Perspectives and practices of cancer screening among workers at a tertiary health facility in Nigeria: indications for adaptation and integration of best practices

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SUMMARY
Objectives: This study identified correlates of good screening performance for three common cancers, while weighing them against the backdrop of existing knowledge, to enable policy makers and healthcare providers focus appropriately to close the gaps that exist in cancer screening in our locale.
Study design: Cross-sectional design
Setting: Tertiary health facility
Participants: Workers at Delta State University Teaching Hospital, Nigeria
Results: Females had significantly better knowledge of cervical cancer, p<0.001; their knowledge of the other two cancers studied did not differ significantly from that of males. Staff members with less than 2 years of service, consistently had significantly better knowledge of all 3 cancers than others, p<0.05. Staff with good knowledge of all 3 cancers also decreased significantly with increasing number of years since graduation, p<0.001. Workers in clinical departments generally had better attitude towards screening for all 3 cancers compared to their counterparts in the non-clinical departments, p<0.001. Tertiary education, being in a clinical department, and Christianity were associated with a better attitude and practice of screening. The practice of screening was generally poor, as 54.9% and 89% of females had never screened for breast cancer and cervical cancer respectively; while almost all (93.5%) males 40 years and over had never screened for prostate cancer.
Conclusion: Overall, knowledge of cancer screening was fair for all cancers; attitude to screening was good towards all cancers. However, significant gaps in compliance with screening were identified for all cancers. Setting up screening facilities and programmes in the work place could help to close these gaps.

Keywords: Cancer, screening, perspectives, practices, health workers

INTRODUCTION
The burden of cancers is on the increase across the world. The last decade chronicled an increase in the incidence of cancers by one-third**;** probably due to longevity, population expansion, other environmental factors, or even better screening practices. Globally, cancer was responsible for the loss of over 200 million disability-adjusted life years in 2005.[1]The future burden is likely to exacerbate due to unwholesome lifestyle choices and exposure to environmental pollutants.[2]

Mortalities from breast and cervical cancer are escalating especially in Africa, advances in medical technology nonetheless. Breast cancer which is primarily associated with risk factors such as being female, advancing age, history in a first-degree relative, oral contraceptive, and obesity, is the leading female malignancy in Nigeria.[3]

Next to breast cancer, cervical cancer is the most frequent cancer among women in Nigeria and about 24.8% of whom are estimated to harbour cervical Human Papilloma Virus (HPV).[4] A quarter of all cancers in developing countries are due to infective causes including HPV,[5] thus, it is a profound hurdle for Nigeria with over 36.6 million women at risk of developing cervical cancer.[6] Prostate cancer is the commonest male cancer, one of the leading causes of cancer-related deaths amongst men of all races, and the fourth commonest cancer in Nigeria.[1,7,8] The lifetime risk of developing prostate cancer is 1 in 6 with a probability of 1 in 33 dying from the disease. More so, the workforce is adversely affected as patients' service years, and even lifespan is shortened.[9]

Cancers diminish one's quality of life; and the psychological and financial burden individuals and families face all interact to depress the economy.[10,11] Nevertheless, early diagnosis of cancer using simple, rapidly and easily applied techniques can detect the disease before it becomes incurable. [12]

To screen for breast cancer, breast self-examination, clinical breast examination and mammogram are employed.[13] Advocated cervical screening techniques comprise Pap smear, liquid-based cytology, HPV-DNA Testing, visual inspection with acetic acid and/or inspection with Lugol's iodine.[14–16] Digital rectal examination is a known prostatic screening modality; however, since the late 1980's when Prostatic Specific Antigen (PSA) assay was introduced into clinical practice, it is no longer commonly used alone. If PSA value is above a certain threshold after repeat, it raises a red flag; nonetheless, its usefulness is limited by other causes such as benign prostatic hyperplasia, prostatitis, trauma, and even recent sexual activity. Thus, a follow-up trans-rectal ultrasound-guided prostate biopsy should be done.[17]

The World Health Organization, as well as other health authorities have described health workers as agents of change.[18,19] This is true of health workers individually and collectively irrespective of work settings. Although the role of change agents is tacitly imbued into the health worker's code of conduct, if it is not accepted, taken up consciously, and imbibed by each health worker individually, the opposite role could be acted out unconsciously.

