

ORIGINAL RESEARCH ARTICLE

Awareness, use and main source of information on preventive health examinations: a survey of childbearing women in Uyo, Nigeria

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Abstract

The study determined awareness, use and the main source of information about preventive health examinations among 387 childbearing women attending three health facilities in Uyo, Nigeria. Respondents were consenting women aged 15-49 years who had a live birth in the two months preceding the survey. Respondents were interviewed using structured questionnaires during child welfare clinic visits at each facility. Awareness about pap smears and breast self examination was 14.2% and 35.3% respectively. Testing rates were highest for blood pressure checks, HIV and blood sugar and lowest for Pap smears and mammograms. Health workers were the main informants on preventive tests. Awareness and secondary education enhanced women's uptake of screening services across levels of health care. Secondary education as a minimum and intensified awareness creation about preventive health examinations through media, school based programs, durbars and public health campaigns are vital to the health and well being of women and children. (*Afr J Reprod Health* 2012; 16[4]: 149-161).

Résumé

L'étude a déterminé la sensibilisation, l'utilisation et la principale source d'informations sur les examens médicaux préventifs chez 387 femmes en âge de procréer qui fréquentent trois établissements de santé à Uyo, Nigéria. Les interviewées étaient des femmes consentantes, âgées de 15-49 ans qui ont eu une naissance vivante au cours des deux mois précédant l'enquête. Les interviewées ont été interrogées à l'aide de questionnaires structurés lors des visites aux cliniques adaptées au bien-être de l'enfant dans chaque établissement. La sensibilisation sur les frottis vaginaux et l'autopalpation du sein était de 14,2% et 35,3% respectivement. Les taux de dépistage étaient plus élevés pour les contrôles de la tension artérielle, le VIH et le sucre sanguin plus faible concernant le test de Papanicolaou et la mammographie. Le personnel sanitaire ont été les principaux informateurs sur les essais de prévention. La sensibilisation et l'éducation secondaire ont amélioré l'adoption des services de dépistage à tous les niveaux des soins sanitaires. L'enseignement secondaire comme un niveau minimum ainsi que la création de la sensibilisation intensifiée par rapport à des examens médicaux préventifs à travers les médias, les programmes scolaires, les durbars et les campagnes de santé publique, sont essentiels à la santé et au bien-être des femmes et des enfants (*Afr J Reprod Health* 2012; 16[4]: 149-161).

Keywords: Screening, prevention, women, Uyo, pap smear

Introduction

It has been widely acknowledged that women generally live longer than men^{1, 2}. An excess of socially related health risks such as smoking, alcohol drinking and drug abuse; respiratory related newborn conditions such as respiratory distress syndrome and asphyxia; occupational risks in males such as drowning, falls, and in some cases, interpersonal violence contribute to premature mortality in males³. Women therefore represent an increasing proportion of older people.

Older people are disproportionately affected by chronic disorders such as hypertension, cancer, diabetes mellitus and cardiovascular diseases resulting diminished quality of life and mortality⁴. Since these diseases have some common modifiable risk factors, their identification and early disease detection through screening can help protect and promote health in later years⁴. During these years, women are also exposed to a disproportionate burden of health risks such as HIV/AIDS, sexually transmitted infections, and pregnancy related complications. HIV is a leading

cause of disease and death in women of reproductive age worldwide¹. Economic vulnerability, biologic factors, gender based violence, and inappropriate cultural practices contribute to the disease burden in women. The early detection of risk factors and diseases through the use of screening tests is referred to as preventive health examinations in this paper. The child bearing years offer women the opportunity to access preventive health services where screening tests can be offered. However, without awareness and information about screening services, women may be poorly motivated to utilize them. Therefore, a cross sectional study was designed to determine the awareness, use and main source of information on specific preventive health examinations among childbearing women in Uyo, Akwa Ibom State, Nigeria.

