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RISK FACTORS FOR CERVICAL CANCER AND PREVALENCE OF PRECANCEROUS CERVICAL CHANGES AMONG SEXUALLY ACTIVE WOMEN IN LAGOS STATE

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FEBRUARY, 2014

DECLARATION

I hereby declare that this work is original. This work has neither been presented to any other faculty for the award of a degree nor has it been submitted for publication.

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CERTIFICATION

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DEDICATION

This book is dedicated to the Almighty God, my source of inspiration.

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ABSTRACT

Cervical cancer is the second commonest cancer amongst women globally. Early diagnosis of precancerous cervical changes (PCC) can prevent the disease Most studies done in Nigeria on cervical cancer are facility based; hence the need for a population based survey. This study was designed to determine the population-based prevalence of PCC and identified its risk factors among women living in Lagos State, Nigeria

A cross-sectional study involving 332 women, who were randomly selected from three LGAs, using a four stage sampling technique (involving the Senatorial Districts, Local Governments, wards and houses) was carried out. Study participants were women above 15 years of age who were sexually active and with no previous diagnosis of cervical cancer. Data were collected using a 48 item, interviewer administered semi-structured questionnaire on respondents' socio-demographic characteristics, knowledge and utilisation of cervical cancer screening services and risk factors of cervical cancer. Knowledge score was computed (maximum score of 16 and minimum score of 0) and respondents scoring 12 to 16 points were graded as having good knowledge. Oral contraceptive (OCP) use was defined as using OCP for ≥ 1 year, early coitarche as first sexual intercourse at <18 years, multiple risks as having 3 or more risk factors and high education as having tertiary education. Visual Inspection with Acetic Acid (VIA) and Visual Inspection with Lugol's Iodine (VILI) were done to screen for precancerous changes in the cervix. Data were analysed using freducncics, proportions, Chi square statistics, prevalence odd ratio (POR) and logistic regression. Level of significance was set at p = 0.05

Respondents' age was 39.0 ±10.0 years. Many were married (227; 68.6%). Thirteen percent (43) had PCC. Prevalence of PCC risk factors were:- grandmultiparity (36; 13.4%); total lifetime

partners of ≥4 (45; 14.6%); OCP use (140; 44.3%); early coitarche (67: 20.2%); multiple risks (34; 10.2%) and history of previous sexually transmitted infection (76; 24.1%). Only (135) 41.9% of respondents had heard of cervical cancer 32.3% of whom had good knowledge of the disease. Radio was the most (65.9%) common source of information. Only 11(3.3%) of respondents had ever had cervical cancer screening. Multiparity [POR 4.27 (1.95-9.39)], early coitarche [POR 15.72 (7.52-32.83)], multiple sexual partners [POR 18.68 (8.76-39.84)] and multiple risks [POR 14.46 (6.53-32.03)] were associated with having PCC. Respondents with low education level were four times less likely to have a good knowledge of the disease compared with those with high education. [POR 0.24 (0.08-0.68). Multiple sexual partners and early coitarche predicted the likelihood of having PCC [AOR 9.69 (3.29-28.50) and AOR 7.93 (3.20-19.6), respectively].

The prevalence of precancerous cervical changes was high. Women who had multiple sexual partners or early coitarche are more likely to have precancerous cervical changes. There was poor knowledge and low utilisation of cervical cancer screening services. Health education programmes on safe sexual practices and benefits of screening for cervical cancer need to be enhanced.

Key words: Precancerous cervical changes, Cervical cancer screening, Sexual practices.

Word count: 475

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HPV- Human Papilloma Virus

HIV - Human Immunodeficiency Virus

OCP- Oral Contraceptive Pills

PCC- Precancerous cervical changes

VIA- Visual Inspection with Acetic Acid

VILI- Visual Inspection with Lugol's Iodine

CIN- Cervical Intraepithelial Neoplasia

HSIL- High-grade Squamous Intraepithelia

WHO- World Health Organisation

UNFPA- United Nations Funds for Population Activities

IARC- International Agency for Research on Cancer

POR-Prevalence odd ratio

OR- Odd Ratio

AOR- Adjusted Odd Ratio

CHAPTER ONE

INTRODUCTION

1.1 Background Information

Cervical cancer is a major public health problem that kills women in the prime of their lives. World Health Organisation (WHO) has identified cancer of the cervix as the second most common cancer among women globally with about 500 000 new cases and 250 000 deaths each year. Almost 80% of these cases occur in low-income countries (WHO, 2012).

The disease is for the most part characterized by a long lead time, with precancerous lesions usually progressing through a succession of identifiable stages prior to invasive disease (Shingleton *et al*, 2008) and these key features of cervical cancer, the slow progression from normal cervical tissue, to precancerous (or dysplastic) change in the tissue and to invasive cancer is very important because it provides opportunities for prevention and early detection and treatment. Treating all pre-cancers can prevent almost all cervical cancers. Because of its association with Human Papilloma Virus (HPV) infection, other modifiable risk factors as well as the ability to screen for premalignant stages of the disease, it is now largely a preventable disease, although its prevalence is on the increase in many developing countries (Micheal, et al., 2010)).

Most women who develop cervical cancer tend to have one or more identifiable factors that increase their risk for the disease, it is uncommon for women to develop cervical cancer without any of these risk factors (Imaginis, 2012). Most of these risk factors can be modified (such as smoking and sexual lifestyle) while a few others cannot be modified (such as family history and age).

Nearly all cases of cervical cancer are associated with HPV infection which is transmitted during sexual activity. Therefore, cervical cancer is seen more frequently in women who commence sexual activity at an early age and with multiple partners (Cooper et al., 2007)). Barrier contraception and/or spermicidal gels may offer some protection. Cigarette smoking or exposure to environmental smoke is also associated with increased risk among HPV-infected women, suggesting that components of tobacco are promoters of abnormal growth of viral-infected cells (Ho, Kadish and Burk, 1998). Those who used oral contraceptives for 5 to 9 years have approximately three times the incidence of invasive cancer, and those who used them for 10 years or longer have approximately four times the risk compared to non users (Moreno, Bosch and Munoz, 2002). Having given birth to three or more children is also an important risk factor. Studies have shown that women who carry seven or more full-term pregnancies are at a higher risk of developing cervical cancer (Fayed, 2008).

Cervical cancer may run in some families. If a person's mother or sister had cervical cancer, the person's chances of developing the disease are 2 to 3 times higher than if no one in the family had it(Fayed, 2008). Most cases are found in women younger than 50. However, the risk of cervical cancer does not disappear all together with age. Almost 20% of women with cervical cancer are diagnosed when they are over 65.

Screening via regular gynaecologic examinations and visual inspection with Acetic acid (VIA) or cytology test (Papanicolaou smear), with treatment of precancerous abnormalities, decrease the incidence and mortality of cervical cancer. (IARC,1986; Kleinman, 1981). Lack of effective screening programs aimed at detecting and treating precancerous conditions is a key reason for the much higher cervical cancer incidence in developing countries (WHO, 1986). It has been estimated that only about 5% of women in developing countries have been screened for cervical dysplasia in the past 5 years, compared with 40% to 50% of women in developed countries

(Sherris, 2001).Women who have regular screening have reduced their risk of developing cervical cancer.

A screening test can detect abnormal cervical changes before they progress to cervical cancer and currently, the best way to prevent cervical cancer is through regular gynaecological screening and treatment of precancerous lesions. In developing countries, however, this method has had only a limited impact due to the cost and complexity of properly screening and treating women (WHO, 2005)

In Nigeria, however, various studies have documented the utilisation of cervical cancer screening service among women to vary between 0.3% to 8.5% (Aboyeji, 2004; Ayinde, 1998; Daramola, 2001; Onajole *et al.* 2004; Roberts *et al.* 2004)

1.2 Problem statement

Cervical cancer is the second most frequent cancer and the fifth most frequent cause of death from cancer among women in the world. Worldwide about 1.5 million live with cervical cancer with 7 million living with precancerous changes. About 493,000 annual cases occur with 80% of this occurring in low resource settings (Kolawole, 2008).

The lifetime risk of cervical cancer in developing countries is 2% and may be as high as 6-7% in Sub-Saharan Africa. Africa has a population of 274.49 million women aged 15 years and older who are at risk of developing cervical cancer. Current estimates indicate that every year 80,419 women are diagnosed with cervical cancer and 53,334 die from the disease (WHO/ICO Information Centre on HPV and Cervical Cancer, 2010)

United Nation estimates Nigeria has a population of 45.87 million women aged 15 years and older who are at risk of developing cervical cancer. Nigeria records 14,550/100,000 population/year new cases of cervical cancer yearly with a crude incidence rate of 19.3/ 100,000

population/year and about 9,559/100,000 population/year cervical cancer deaths yearly (with a projected number of 22,914 new cervical cases in 2025) (WHO/ICO Information Centre on HPV and Cervical Cancer, 2010). Almost 80 percent of these cases are at advanced stage where very little or nothing can be done

This debilitating ailment is almost entirely preventable (Janicek, 2008) and indeed, 100 per cent curable when detected early but alarmingly still kills, at least, a woman every hour in Nigeria (Ogundipe & Obinna, 2010). As a matter of fact, it kills more women aged 24 to 35 years old in developing countries than any other cancer in other parts of the world. Shockingly, less than 0.1 per cent of Nigerian women have ever had cervical cancer screening in their lifetime, just as less than one per cent of them are said to be aware of the existence of this disease which is better described as a silent killer. Worst still is the absence of widespread interventions like screening tests, while the mortality in developed countries like the United States has decreased over the last five decades by over 70 percent in large part attributable to the introduction of screening tests (Saslow *et al*, 2009).

1.3 Justification

Reports of the serious challenge posed by cervical cancer, especially in the developing world, are alarming, and the scourge must be tackled head on.

The conservative estimate of the cost per cycle of treatment of advanced stage is about ₦30, 000 and about seven cycles are normally required, chemotherapies required to treat the advanced stage are also very expensive, toxic and could be unavailable. Follow up of discharged patients is difficult. While on the other hand screening and treatment in early stages is cheap and simple requiring minimal manpower to achieve a high cure rate.

Cervical cancer prevention strategies that use visual inspection with acetic acid (VIA) and same-visit cryotherapy ("see-and-treat") are cost-effective alternatives to treatment of advanced disease (Mwanahamuntu, 2008). Control of cervical cancer may significantly contribute to achieving 4 of the millennium development goals (Kolawole, 2008). There is also limited information on the prevalence of cervical neoplasia in sub-Saharan Africa (Menendez *et al.* 2010).

Lagos State is the commercial heart of Nigeria with female residents drawn from different ethnicities in Nigeria and even West Africa who like other urban dwellers of the world are at significant risk of cervical cancer. Partly due to the rough city lifestyle like smoking, multiple sexual partnering etc. which poses them at a greater risk than their rural counterparts. There is also paucity of population based studies and data on VIA findings and risk factors of cervical cancer in Nigeria.

This study aimed to investigate the risk factors of cervical cancer, knowledge of cervical cancer and their association with findings on cervical cancer screening test with Visual Inspection with Iodine (VIA). The information obtained from this study would be disseminated to top management of the Lagos State Ministry of Health, other health professionals and other stakeholders through meetings and publications so as to help in the development of targeted interventions that would reduce the scourge ofcervical cancer.

1.4 Objectives

General objective: The general objective of the study was to determine the population-based prevalence of precancerous cervical changes and its risk factors among sexually active women in Lagos

Specific objectives

1. To assess the knowledge of cervical cancer, its preventive measures utilisation and the factors associated in the study population
2. To determine the prevalence of risk factors for cervical cancer among sexually active women in selected LGAs in Lagos.
3. To determine the prevalence of precancerous cervical changes using Visual Inspection with acetic acid (VIA) and Visual inspection with Lugol's iodine (VILI)
4. To identify the predictors of precancerous cervical changes among sexually active women in Lagos

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

Cancer is a generic term for a large group of diseases that can affect any part of the body. Other terms used are malignant tumours and neoplasm. One defining feature of cancer is the rapid creation of abnormal cells that grow beyond their usual boundaries, and which can then invade adjoining parts of the body and spread to other organs. There is an impending cancer epidemic in Africa. In Nigeria, this disease is causing untold devastation, and control measures are desperately needed (Nwogu *et al.* 2010)

Cervical cancer is a preventable disease that remains a challenge to public health today. It is a slowly progressive disease that usually begins as a mild dysplasia and progress over many years to invasive cervical carcinoma (Schwarz et al, 1996). The first symptom of early cervical cancer is a thin, watery blood tinged vaginal discharge that frequently goes unrecognised by the patient (Dibaia, 1993). It may also present with irregular bleeding (Ijaiya, 2004). Late presentation is a feature of cervical cancer in this part of the world (Ementolu, 1988; Parkin, 1990; Adadevoh, 1994) and the symptoms of late presentation include pain often referring to the flank or leg, massive haemorrhage and development of uraemia.