One great way in which health workers fulfil their roles as change agents is through role modelling, as members of the public tend to look out for living examples of principles they have learnt and idealized.[20] Screening for cancer as and when due is one of the health services expected under the universal health coverage paradigm, and a habit each health worker is expected to role model; especially those working at a tertiary hospital, the zenith of tiered health care provision.

With the global increase in cancer incidence, screening has become a cardinal requirement to prevent cancer.[21] In fact, certain cancer testing paraphernalia should be a constant in a functional health centre; this is reflected in the Essential Diagnostics List (EDL) launched by the World Health Organization in May, 2018.[22] However, in many developing countries a chasm is apparent in the availability and utilization of screening services, owing to multifactorial barriers, and could further amplify disparities in health due to unequal access to quality healthcare.[23–25] Thus, this study assessed the factors associated with perception and practice of cancer screening amongst workers at a tertiary health facility; with emphasis on breast, cervical and prostate cancers which are the commonest cancers in our environment for which screening measures are available. Identifying the correlates of good screening performance, and weighing them against the backdrop of existing knowledge, would allow policy makers and healthcare providers focus appropriately to close the gaps that exist in cancer screening in our locale.

METHODS

This cross-sectional study conducted between September 2014 and September 2015, involved 316 workers selected using gender-proportionate stratified sampling technique from the departments/units of Delta State University Teaching Hospital, where equipment and personnel for cancer screening services are mostly available but screening is not promoted. Participants were distributed across 42 departments (strata) and simple random sampling technique, with the aid of a table of random numbers, was applied to select respondents from each stratum. The total number of staff was 1009; males: 513 and females: 496 - details are as shown in appendix A below:

A structured questionnaire was self-administered by workers to collect data on their perspectives and screening practices towards prevention of breast, cervical and prostate cancers. All staff were eligible regardless of their ages or duration of stay at the institution; only visiting consultants were excluded. Total questionnaires administered were 328 but 12 were either incompletely filled or not returned; giving a response rate of 96.3%.

Statistical Analysis

Data from carefully sorted properly filled questionnaires were entered unto the spread sheet of Statistical Package for the Social Sciences (SPSS) Version 22 for analysis, while the Program for Epidemiologists (PEPI) was applied to compute secondary data from pre-analysed data. Levels of knowledge, attitude and practice and other categorical variables were presented as frequencies with percentages while continuous data was summarized as means (± standard deviation); and tests of association were performed using chi-square and odds ratios. Level of significance was set at $p<0.05$.

Workers' knowledge of cervical and prostate cancer screening was assessed using eight question items with various options as follows: correct age to begin screening (1 point); Risk factors for acquiring the disease (5 points); whether or not specific symptoms of disease should precede screening oneself (3 points and 1 point for cervical and prostate cancer screenings respectively); Knowledge of a screening centre (1 point); Method of screening (1 point).

The total score for correct answers was 11 points. Scores were split into quartiles: 1st quartile (0), 2nd quartile (6), and 3rd quartile (8). Poor knowledge was a score below 6; fair knowledge a score of 6-8; while a score of 9-11 was good knowledge. The knowledge of breast cancer screening was assessed using 13 multiple choice questions. Each correct response was given a score of 1 and the wrong response, a score of 0. Total points scored were 13 and the minimum was 0.

Questions were asked about the age of onset of screening (1 point each for Breast self-exam, Clinical breast exam and Mammography); Risk factors for acquiring the disease (4 points); whether or not symptoms were to be seen before screening oneself (1 point); Knowledge of a screening centre (1 point); Method of screening (1 point). Scores were split into quartiles: 1st (5), 2nd quartile (8), and 3rd quartiles (10). A total score of 0-4 was taken to be poor knowledge, a score of 5-9 was taken to be fair knowledge, and a score of 10 and above was taken to be good knowledge.

Attitude to screening for all cancers was assessed using 6 questions with responses that ranged from agree to disagree. The scoring system used with respect to respondents' responses was as follows: correct response (agree/disagree) - 3 points, indifferent - 2 points, wrong response (agree/disagree) - 1 point. The total score for correct answers was 18. The first quartile was 14, 2nd quartile was 15, and 3rd quartile – 16. Attitude was rated as either poor or good. Good attitude was regarded as a score of 15 or greater, while poor attitude was a score less than 15.