Rationale for the study

The need for preventive health examinations among women can be illustrated using hypertension as an example. Hypertension has been defined in most studies using World Health Organization (WHO) criteria as blood pressure $\geq 160/95$ mmHg or the Seventh Report of Joint National Committee on Prevention, Evaluation and Treatment of High Blood Pressure (JNC 7) criteria as blood pressure $\geq 160/90$ mmHg⁵. Hypertension is a major risk factor for cardiovascular disease^{5, 6}. Cardiovascular disease and stroke cause the greatest morbidity and mortality in women aged over 60 years globally¹. Studies indicate that mortality due to cardiovascular disease is expected to increase by 120% for women by 2020⁵. Hypertension prevalence rates in Nigeria range from 15.2% in Northern Nigeria to 46.4% in Southern Nigeria^{5, 7, 8}. Studies reporting rates of hypertension among women in Nigeria have found 12% in the Niger Delta region⁹, 24.0% in the North west¹⁰, 42.3% in the rural East¹¹, 44.8% in the rural South East⁸ and 49.3% in the West¹². By blood pressure measurement, hypertension can be effectively detected and treatment offered in order to reduce cardiovascular events¹³. Effective treatment can reduce mortality attributed to cardiovascular disease (CVD) by 20%¹⁴. The risk of

cardiovascular events and the potential benefit of screening rely on the level and duration of blood pressure elevation, as well as the presence of other cardiovascular risk factors such as age, gender, lipid disorders, smoking and diabetes. This justifies the need to screen early, perhaps more so when these risk factors are present^{13, 15}.

Hypertension has other implications for women and the developing fetus during pregnancy. Hypertension is the most frequently encountered disorder affecting 10-12% of all pregnancies¹⁶. It is usually the first sign of pre-eclampsia, a hypertensive disorder of pregnancy, which accounts for one sixth of maternal deaths and places women at an increased risk of developing cardiovascular disease later in life^{6, 17}. It also affects the fetus either directly through placental insufficiency causing poor fetal growth or indirectly through iatrogenic preterm delivery. It also accounts for a quarter of all very low birth weight infants weighing <1,500 grammes, who need advanced care for breathing and feeding¹⁶. These babies account for the majority of newborn deaths¹⁷.

Problem statement

Evidence exists that awareness and uptake of some preventive health examinations remains low in Nigeria. Cervical cancer screening is a case in point. In a survey of market women, Ogunbode and Ayinde found that 19.7% were aware of the Papanicolaou (Pap) smear as a screening test and 5.2% had a Pap smear previously¹⁸. In this study, the major media of awareness were electronic media, 46.6%, and public lectures, 27.8%. Wright et al carried out an intervention study which involved community based health information on cervical cancer prevention for the intervention group and on hypertension for the control group¹⁹. They found that less than 15% of market women sampled had correct information on Pap smears as a screening tool for cervical cancer and only 3% had undergone a Pap smear test at baseline¹⁹. Although awareness improved, there was no significant change in uptake of cervical screening post intervention in both groups¹⁹. In another study conducted among female medical practitioners who were aware of the Pap smear

test, only 18% had actually accessed it²⁰. These cervical screening rates contrast sharply with 66% found among rural women in USA, which fell below the recommended screening rate (*Healthy People 2010*) of 78%²¹. The disparities in screening rates between developed and developing countries may be attributed to greater awareness, physician recommendation and organized screening programs in the former. While it is acknowledged that awareness alone may not be sufficient to achieve optimal uptake of screening services, it does play a key role. For instance in a study conducted in rural Tanzania where the cervical screening rate was 22.6%, factors that were significantly associated with uptake were knowledge of cervical cancer and its prevention (nine-fold likelihood) and the distance to the facility (four-fold likelihood)²². Faced with the epidemiological transition from communicable to non-communicable diseases which characterizes most African countries today and greater longevity in women, there is an urgent need to revisit the uptake of preventive health examinations.

Materials and Methods

Background of study area

Nigeria, one of the countries on the West coast of sub-Saharan Africa, comprises 36 states and a Federal Capital Territory. These are subdivided for administrative purposes into six geopolitical zones. Akwa Ibom State is located in the south-south geopolitical zone of Nigeria. The state comprises of 31 local government areas (LGAs) including Uyo, as its capital. It has a projected 2011 population of 4,633,528 and an annual growth rate of 3.4 per annum²³. Women in child bearing age contribute 22% of the population²⁴.

Study sites and subjects

Three public health facilities were selected to reflect a mix of the primary, secondary and tertiary health care in Uyo Metropolis based on high patronage for maternal and child health services. Child welfare clinics at University of Uyo Teaching Hospital (UUTH), the only tertiary level health care facility in the state; St. Luke's Hospital, Anua (SLHA), which is a secondary

level public-private health care facility; and Maternal and Child Health Unit, Barracks Road (MCH), a primary level health facility comprised the study sites. In each facility, study subjects were recruited consecutively during visits to the child welfare clinics from May to mid-July, 2011 to obtain the required sample size. Eligible study subjects were women aged 15-49 years who had a live birth in the two months preceding the survey and gave informed consent to participate in the study.

