate cancer.	144(68.6)	66(31.4)	128(61.0)	82(39.0)
Prostate cancer affects both males and females.	0(0.0)	210(100)	124(59.0)	86(41.0)
Frequent pain often in your lower back could be a sign of prostate cancer.	166(79.0)	44(21.0)	162(77.1)	48(22.9)
Prostate cancer may grow slowly in some men.	149(71.0)	61(29.0)	137(65.2)	73(34.8)
Blacks have a higher rate of prostate cancer than Whites.	185(88.1)	25(11.9)	73(34.8)	137(65.2)
Most 70 year old men do not need a prostate cancer screening.	62(29.5)	148(70.5)	146(69.5)	64(30.5)
Some treatments for prostate cancer can make it harder for men to control their urine	83(39.5)	127(60.5)	71(33.8)	139(66.2)
Some treatments for prostate cancer can cause problems with a man's ability to have sex.	169(80.5)	41(19.5)	57(27.1)	153(72.9)
Doing Digital Rectal Exam (DRE) or Prostate Specific Antigen (PSA) is enough to test for prostate cancer.	167(79.5)	43(20.5)	75(35.7)	135(64.3)
Doctors can tell those men that may die from prostate cancer and the men that will not be harmed by prostate cancer.	122(58.1)	88(41.9)	163(77.6)	47(22.4)
An abnormal prostate specific antigen (PSA) blood test means I have prostate cancer for sure.	160(76.2)	50(23.8)	161(76.7)	49(23.3)
A rectal examination is important in checking for prostate cancer.	170(81.0)	40(19.0)	155(73.8)	55(26.2)
The prostate specific antigen is a blood test that can detect prostate cancer.	174(82.9)	36(17.1)	54(25.7)	156(74.3)
Prostate cancer can be cured if detected early.	194(92.4)	16(7.6)	54(25.7)	156(74.3)
Prostate can be prevented by regular exercise.	31(14.8)	179(85.2)	130(61.9)	80(38.1)
It is recommended to have a yearly digital rectal examination beginning at age 40.	187(89.0)	23(11.0)	99(47.1)	111(52.9)
I should have a yearly blood test for prostate cancer starting at age 40.	164(78.1)	46(21.9)	54(25.7)	156(74.3)
Test for prostate cancer is needed only when one has symptoms or problems.	86(41.0)	124(59.0)	67(31.9)	143(68.1)
There is no cure for prostate cancer.	104(49.5)	106(50.5)	51(24.3)	159(75.7)

Result in table 6 revealed that majority of participants 90% intervention group versus few 25.2% control group agreed that family history of prostate cancer is a risk factor to other male members. Also, majority 79.5% intervention group agreed that one can have prostate cancer and will not know about it as compared to 46.2% control group. Similarly, results have been consistent among the intervention group. 100% disagreed that prostate cancer affects both sexes. Interestingly, 71% versus 65.2% of intervention and control groups respectively are on the affirmative that prostate cancer grow slowly in some men while majority 88.1% and few 34.8% of intervention and control groups are of the opinion that blacks have a higher rate of prostate cancer than whites.

Results in table 6 revealed that majority 80.5% intervention group compared to 33.5% control group agreed that doing digital rectal examination or prostate specific antigen is enough test for prostate cancer. Similarly, majority 92.4% intervention group and only 25.6% of control group indicated that prostate cancer can be cured if detected early. Majority 89% intervention group versus 47.1% support the recommendation to have yearly digital rectal examination beginning at age 40.

Discussion

A comparison of the intervention and control groups showed that both groups have similar socio-demographic characteristics. The participants were predominantly adult men. The age range of the participants falls within the age for which cancer of the prostate had been reported among men in Nigeria. Most research works revealed that prostate cancer (PC) has become the number one cancer in adult men aged between 50 years

and above with increasing incidence and morbidity in men of black ancestry (DeLongchamps, *et.al* 2007). They further stated that adult black men are 2.5 times more likely to develop the disease than any other ethnic groups and are two to three times more likely to die of the disease (Achebe *et.al*, 2009). This is in line with a study conducted by Ohaeri *et.al* (2015) who stated that there is need for creation of awareness of prostate cancer for those who are approaching this age range so that they can actively be screened for cancer of the prostate. They further asserted that early screening for prostate cancer may translate to reduced morbidity and mortality among the populace.