Screening practice for all three cancers was reflected simply as having previously screened or not screened, and the frequency of screening. The following constituted appropriate screening for the respective cancers: Digital rectal examination and PSA for prostate cancer; Breast Self-examination, Clinical Breast examination or mammogram for breast cancer; Pap smear, visualization with Lugol's iodine and/or Acetic acid for cervical cancer.

The study was approved by the health research and ethics review committee of the Delta State University Teaching Hospital with the reference ID: DELSUTH/HREC/2014/045. Informed consent was obtained from participants and utmost confidentiality was maintained throughout the study.

RESULTS

The modal age group of respondents was 30-34 years, and their mean age 33.37 ± 6.7 years. A little over half of all respondents, (51.9%) were female; nearly two-thirds, (63.9%) were married. The majority, (70.9%) were <10 years post-graduation and almost three-quarters, (73.7%) had tertiary education. (Table 1)

Table 1 Socio-demographic profile of respondents

Variable		Frequency
Sex	**Male**	152 (48.1)
	Female	164 (51.9)
Age groups	**< 25**	9 (2.8)
	25 – 29	76 (24.1)
	30 – 34	123 (38.9)
	35 – 39	58 (18.4)
	40 – 44	29 (9.2)
	45 – 49	12 (3.8)
	≥ 50	9 (2.8)
Mean ages	Male=34.82 ± 6.8, Female=32.03 ± 6.3, Combined= 33.37 ± 6.7	
Years at DEL-SUTH	<2	55 (17.4)
	≥2	261 (82.6)
Years since graduation	< 10	224 (70.9)
	10-19	57 (18.0)
	20-29	28 (8.9)
	30-39	6 (1.9)
	>40	1 (0.3)
Level of Education	No formal	4 (1.3)
	Primary	17 (5.4)
	Secondary	62 (19.6)
	Tertiary	233 (73.7)
Marital status Status	Single	108 (34.2)
	Cohabiting	4 (1.3)
	Married	202 (63.9)
	Widowed	2 (0.6)
Religion	Christian	290 (91.8)
	Others	26 (8.2)

Others: Jehovah's Witness, African Traditional Religion, Islam

Staff members, who had been employed for less than 2 years, consistently had significantly better knowledge of all 3 cancers, p<0.05. The proportion of staff with good knowledge of all 3 cancers also decreased significantly with increasing number of years since graduation, p<0.001.

Females had significantly better knowledge of cervical cancer, p<0.001, but knowledge of breast and prostate cancers was not significantly different between males and females, p>0.05. Workers at the clinical departments and those with tertiary education had consistently better knowledge of all 3 cancers, p<0.001.

Good knowledge of cervical cancer was highest among workers at the clinical departments followed by good knowledge of Ca prostate. Workers who were less than 10 years post-graduation had better knowledge of all cancers compared to those who had graduated over 10 years. Generally, knowledge of the 3 cancers decreased with increasing number of years since graduation. (Table 2)

Table 2: Correlates of knowledge of cancer screening among respondents

Variable — Knowledge of cancer screening Frequency (%)