Aetiologic association and possible risk factors for cervical carcinoma have been extensively studied. The factors are: Sexual and reproductive factors, socio-economic factors (education and income), viruses e.g Human Papillomavirus (HPV), Human Immunodeficiency Virus and other factors like smoking, oral contraceptives, etc. The accumulated evidence however suggests that cervical cancer is preventable and is highly suitable for primary prevention. Education,

modification of sexual practices, screening of high risk groups and improvement in socio-economic status can reduce cervical cancer morbidity and mortality significantly (Naslow, 2009).

Cervical cancer is the second most common cancer in women, ranking after breast cancer. About 400,000-500,000 new cases occur yearly with 80% of these in developing countries. Best available data have estimated the global incidence to be 470.6/100,000 with a mortality of 233.4/100,000 and a 5 year prevalence of 1,860.3/100,000 (Parkin, 2001a). Globally, the highest burden is seen in Latin America and the Caribbean, sub-Saharan Africa, and South and South East Asia, where it is responsible for up to 22% of all new cases of female cancers yearly, with an age-standardized incidence of 31 per 100 000 (Parkin, 2001b). Cervical cancer develops around the 4th to 6th decade of life but is usually heralded by premalignant changes 10-20 years earlier (WHO/UNFPA, 2006).

It affects approximately 1.4 million women worldwide and claims an estimated 239 000 lives each year. Over 99% of cervical cancer cases result from genital infection with Human Papillomavirus (HPV). The disease represents a major health inequity, as 80% of those with cervical cancer live in developing countries. (WHO, 2005)

It is an important public health problem among women in developing countries. While frequently replaced screening programmes have led to a large fall in its incidence and mortality in developed countries, it remains largely uncontrolled in high-risk developing countries because of ineffective or no screening (WHO, 2001). There were an estimated 233 000 deaths from cervical cancer worldwide in 2000, 83% occurring in lower resource areas, where this is the most common cause of cancer death (Parkin, 2001c). While mortality rates are much lower than incidence rates (the worldwide ratio of mortality to incidence is 49%), they correlate rather well with incidence patterns (IARC GLOBOCAN, 2005). It affects the younger age group as a

result of early sexual activity, several sexual partners and history of sexually transmitted infections mainly linked with human papilloma virus (HPV) (WHO, 2012). The majority of cases of cervical cancer are squamous-cell carcinomas.

In Nigeria, cancers remain one of the three most common non- communicable diseases. It is responsible for 4.4% of deaths (WHO, 2008) with a crude rate of 12.9/100,000 women/ year and an age standardised mortality rate of 22.9/ 100,000 women/ year (WHO, 2008) with cervical and breast cancers causing most cancer deaths in women.

About 45.87 million females (i.e. estimated female population ≥ 15 years) are said to be at risk of cervical cancer in Nigeria with an estimated 14550 no of new cervical cancer cases diagnosed annually and 9659 no of deaths (IARC GLOBOCAN, 2008)

2.2 Risk Factors for Cervical Cancer

2.2.1 Human Papillomavirus Infection

HPV infection is a common sexually transmitted infection occurring worldwide. The majority of cases are transient and asymptomatic (Illiyasu *et al*, 2010). HPV is particularly prevalent in Sub-Saharan Africa (Anorlu, 2008; Clarke *et al*, 2011) and the region has the highest prevalence of all HPV types. HPV-positive women in Sub-Saharan Africa are also more likely to have multiple infections with other high-risk types (Anorlu, 2008) and it is associated with a high mortality rate. About 21.3% of women in the general population in Africa are estimated to harbour cervical HPV infection at a given time (WHO/ICO, 2010). Thomas et al (2004) reported a prevalence of 26.3% of HPV amongst women in Ibadan and the most commonly found HPV types, in either single or multiple infections, were HPV 42 , HPV 16, and HPV 35 .In another study in rural Nigeria, 12.8% were HPV positive (Gage *et al*, 2012)

Virtually all cervical cancer cases (99%) are linked to genital infection with Human Papillomavirus (HPV), which is the most common viral infection of the reproductive tract. There are 40 different genotypes of HPV that can infect the genital area of men and women, including the skin of the penis, the vulva (the area outside the vagina), and anus, and the lining of the vagina, cervix, and rectum. Two "high-risk" genotypes (HPV 16 and 18) are responsible for the majority of HPV-related cancers of the cervix, vulva, vagina, anus and penis worldwide. Two "low-risk" genotypes (HPV 6 and 11) cause a substantial proportion of low-grade cervical dysplasia (i.e. cell abnormalities) detected in screening programmes and more than 90% of genital warts (WHO/UNFPA, 2006)

A statistically significantly increased Odd Ratios were found in a study in Kampala, Uganda among women infected with HPV, For both squamous cell carcinoma (SCC) and adenocarcinoma of the cervix, particularly in single HPV infections, infections with HPV16-related types and high-risk HPV types(in particular HPV16, 18 and 45) (Odida *et al*, 2011)

Women living with HIV are at a higher risk of harbouring HPV and subsequently developing cervical cancer. In Malawi, HPV DNA was detected in 23% of HIV-uninfected women but in 60% of HIV-infected women with <300 CD4 cells/mm. High-risk HPV types 16 and 18 constituted half of the identified type (Moll) *et al*, 1996). The peak incidence of HPV infection generally occurs between the ages of 16 and 20 years i.e. in adolescents and young women. HPV infection usually resolves spontaneously, but may persist (WHO, 2006) with precancerous cervical changes following and cervical cancer typically follows 20-30 years late if untreated (PRB, 2004: WHO, 2005). During the period of persistent HPV infection, precancerous changes may be detected in the cervix; early detection of these changes is an effective strategy for prevention of cervical cancer. (WHO, 2006). The introduction of HPV vaccination could effectively reduce the burden of cervical cancer in the coming decades (Cervical Cancer Action, 2012).

2.2.2 Multiple sexual partners.

The greater the number of sexual partners — and the greater a partner's number of sexual partners — the greater the chance of developing cervical cancer. A study among Rwandan women found women with ≥7 lifetime sexual partners to be at a higher risk. (Anastos *et al*, 2010). In a survey among South African women, there was an excess 70% risk of cervical cancer in women with ≥ 4 life-time sexual partners (Cooper *et al*, 2007).

In Northern Nigeria, findings revealed multiple sexual partners, place women at high risk of developing cervical cancer (Adewuyi, 2008). According to a study among female undergraduates in Nigeria, Fifty seven per cent had multiple sexual partners, but only 38.1% used condoms.(Ayinde, 2004)

2.2.3 Early sexual debut.

Epidemiological studies (mainly case-control studies) showed consistent associations between risk and early age at initiation of sexual activity (IARC GLOBOCAN, 2005). Young age at first intercourse, high numbers of sexual partners, high parity, cigarette smoking, race, and low socioeconomic status have consistently emerged as significant risk factors for cervical cancer. These, however, are linked to sexual behaviour and the acquisition of HPV, and, except for smoking, none have consistently been shown to be significant independent risk factors (Janicek, 2008). Thomas *et al* (2012) found mean age at first sexual intercourse among women in Ibadan to be 20.3 years. The mean and modal ages at sexual debut were 18.8 and 18 years respectively in another study among female undergraduates in Ibadan (Ayinde, 2004). Cooper et al (2007) reported a 60% increased risk of cervical cancer for girls with sexual debut < 16 years in South

Africa. Young age at first sex (≤ 17 years) and early first marriage (< 25 years) was found to be associated with a positive VIA in Nigeria (Ogunbowale. 2008). Early age at first sexual intercourse and multiple sexual partners, place women at high risk of developing cervical cancer in northern Nigeria (Adewuyi, 2008). In Zaria, early age at marriage (80.0%) and at first pregnancy (77.8%) was significant factors found to be associated with the development of cervical cancer (Emembolu, 1988).

2.2.4 Use of oral contraceptives.

A meta-analysis found risk of invasive cervical cancer in current users of combined OCs increases by 7% for each year of use. The risk increase for five years of use is approximately 10%. The risk increase is temporary, and risk returns to the level of a never-user after 10 years of stopping use (Appleby, 2007). A study in South Africa shows that the risk of cervical cancer is increased significantly among women who are current and recent users of oral contraceptives (Urban *et al.* 2012). Birth control use and age at first pregnancy were associated with HR-HPV in another study in rural Nigeria (Clarke et al, 2011). Conversely however, In Zaria, low contraceptive usage was identifiable associated factor with cervical cancer (Emembolu, 1988). Also, Were (2010), reported VIA Positive test finding to be significantly related to contraceptive never-use after controlling for previous screening. The prevalence of current use of oral contraceptives among women 15–49 in Nigeria is 1.6%. 1.7% among married women and 4.4% among the sexually active unmarried (NDHS. 2008).

2.2.5 Cigarette smoking.

Cigarette smoking (even passive smoke) has been linked to an increased risk of cervical cancer. Interestingly, any observed effect appears to be linked to squamous carcinomas and not adenocarcinomas or adenosquamous carcinomas. The presence of cigarette carcinogens in cervical mucus has been described as a possible biological explanation for the epidemiologic

association (Janicek, 2008). In Nigeria, the prevalence of cigarette use among women 15–49 is 0.2% (NDHS, 2008). A meta-analysis showed that risk of squamous cell cervical cancer is increased by 50% in current smokers (International Collaboration of Epidemiological Studies of Cervical Cancer, 2007). In a prospective matched cohort study, current smokers were found to have a threefold increased risk of treatment failure of CIN compared with non smokers (Acladious *et al*, 2002). Szarewski *et al* (1996) also reported a twelve times likelihood of reduction in cervical cancer lesion in women who gave up smoking after diagnoses. Smoking and other factors may have to work together to cause cervical cancer.

2.2.6 Multiparty

The risk of cervical cancer has been reported by many studies to be increased with the number of births. (Bayo, 2002; Adewuyi, 2008; Anastos *et al*, 2008). The NDHS (2008) reported a total fertility rate of 5.7 births per woman in Nigeria. In a Rwandan study, factors associated with Cervical Intraepithelial Neoplasia (3+) included ≥7 (vs. 0-2) pregnancies (Anastos *et al*, 2008). In Mali, risk factors for cervical cancer included parity >10 (Bayo, 2002). Adewuyi (2008) found an average of 6.8 live births per cervical cancer patient in Nigeria. Significant host-related factors in those with HSIL and invasive cancer in Ibadan included high parity among others (Thomas *et al*, 2012). On the other hand, in Zaria the parity of the patient did not seem to be of significance in the development of cervical cancer (Emembolu, 1988). Also, Ogunbowale (2008) reported women with lower parity (0-3) having borderline significantly increased risk of having a positive VIA (OR:3.1 (CI:0.9-10.6))

2.2.7 Socio-economic factors

Not only is cervical cancer a common cancer in poor women, but cure rates are low because women present with advanced disease (Denny, 2008). Worldwide women of low socio-

economic status have a greater risk of cervical cancer and cervical cancer is often referred to as a disease of poverty. Poverty is endemic in sub-Saharan Africa. Studies in West Africa showed that within a population widely infected with HPV, poor social conditions, high parity and poor hygienic conditions were the main co-factors for cervical cancer (Anorlu, 2008). In a study in Ontario, Canada, certain variables were significantly associated with lack of screening across all or nearly all world regions and this included residence in the lowest-income neighbourhoods (Lofters, 2011). Socio demographic factors, such as low socioeconomic level place women at high risk of developing cervical cancer in northern Nigeria. (Adewuyi, 2008)

2.3 Preventive measures of cervical cancer

2.3.1 Prevention of HPV Infection

Primary prevention of cervical cancer would require the prevention of HPV infection of the genital tract de novo, or, at least, preventing persistent infection of the cervix with HPV. As the primary method for the transmission of genital HPV is via sexual intercourse, possible methods of primary prevention include abstinence, mutual monogamy in virgins and use of condoms. Another potentially effective method of primary prevention is vaccination against cancer associated types of HPV (Denny, 2008).