Study design and sample size

The cross sectional design was used because outcome variables and correlates were determined simultaneously. Eligible women attending the child welfare clinics were interviewed to determine three key outcomes: awareness, screening practices, and main sources of information on preventive health examinations. Interviews were conducted on-site by six trained interviewers using a pre-tested, structured questionnaire. The required sample size was determined to be 358 respondents using the expression for a cross sectional study: $n = Z^2 (100-p) p/d^2$ where n is the minimum sample size, Z is the standard normal deviate set at 1.96 for a confidence level of 95%, p is the proportion with the attribute and d , a tolerable error margin of 5%²⁵. Several specifications of p were made based on the objectives of a larger study on pregnancy and childbirth experiences among childbearing women in Uyo, of which the present study is a part. The largest sample size which satisfied all objectives was used. The minimum number recruited from each clinic was determined by proportional allocation described in another paper (Udofia et al, unpublished). A total of 387 women were recruited comprising: 104 from MCH, 74 from SLHA and 209 from UUTH. This represented all eligible volunteers during the period of survey. Ten women declined consent at MCH giving a non-response rate of 8.8%; 5 women cited concerns about whether survey outcomes would be immediately helpful and the rest did not provide any reason. Ethical approval for the survey was given by the Akwa Ibom State Ministry of Health Ethical and Protocol Committee.

Data collection and analysis

The study instrument was a structured questionnaire divided into sections including background characteristics, reproductive health information, awareness and use of specific screening tests, as well as sources of information about the tests. The tests considered were Papanicolaou smear (Pap smear), breast self examination (BSE), clinical breast examination (CBE), mammogram, blood pressure check, blood sugar test, HIV test, hepatitis B screen and lipid screen. Women were interviewed during waiting periods at the clinics after obtaining individual informed verbal consent. Data entry, validation and analysis were done using the software Statistical Package for Social Sciences (SPSS) version 17. Frequency distributions and percentages were generated for the outcome variables. The chi-square test was applied to evaluate associations of categorical variables and variables attaining statistical significance at p -values <0.05 were subjected to binary logistic regression. Odd ratios (OR) were calculated with 95% confidence intervals (95% CI).

Results

Socio-demographic characteristics

All 387 women interviewed were Christians, most of whom were married (93.8%) with four children or less (95.6%). The mean age of the respondents was 29.3 years, with a standard deviation of 5.5 years. Respondents were mainly traders (34.1%) and civil servants (20.2%). The majority of the women were educated (98.2%) with 154 (39.8%) and 138 (35.7%) respondents achieving secondary and tertiary education respectively. The modal age group at first pregnancy was 25-29 years, with fifty eight women (15.8%) having their first child by the age of 20 years (Table 1).

Preventive health examinations

Table 2 shows periodic preventive health examinations received by the respondents. Reported screening rates were highest for blood pressure check, HIV test and blood sugar check as by 310 (84.5%), 281 (76.6%) and 273 (74.4%)

Table 1: Socio-demographic characteristics of women attending child welfare clinics at three public health facilities in Uyo, Nigeria

Characteristics	Number (%)
Age (years)	
15-19	12(3.1)
20-24	60(15.5)
25-29	143(37.0)
30-34	112(28.9)
35-39	50(12.9)
40-44	7(1.8)
45-49	3(0.8)
Marital status	
Single	16(4.1)
Married	363(93.8)
Cohabiting	8(2.1)
Educational status	
No formal education	7(1.8)
Primary	8(2.1)
JSS	32(8.3)
SSS	122(31.5)
Vocational/OND/NCE	80(20.7)
Tertiary/HND	138(35.7)
Occupation	
Artisan	27(7.0)
Trader	132(34.1)
Services	18(4.7)
Civil servant	78(20.2)
Professional	36(9.3)
Homemakers/unemployed	45(11.6)
Others	51(13.2)
Religion	
Christianity	387(100.0)
Ethnicity	
Ibibio	270(69.8)
Annang	52(13.4)
Oron	16(4.1)
Others	49(12.7)
No. of children	
0-2	251(64.9)
3-4	115(29.7)
5-7	20(5.2)
>10	1(0.3)
Age at first pregnancy(years)	
<15	2(0.5)
15-19	56(15.3)
20-24	97(26.4)
25-29	160(43.6)
30-34	46(12.5)
35-39	3(0.8)
Not disclosed	3(0.8)

*Numbers may not add up because of non-responses to some variables; some % may not add up to 100 due to rounding off decimal points.