		Breast cancer			Cervical cancer			Prostate cancer		
		Good (27.2)	Fair	Poor	Good (37.3)	Fair	Poor	Good (31.3)	Fair	Poor
Years in DELSUTH	< 2yrs	26 (47.3)	22 (40.0)	7 (12.7)	29 (52.7)	12 (21.8)	14 (25.5)	26 (47.3)	17 (30.9)	12 (21.8)
	≥2yrs	60 (23.0)	150(57.5)	51 (19.5)	89 (34.1)	92 (35.2)	80 (30.7)	73 (38.0)	104 (39.8) (66.7)	84 (32.2)
		X^2: 13.540; p=0.001			X^2: 7.124; p= 0.028			X^2: 7.957; p = 0.019		
Sex	Male	35 (23.0)	83 (54.6)	34 (22.4)	58 (38.2)	33 (21.7)	61 (40.1)	51 (33.6)	49 (32.2)	52 (34.2)
	Female	51 (31.1)	89 (54.3)	24 (14.6)	60 (36.6)	71 (43.3)	33 (20.1)	48 (29.3)	72 (43.9)	44 (26.8)
		X^2: 4.461; p=0.107			X^2: 21.835; p<0.001			X^2: 4.681; p = 0.096		
Job category	Clinical	82 (47.7)	87 (50.6)	3 (1.7)	113(65.7)	54 (31.4)	5 (2.9)	95 (55.2)	71 (41.3)	4 (2.8)
	Non-clinical	4 (2.8)	85 (59.0)	55 (38.2)	5 (3.5)	50 (34.7)	89 (61.8)	5 (3.5)	50 (34.7)	90 (62.5)
		X^2: 137.96; p<0.001			X^2: 207.77; p<0.001			X^2: 189.86; p<0.001		
Education	≤ S/dary	2 (2.4)	42 (50.0)	40 (47.6)	2 (2.4)	23 (27.4)	59 (70.2)	1 (1.2)	19 (22.6)	64 (76.2)
	Tertiary	84 (36.2)	130(56.0)	18 (7.8)	116(50.0)	81 (34.9)	35 (15.1)	98 (42.2)	102(44.0)	32 (13.8)
		X^2: 79.726; p<0.001			X^2: 101.574; p<0.001			X^2: 119.548; p<0.001		
Years post-graduation	< 10	73 (32.6)	125(55.8)	26 (11.6)	101(45.1)	68 (30.4)	55 (24.5)	88 (39.3)	96 (42.9) (78.6)	40 (17.9)
	10 -19	8 (14.0)	32 (56.1)	17 (29.8)	11 (19.3)	22 (38.6)	35 (61.4)	7 (12.3)	21 (36.8)	29 (50.9))
	≥20	5 (14.2)	15 (42.9)	15 (42.9)	6 (17.1)	14 (40.0)	21 (60.0)	4 (11.4)	4 (11.4)	27 (77.1)
		X^2: 30.225; p<0.001			X^2: 51.491; p<0.001			X^2: 60.038; p<0.001		

S/dary = secondary

Staff members of clinical departments and respondents with tertiary education generally had a better attitude towards screening, p<0.001. Females had a better attitude towards screening for cervical cancer, p=0.012. All other tested correlates of knowledge of cancer screening were not significantly associated with attitude

to screening except, number of years since graduation, which was significant only for Cervical cancer and prostate, p<0.001. Most respondents had a good attitude towards breast cancer screening; hence, no significant difference between categories. **(Table 3).**

Screening practices were not significantly different between workers with <2 or ≥2 years of service at DELSUTH, p>0.05. Less than half, (45.1%) of all females had ever screened for breast cancer; while just over a tenth (11%) had ever screened for cervical cancer. Screening for Ca prostate was the least practiced, as only 2 (6.5%) of eligible men had ever screened for it. Females of the clinical departments were over 12 times

as likely to have screened for breast cancer compared to those of the non-clinical departments; OR-12.05; and those with tertiary education were over 10 times as likely as those with lesser education to have screened for breast cancer.