Below average of participants in the intervention and control groups are civil servants and self employed respectively. These groups of occupations constitute the link between the high social classes, which are likely to be informed formally or informally about cancer of the prostate. About half of the participants have educational qualification below secondary level. The implications are that, these groups of participants need to rely on organized form of information dissemination to have knowledge about diseases like prostate cancer. Thus, the increase in the incidence of prostate cancer in our environment may be due to lack of awareness about the disease. Results also revealed that about two third of the participants live below the minimum income level of 18,000 naira per month. This finding is not healthy enough for the participants as this meager amount of money is not enough to sustain healthy living of an individual. Most of the participants are retirees where their pension is not paid as at when due.

The findings of the study at the pre intervention phase indicated that knowledge of prostate cancer did almost not exist among the participants. At the baseline level,

only few participants in the intervention group and similar number in the control group agreed to have heard about prostate cancer while majority of participants in both the intervention and control groups had never heard of prostate cancer. The above finding is in support of the results of a study made by Ajape, *et.al* (2010) which shows that majority of the respondents had never had any information on cancer of the prostate. They concluded that there was remarkable lack of awareness of prostate cancer among the Nigerian native urban populace. This finding is not surprising in the study settings since there is no educational programme by healthcare professionals for this group of men who seek medical care in any secondary health care settings in Cross River State. The researcher's observation and interaction with the nurses in the health care settings showed that they give general health information to men on a wide range of health promotion and disease prevention activities during their visits without particular emphasis on awareness creation and screening practices for early detection of PC.

Findings revealed that majority of participants both in the intervention and control groups at pre-intervention test were not aware of the risk factors/symptoms of prostate cancer. This finding is not surprising as majority of Nigerian population Men's health are less discussed or given attention in most spheres of life despite the fact that they are prone to many health problems due to unhealthy behaviour or causes like tobacco use, alcohol consumption, poor diet consumption, over speeding, late or irregular health care seeking or poor utilization of health facility, risk taking, denial of ill health conditions, unemployment, underemployment and stress. They do not take signs and symptoms of malignant diseases serious because they have no knowledge of the negative effect which often leads to late presentation of patients to hospitals when the disease could not be cured.

Finding also revealed that few participants were able to identify the specific symptoms and risk factors associated with prostate cancer. The result obtained from this study corresponds with Nnodimele *et.al* (2010) whose findings revealed that only few of their participants know the specific symptoms of prostate cancer. With these findings from this study, it showed that knowledge about prostate cancer and its risk factors is poor, which is comparable to Nnodimele *et.al* (2010) whose findings revealed below average of their participants that know the risk factors of prostate cancer. This finding also corroborates Woods *et.al* (2004), whose report quoted that below average of their respondents were not certain of the risk factors of prostate cancer. The findings from this study simply imply that knowledge about symptoms of prostate cancer is poor among men in Cross River State, which could be as a result of poor health education system among health care providers in Nigeria in sensitizing the public about prostate cancer (Abdulwahab, *et al*, 2010).