HPV vaccine is a critical public health need for all women but particularly for poorer women in less developed countries. In developing countries, preventing cervical cancer through regular gynaecological screening and treatment of precancerous lesions has had only a limited impact due to the cost and complexity of properly screening and treating women. However, vaccines against HPV infections are likely to be a cost-effective and practicable means to reduce incidence of cervical cancer (WHO/ IVM, 2005).

Theoretically, an HPV vaccine with 100% efficacy in preventing HPV-16 and 18 infections could potentially reduce the cervical cancer burden by more than 60%, assuming 100% coverage (Sankaranarayan. 2008). Preliminary findings of an Indian case study using base-case estimates suggest that a combination of a one-time screen with HPV and vaccination may be a cost-effective strategy (WHO/IVM. 2005).

Results from large studies of the HPV vaccines, with about 2–5 years of follow-up, showed almost 100% protection against cervical cancer, however, a proportion of cervical cancer cases (about 30%) cannot be prevented by vaccination with the current HPV vaccines; screening programmes will therefore need to be maintained and women should be encouraged to continue to come for screening (WHO/UNFPA. 2006).

WHO/IVM (2005) reported that in many countries, awareness of the role of HPV in cervical cancer is low and there is also great potential for misperceptions about HPV and HPV vaccines. Examples of potential misperceptions documented included the following:

"because HPV vaccine is a vaccine against a sexually transmitted infection"; "If I'm vaccinated, I'm protected against all STIs because HPV is sexually transmitted"; "Giving a vaccine to prevent it, means health authorities are encouraging promiscuity"; and "because HPV vaccine prevents cervical cancer I'm protected and I don't need to get screened".

And in addition, there may be confusion between HPV and HIV due to the similarities of the acronyms; and there are false expectations among some health professionals that HPV vaccine could reduce transmission of HIV, because of knowledge that other STIs influence HIV transmission.

In a study among students in Northern Nigeria, reasons for vaccine rejection included: fear of side-effects (11.0%), fear of the unknown (8.0%) and controversies surrounding vaccines (7.0%) while on bivariate analysis, acceptance was significantly associated with age, faculty of study, awareness of cancer of the cervix, awareness of HPV and religion and after adjusting for potential confounders: age, medical education, knowledge of HPV and awareness of cervical

cancer remained significant predictors of willingness to accept HPV vaccination. (Illiyasu *et al*, 2010).

In defining the target population for immunization, a key consideration is that HPV infection is sexually transmitted and is usually acquired within the first few years following sexual debut. Ideally, therefore, the vaccine should be administered before sexual debut, i.e. before any risk of exposure to HPV. Globally, the primary aim of HPV vaccination is to prevent cervical cancer at least in the short term, vaccination will be targeted to women and young girls, either from age 15 years or age 9 years (WHO/IVM, 2005).

In February 2011, Nigeria embarked on the public HPV vaccination programme to reduce the burden of cervical cancer cases in the country by commencing the vaccination of girls between the ages of 9 and 15 with the Human Papilloma Virus (HPV) vaccine as part of a national strategy to reduce the mortality associated with cervical cancer. The launch took off with initial vaccination of a set of 186 indigent girls from Abuja aged between 9 and 15 on February 4, 2011. A month later, the second dose was administered to them. The final dose of the Human-Papilloma Virus vaccine was administered on August 15, 2011(Oguntola, 2011).

2.3.2 Cervical cancer screening

Cytology, HPV testing and visual screenings with acetic acid (VIA) or Lugol's iodine (VILI) are known to be accurate and effective methods to detect cervical cancer and could contribute to the reduction (Sankaranarayanan *et al*, 2008). Secondary prevention of cervical cancer through cytology- based screening programmes and visual inspection of the cervix with acetic acid have been used for the early identification of pre-malignant conditions, leading to marked reduction in mortality rate from the disease in developed countries (Illiyasu *et al*, 2010). However, the potential difficulties in implementing cervical cytology-based screening in low resource settings

have prompted the investigation of the accuracy of alternative low-technology tests such as VIA and VILI in the early detection of cervical neoplasia (Sankaranarayanan. 2003) .

Cytology-based screening, which is used in developed countries, is resource intensive. and difficult to realise in very many countries in sub-Saharan Africa because of poor health care infrastructure and lack of resources. There are very few cytopathologists, cytoscreeners and cytotechnicians; some have inadequate training. Quality contrd is also inadequate and histopathological services are extremely limited in many countries (Anorlu, 2008).

Several studies that have examined the accuracy of the VIA/VILI have found it at least as reliable as the Pap smear at detecting severe dysplasia in women who have the disease though it is less reliable than the Pap smear in ruling out women who do not have the disease (PRB, 2004).The procedure is relatively simple, low-cost and rely on little infrastructure Non physicians can perform it, provided that they receive adequate training and supervision (PATH.2001). The results of VIA and VILI are also immediately available and do not require any laboratory support.

Screening women once in their lifetime, at the age of 35 years, with a one-visit or two-visit screening strategy involving visual inspection of the cervix with acetic acid or DNA testing for human papillomavirus (HPV) in cervical cell samples, reduced the lifetime risk of cancer by approximately 25 to 36 percent, and cost less than 500 dollars per year of life saved. Relative cancer risk declined by an additional 40 percent with two screenings (at 35 and 40 years of age) (Goldie *et al.* 2005). Very few women in sub-Saharan Africa are ever screened for cervical cancer. In a cross sectional study among women visiting MCH-FP (Maternal and Child Health-Family Planning) clinic in Kenya previous screening for cervical cancer was found to be uncommon (12.3%) (Were, 2011). Screening uptake was surprisingly poor among healthcare workers more closely involved in women's health in Cameroon (59% of women had not had a pap smear in the last 5 years) (Mc Carey et al, 2011). In Botswana, the cervical cancer screening

rate was found to be 39% which was far too low compared to the national target of greater than 75% (Hoque, 2009).

In a study in Owerri, South Eastern Nigeria, only 31.3% the respondents were aware of screening with just 7.1% of the respondents having ever done the test and most of these were done over three years. Dim *et al* (2009) reported awareness of the Pap smear among women attending outpatient clinic in Owerri to be 41.2%

Husband approval of cervical cancer screening, women's level of education, women's knowledge of cervical cancer and its prevention, women's concerns about embarrassment and pain of screening, women's preference for the sex of health provider, and women's awareness of and distance to cervical cancer screening site significantly affect the uptake of screening services in Tanzania (Lyimo, 2012). The reasons reported for the lack of uptake in another study included lack of awareness, no need for it and fear of a bad result. (Ezem, 2008).

It is established that well-organised cervical screening programmes or widespread good quality cytology can reduce cervical cancer incidence and mortality.

2.4 Knowledge of Cervical Cancer:

It is known that an adequate understanding of cervical cancer and cervical cancer prevention is required for the general public to make appropriate choices (Davies, 2012). Henderson *et al* (2011) interviewed British girls who had been offered HPV vaccination, together with their parents, finding a lack of understanding about the level of protection offered by the vaccines and the need for cervical cancer screening. Njah (1994) found that generally, most women would like information about cancer and the majority is in favour of screening. In a quassi experimental study in Lagos, at baseline, only 5.7% and 13.1% of the experimental and control groups respectively knew that all sexually active women are at risk of cervical cancer while in

the post intervention phase; more women in the experimental group (49.7%) had correct knowledge with a percentage increase of 44% (Wright, 2010).

In another study among nurses in a tertiary hospital in Nigeria, almost all (99.4%) of the respondents had heard of cervical cancer, while about 85% of them had heard of HPV infection but surprisingly only a quarter (25.3%) of the nurses had heard of the HPV vaccines, and of those only 26.7% knew the vaccines were for the prevention of cervical cancer (Makwe, 2011). A study among students in Ghana showed most were unaware of local screening initiatives, and only 7.9% were aware of the link between human papillomavirus and cervical cancer. (Abotchie, 2009).

A similar study found about 2/3 of students not knowing about Pap smear and worse still, none of them had undergone a Pap screening test before. This low participation in screening for cervical cancer was attributed to several reasons including ignorance of the existence of such a test, lack of awareness of centres where such services are obtainable, ignorance of the importance of screening and the risk factors to the development of cervical cancer. In South Eastern Nigeria, good level of awareness of cervical cancer among the female undergraduates but poor knowledge and participation in cervical cancer screening was reported (Akujobi *et al*, 2008).

In a study among female undergraduates in Nigeria, about 23.1% identified the Pap smear as a screening test while only 5.2% of respondents had ever been screened and 52.8% reported willingness to be screened (Anicbuc, 2010). Ayinde (2004) reported seventy one per cent awareness of cervical cancer among students in Ibadan while only 33.5% were aware of Papanicolaou's smear. Awareness was found to be more among medical students and the married ones (Ayinde, 2004).

There is however an urgent need for an aggressive awareness campaign and the provision of a screening program nationally (Gharoro, 2006).

CHAPTER THREE

METHODOLOGY

3.1 Study Area:

The study was carried out in Lagos State, South Western Nigeria. Lagos State is located on the south-western part of Nigeria on the coastal flood plain of Bight of Benin. It lies approximately on longitude 3^0 45' East and latitude 6^0 35'N (Lagos State Government, 2013). Lagos State is bounded in the North and East by Ogun State of Nigeria, in the West by the Republic of Benin, and in the South by the Atlantic Ocean. It has five administrative divisions of Ikeja, Badagry, Ikorodu, Lagos Island and Epe. Territorially, it encompasses an area of 358.862 hectares or 3,577sq.km. Lagos State consists of 3 Senatorial Districts (Lagos East, Lagos West and Lagos Central) and 20 Local Government areas with about 10 million population. The UN estimates that at its present growth rate, Lagos state will be third largest mega city in the world by year 2015 after Tokyo in Japan and Bombay in India (Transparency for Nigeria, 2010). The state's population density is 2,593.7/km2, while that of Lagos metropolitan area is 8,000/km^2.

Lagos State is a multi-ethnic city. It is a coastal City surrounded by the Lagoon (where it got its name from Lagoon State") and the Atlantic Ocean. It is the commercial hub of Nigeria. It is the smallest State in Nigeria but the second most populous state and the most economically important state of the country. The health facilities available in Lagos include both government owned and privately owned. Government owned; about 274 Primary Health Centres, 25 secondary health facilities and four tertiary facilities, privately owned; about 2886 private health facilities with over 2000 medical personnel in all the state (both private and government) (Lagos State Government, 2011; LAWMA, no date). Concerning social media, about 29%, 86%, 78% and 26% of Lagosinns have access to newspaper, TV, radio and the 3 media (newspaper, TV and radio) at least once weekly, respectively (NDHS,2008). About 91% of households and

same percentage of the population in Lagos have access to electricity while about 24% of households have access to improved, not shared toilet facility with 76% having access to non improved toilet facility (NDHS,2008). Sixty eight percent of the population have access to improved water source, 9.4% have access to non improved water source and 18% use appropriate water treatment method (NDHS.2008) . About 18% and 15% of males and females in Lagos, respectively have more than secondary education (NDHS,2008). It is the largest urban area and the financial capital of Nigeria. The three most common religion practised in Lagos are Christianity, Islam and the Traditional religion. The State is essentially a Yoruba-speaking environment but a socio-cultural melting point for Nigerians, attracting both Nigerians and foreigners alike.

3.2 Study Design:

The study was a cross-sectional descriptive study. A community based design was employed.

3.3 Study Population:

The respondents were eligible females residing in the selected wards in Apapa, Eti Osa, Alimosho and Agege Local Government Areas of the State.

3.4 Sample size Determination:

The sample size was determined using the formula

$n = Z\alpha^2 pq / d^2$ (Kirkwood, 1998)

n= minimum sample size

$Z\alpha$= standard normal deviate corresponding to a 2 sided level of significance=1.96

p= prevalence of CIN (Cervical Intraepithelial Neoplasia) in Nigerian women (Audu *et al.* 1999) =18.3%

d= level of precision=5%

q= 1-p=1-0.183=0.817

Therefore $n=1.96^2*0.183*0.817/0.05^2=230$

Adjusting for a 10% non response rate, the minimum sample size was calculated to be =253

3.5 Sampling technique;

The multistage sampling technique was employed.