Table 3 Correlates of workers' attitude towards cancer screening

Variable		Attitude to cancer screening Frequency (%)					
		Breast cancer		**Cervical cancer**		**Prostate cancer**	
		Good	**Poor**	**Good**	**Poor**	**Good**	**Poor**
Years in DEL-SUTH	< 2yrs	49 (89.1)	6 (10.9)	39 (70.9)	16 (29.1)	39 (70.9)	16 (29.1)
	≥2yrs	217 (83.1)	44 (16.9)	166 (63.6)	95 (36.4)	174 (66.7)	87 (33.3)
		OR:1.66 (0.65-5.02) p= 0.292		OR:1.39 (0.72-2.82) p= 0.580		OR:1.39 (0.72-2.82) p= 0.563	
Sex	**Male**	124 (81.6)	28 (18.4)	88 (57.9)	117 (71.3)	100 (65.8)	113 (68.9)
	Female	142 (86.6)	22 (13.4)	64 (42.1)	47 (28.7)	52 (34.2)	51 (31.1)
		OR:1.22(0.62-2.47) p=0.223		OR:0.55(0.34-0.90) p=0.012		OR:0.87(0.53-1.43) p = 0.555	
Department category	**Clinical**	160 (93.0)	12 (7.0)	161 (93.6)	11 (6.4)	164 (95.3)	8 (4.7)
	Non-clinical	106 (73.6)	38 (26.4)	44 (30.6)	100 (69.4)	49 (34.0)	95 (66.0)
		OR:4.78(2.31-10.48) p<0.001		OR:33.26(15.85-73.86) p<0.001		OR:39.74(17.51-99.92) p<0.001	
Education	S/dary	54 (64.3))	30 (35.7)	12 (14.3)	72 (85.7)	12 (14.3)	72 (85.7)
	tertiary	212 (91.4)	20 (8.6)	193 (83.2)	39 (16.8)	201 (86.6)	31 (13.4)
		OR:0.17(0.08-0.34) p<0.001		OR:0.03(0.02-0.07) p<0.001		OR:0.03(0.01-0.06) p<0.001	
Religion	**Christian**	245 (84.5)	45 (15.5)	192 (66.2)	98 (33.8)	201 (69.3)	89 (30.7)
	Others	21 (83.3))	5 (16.7)	13 (50.0)	13 (50.0)	12 (45.8)	14 (54.2)
		OR:1.30(0.36-3.78) p= 0.580*		OR:1.96(0.8-4.77) p= 0.132*		OR:2.63(1.08-6.49) p= 0.027*	
Years post-graduation	< 10	194 (86.6)	30 (13.4)	169(75.5)	55 (24.5)	176 (78.6)	48 (21.4)
	10 -19	42 (73.7)	15 (26.3)	22 (38.6)	35 (61.4)	28 (49.1)	29 (50.9)
	≥20	30 (85.7)	5 (14.3)	14 (40.0)	21 (60.0)	9 (25.7)	26 (74.3)
		p=0.203		p<0.001		p=<0.001	

* **Fischer's exact**

All those who had screened for both cervical cancer and prostate were of the clinical departments and had tertiary education. There was no significant difference between single and married women in terms of likelihood to have screened for both breast and cervical cancers. (Table 4)

All those who had ever screened, for breast cancer had BSE, and 28.4% also had CBE in addition; less than half, (48.6%) of all those who had done CBE started before 25 years of age. Only one person had ever had a mammogram. Pap smear was the only cervical screening test done, and among those who had screened, the largest proportion started at 25-29years of age. Except for BSE which most (94.5%) had repeated, only 4 (17.6%) of the women who had ever done a CBE had repeated it and 3 (16.7%) of the women who had ever done a pap smear did a repeat test. Both men, who had ever had a PSA test, did a repeat test (Table 5).

Table 4: Predictors of screening practices among workers

Variable		Cancer screening Frequency (%)					
		Breast cancer(n=164)		**Cervical cancer(n=164)**		**Prostate cancer(n=31)**	
		Ever screened	Never screened	Ever screened	Never screened	Ever screened	Never screened
Years in DEL-SUTH	< 2yrs	14 (48.3)	15 (51.7)	5 (17.2)	24 (82.8)	0 (0.0)	2 (100.0)
	≥2yrs	60 (44.4)	75 (55.6)	13 (9.6)	122 (90.4)	2 (6.9)	27 (93.1)
		OR: 1.17 (0.48-2.82)		**OR: 1.96 (0.50-6.58)**		**p= 1.000***	
Sex	**Male**	NA	NA	NA	NA	2 (6.5)	29 (93.5)
	Female	74 (45.1)	90 (54.9)	18 (11.0)	146 (89.0)	NA	NA
		NA		**NA**		**NA**	
Job category	**Clinical**	63 (70.8)	29 (29.2)	18 (19.6)	74 (80.4)	2 (15.4)	11 (84.6)

	Non-clinical	11 (15.3)	61 (84.7)	0 (0.0)	72 (100.0)	0 (0.0)	18 (100.0)
		OR: 12.05 (5.53--26.23)		p<0.0001		p= 0.1677*	
Education	Tertiary	69 (57.5)	51 (42.5)	18 (15.0)	102 (85.0)	2 (10.5)	17 (89.5)
	S/dary	5 (11.4)	39 (88.6)	0 (0.0)	44 (100.0)	0 (0.0)	12 (100.0)
		OR: 10.55 (3.89--28.65)		p=0.0085		p= 0.5097*	
Marital status	Single	21 (45.6)	25 (54.4)	3 (6.5)	43 (93.5)	0 (0.0)	0 (0.0)
	Married	53 (44.9)	65 (55.1)	15 (12.7)	103 (87.3)	2 (6.5)	29 (93.5)
		OR: 1.03 (0.52--2.04)		OR: 0.48 (0.13--1.74)		NA	
Years post-graduation	<10	58 (47.9)	63 (52.1)	13 (75.5)	109 (24.5)	0 (0.0)	6 (100.0)
	10 -19	12 (42.8)	16 (57.2)	4 (38.6)	28 (61.4)	0 (0.0)	9 (100.0)
	≥ 20	4 (26.7)	11 (73.4)	1 (7.1)	13 (92.9)	2 (9.5)	14 (90.5)
		p=0.203		p<0.001		p= 0.250^{LR}	