Abbreviations: JSS – Junior Secondary School; SSS – Senior Secondary School; OND – Ordinary National Diploma; HND – Higher National Diploma; NCE – National Certificate of Education.

Table 2: Preventive health examinations received by women of childbearing age attending child welfare clinics at three public health facilities in Uyo, Nigeria

Screening test	Number* (%)
Papanicolaou smear	34(9.3)
Self breast examination	164(44.8)
Clinical breast examination	73(19.9)
Mammogram	11(3.0)
Blood pressure check	310(84.5)
Blood sugar check	273(74.4)
HIV test	281(76.6)
Hepatitis B	177(48.2)
Lipid screen	109(29.7)

*Yes responses only; N =367 for all tests except self breast examination and clinical breast examination where N = 366

respondents respectively. The lowest screening rates were reported for Pap smears and mammograms by 34 (9.3%) and 11 (3.0%) respondents respectively. Various screening test combinations are shown in Table 3. Two hundred and fifty eight (66.7%) respondents had combined blood sugar and blood pressure checks; 146 (37.7%) respondents had combined HIV and Hepatitis B screening; and 136 (35.1%) respondents had combined blood sugar, blood pressure, HIV and Hepatitis B screening. Only 4 women were screened for all tests (1%). Twenty five women reported they had not received any screening test (6.5%).

Table 4 shows the top three sources of information on each preventive health examination. Health workers were the primary informant for all tests (Pap smear 63.4%; breast self examination 72.7%; clinical breast examination 93.2%; HIV test 97.1%; blood pressure test 97.4%; blood sugar test 97.8%; lipid screen 98.2%; hepatitis B screen 98.3%) except mammograms, where schools (50.0%) played the key role. Health workers had a secondary role as informants about mammograms while schools were secondary informants on Pap smears. Print media had a secondary informant role on breast self examination (BSE), clinical breast examination (CBE), blood pressure check, blood sugar test, HIV test and lipid screen. Family members (mother, siblings) played minor roles as

informants on clinical breast examinations and blood pressure checks. Friends and peers were secondary informants on CBE and Hepatitis B. The periodicity of performance was considered for Pap smears and self breast examination based on breast and cervical cancers being leading causes of cancer among women. Fifty two (14.2%) and 129 (35.3%) respondents were aware of the timing for Pap smear and breast self examination respectively (Not shown).

Table 3: Screening rates for combinations of tests offered to women of childbearing age attending child welfare clinics at three public health facilities in Uyo, Nigeria (N = 387)

Screening test combinations	Number (%)
All screening tests	4(1.0)
No screening test	25(6.5)
BS, BP	258(66.7)
HIV, Hepatitis B	146(37.7)
BS, BP, HIV, Hepatitis B	136(35.1)
BS, BP, lipids	102(26.4)
SBE, CBE	65(16.8)
Pap smear, SBE	28(7.2)
Pap smear, SBE, CBE	17(4.4)
Pap smear, MG	8(2.1)
MG, SBE, CBE	8(2.1)
Pap smear, SBE, CBE, MG	6(1.6)

Abbreviations: SBE = self breast examination, CBE = clinical breast examination, MG = mammogram, BP = blood pressure, BS = blood sugar, HIV = Human immunodeficiency virus

Factors associated with specific preventive health examinations

Significant factors associated with the uptake of selected preventive health examinations were secondary education or higher (OR = 7.11; 95% CI 1.49-34.00), not ever being pregnant before marriage (OR = 4.40; 95% CI 1.41-13.71), awareness about performing annual Pap smears (OR = 12.31; 95% CI 5.05-30.04) for pap smears; secondary education or higher (OR = 1.93; 95% CI 1.03-3.61), awareness about performing monthly BSE (OR = 27.81; 95% CI 13.70-56.43), ability to discuss reproductive health information (OR = 3.67; 95% CI 1.38-8.22) for BSE; awareness of

monthly BSE (OR = 4.04; 95% CI 2.21-7.38) and ability to discuss reproductive health information (OR = 4.49; 95% CI 1.55-13.02) for clinical breast examination (CBE) shown in Table 5.