Stages 1: Two Senatorial Districts (Lagos West and Lagos Central) out of the 3 Senatorial Districts in Lagos State were selected by simple random sampling using balloting.

Stage 2: Two LGAs were also selected out of the ten senatorial districts in Lagos West and two out of the five senatorial districts in Lagos Central by balloting (Apapa LGA and Eti Osa LGA in Lagos Central; Alimosho and Agege LGA in Lagos West)

Stage 3: One ward was then selected in each of the ten wards in Eti- Osa and Apapa LGAs and from the 11 wards in Alimosho and Agege LGAs by balloting; namely Ikoyi 2 from Eti Osa LGA, Ijora Oloye ward from Apapa LGA, Shasha/Akowonjo ward from Alimosho LGA and Agbotikuyo/Dopemu ward from Agege LGA.

Stage 4: Systematic random sampling was used to select houses from the 4 selected wards. The list of registered houses in the wards was obtained from the Local Government.

Stage 5: Sampling of one eligible female in each house chosen by balloting was then carried out until the minimum sample size was obtained.

3.6 Eligibility Criteria:

All consenting sexually active, non-pregnant,>15 years females with no previous diagnoses of cervical cancer, living in the selected area were eligible for inclusion into the study.

3.7 Data collection tools: Data was collected using an interviewer administered semi structured questionnaire developed for this purpose

Section A: Socio-demographic and background information included 9 questions covering age, educational level, occupation, marital status etc.

Section B: Explored respondents' knowledge of cervical cancer and had 15 questions.

Section C: Contained questions assessing preventive practices against cervical cancer.

Section D: Explored risk of cervical cancer. Seventeen questions, assessing Obstetrics and gynaecology history, family history, marital experience and smoking history.

Section E: findings on VIA and VILI

Visual Inspection with Acetic acid (VIA) and Visual Inspection with Lugol's iodine (VILI) of the cervix was also done and respondents were classified as having precancerous changes if they had both aceto-whitening on VIA and Yellowish changes on VILI.

The standard operating procedure (SOP) is as follows.

1. Respondent removes underwear and lies on her back on the couch
2. Put respondent in a lithotomy position to expose respondent private part

3. Focus light source to illuminate respondent private part
4. Insert a sterile disposable speculum into the private part of the respondent to view the os of the cervix.
5. When the cervical os is in focus with the light source also focussing on the cervical os, clean the os and the area around it with a sterile swab
6. Spray acetic acid around the os of the cervix.
7. Observe the area around the cervical os for changes after about 1 minute.
8. VIA is negative, if there are no changes around the cervical os.
9. If VIA is negative, the result is negative. Patient is then encouraged to continue to screen yearly
10. VIA is said to be positive, if there are acetowhitening changes around the cervical os after 1 minute.
11. If VIA is positive, leave the speculum in place.
12. spray the cervix with Lugol's iodine solution.
13. Inspect the cervix carefully, paying particular attention to areas that were acetowhitening on VIA
14. The result is positive if there is dense, bright, banana-yellow areas around the cervical os. The result is negative if there are no changes on VIA.
15. Take care not to spill the Lugol's iodine or get it on the patient's clothes (washes out).
16. After the examination, mop up excess iodine in the vagina with a dry cotton swab.

3.8 Data Management:

3.8.1 Data analysis

Data collected was checked for errors, cleaned, entered and analyzed using the EPI INFO 3.4.3. Qualitative variables were summarised as proportions and quantitative variables as means with

standard deviations. Data were presented as tables and charts as appropriate. Proportions of respondents with risk factors of cervical cancer, practices of its preventive measures, abnormal cervical finding and good knowledge of cervical cancer were derived.

In order to avoid empty cells and for the sake of analysis some of the demographic variables were regrouped as thus:

Table 3.1: Recoding scheme for study variables

Variable	Recoded variable
Age in years (Q 1)	< 20 years, 20-29 years, 30-39 years, 40-49 years, 50-59 years and >59 years
Highest level of education(Q5)	Below tertiary education – No formal education, primary education and secondary education Tertiary Education – tertiary education
Marital status (Q3)	Not currently married (respondents who were singles, cohabiting, separated, divorced and widowed) and currently married (respondents who were married)

Significance testing was done to assess association between outcome variables and predictors using the chi square test and confidence interval of prevalence odds ratio: A binary logistic regression model was fitted for precancerous cervical changes. Variables entered into the logistic model were those which had earlier been significantly associated on bivariate analysis at 10% significance, derived from literature as related to pre cancerouscervical changes or plausibly related to it. Predictors were determined at 5% significance.

3.9.2 Study Variables

The primary dependent variables was

- Precancerous cervical changes

The secondary dependent variables were

- Risk factors of cervical cancer
- Knowledge of cervical cancer
- Practices of preventive measures of cervical cancer

The independent variables included:

- Socio-demographic characteristics including age, educational attainment, marriage type, tribe
- Factors associated with practises of preventive measures
    - Availability of screening/immunisation services
    - Accessibility of screening services
- Factors associated with cervical findings

3.9.3 Operational definition of variables (using the NDHS definitions and standard definitions, and definitions from literatures)

- Early coitarche- This was defined as having first sexual intercourse before the age of 18 years
- Grandmultiparity- Respondents who reported parity of more than 5 were classified as thus
- Multiple sexual partner- Respondents were classified as having multiple sexual partners when they report number of lifetime partners of more than four
- Sexually transmitted Infection- Infection that presents with foul smelling and/or copious vaginal discharge OR a genital lesion (sore or growth)
- OCP use-This was defined as having used OCP for at least 1 year. OCP use was then categorised as currently use OCP/ not currently use OCP. Current OCP users are those

who have used OCP in the previous 3 months. Current OCP users were further categorised as currently use OCP every day or currently use OCP some day

- Smoking status- Ever smoked were respondents who have smoked at least 1 cigarette in their lifetime

  Current smoking status- currently smoke (having smoked at least 1 cigarette in the past 3 months)/ not currently smoke

  Current smoking pattern- every day/ some days
- Sexually active- Having experienced at least one sexual intercourse
- Multiple risks- was defined as having 3 or more defined risk factors
- Knowledge of cervical cancer- this was assessed by questions 10-19 of the questionnaire. Respondents were asked whether they had heard of cervical cancer, their sources of information and symptoms and risk factors of cervical cancer. Questions 12-19 were scored. respondents were scored as thus: right answer- 2, I don't know- 1, wrong answer-0. Total knowledge score was computed. Of a maximum score of 16 and minimum score of 0, respondents who scored 12 (i.e. 75% of maximum obtainable score) and above were classified as having "good knowledge" and respondents who scored 11 and below were classified as having "poor knowledge".

3.10 Pretesting and reliability of data collection instruments

The study instrument was pretested among 30 respondents in ward 3 of Mushin Local Government Area (LGA). No ambiguous questions were discovered. Administration of the questionnaires lasted 50 minutes.

3.11 Quality Control:

Research assistants were trained on data collection over 2 days. Four research assistants with at least Ordinary National Diplomas and prior experience in data collection were trained. Training covered administration of the instruments, techniques in creating a rapport with respondents and definitions of items as stated in the questionnaire. The field session following the training was pre testing as earlier described.

3.12 Ethical considerations:

Ethical approval was obtained at the Nigeria Institute of Medical Research Institutional Review Board

Consent: Approval was obtained from the local government. Informed consent was also obtained from respondents and respondents were informed that the positivity of VIA/VILI does not imply a cervical cancer diagnoses. All respondents with positive result were referred immediately to the Lagos State University Teaching Hospital for confirmation by colposcopy and biopsy.

Confidentiality: Data collected was kept confidential on a password protected computer. Names and addresses were not included in the data collection instrument and thus collected data cannot be linked with any person.

Beneficence: Women who were found to have pre-cancerous lesion were referred immediately to the Obstetrics and Gynaecology unit of the Lagos University Teaching Hospital. All services were provided free of charge. Participants were also given health education on the implication of risk behaviours associated with cervical cancer, measures to reduce the risk and benefits of screening.

CHAPTER FOUR

RESULTS

4.1: Socio demographic characteristics of respondents

A total of 350 eligible women were approached but 332 consented, giving a response rate of 95%. Of these 332 respondents, 80, 90, 82 and 80 were recruited from Apapa, Alimosho, Eti Osa and Agege LGAs, respectively. Respondents' socio demographic characteristics are shown in Table 4.1. Married women constituted more than half of the respondents, 227(68.6%). Only 59 (17.8%) were single, 23 (6.9%) were widowed while the rest were divorced or cohabiting. The mean age of the respondents was 39.4 ± 10 years. The five-number summary of the age distribution is: minimum age, 15; 25th percentile, 32; median age,39; 75th percentile, 46; maximum age,72; The age group 30-39 years had the highest proportion accounting for 35.3% of respondents. The majority of respondents were Christians, 289(87.8%). About 143(43.9%) had a tertiary education, 123 (37.7%) and 47(14.4%) had secondary and primary education respectively while the rest had no formal education. More than half of the respondents, 193(59%) were Yoruba, followed by Ibo, 16(18%) while the rest belonged to other tribes.

Table 4.1: Socio-demographic characteristics of respondents

Variables	Frequency	Percentage
Age groups in years (N= 326)		
≤ 19	5	1.5
20-29	49	14.8
30-39	115	34.6
40-49	101	30.1
50-59	42	12.7
≥ 60	14	4.2
Missing	6	1.8
Mean age of respondents	39.4±10.0	
Marital Status (N=331)		
Single	59	17.8
Cohabiting	5	1.5
Married	227	68.4
Separated	4	1.2
Divorced	13	3.9
Widowed	23	6.9
Missing	1	0.3
Highest level of educational attainment (N=326)		
No formal education	13	3.9
Primary	47	14.2
Secondary	123	37.0
Tertiary	143	43.1
Missing	6	1.8
Tribe (N=327)		
Yoruba	193	58.1
Ibo	59	17.7
Hausa	16	4.8
Others	59	17.7
Missing	5	1.5

4.2 Knowledge of cervical cancer

Of the 332 respondents, only 135(41.9%) were aware of cervical cancer, and of those, only about one third (38; 28.0%) had a good knowledge of the disease.

4.2.1 Sources of Information on cervical cancer

In figure 4.1, radio was the most mentioned source of information on cervical cancer 89 (65.9%), this was followed by health workers (33; 24.4%). The least mentioned was those with the disease 4 (3.0 %).

Figure 4.1: Sources of information on cervical cancer

*Multiple response for sources of information

4.2.2 Association between knowledge of cervical cancer and socio-demographic characteristics of respondents

In Table 4.2, Bivariate analysis was done to determine the association between knowledge of cervical cancer and socio-demographic characteristics of respondents. A higher proportion of respondents with tertiary education had a good knowledge of cervical cancer compared with those with below tertiary education [33(41.8%) vs. 5(14.7%); P=0.01] [those with below tertiary education were less likely to have good knowledge compared with those with tertiary education (POR=0.24; CI- 0.08-0.68)]. A lower proportion of those that were below 40 years had a good knowledge of cervical cancer compared with those that were 40 years and above [21(27.7%) vs. 17(43.6%); P= 0.012]. although this difference was not significant. No significant association was also found between tribe and marital status of respondents and knowledge of cervical cancer (p= 0.15 and 0.86, respectively)

Table 4.2: Association between knowledge of cervical cancer and socio-demographic characteristics of respondents

VARIABLE	Knowledge (N=135) Good n(%)	Poor n(%)	Prevalence odds (POR) (Confidence interval)	P value
Educational level				
Below tertiary education	5(14.7%)	36(85.3%)	0.24 (0.08-0.68)	
Tertiary education	33(41.8%)	61(58.2%)	Ref	0.01
Age group				
< 40 years	21(27.3%)	69(72.3%)	0.40 (0.22-1.09)	
≥ 40 years	17(43.6%)	28(57.4%)	Ref	0.12
Marital status				
Currently married	30(37.0%)	63(63.0%)	2.13 (0.86-5.26)	
Not currently married	8(21.6%)	34(78.4%)	Ref	0.15
Tribe				
Yoruba	21(32.3%)	54(67.7%)	0.98 (0.46- 2.15)	
Others	17(32.1%)	43(67.9%)	Ref	0.86

4.3 Preventive measures for cervical cancer

4.3.1 Awareness of preventive measures for cervical cancer

When the prevalence of those who were aware of any preventive measure for cervical cancer was assessed, less than half 62 (47.0%) of these 135 who were aware of cervical cancer knew of any preventive measure.