¥-only 31 males were 40 years or above,*Yates corrected, NA – Not applicable, *unreliable test; LR: Likelihood Ratio chi-square

Table 5 Age at onset of screening and procedures performed by respondents

Variable		**Screening procedures Frequency (%)**				
	Category	BSE (n = 74)	CBE (n= 21)	Mammography (n= 1)	Pap smear (n= 18)	PSA (n=2)
Age at onset of screening	≤24	36 (48.6)	3 (14.3)	0 (100.0)	3 (16.7)	N/A
	25-29	28 (37.9)	9 (42.9)	0 (0.0)	8 (44.4)	N/A
	30- 34	8 (10.8)	5 (23.8)	0 (0.0)	4 (/.22.2)	N/A
	>35	2 (2.7)	4 (19.0)	1 (100.0)	3 (16.7)	2 (100.0)
Repeat screening	Yes	68 (94.5)	4 (17.6)	0 (0.00)	3 (16.7)	2 (0.0)
	No	6 (5.6)	17 (82.4)	1 (100.0)	15 (83.3)	0 (0.0)

PSA=Prostate Specific Antigen; N/A: not applicable

The odds of having a good knowledge of screening for all 3 cancers was much higher among clinical staff compared to non-clinical staff: OR=21.94, 27.44, and 80.02 for knowledge of breast, prostate, and cervical screening respectively. It was also better among those who had spent more years at DELSUTH. There was a generally good attitude towards screening for all cancers.

Having tertiary level education was the best predictor of a good attitude to screening; Odds ratios comparing persons with and without tertiary education were 10.11 for cervical screening, 8.77 for prostate screening, and 3.24 for breast cancer screening.

Being of a clinical discipline was the next best predictor of having a good attitude – Odds ratios were, 2.27, 6.18 and 6.82 for breast, prostate and cervical screening respectively. Females had better attitudes towards screening for breast and cervical cancers; OR – 1.93 and 3.04 respectively; however, attitude towards breast cancer screening was better among those who had worked fewer years.

The odds of having had a Breast Self-Examination among women of clinical disciplines was about 8 times that of their non-clinical counterparts; OR=7.97. (Table 6)

Table 6 Logistic regression: Predictors of perception and practice of cancer screening

Variables	Predictors	p-value	OR	95% C.I. for OR	
				Lower	Upper
Good knowledge of Breast Cancer screening	Clinical department	<0.001	21.94	6.31	76.33
	Years at DELSUTH	0.008	1.47	1.11	1.94
Good knowledge of cervical cancer screening	Clinical department	<0.001	80.02	8.56	747.86
Good knowledge of Prostate Cancer screening	Clinical department	<0.001	27.44	5.50	137.04
Good attitude towards breast cancer screening	Clinical department	0.013	2.27	1.19	4.33

Variables	Predictors	p-value	OR	95% C.I. for OR	
				Lower	Upper
	Tertiary education	0.001	3.24	1.61	6.51
	Sex: Female	0.013	1.93	1.15	3.22
	Years at DELSUTH	0.019	0.73	0.57	0.95
Good attitude towards cervical cancer screening	Clinical department	<0.001	6.82	3.49	13.31
	Tertiary education	<0.001	10.11	3.67	27.82
	Sex: Female	<0.001	3.04	1.66	5.56
Good attitude towards prostate cancer screening	Clinical department	<0.001	6.18	3.26	11.73
	Level of education	<0.001	8.77	3.32	23.20

Note: Only significant predictors of knowledge, attitude or practice were included in this table