Table 4: Top three sources of information on preventive health examinations received by the respondents, Uyo, Nigeria

Screening tests	Number (%)
Papanicolaou smear	N = 41
Health workers	26(63.4)
School	8(19.5)
Print media	5(12.2)
Self breast examination	N = 165
Health workers	120(72.7)
Print media	11(6.7)
School	5(3.0)
Clinical breast examination	N = 74
Health workers	69(93.2)
Print /electronic media	3(4.1)
Mother/Peers*	1(1.4)
Mammogram	N = 12
School	6(50.0)
Health workers	5(41.7)
Print/electronic media	1(8.3)
Blood pressure check	N = 310
Health workers	302(97.4)
Print/electronic media	6(1.9)
School/Siblings*	1(0.3)
Blood sugar check	N = 272
Health workers	266(97.8)
Print/electronic media	5(1.8)
School	1(0.3)
HIV test	N = 280
Health workers	170(98.3)
Peers/Friends	2(1.2)
Print/electronic media	1(0.6)
Lipid screen	N = 111
Health workers	109(98.2)
Print/electronic media	2(1.8)

*Both options had the same value

Discussion

Chronic disorders such as hypertension, diabetes mellitus and HIV/AIDS have received global attention which may account for the high screening rates for blood pressure, blood sugar and HIV testing. Most maternal health care protocols include screening tests for these diseases as routine procedures, although in practice they may be

Table 5: Predictors of selected preventive examinations received by the respondents, Uyo, Nigeria

Variables	Exp [B]	p-value	95% CI
Pap smear			
Pregnant before marriage			
No	4.40	0.01	1.41-13.71
Yes	Ref.		
Educational status			
≥Secondary	7.11	0.01	1.49-34.01
<Secondary	Ref.		
Aware of yearly pap smear			
Yes	12.31	0.00	5.05-30.04
No	Ref.		
Breast self examination			
≥Secondary	1.93	0.04	1.03-3.61
<Secondary	Ref.		
Aware of monthly breast examination			
Yes	27.81	0.00	13.70-56.43
No	Ref.		
Can share reproductive health information			
Yes	4.49	0.01	1.55-13.02
No	Ref.		

*Ref. – reference category

approached on a risk basis. Since the study subjects were recently delivered women, maternal health care may have afforded them the opportunity to avail themselves of preventive health examinations according to protocol. The rates may also indicate the availability and accessibility of screening services. The blood pressure screening rate in this study, 84.5%, falls below 99% reported in United States²¹ but exceeds reported rates of 72% in Australia,²⁶ 71% in Israel,²⁷ 64.4% in Southern Italy²⁸ and 54% in China²⁹. In developed countries, screening for hypertension is strongly recommended in adults aged 21 years and older using standard office sphygmomanometry. This correlates with intra-arterial measurements and is predictive of cardiovascular risk¹³. Individuals with hypertension have a 2-4 fold risk of developing stroke, heart failure myocardial infarction and peripheral vascular disease compared to non-hypertensive individuals¹³. Hypertension during pregnancy can increase the risk of maternal death, fetal compromise and cardiovascular disease in later years. Regular screening for early detection of elevated blood pressure provides an opportunity

for treatment so cardiovascular events are prevented.

In developing countries, 25% of all adults with diabetes are younger than 44 years compared to 8% in developed countries, with more women in childbearing age suffering from the disease³⁰. In the present study, 74.4% of women had a screening test for blood sugar. This exceeds 43% reported in Australia²⁶ and 66% in the USA³¹. Women who have a compromised pancreatic reserve may develop abnormal glucose tolerance and gestational diabetes, which is associated with a 17% to 63% risk of developing diabetes in later years³². This in turn increases the risk of cardiovascular disease. High congenital abnormality rates are associated with pregnancy in women with pre-existing diabetes³³. A raised blood glucose level in pregnancy has adverse effects which span from conception to adolescence predisposing the offspring to metabolic syndrome and type 2 diabetes³³. Early detection of hyperglycaemia through blood sugar testing offers an opportunity for appropriate management of abnormal glucose levels. Without testing, abnormal levels may remain undetected with attendant risks to mother and child. Two thirds of women in this study were tested for both blood sugar and blood pressure which is important because of the potential risk of co-morbidity. A Japanese study conducted among 5,010 adults aged 33-66 years indicates that individuals who had single or combined maternal histories of hypertension, diabetes and dyslipidaemia had higher risk factors clusters compared to individuals without maternal histories, after adjusting for confounders³⁴. A comparatively lower risk was found if both maternal and paternal histories existed, but the number of paternal histories was not associated with risk factor clusters. This demonstrates the importance of screening childbearing women early for these diseases.