4.3.2 Distribution of respondents by type of cervical cancer preventive measures known

As seen in Table 4.3, about two third of those who were aware of any preventive measure (41; 66.1%) had ever heard of pap smear, 21 (33.9%) of VIA/VILI but none (0%) had ever heard of Human papilloma virus (HPV) DNA screening and HPV vaccine.

Table 4.3: Distribution of respondents by type of cervical cancer preventive measures known

Preventive measures	Frequency n	Percentage (%)
Pap smear	41	66.1
VIA/VILI screening	21	33.9
HPV DNA screening	0	0
HPV vaccine	0	0
Total	62	100.0

4.3.3 Distribution of respondents by preventive measures uptake

Table 4.4 shows practises of preventive measures for cervical cancer. Of the 11 who had ever had any preventive measure for cervical cancer done, four (36.4%) and seven (63.6%) had pap smear and VIA/VILI done in their lifetime, respectively. None had ever had HPV vaccine and HPV DNA screening.

Table 4.4: Distribution of respondents by preventive measures uptake

Variables	Frequency n	Percentage %
VIA/VILI	7	63.6
Pap Smear	4	36.4
HPV vaccine	0	0
HPV DNA	0	0
Total	11	100.0

4.3.4 Availability and accessibility of screening services

Of the 62, who were aware of screening for cervical cancer, only 18 (29%), had such facility close to where they live or work.

Furthermore Figure 4.2 shows that of these 18, 10 (55%) have the service at about 30 min driving distance, 6(30%) have it at ≥ 30min driving distance and only 2(15%) have it within a walking distance.

Figure 4.2: Accessibility of screening services

4.3.5 Association between knowledge of cervical cancer and uptake of cervical cancer screening

Table 4.5 shows the association between the knowledge of cervical cancer and uptake of cervical cancer screening. A significantly higher proportion of those with a good knowledge (9; 40.9%) of cervical cancer compared with those with poor knowledge (2; 2.3%) had had at least one screening either by Pap smear or VIA/VILI done in their lifetime (p=<0.001). Those with good knowledge of the disease were more likely to take up cervical cancer screening.

Table 4.5: Association between knowledge of cervical cancer and uptake of cervical cancer screening

	Ever screened by Pah smear OR VIA/VILI				
	Yes n(%)	No n(%)	Total		
wledge grade				Prevalence odds (POR) (Confidence interval)	P value
Good	9(40.9%)	12(59.1%)	21	29.08 (3.4-251.5)	<0.001
Poor	2(2.3%)	39(97.7%)	41	Ref	(fishers exact)
Total	11	51	62		

4.3.6 Association between availability of a screening facility and utilization of cervical cancer screening

In Table 4.6, bivariate analysis was done to explore the association between availability of a screening facility and utilization of cervical cancer screening.

This exploration found a non significant increased proportion of those who have the facility available taking up screening.

Table 4.6 Association between availability of a screening facility and utilization of cervical cancer screening

	Ever screened by Pap smear OR VIA/VILI				
	n(%)	n(%)	Total	Prevalence odds (POR) (Confidence interval)	P value
Availability of screening facility					
	Yes	No			
Yes	3(17.6%)	13(82.4%)	16	1.8 (0.38-8.51)	
No	5(10.6%)	41(89.4%)	46	Ref	0.36
Total	8	54	62		

4.3.7 Reported reasons for not previously screening for cervical cancer

In Table 4.7, most of the reasons given for never to have been screened for cervical cancer were because of the belief that screening is not important (15; 31.3%) and non availability of screening facility (15;31.3%). Other reasons included the belief of not been at risk of the disease, fear that screening will hurt and belief that screening is expensive.

Table 4.7: Reported reasons for not previously screening for cervical cancer

Reasons	Frequency	Percentage
"I dont think its important"	15	29.4
"No screening facility is available"	15	29.4
"because I can't have cancer"	7	13.7
"Screening is expensive "	7	13.7
"I am afraid it will hurt"	3	5.9
"Centre for screening is too far"	4	7.8
Total	51	100

Risk factors for cervical cancer

4.4: Prevalence of risk factors for cervical cancer among respondents

Table 4.8 shows the prevalence of risk factors among respondents. The prevalence of oral contraceptive use was highest with 44.3% reporting use, followed by previous STI, 24.1%.This was followed by early coitarche with 20.8%. Multiple sexual partnering (i.e. no of Life time partners >4) and grandmultiparity (i.e. parity of >5) accounted for 14.6% and 13.4%, respectively. In addition to the individual risk factors, the prevalence of multiple (3 or more) risk factors was 10.2%

Table 4.8: Prevalence of risk factors for cervical cancer among respondents (N=332)

Variables	Frequency n	Percentage %
Oral contraceptive	140	44.3
Previous STI	76	24.1
Early coitarche	67	20.2
Multiple sexual partners	45	14.6
Grandmultiparity	36	13.4
Multiple risk factors	34	10.2
Smoking	4	1.3

*Multiple response for the risk factors

4.5 Age specific prevalence of risk factors for cervical cancer

Table 4.9 shows the age specific prevalence of risk factors for cervical cancer. When the risk factors for cervical cancer was assessed for each age group, a higher proportion of those with history of previous STI, early coitarche, and multiple sexual partners were found in the <40 years age group, although only previous history of STI was found to be significant ($p=0.011$). On the other hand, only grandmultiparity and smoking were higher in the ≥ 40 years age group.

Table 4.9: Age specific prevalence of risk factors for cervical cancer

Variable	Age group in years (N=326) <40 YEARS (N=169) n (%)	≥40 YEARS (N=157) n(%)	χ^2	p
Oral contraceptive use	70(41.4%)	68(43.3%)	0.05	0.820
Previous STI	48(28.4%)	25(15.9%)	6.59	0.011
Early coitarche	37(29%)	29(18.5%)	0.40	0.532
Multiple sex partner	28(16.6%)	16(10.2%)	2.3	0.130
Grandmultipurity	14(8.3%)	22(14%)	2.17	0.141
Smoking	1(0.6%)	3(1.9%)	Fisher exact	0.280
Multiple risk factors	32(12.4%)	2(7.6%)	1.55	0.211

4.6 Association between educational level of respondents and risk factors for cervical cancer on bivariate analysis

Table 4.10 shows the association between the risk factors of cervical cancer and educational level of respondents. There was a significant relationship between educational level and parity and age of first sexual intercourse. Respondents with below tertiary education were four times more likely to be grandmultiparous ($p<0.001$) and four times more likely to experience early sexual debut ($p<0.001$).

Table 4.10: Association between educational level of respondents and the risk factors for cervical cancer on bivariate analysis

Risk factors	Educational level: Below tertiary n(%)	Tertiary n(%)	Prevalence odds	P-value
Grandmultiparity				
Yes	30 (18.5%)	6 (5.6%)	3.83	<0.001
No	132 (81.5%)	101(94.4%)	Ref	
Multiple sexual partners				
Yes	28(14.8%)	17 (11.9%)	1.29	0.540
No	161(85.2%)	126 (88.1%)	Ref	
Early coitarche				
Yes	53(28.0%)	14(9.8%)	3.60	<0.001
No	136(72.0%)	129 (90.2%)	Ref	
Oral Contraceptive				
Yes	71(37.6%)	69(49.2%)	0.65	0.071
No	118(62.4%)	74 (51.8%)	Ref	
Smoke				
Yes	1(0.5%)	3(2.0%)	0.25	0.430
No	188(99.5%)	140(98.0%)	Ref	
Previous STI				
Yes	38(20.1%)	38(26.6%)	0.69	0.211
No	151(79.9%)	105(73.4%)	Ref	
Multiple risks				
Yes	10(9.7%)	2(3.7%)	1.66	
No	93(90.3%)	52(96.3%)	Ref	0.252

Findings on VIA and VILI

4.7 Prevalence of pre cancerous changes

Figure 4.3 shows the prevalence of precancerous changes on both VIA and VILI. A total of 52 respondents were positive on VIA. when VILI was done on this 52 women, only 43 remained positive on VILI (i.e. positive on both VIA and VILI), making the overall prevalence of precancerous findings to be 13.0%.

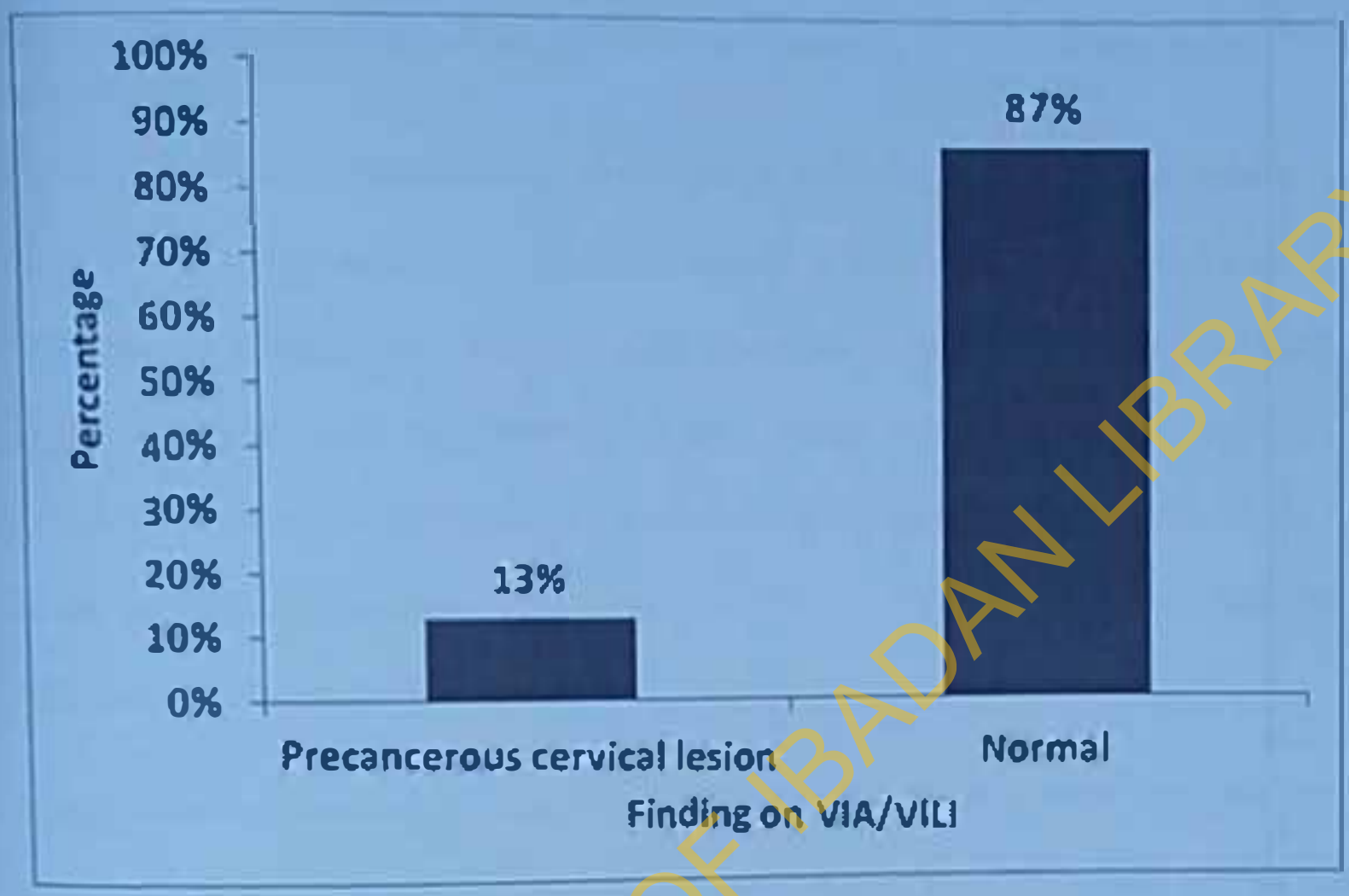

Figure 4.3: Prevalence of precancerous cervical changes

4.7.1 Specific prevalence of pre cancerous cervical changes by socio-demographic characteristics

As seen in Table 4.11, the prevalence of pre cancerous findings of the two educational groups (below tertiary and tertiary) shows a higher proportion of those with below tertiary education 28 (14.8%) having precancerous cervical changes compared to those with a tertiary education 15 (10.5%), the difference in the proportion of the 2 groups was not statistically significant (p=0.204). The prevalence of precancerous lesion was slightly higher [23 (13.6%)] in those below the age of 40 years compared with ≥ 40 years [19 (12.1%)], the difference was also not statistically significant (p=0.680).