In view of the fact that the nurse-led educational package was implemented among the intervention group, results were significantly greater than scores at baseline or pre intervention phase. Majority of participants in the control group had not heard about prostate cancer at the post intervention phases as compared to intervention group ($P=0.027$). At post intervention test one, all the participants in intervention group and only few participants in control group indicated that they had heard about prostate cancer ($P=0.000$). Also, at post intervention test two, all the participants in intervention group and few control group agreed they had heard about prostate cancer. A similar picture showed at post intervention test three with majority of intervention and few of the control group indicated they ever heard about prostate cancer ($P=0.000$). Thus, the educational/interventional programme improved the participants' awareness and knowledge especially in the intervention group. There was a significant increase and differences in the sources of information of prostate cancer among the intervention group. All the participants in the intervention group mentioned the sources of their information to include intervention package delivered by health professionals and handbills distributed by the researcher, while there was no much change in the control group. This shows that participants in the intervention group received information on prostate cancer and become knowledgeable than those in the control group. This finding agreed with the assertion of Modeste, *et.al* (2006) that a primary reason for the escalating mortality of malignant diseases is lack of health promotion initiative by health care professionals and non use of early detection strategy.

Conclusion and implications for the Nurses

As earlier stated, the incidence of PC is increasing worldwide with the increase occurring in countries that hitherto had low incidence rates such as Nigeria. There is poor knowledge of PC among Nigerian men and this engenders a negative attitude towards prevention as most Nigerian men do not have regular medical checkups and present late for treatment, thus increasing the likelihood of poor treatment outcomes. This disease is a serious health problem in Nigeria and the situation signifies urgent need for prevention. A definite way to prevent or reduce the steady rise in PC incidence and its health damaging effects is through intensive health promotion programme by health care workers especially nurses.

The study has concluded that individuals should be provided the recommended education concerning prostate cancer risk, screening risk and benefits. However, insufficient data exist to determine if this education is being provided, most importantly in a manner that is understood and is culturally sensitive, especially among men of black ancestry. One should never assume that patients already possess knowledge

about their health. Health care professionals, such as nurses, educators and other health care providers, are vital links in supplying information to individuals concerning prostate cancer screening. This education will assist individuals in making informed decisions concerning prostate cancer health promotion and decision making. Better understanding of the negative factors contributing to disparities about prostate cancer and screening was identified. The findings of this study indicated that prostate cancer and screening knowledge alone may not prompt men in Cross River State to participate in screening, therefore, it is expected that nurses who form the bulk of health care workers and provide health care services across all the sectors of health care delivery should use their skills to encourage patient to screen, as this will help in promoting cancer prevention programmes and promoting healthy living.

For early diagnosis and treatment programme of any malignancy to be effective, the general public must be aware of the disease and its impact, presentation and potential treatments. This has been illustrated through health education campaigns in developed and developing countries on awareness of breast and cervical cancers in women at risk, which have dramatically increased their awareness and have led to increased rates of early diagnosis and treatment. Therefore, nurses need to take urgent steps such as embarking on health educational programme to ameliorate the situation. This creation of awareness on early detection measures is essential in order to aid informed decisions on prevention and care. Health educational programme enable people to increase control over and to improve their health. This programme can be carried out in different settings where nurses render health care services, the hospital, home, community etc where programme on PC can be organized with positive results as it plays an important role in promoting health, preventing diseases and providing rehabilitation services.

Recommendations

- First, the findings revealed that there is lack of knowledge about prostate cancer pointing to the need to design an intervention programme through innovative health education strategies by the government to sustain and improve knowledge about prostate cancer.
- The findings also point to the need to do regular screening. In order to achieve this, the study recommends health promotion campaigns that emphasize prostate cancer screenings which should be organized regularly by the government through the Ministry of Health and other NGOs.
- Initiation of aggressive prostate cancer education/teachings in hospitals, schools, churches and traditional gatherings by nurses and other health care providers should be given regularly to men and the general public.
- There should be a policy formulation that every male from age 40 should be involved in health education and health promotion programmes for prostate cancer
- Government and Non Governmental Organizations should fund the training and equipping of nurses about cancer and it's preventive measures.
- The Cross River State Ministry of Health should encourage policy on men's health and should provide screening services for prostate cancer at no cost.

Conflict of interest

The researchers declare there is no conflict of interest in this study.

Acknowledgement

The researchers wish to appreciate the participants, research assistants and management of the selected General hospitals in Cross River State for their co-operation and assistant.

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