In sub-Saharan Africa, only 10-20% of adults have been tested, despite it being home to 67% of people living with HIV globally and where 72% of AIDS deaths occurred in 2007³⁵. Sub-Saharan Africa is also the only region in the world where HIV infection rates are higher among women than among men³⁶. Of the 22.4 million adult infections

in sub-Saharan Africa, 60% occur in women³⁷. Nine in ten infections in children are acquired through vertical transmission from infected mothers³⁸. Although early identification of the maternal HIV status is critical to prevention of mother to child transmission on HIV infection³⁹, global estimates in 2008 indicate that only 21% of pregnant women received HIV counseling and testing¹. Most antenatal services in Nigeria include point of service counseling and testing. Prevalence rates of HIV reported among pregnant women in Nigeria include 6.7% in Ibadan³⁸, 6.9% in Sagamu⁴⁰, 5.1% in Benin City⁴¹ and 7.3% in Port Harcourt⁴². In Akwa Ibom State, the HIV prevalence rate was 10.9% in 2010, returning to a level observed almost a decade ago at 10.7% in 2001^{43, 44}. Akwa Ibom State accounts for almost 3% of pregnant women and nearly 6% of mother to child transmission of HIV in the country, which translates to large numbers given the population of 4.6 million⁴⁵. In order to reverse the upward trend of the infection, preventive services and a universal uptake of screening services is desired. In this study, the antenatal screening rate for HIV of 76.6% was lower than reported in Sagamu (86.5%)¹⁸; similar to Calabar (70.2%)⁴⁶ and higher than observed in Benin City (25.0%)⁴⁷. Much lower rates were reported other African countries such as 30.3% in Sudan⁴⁸ and 47% in Uganda⁴⁹. Metabolic abnormalities associated with preeclampsia include increased low density lipoprotein cholesterol (LDL-C) and triglyceride level, and reduced high density lipoprotein (LDL-C)³². Preeclampsia is associated with later life cardiovascular disease and mortality³². Two meta-analyses assessing findings in over 2 million women found more than a 2-fold risk of total and fatal myocardial ischaemic events in a follow up period of 15 years among women with preeclampsia regardless of severity, time of occurrence during pregnancy, recurrence or fetal outcome³². Another study reported that elevated LDL-C, non-HDL-C, or triglycerides 4 to 5 years before pregnancy each significantly increased risk of preeclampsia⁵⁰. In the present study, 39.5% of the women reported that they were managed for symptoms of preeclampsia during pregnancy (not shown). In this study, 29.7% of women had a lipid screen which is comparably lower than 54%

reported in Spain¹⁵ and 41% - 72.5% in USA³¹. Even fewer women were screened for the combination of lipid disorders, hypertension and hyperglycaemia, 26.4%. As a result, the added risk from this potentially harmful trio was not detected in three quarters of the women and lipid disorders are amenable to treatment.

While 48.2% of respondents in our study sample reported they had been screened for hepatitis B virus (HBV), fewer were tested for possible co-infection, 37.7%. The presence of HBV infection during pregnancy results in vertical transmission from mother to child. This affects up to 10% of neonates when infection occurs in the first trimester and 60% to 90% of neonates when it occurs in the third trimester^{51,52}. In a study conducted in southeastern Nigeria, the vertical transmission rate was 51.6%⁵³. The infected newborn often becomes a chronic carrier. Other sequelae include liver cirrhosis and hepatocellular carcinoma⁵¹. When the mother's status is known, administration of hepatitis B immunoglobulin from 28 weeks of gestation combined with the 3-dose vaccine can prevent up to 95% of the carrier status in the newborn^{51,53}. Lamivudine therapy has also demonstrated rapid reduction in viral levels when used in the last trimester⁵³. Although studies conducted among pregnant women in Nigeria indicate HBV infection prevalence rates ranging from 2% to 15%, evidence exists that screening for HBV is not routinely practiced in antenatal clinics⁵³. Without routine testing, it is highly probable that infected cases may be missed. In a survey conducted in Nnewi, Nigeria, none of those who tested positive for HBV, 40 (8.3%) were previously aware of their condition and the age group with the highest prevalence was 20-24 years⁵³. This suggests the need to screen women during their reproductive years.