The prevalence of precancerous lesion was also found to be higher in those who were currently married and those of the other tribes when compared against the not currently married and the Yoruba tribe respectively.

Table 4.11 Specific prevalence of precancerous cervical changes by socio-demographic characteristics of respondents

VARIABLE	Prevalence of Precancerous lesions	Z test	p value
N=43	n(%)		
Educational level			
Tertiary	15(10.5%)	-1.271	0.204
Below tertiary	28(14.8%)		
Age group			
< 40 years	23(13.6%)	0.406	0.680
≥ 40years	19(12.1%)		
Marital status			
Currently married	25(11.1%)	-1.581	0.114
Not currently married	18(17.3%)		
Tribe			
Yoruba	24(12.4%)	1.475	0.142
Others	19(14.2%)		

4.8 Factors associated with pre cancerous cervical changes

Table 4.12 shows association between risk factors of cervical cancer and pre cancerous finding on VIA and VILI. A significantly (p=0.00) higher proportion of those who experienced early coitarche 30(44.8%) had precancerous cervical changes compared to those who had delayed coitarche 13(4.9%). Those who reported grandmultiparity were more likely to have precancerous lesions than those who did not [33.3% vs. 10.6%; p=0.001].

Respondents with history of OCP use 22 (15.7%) were found to have a higher proportion of precancerous cervical changes than respondents with no history of OCP use 21(10.9%), although this was not significant. Significantly higher proportion of those with multiple sexual partners 25(55.6%) had precancerous cervical changes compared to those without multiple sexual partners (18(16.3%), p=0.000

Having a previous history of STI was found to be protective of precancerous cervical changes (POR=0.74), this association however, was not significant(CI 0.33-1.68, P=0.601). Those with multiple risks were more likely to have precancerous cervical changes (POR=14.50, CI=6.53-32.03).

Also, the mean age of coitarche in those with precancerous cervical changes (16.3 years) was found to be significantly lower compared with those with no precancerous cervical changes (21.1 years) p<0.001.

Table 4.12: Factors associated with precancerous cervical changes

Variable	Pre cancerous cervical changes Yes n(%)	No n(%)	prevalence odds ratio (confidence interval)	p value
Early Coitarche				
Yes	30(44.8%	37(55.2%)	15.72 (7.52-32.83)	<0.001
No	13(4.9%)	252(95.1%)	Ref	
Grandmultiparity				
Yes	12(33.3%)	24(66.7%)	4.27 (1.95-9.39)	0.001
No	31(10.5%)	265(89.5%)	Ref	
OCP use				
Yes	22(15.7%)	118(84.3%)	1.52 (0.80-2.88)	0.28
No	21(10.9%)	171(89.1%)	Ref	
Multiple sexual partners				
Yes	25(55.6%)	20(44.4%)	18.68 (8.76-39.84)	<0.001
No	18(6.3%)	269(93.7%)	Ref	
Previous STI				
Yes	8(10.5%)	68(89.5%)	0.74(0.33-1.68)	0.601
No	35(13.7%)	221(86.3%)	Ref	
Smoking				
Yes	0(0%)	4(100%)	0	Undefined
No	35(13.7%)	221(86.3%)		
Multiple risks				
Yes	19(55.9%)	15(44.1%)	14.46 (6.53-32.03)	<0.001
No	24(8.1%)	274(91.9%)	Ref	
Mean age of coitarche	16.3 years	21.1 years	*6.99	**<0.001

*value of T statistics

**P value based on t statistics

4.8.1 Predictors of precancerous cervical changes

Table 4.13 shows the predictors of precancerous cervical changes on logistic regression. After the bivariate analysis was done, the factors that were significantly associated with precancerous cervical changes at $p > 0.05$ were entered into the logistic regression model. After building a model, coitarche and multiple sexual partners were found to be independent risk factors for cervical cancer. Those who experienced an early coitarche were 8 times more likely to have precancerous cervical changes and those with multiple sexual partners were 10 times more likely than those without.

Table 4.13: Predictors of precancerous cervical changes

Variables	Adjusted Odds ratio	95% Confidence interval	p value
Grandmultiparity	1.67	0.57-4.85	0.35
Early coitarche	7.93	3.20-19.6	0.00
Multiple sexual partners	9.69	3.29-28.50	0.00
Multiple risk factors	0.67	0.18-2.54	0.55

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 DISCUSSION

This community based cross sectional study assessed the prevalence of risk factors for cervical cancer, prevalence of precancerous cervical changes using VIA/VILI, knowledge of cervical cancer, practices of its preventive measures and the factors associated with precancerous cervical cancer lesions.

Of the 350 respondents recruited for this study, about 332 responded, giving a response rate of 94.8%. This high response rate is similar to the high response rate obtained in the study by Wong et al (2013) in Malaysia. Similarly with this study, Ajayi and Adewole reported a response rate of 100% in their clinic based study in Ibadan, in 1998. Comparatively, Mutyaba,Mimiro and Weiderpass in 2006 also reported a response rate of 92% in their study in Uganda.

The mean age of respondents in this study is similar to the mean age of respondents in other studies. A mean age of 38.96 years was reported by Liang et al (2013) in China. Thomas et al (2012) also reported respondents mean age of 39.8 years in a similar population based study in Ibadan. The mean age of first sexual intercourse in this study is similar to the mean age of first sexual intercourse of urban residents in Nigeria as reported in the National Demographic and Health Survey (NDHS 2008) although this was lower to the mean age of coitarche in a study in South Africa by Fonn et al

Married women constituted more than half of the respondents which is not surprising because the study included only sexually active women and the married ones are more likely to be sexually active than the unmarried women. In the same vein, Kahesa et al (2012) and Wong et al (2013) reported same pattern in their study in Tanzania and Malaysia respectively.

In this study, most respondents had either at least a secondary education and this may be adduced to the fact that this study was conducted in an urban setting and a similar result was reported by the NDHS 2008.

This study revealed the prevalence of risk factors for cervical cancer within the study population. The most prevalent risk factors were oral contraceptive use, previous STI, early coitarche and multiparity. This finding is comparable with the findings of other studies. (Durowade et al, 2012, Oguntayo et al 2011 , Kahesa et al 2012).

Various studies have shown association between grandmultiparity and cervical cancer/ precancerous cervical changes, however, the association between cervical cancer ond grandmultiparity was not significant .

The finding of this study about the non significant association between Grandmultiparity and the occurrence of precancerous cervical changes is in contrast to other studies. Bayo et al (2002) in his study in Mali reported an increased risk for parity greater than 10. He found high parity to be one of the main co factors for cervical cancer in population prevalent with HPV infection.

In a similar study among Rwandan women by Kahesa et al (2011), parity ≥7was associated with the occurrence of CIN.

Adewuyi (2008) found an average of 6.8 live births per cervical cancer patient in Nigeria. Also in another study in Ibadan, Thomas et al (2012) found significant host-related factors in those with invasive cancer to include high parity among others.

In another study, that examined the risk of cervical cancer in a Finnish cohort of grand multiparous women (at least five children), an increased risk attributable to grand multiparity was found (Hinkula et al 2004).

The finding of this study is consistent with that of Emembolu (1988) in Zaria who found the parity of respondents not to be of significance in the development of cervical cancer.

Also, Ogunbowale (2008) reported women with lower parity (0-3) having borderline significantly increased risk of having a positive VIA

As previously documented in literature and other studies, early coitarche was found by this study to be a significant factor in the development of precancerous cervical changes. Durowade et al in his study in Ilorin [although with the use of another method of screening (Pap smear)] identified the risk factors for cervical cancer to include coitarche among other factors. A similar result was seen in a case control study in Thailand by Natphopsuk et al in 2012 where early age at first sexual exposure, and multiple sexual partners increased the risk of cervical cancer . This study in Thailand also further explored the interval between menarche and coitarche and found a significant increase in the risk for cervical cancer in the interval between menarche and coitache <6 years compared to interval ≥6 years.

In consonance with the findings of this study, Peter in 1986 reported in his study a 3 times risk of cervical cancer in those who attain coitarche between the ages of 16-19 years compared with those who attain coitarche after 19 years this is explained by the postulation that during the time of menarche in early reproductive life, the transformation zone of thecervix is more susceptible to oncogenic agents, such as HPV. Women who begin sexual activity early in life are at particularly high risk of developing invasive cervical carcinoma (Morrow et al, 1998). Although our study found much higher odd of precancerous lesions with early coitarche, this may be due to the screening technique used in this study to assess precancerous lesions which has a high false positivity with other lesions in the cervix such as STIs, inflammation etc. which are also related to early coitarche.

Our study also showed the mean age of coitarche in those with precancerous findings to be significantly lower in those without pre cancerous cervical lesions.

In this study, multiple sexual partners was found to be predictive of precancerous lesions and comparably with this study. Hinkula et al (2004) found number of sexual partners (especially

before age 20) to be strongly predictive of risk for 10 or more partners compared with no partners.

Also, a case-control study in four Latin American countries assessing risk factors for different histologic types of invasive cervical cancer observed same and found a high risk associated with multiple sexual partners (Brinton et al, 1993)

Furthermore, another study observed a pronounced effect of multiple sexual partners, with those reporting 10 or more partners being at a significant threefold excess risk. (Brinton et al, 1987)

In a matched case control study in America, a heavy excess of multiple coital mates was shown for cervical cancer compared to controls. Further, risk rises as there are more marital and/or sexual mates. Multiple coital mates increase the probability of contact with a mate who may contribute a contaminant or initiating agent. (Rorkin,1967)

The prevalence of OCP found in the study is high. This is at variance with the prevalence reported by NDHS 2008 of 1.6%. This may however be due to the fact that our study explored "ever used" OCP for at least 1 year while the data for NDHS explored current OCP use status only. There was no significant difference in the OCP use pattern between the different educational levels and age groups (tertiary and below tertiary educational level: <40 years and ≥ years age group). This means that OCP use is a common practice among women in this study population irrespective of their different characteristics.

However, on bivariate analysis OCP use was found not to be associated with the occurrence of pre cancerous cervical lesion and similar to our finding, a Costa Rican study by Irwin et al (1988) found no increase in risk of invasive cervical cancer in OCP users although a slight increase in risk of carcinoma in situ was found, and on further analysis, the study found this risk to be associated with recently used oral contraceptive but this was adduced to detection bias. Data from other part of the world conflicts with ours such as that of Victor Moreno and colleagues who reported a relative risk of 4.03 for cervical cancer in women who tested positive

for cervical infection with HPV and had used oral contraceptives for 10 years or longer compared with HPV-seropositive women who had never used them. Similarly, a case control study by Brinton et al (1990) in four South American countries that enabled an evaluation of cervical cancer risk in relation to OCP, reported an overall use that was associated with a 21% non significant elevation in risk, this South America study provides result that support an adverse effect of OCP on cervical cancer risk, ahhough possibly limited only to a subpopulation of cases.

The high prevalence of OCP use in this study population and the association of OCP use with precancerous changes in the cervix (from other studies) brings concern about the aggressive marketing and advertisement of OCP use for women of child bearing age for family planning. Policy on family planning should be reviewed to reserve OCP as the last resort for family planning when all other methods have failed or not suitable.

About a third of the respondents in this study reported a previous history of STI which is much higher than the prevalence reported by the 2008 NDHS which ranged from 1.8%- 2%. This is probably because of the self reported nature of this finding which may give an inaccurate result and also, the NDHS data reported the prevalence of STI in the past 12 months while our study explored the occurrence of STI ever in the respondents' life.

From this study, STI was found to significantly occur more in the <40 years compared with the ≥40 years, this result is also similar to the finding of the 2008 NDHS which reported different pattern of STI occurrence in both age groups.

However, on bivariate analysis, there was no significant difference in the occurrence of precancerous lesions in those reported STI and those without. This may be due to the self reported nature of the variable in this study, because a lot of other infections commonly seen in female e.g candidiasis are often reported by women in this environment as STI thereby causing a non differential misclassification bias and moving the hypothesis towards the null.