Among those who had ever screened, adverts and having a medical fitness evaluation were the most important reasons why they screened; 51.4% and 22.9% respectively. For eligible persons who had never screened, having no symptoms, feeling immune to cancer, not knowing a screening centre, and not having thought of it, were the most prevalent reasons for not screening. (Table 7)

Table 7 Reasons given for screening or not screening

Variable	Reasons for Screening/not screening Frequency (%)		
Reasons for screening	**Breast cancer n=74**	**Cervical cancer n=18**	**Prostate cancer n=2**
Family history	6 (8.1)	0 (0.0)	0 (0.0)
Had symptoms	4 (5.4)	1 (5.6)	1 (50.0)
Death of friend from cancer	3 (4.1)	4 (22.2)	0 (0.0)
Saw/heard from an advert	38 (51.4)	5 (27.8)	0 (0.0)
Medical fitness evaluation	17 (22.9)	6 (33.3)	0 (0.0)
Fear of having it	6 (8.1)	2 (11.1)	1 (50.0)
Reasons for not screening	**n= 90**	**n= 146**	**n = 150**
Anxiety about the outcome	7 (7.8)	15 (10.2)	12 (8.0)
No known screening centre	13 (14.5)	2 (1.6)	0 (0.0)
Feel immune to it	22 (24.4)	17 (11.6)	10 (6.7)
Has no symptoms	27 (30.0)	41 (28.1)	7 (4.6)
Not thought of it	12 (13.3)	14 (9.6)	0 (0.0)
Unaware of screening	3 (3.3)	26 (17.8)	0 (0.0)
Age below eligible bracket	0 (0.0)	0 (0.0)	121 (80.7)
Lack of finance	6 (6.7)	16 (11.0)	0 (0.0)

DISCUSSION

Women in this study with a mean age of 32.03 ± 6.3 years were well within the recommended ages for screening for cervical and breast cancers. The majority were married, and the others may be in relationships that are sexual in nature, and thus, in danger of being exposed to Human Papillomavirus (HPV) which causes cervical cancer. However, their mean age is slightly less than that recommended for mammography screening. This may be one of the reasons responsible for their low level of practice of mammography screening generally.

Breast cancer screening is the most publicized by mass media in Nigeria[26]; responding to these adverts should aid building the habit of seeking professional medical help for cancer screening – both breast and other cancers.

Unlike in this study, a similar study of female health workers at a public hospital in Ethiopia, showed them having a very high knowledge of, and practice of breast cancer screening[27]; maybe this difference was because that study was conducted at hospital with an established

screening program known to its staff. In other similar studies conducted in Nigeria, health workers' levels of knowledge were much higher than in this one, and most respondents knew a screening centre.[28,29] Again, these facilities had well established cancer screening programs compared to index study where no formal cancer screening program existed.

Amongst the men in this study, only about a fifth (20.4%) were eligible to be screened for prostate cancer but since only 2 (1.3%) of men had ever screened, there may be deeper-seated reasons than a need for enlightenment; bearing in mind their knowledge and attitudes were much better. Both men who had screened for cancer of the prostate, also had repeat screens, strongly suggesting they were referred for PSA levels, in the first place, by an attending physician and asked for repeat tests. Poor performance of free PSA in predicting the incidence of prostate cancer is well documented in the literature from several studies[17,30,31]; it may be known to men on this study and their reason for not screening for prostate cancer.

Attitudes were good in this study like in others, and that's not surprising as it is only natural for one to wish oneself good health. Working in a clinical department and having tertiary education influenced attitude to all cancers. And as would be expected, being female affected attitude to screening for breast and cervical cancers. [23,27]

Interestingly, within this study population there was quite some heterogeneity in terms of level of knowledge and practice of screening. The apparent predictors of these were level of education, working at a clinical department, sex of respondent, length of years since graduation and even duration of work in the hospital. However, further analysis using logistic regression modelling, revealed fewer true predictors than it seemed initially. Working at a clinically inclined department proves to be the most consistent predictor of good knowledge, attitude or practice of cancer screening in general.