The lowest screening rates in this study for Pap smears and mammograms supports evidence from earlier studies conducted in Nigeria^{18, 54-58}. An earlier study conducted in Akwa Ibom State among nurses in a tertiary health facility indicated that although awareness about the Pap smear was high at 94.3%, only 7.4% had a previous screen⁵⁹. In the present study, awareness regarding Pap smears was much lower compared to previous studies^{18, 19}. However, the screening rate of 9.3%

was higher than earlier reported in Akwa Ibom State, 7.4%⁵⁹ and Ibadan¹⁸; similar to 9.0% reported in Enugu⁵⁷ and lower than 19.0% reported in a multi-centric study in Enugu⁵⁶ and 18% among female medical practitioners⁵⁸. These screening rates differ disparately from 39% reported in Botswana⁶⁰, 66% reported in the United States²¹, and 72% reported in Australia,²⁶ which have existing screening programmes. In Botswana, at least 70% of the women surveyed were reasonably informed about cervical cancer screening⁶⁰. Awareness was high in a study which involved well educated women in Accra, Ghana, but only 39% of respondents had sufficient knowledge and 8.5% had a previous screen⁶⁸. The similar screening rates may be attributed to post secondary education attained by 55.4% of the study sample. Women with post secondary education had a seven fold likelihood of having a Pap smear done compared to those with lower educational attainment. Studies have suggested that screening rates are higher in women who are better informed about the test or risk factors for cervical cancer^{56, 61, 62} and in older age groups^{26, 56}. A study in Botswana showed that perceived benefits was not a predictor of cervical cancer screening⁶⁰. Patient related barriers to uptake of preventive health examinations include low income, low educational status, being uninsured, rural residence and limited access to health care^{54, 63}. Others include lack of knowledge about test indications, risk perception, fear of embarrassment or pain, negative attitude of male partners and marital status^{22, 57, 64}. Service related barriers are timing and scheduling of examinations, belief in the value of the examinations, unavailability of a female screener, provider recommendations and competence in communicating the recommendations, local availability of services, service costs and transportation^{54, 64}. Since most lesions are asymptomatic, detection by cervical screening affords the opportunity for early treatment to avoid disease progression, reduce mortality, health care costs and adverse effects on the household⁶².

Awareness about breast self examinations (BSE) was found to be lower in Ibadan, Nigeria compared to awareness in the study sample, 13.3%

and 35.3% respectively⁵⁵. The difference could be attributed a higher proportion of highly educated women our study sample (35.7% vs. 1.7%), since post secondary education was a significant factor in the practice of BSE. None of the respondents in the Ibadan study acknowledged mammography as a screening test. In a survey conducted in Benin City, Nigeria, 35% of women were aware of mammography but only 7% received yearly screening⁵⁴. Our study sample had a lower screening rate of 3% and did not include questions on awareness for mammography. In both studies, the rates are much lower than observed in Australia at 45%²⁶, 55% in the United States²¹ and 57% in Israel²⁷. Cost and technical expertise are barriers to the uptake of mammography which is still not widely available. This underscores the importance of utilizing BSE and CBE to protect breast health in low resource settings. Unfortunately, only a fifth of women in the study sample reported having a CBE done. In southern Italy, screening uptake at recommended times were 51.5% for mammography, 52.4% for Pap smear and 25% for CBE²⁸. In the study by Osime et al⁵⁴, 85% of women were aware of BSE and 68.5% practiced it exceeding the screening rate of 44.8% in the present study. The higher screening rate could be attributed to tertiary education (72% vs 35.7%) and an older demographic profile (mean age: 38 +/- 9.4 years vs. 29.3 +/- 5.5 years).

In the present study, awareness about monthly BSE and self reported ability to discuss reproductive health information was significantly associated with both clinical and self breast examinations. A meta-analysis of trials which included women aged <50 years estimated a relative reduction in breast cancer mortality of 15% making it evident that there are clear benefits in screening women of childbearing age for breast cancer^{65, 66}. In developed countries periodic screening is recommended for women >50 years, but this threshold may not be suitable for Africans in whom cancers occur at younger ages⁶⁷. Seventy percent of Nigerian women present in advanced stages so that the 5-year survival rate is 10% compared to 70% in advanced countries⁶⁸. This also explains why more than half of the breast cancer deaths globally occur in low and middle income countries, in spite of a relatively low

incidence⁶⁹. Combined screening for cervical and breast cancer were low among respondents ranging from 1.0% to 7.2%, while combinations of breast examinations ranged from 2.1% to 16.8%. This is far below the estimated 70% coverage that is required to effectively reduce mortality from breast cancer through screening^{67, 70}. Women who did not report any screening test were mostly aged <30 years and had basic education. This supports the positive role of secondary education identified in this and earlier studies^{54, 63}. Higher educational attainment has been associated with uptake of screening services, possibly through greater awareness, health care seeking or recollection of services received^{71, 72}. The younger age of non-reporting women also supports a higher uptake of screening services in older women found in previous studies^{26, 56}.