The findings of our study is however in disagreement with that of other studies, such as the study by Slattery and colleagues which found among the factors identified as altering the risk for cervical cancer, after the adjustment for age, education, church attendance and cigarette smoking was reported Trichomonas infection.

Similarly and still contrary to our finding, the data in the publication of Heral (1974) in Lancet suggest that exposure to sexually transmitted infection is an important determinant of cervical cancer.

This study found a prevalence of those who had heard of cervical cancer to be almost half of the respondents, this prevalence is much higher than 15% prevalence reported by Ajayi and Adewole in 1998. This higher prevalence reported by this study may be due to improvement in awareness of the disease over the years.

Similarly with our study where media was the main source of information for those who had heard of the disease, Ajayi and Adewole (1998) also reported same as the main source of information.

Our study found most of the people who had heard of cervical cancer to have a poor knowledge of the disease which is similar to the finding of Ajayi and Adewole (1998).

In a study of prospective cohort of English-speaking patients ≥18 years (n = 529) in ambulatory women's clinics, literacy was the only factor independently associated with knowledge related to cervical cancer (Lindau et al, 2002) our study also found a similar trend where those with below tertiary education were 4 times less likely to have good knowledge compared with those with tertiary education.

This study also found a non significant higher proportion of good knowledge of cervical cancer in the ≥40 years age group compared with <40 years which is at variance with the finding of Ramirez et al that reported Knowledge as being significantly related to age.

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This study also found a non significant higher proportion of good knowledge of cervical cancer in the ≥40 years age group compared with <40 years which is at variance with the finding of Ramirez et al that reported Knowledge as being significantly related to age.

The prevalence of those who were aware of any screening method for cervical cancer was very low in our study (18% of the total respondents sampled and 47% of those who had heard of cervical cancer). This finding is at variance with the report of a study among medical workers in Uganda that reported 83%.

In this study, it was observed that only 3.3% of the sampled women had ever had screening for cervical cancer either Pap smear or VIA/VILI. Similarly other studies done in Nigeria, have also documented the utilisation of cervical cancer screening service among women to vary between 0.3% to 8.5% (Aboyeji, 2004; Ayinde, 1998; Daramola, 2001; Onajole *et al*, 2004 Roberts *et al* 2004). In a similar population based study done among women of Vietnam origin in seattle,USA, 68%(2/3) had had screening by pap smear done in the past 3 years, while in another African study done in Uganda, a higher prevalence of 19% was also reported (Mulyaba and colleagues 2006). McFarland in 2003, in his study in a similar setting in Botswana reported a much higher prevalence of 60% women that had cervical cancer screening done. Wellensick (2002) reported a prevalence of 36.7% among South African women. Twin in 2002 also reported a higher prevalence of 57% among Hong Kong Chinese women.

This findings show that the utilisation of cervical cancer screening among Nigerian women is generally poor compared to their counterparts in other parts of the world. This may be attributable to the low awareness of cervical cancer among them and poor knowledge of the disease even among those who were aware of the disease. And among those who were aware of the disease and its screening measures, our study found major barriers to screening to include limited access to facility and also believe about not been at risk of the disease, this is similar to the finding of McFarland. Fear of the test was also one of the reasons for not ever having had the test done, which is similar to the report of Nelson and Jones (1998)

5.2 Limitations

This study has a number of limitations.

1. Social desirability bias- some of the issues explored in this study were sensitive topics e.g. issues relating to sexual life. Respondents may have reported inaccurately on this sensitive topics in order to present themselves in the best possible light. To prevent the anonymity of respondents and to ensure honest responses, confidentiality was assured and maintained.
2. A potential bias in this study was recall. This might have been present as this is not unusual in self reported prevalence surveys. This study explored issues that majored on the long term memory of respondents.
3. Ascertainment bias- this might also be a possibility, because some of the risk factors were self reported and not validated by objective measures e.g history of previous STI. respondents might have given inaccurate answers. The operational definitions were used to limit this.
4. With the cross sectional design of this study, causal relationships among variables could not be drawn.
5. There is a general concern about VIA concerning differences in providers' skill, lack of standardized test definition and the underlying prevalence of STIs. The observed positivity of the VIA/VILI may be due to other factors other than the disease prevalence. This was limited by ensuring the VIA/VILI providers were well trained and agreement by at least 2 test providers about the positivity of a result.

5.3 Conclusion

The prevalence of the cervical cancer risk factors explored in this study was high. The factors associated with cervical cancer (multiple sexual partners and early coitarche) and the other prevalent factors were all modifiable factors, this possibly indicates that the burden of cervical cancer in the study area could be reduced by public health enlightenment to address this modifiable factors. This population based study has also shown a high prevalence of precancerous cervical changes, higher than what had been documented in other facility based studies done.

The results of this study have also indicated that examined women have poor knowledge about cervical cancer, screening measures and exhibit low utilization rates for cervical cancer screening. The low screening participation among the women studied may be due to their limited awareness and knowledge about cervical cancer and its screening examinations.

In conclusion, these findings have underscored the point that cervical cancer is a public health problem in the study population

5.4 Recommendations

1. There is need to initiate health education on cervical cancer targeting women with early coitache and multiple sexual partners
2. We also recommend that efforts to boost cervical cancer screening through improved understanding should be directed toward women with below tertiary education.
3. Based on the implications of the findings of women's poor knowledge and poor screening utilization, we recommend the need for the inclusion of culturally sensitive health promotion and intervention strategies in cervical cancer control.
4. Contrary to expectation, health workers were not the most mentioned source of information on cervical cancer in this study, so there is need for sensitisation of health workers at all levels of care about the importance of emphasising accurate information about cervical cancer and importance of screening to all female patients

REFERENCES

Abdul M. A., Shittu S.O., Randawa J. A. and Shehu, M. S. 2009. The Cervical Smear Pattern in Patients With Chronic Pelvic Inflammatory Disease. *Niger J Clin Pract.* 12, 289-293.

Abolchic P. N. and Shokar N. K. 2009. Cervical Cancer Screening Among College Students in Ghana: Knowledge and Health Beliefs. *Int J Gynecol Cancer*, 19, 412-416.

Abayeji PA, Ijaiya MA. Jimoh AA. Knowledge, attitude and practice of cervical smear as a screening procedure for cervical cancer in Ilorin, Nigeria. Tropical Journal of Obstetrics and Gynaecology 2004;21:114-117.

Acladious N., Sutton C., Mandel D., Hopkins K., Zaklama M. and Kitchener H. 2002. Persistent Human Papillomavirus Infection and Smoking Increase Risk of Failure of Cervical Intraepithelial Neoplasia. *International Journal of Cancer*, 98, 435-439.

Adadevoh S.W.K. 1991. Clinical Presentation of Cervical Carcinoma in Kumasi, Ghana Int. J. Gynaecol Obstet. 46: 333-334

Adewuyi S. A., Shittu S. O. and Rafindadi A. H. 2008. Sociodemographic and Clinicopathologic Characterization of Cervical Cancers in Northern Nigeria. *Eur J Gynaecol Oncol*, 29, 61-64.

Ajayi I. Adewole I. 1998. Knowledge and Attitude of General Outpatient Attendants in Nigeria to Cervical Cancer. *Cent Afr J Med.* Feb;44(2):41-43.

Akinjobi C. N., Ikechebelu J. I., Onunkwo I. and Onyiaorah I. V. 2008. Knowledge, Attitude and Practice of Screening for Cervical Cancer among Female Students of a Tertiary Institution in South Eastern Nigeria. *Niger J Clin Pract*, 11, 216-219.

Anastos K., Hoover D. R., Burk R. D., Cajigas A., Shi, Q., Singh D. K., Cohen M. H., Mutimura E., Sturgis C., Banziaf W. C. and Castle P. E. 2010. Risk Factors for Cervical Precancer and Cancer in HIV-Infected, HPV-Positive Rwandan Women. *Plos One*, 5, E13525.

Anicbue P. N. and Anicbue U. U. 2010. Awareness and Practice of Cervical Cancer Screening among Female Undergraduate Students in A Nigerian University. *J Cancer Educ.* 25, 106-108.

Anorlu R. 2008. Cervical Cancer: The Sub-Saharan African Perspective. *Reproductive Health Matters*. 16, 41-49

Appleby P., Beral V., Berrington De Gonzalez A., Colin D., Franceschi S., Goodhill A., Green J., Peto J., Plummer M. and Sweetland S. 2007. Cervical Cancer and Hormonal Contraceptives: Collaborative Reanalysis of Individual Data for 16,573 Women with Cervical Cancer and 35,509 Women without Cervical Cancer from 24 Epidemiological Studies. *Lancet*, 370, 1609-1621.

Audu BM, El-Nafaty AU, Khalil M and Otubu JA. Sexual attitudes and their relation to cervical intraepithelial neoplasia in Maiduguri, Nigeria. J Obstet Gynaecol. 1999 Jul;19(4):412-416.

Ayinde AE, Adewale IF, Babarinsa IA. Trends in cervical smear screening in Ibadan, Nigeria: A four year review. West Afr J Med 1998;19:25-30

Ayinde O. A., Omigbodun A. O. and Ilesanmi A. O. 2004. Awareness of Cervical Cancer, Papanicolaou's Smear and its Utilisation Among Female Undergraduates in Ibadan. *Afr J Reprod Health*, 8, 68-80.

Bayo S., Bosch F. X., De Sanjose S., Munoz, N., Combita A. L., Coursaget P., Diaz M., Dolo A., Van Den Brule A. J. and Meijer C. J. 2002. Risk Factors of Invasive Cancer in Mali. *Int J Epidemiol*, 31, 202-209.

Beral V. 1974. Cancer Of The Cervix: A Sexually Transmitted Infection? *The Lancet*, Volume 303, Issue 7865 Pg 1037- 1040

Brinton L.A., Reeves W.C., Brenes M.M., Herrero R., De Britton R.C., Gaitan E., Tenorio F., Garcia M. And Rawls W.E. 1990. Oral Contraceptive Use and Risk of Invasive Cervical Cancer. *International Journal of Epidemiology*, 19: 4-11.

Brinton L., Herrero R., Reeves W., De Britton R., Gaitan E., Tenorio F. 1993. Risk Factors for Cervical Cancer by Histology. *Gynecologic Oncology*, 51(3):301-306

Brinton L.A., Hamman R.F., Huggin G.R., Lehman H.F., Levine R.S., Matlin K., Fraumeni J.F. 1987. Sexual and Reproductive Risk Factors for Invasive Squamous Cell Cervical Cancer. *Jnci J Natl Cancer Inst (1987) 79 (1): 23-30.*

Cervical Cancer Action. 2012. Progress in Cervical Cancer Prevention: The CCA Report Card [online]. Available from http://www.cervicalcanceraction.org/pubs/CCA_ReportCard_low.pdf (Accessed March. 2014)

Chirenje, Z. M. 2005. HIV and Cancer of the Cervix. *Best Practice and Research in Clinical Obstetrics and Gynecology*, 19, 269-276.

Christian M. and Rose A. 2011. Knowledge of and Attitude toward Human Papillomavirus Infection and Vaccines among Female Nurses at a Tertiary Hospital in Nigeria. *International Journal of Women's Health*, 3, 313-317.

Clarke M. A., Gage J. C., Ajenifuja K. O., Wentzensen N. A., Adepiti A. C., Wacholder S., Burk R. D. and Schiffman M. 2011. A Population-Based Cross-Sectional Study of Age-Specific Risk Factors for High Risk Human Papillomavirus Prevalence in Rural Nigeria. *Infect Agent Cancer*, 6, 13.

Cooper D., Hoffman M., Carrara H., Rosenberg L., Kelly J., Stander I., Denny L., Williamson, A. L. and Shapiro, S. 2007. Determinants of Sexual Activity and Its Relation to Cervical Cancer Risk among South African Women. *BMC Public Health*. 7, 341.

Daramola A. A study of the awareness of screening procedure for carcinoma of the cervix (Pap smear) amongst health service users. Proceeding's of the 25[th] International Congress of the Medical Women's Association, 2001

Denny L. 2008. Prevention of Cervical Cancer. *Reproductive Health Matters*. 16, 18-31.

Denny L., Kuhn L., Pollack A. and Wright T. C., Jr. 2002. Direct Visual Inspection for Cervical Cancer Screening: An Analysis of Factors Influencing Test Performance. *Cancer*. 94, 1699-1707.