Level of education, was the next strongest predictor, and this is understandable as having a tertiary education, heightens one's ability to access and imbibe information (knowledge) leading to a good attitude towards cancer screening and health-seeking generally; but taking the decision to screen is a much more intricate decision and requires motivation. While adverts and medical fitness evaluation were the most often cited reasons for screening, respondents apparently needed proximity to patients and continuing medical stimulation available only at the clinical departments, to be motivated enough to screen as fitness screenings or adverts were not reserved for persons in clinical departments. This finding uncovers a definite need for deliberate public enlightenment on the

indispensability of cancer screening, as the major reasons for not screening included having no symptoms, not having thought of screening, feeling immune to cancer, and not knowing about screening or a screening centre. All these reasons would likely yield to the motivation of having a known screening centre nearby and the knowledge to take the right decisions concerning when, and for what cancer to screen. Waiting to have discomforting symptoms before seeking medical care may be true for many other illnesses but not for cancers. There is a clear need to change this misinformation with clear, concise and reinforced knowledge.

Another very interesting finding in this study is that knowledge of the cancers decreased with increasing years since graduation and employment. These suggest that it is mostly knowledge gained from initial medical education that staff of the institution had to act on; with the exception of those who got some extra exposure stimulation at clinical departments.

All these findings allude to a need for establishment of cancer enlightenment and screening programs at the institution of this research and similar institutions which can host this service. Cancer screening services are known to educate, provide advice and screen clients.

Once such a program is made available, the awareness and enlightenment that would follow will generally improve all the indicators of interest if implementation is properly done and the tempo rightly sustained. Sadly, only about a quarter of health facilities in low and middle income countries have laboratory services required for cancer screening.[32]

While at the centre of this study, there is paucity both of knowledge and practice of cancer screening, health personnel at another centre in Nigeria were expected many years ago, not only to have a good knowledge of cancer screening but also to be able to estimate cancer risk both in themselves and in a client.[33] This comparison suggests that there is poor collaboration for integration and adaptation of best practices between health institutions in Nigeria.

Apparently, specialists acquire new knowledge and skills, and improve the practice at their very own institutions. There is a glaring need to accelerate adoption and reproduction of this much needed service; the evidence seems to suggest a need for more inter-institutional cooperation and cohesion. Greater political will should go a long way to enhance cooperation across health institutions and fast-track appropriation these required integrations.

CONCLUSION

Overall, knowledge of and attitude to cancer screening was respectively, fair and good towards all cancers; however, significant gaps in compliance with screening were identified for all cancers. Level of education and working at a clinical department were the most significant predictors of cancer screening performance. Setting up screening facilities in the work environment and adapting best practices from other institutions may help close these gaps.

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Appendix A: Worker distribution at Delta State University Teaching Hospital, Oghara

Department/Office	Female		Male		Department/Office	Female		Male	
	a	b	a	b		a	b	a	b
Chief Medical Director Office	2	1	4	1	Ophthamology	3	1	2	1
CMAC Office	1	1	2	1	Orthopaedic	9	3	7	2
DCMAC Office	1	1	1	1	Physiotherapy	5	2	3	1
Central Admin Office	8	3	7	2	Nursing Services	129	39	51	16
Board Chairman Office	1	1	nil	--	Pharmacy	17	5	14	5
Accounts	8	3	21	7	Medical Records	13	4	4	1
Pathology	24	8	44	14	Library	5	2	3	1
Radiology	6	2	14	5	Social Welfare	5	2	1	1
Surgery	15	5	23	7	ICT	2	1	5	2
Obstetrics & Gynaecology	4	1	26	8	Legal	Nil	--	3	1
Paediatrics	17	5	14	5	Public Relations	5	2	4	1
Internal Medicine	15	5	22	7	Engineering/ Maintenance	3	1	48	15
Family Medicine	4	1	7	2	Procurement & Stores	5	2	9	3
Community Health	12	4	7	2	Catering services	28	9	4	1
Accident & Emergency	12	4	9	3	Dietetics	Nil	--	1	1
Anaesthesia/ ICU	10	3	19	6	Audit	1	1	5	2
Mental Health/ Psychiatry	1	1	5	2	School Of Nursing	5	2	3	1
Oral/Maxillofacial Surgery	4	1	4	1	Laundry	22	7	7	2
Security Services	3	1	34	11	Gardener	20	6	36	11
CSSD Unit	7	2	2	1	Drivers' Unit	Nil	--	20	6
Cleaners in other Sections	64	20	17	5	Guest House	Nil	--	1	1

a: Number available; b : number selected