In a study done in Akwa Ibom State, the main sources of information on cervical screening were the hospital (87.5%) and textbooks (13.6%), whereas media and friends played a minor role (<4%)⁵⁹. Oluwatosin and Oladepo reported similar findings regarding BSE⁵⁵. Contrariwise, Gwarzo et al found that the media (46.5%) was a primary informant on BSE followed by health workers (32.2%)⁷³. In southern Italy, electronic media (television/radio programmes) were the main source of information on breast cancer (39.3%) followed by health professionals (23.4%)²⁸. In a study conducted among market women in Southern Nigeria, the common media of awareness were the media (46.6%), public lectures (27.8%) and friends/relatives (19.9%). In the present study health workers were the main source of information on nearly all preventive examinations which agrees with earlier studies by Nnodu et al⁷⁴ and Dundar et al⁷⁵.

Health workers can offer useful information about services, utilizing every patient contact to motivate and provide services. However, they are often constrained by a heavy patient load, staff shortage and multi tasking. Preventive health examinations may not be given emphasis during group sessions and health providers are often limited to those who have access to the health facility. Studies indicate that uptake of screening services is low among health workers^{58, 59}. Although women look up to their health providers

as role models, it is clear that health workers alone cannot achieve optimal coverage. The media played a secondary informant role on preventive health examinations, particularly with Pap smears. A greater involvement will be required of the media as it has the ability to disseminate information to the wider public and policy makers in a timely manner, bringing them to focus on important issues⁷⁶. The media and physicians are influential sources of information on breast health in Taiwan where it has been reported that physicians recommend the practice of CBE over monthly BSE promoted by the Department of Health through the media⁷⁷. Velozzi et al found that the media were successful in encouraging Hispanic women to take action to ensure breast health⁷⁸. Schools played a key role in disseminating information about mammography and Pap smear. This is important in inculcating healthy lifestyles in older adolescents in order to protect health as they grow older and live longer.

Conclusion and Recommendations

High screening rates were acknowledged for blood pressure, HIV and blood sugar, while Pap smears and mammograms had the lowest screening rates. Even where screening rates were comparable within the country, nearly all were lower than rates in developed countries. Health workers were the principal informants on all screening tests, except mammography. The increasing burden of non-communicable diseases, evidence that maternal histories of risk factors are associated with risk factor clusters in offspring, implications for pregnancy among women of childbearing age and the fact that screening tests can help reduce both morbidity and mortality associated with the conditions discussed in this study, support the need to improve existing screening rates to near universal. We advocate for a shift from pregnancy centred care to preconception/interconception care inclusive of a full range of preventive health examinations at baseline and periodically as appropriate to risk clusters. Such care should be contained within a National Health Insurance Scheme completely at baseline and subsidized for periodic screens. This should be provided to all individuals, but women in particular as an

integrated package within primary health care with affiliation to designated secondary and tertiary institutions for specialist care. Nigeria's National Cancer Control Plan will be useful to demonstrate political commitment, drive policy implementation, and stimulate grassroots' action. The media and schools should be harnessed as advocacy tools to create awareness and disseminate information to the wider public utilizing public and social events, regular radio jingles, organized parent-teacher interactions, and other school and community events. Finally, it is pertinent that an additional Millennium Development Goal (MDG), target or indicator be couched to drive international commitment towards achieving a near universal uptake of preventive health examinations. Preventive health examinations are critical to the management of the double epidemic most developing countries now face and must take a prime position, not backstage.

Contribution of Authors

EU conceived and designed the study. CA and UE collected and validated data. UE contributed to preliminary analysis. EU was responsible for the final analysis of data. CA and UE contributed to the draft manuscript. EU wrote the paper. All authors reviewed and approved the manuscript.

Conflict of Interest

The authors declare there is no conflict of interest.

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