Dibaia P.J., Creasman W.T. 1993 Invasive Cervical Cancer in Clinical Gynaecology Oncology 4[th] Edition. Mosby Year Book, Boston 58-125

Dim C. C., Ezegwui H. U., Ikeme A. C., Nwagha U. I. and Onyedum C. C. 2011. Prevalence of Cervical Squamous Intraepithelial Lesions among HIV-Positive Women in Enugu, South Western Nigeria. *Journal Of Obstetrics And Gynaecology*. 31, 759-762

Dim C.C., Nwagha U. I., Ezegwu H. U. and Dim, N. R. 2009. The Need to Incorporate Routine Cervical Cancer Counselling and Screening in the Management of Women at the Outpatient Clinics in Nigeria. *Journal Of Obstetrics And Gynaecology*. 29(8), 754–756.

Durowade K., Osagbemi G., Salaudeen A., Musa O., Akande T., Babatunde O., Raji H., Okesina B., Fowowe A. & Ibrahim O. 2012. Prevalence and Risk Factors of Cervical Cancer among Women in an Urban Community of Kwara State, North Central Nigeria. *J prev med hyg*. 53, 85-88.

Ezechebelu J. O. and Ekwempu C. C. 1988. Carcinoma of the Cervix Uteri in Zaria: Etiological Factors. *Int J Gynaecol Obstet*. 26, 265-269.

Ezem B. U. 2007. Awareness And Uptake Of Cervical Cancer Screening in Owerri, South-Eastern Nigeria. *Annals Of African Medicine*. 6, 94-98.

Fayed L. 2008. Cervical Cancer Risk Factors: Who Is At Risk For Developing Cervical Cancer? About.Com Cervical Cancer [Online] Available From: Http://Cervicalcancer.About.Com/Od/Riskfactorsandprevention/A/Cervicalrisk.Htm

Fonn S., Bloch B., Mabina M., Carpenter S., Cronje H., Maise C., Bennun M., Toit G. D., De Jonge E. & Manana I. 2002. Prevalence of Pre-Cancerous Lesions and Cervical Cancer in South Africa-a Multicentre Study. *South African Medical Journal-Cape Town-Medical Association Of South Africa*. 92, 148-156.

Franceschi S. and Jaffe H. 2007. Cervical Cancer Screening of Women Living With HIV Infection: A Must in the Era of Antiretroviral Therapy. *Clin Infect Dis*. 45, 510-513.

Friday L. S. and Tanya B. N. 2012. Demographic, Knowledge, Attitudinal, and Accessibility Factors Associated with Uptake of Cervical Cancer Screening among Women in a Rural District of Tanzania: Three Public Policy Implications. *Bmc Public Health*. 12, 22.

Gage J. C., Ajenifuja K. O., Wentzensen N. A., Adepiti A. C., Eklund C., Reilly M., Hutchinson M., Wacholder S., Harford J., Soliman A. S., Burk R. D. and Schiffman M. 2012. The Age-Specific Prevalence of Human Papillomavirus and Risk of Cytologic Abnormalities in Rural Nigeria: Implications for Screen-and-Treat Strategies. *Int J Cancer*, 130, 2111-2117.

Gharoro E. P. and Ikeanyi E. N. 2006. An Appraisal of the Level of Awareness and Utilization of the Pap Smear as a Cervical Cancer Screening Test among Female Health Workers in a Tertiary Health Institution. *Int J Gynecol Cancer*, 16, 1063-1068.

Goldie S. J., Gaffikin L., Goldhaber-Fiebert J. D., Gordillo-Tobar, A., Levin. C., Mahe C., Wright T. C. and Alliance for Cervical Cancer Prevention Cost Working Group. 2005. Cost-Effectiveness of Cervical-Cancer Screening in Five Developing Countries. *N Engl J Med*, 353, 2158-2168.

Gulich A. E., Swerdlow A. J., Head J. and Marmot M. G. 1992. Cancer Mortality in African and Caribbean Migrants to England and Wales. *Br J Cancer*. 66, 9059 11.

Henderson L., Clements A. and Damery S. 2011. 'A False Sense of Security'? Understanding the Role of the HPV Vaccine on Future Cervical Screening Behaviour: A Qualitative Study of UK Parents and Girls of Vaccination Age. *J Med Screen* 18, 41-45.

Hinkula M., Pukkala E., Kyyronen P., Laukkanen P., Koskela P., Paavonen J., Lehtinen M., Kauppila A., 2004. A Population-Based Study on the Risk of Cervical Cancer and Cervical Intraepithelial Neoplasia among Grand Multiparous Women in Finland. *British Journal Of Cancer*. 90(5):1025-1029

Ho GY, Kadish AS and Burk RD, 1998. HPV 16 and cigarette smoking as risk factors for high-grade cervical intra-epithelial neoplasia. Int J Cancer 78 (3): 281-285

Hoque M., Ibekwe C. M. and Ntuli-Ngcobo B. 2009. Screening and Perceived Severity of Cervical Cancer among Women Attending Mahalapye District Hospital, Botswana. *Asian Pac J Cancer Prev*, 10, 1095-1100.

IARC GLOBOCAN. 2005. IARC Hnndbooks of Cancers Prevention. *Cervix Cancer Screening*. Lyon, France: International Agency Research on Cancer.

IARC GLOBOCAN. 2008. IARC Handbooks of Cancers Prevention. *Cervix Cancer Screening*. Lyon, France: International Agency Research on Cancer.

Ijaiya M. A., Aboyeji P.A., Buhari M.O. 2004. Cancer of the Cervix in Ilorin, Nigeria. WAJM. Vol 23 (4). 319-322

Iliyasu Z., Abubakar I. S., Aliyu M. H., and Galadanci H. S. 2010. Cervical Cancer Risk Perception and Predictors of Human Papillomavirus Vaccine Acceptance among Female University Students in Northern Nigeria. *Journal of Obstetrics and Gynaecology*. 30. 857-862.

Imaginis. 2012. Cervical Cancer - Risk Factors and Symptoms. http://www.imaginis.com/cervical-cancer-screening-prevention/cervical-cancer-risk-factors-and-symptoms-2. [Accessed. September 2012]

International Collaboration of Epidemiological Studies of Cervical Cancer. 2007. Comparison of Risk Factors for Invasive Squamous Cell Carcinoma and Adenocarcinoma of the Cervix: Collaborative Reanalysis of Individual Data On 8,097 Women with Squamous Cell Carcinoma and 1,374 Women with Adenocarcinoma from 12 Epidemiological Studies. *International Journal Of Cancer*, 120, 885-891.

Irwin K., Rosero- Bixby L., Oberle M., Lee N., Whatley., Fortney J., Bonhomme M. 1988 Oral Contraceptive and Cervical Cancer Risk in Costa Rica. Detection Bias or Causal Association *Jama*, Volume 259, No 1

Janicek M. and Averette H. 2008. Cervical Cancer: Prevention, Diagnosis, and Therapeutics. *Ca: A Cancer Journal for Clinicians*, 51, 92-114.

Kahesa C., Kjaer S. K., Ngoma T., Mwaiselage J., Dartell M., Iftner T. & Rasch V. 2012. Risk Factors for VIA Positivity and Determinants of Screening Attendances in Dar Es Salaam, Tanzania. *BMC public health*, 12, 1055.

Kirkwood B. Essentials of Medical Statistics: Blackwell scientific Publications; 1998.

Kleinman JC, Kopstein A: Who is being screened for cervical cancer? Am J Public Health 71 (1): 73-6, 1981

Kolawole A. 2008. *Cervical Cancer and its Control in Nigeria: Challenges and the Way Forward*. MPH, Vrije Universiteit/Free University Of Amsterdam (Vu), Amsterdam, the Netherlands.

Lagos Forum (That Lagos Might Excel). 2010. [Online]. Available At: www.Ekoonibaje.Com. [Accessed February 2013]

Lagos State Government.2013 [Online]. Available: www.Lagosstate.Gov.Ng. [Accessed February 2013]

Lagos State Government. 2014 [Online]. Directorate of Medical Services. Available:www.lagosstate.gov.ng/pagemenus.php. [Accessed March 2014]

LAWMA. No date.[Online] Statistics of Healthcare Facilities in Lagos State . Available: www.lawma.gov.ng/DataBank/LAWMAMedicalWasteManagementUnit. [Accessed March 2014]

Lindau S., Tomori C., Lyons L., Langseth L., Bennett C., Garcia P.,2002 The Association Of Health Literacy with Cervical Cancer Prevention Knowledge and Health Behaviors in a Multiethnic Cohort of Women. *American Journal of Obstetrics and Gynecology*. Volume 186, Issue 5 Pages 938–943

Lofters A. K., Moineddin R., Hwang S. W. and Glazier R. H. 2011. Predictors of Low Cervical Cancer Screening among Immigrant Women in Ontario, Canada. *BMC Womens Health* 11, 20.

Mayaud P., Gill D. K., Weiss H. A., Uledi E., Kopwe L., Todd J., Ka-Gina G., Grosskurth H., Hayes R. J., Mabey D. C. and Lacey C. J. 2001. The Interrelation Of HIV, Cervical Human Papillomavirus, and Neoplasia among Antenatal Clinic Attenders in Tanzania. *Sex Transm Infect*. 77, 248-254.

Mbaror J. O., Umeora O. U. and Egwuatu V. E. 2011. Cervical Cytology Profile of Infertility Patients in Abakaliki, South-Eastern Nigeria. *J Obstet Gynaecol*, 31, 173-177.

Mccarey C., Pirek D., Tebeu P. M., Boulvain M., Doh A. S. and Peltignat P. 2011. Awareness of HPV and Cervical Cancer Prevention among Cameroonian Healthcare Workers. *BMC Womens Health*, 11, 45.

Mcfarland, D 2003. Cervical Cancer and Pap Smear Screening in Botswana: Knowledge and Perceptions. *International Nursing Review, 50: 167–175*

Menczer. J. 2011. Cervical Neoplasia in Israeli Jewish Women: Characteristics in a Low Risk Population. *Isr Med Assoc J*, 13, 700-701.

Menendez C., Castellsague X., Renom M., Sacarlal J., Quinto L., Lloveras B., Klaustermeier J., Kornegay J. R., Sigauque B., Bosch, F. X. and Alonso, P. L. 2010.

Micheal J.T., John O. D., Melissa M.C., Ahmedin J. and Elizabeth M.W. 2010. The global burden of cancer: priorities for prevention. *Carcinogenesis, Volume 3, Issue 1, 100-110*

Moreno V, Bosch F. X., Munoz N., 2002. Effect of Oral Contraceptives on Risk of Cervical Cancer in Women with Human Papillomavirus infection: The IARC Multicentric Case-Control Study. Lancet; 359: 1085-1092.

Morrow C. P., Curtin J.P, Townsend D.E., (Eds). 1998. Synopsis of Gynecologic Oncology, 5th Ed. New York, Churchill Livingstone.:

Molli P. G., Dallabetta G. A., Daniel R. W., Canner J. K., Chiphangwi J. D., Liomba G. N., Yang L. and Shah K. V. 1996. Cervical Abnormalities, Human Papillomavirus, and Human Immunodeficiency Virus Infections in Women in Malawi. *J Infect Dis*, 173, 714-717.

Mutyaba T., Mmiro F. A. and Weiderpass, E. 2006. Knowledge, Attitudes and Practices on Cervical Cancer Screening Among the Medical Workers of Mulago Hospital, Uganda. *Bmc Med Educ*, 6, 13.

Mwanahamuntu M., Sahasrabuddhe V., Stringer, J. and Parham G. 2008. Integrating Cervical Cancer Prevention in HIV/AIDS Treatment and Care Programmes. *Bulletin Of The World Health Organization* [Online], 86. Available: http://www.who.int/bulletin/volumes/86/8/08-056275/en/index.html [Accessed June 2012].

Nalphopsuk S., Settheetham-Ishida W., Sinawat S., Pientong C., Yuenyao P. & Ishida T. 2012. Risk Factors for Cervical Cancer in Northeastern Thailand: Detailed Analyses Of Sexual and Smoking Behavior. *Asian Pac J Cancer Prev*, 13, 5489-5495

National Cancer Institute. 2012. Cervical Cancer Prevention. Available at http://www.cancer.gov/cancertopics/pdq/prevention/cervical/HealthProfessional/ [Accessed, June 2012]

National Population Commission. 2008. Nigeria Demographic and Health Survey. Nigeria.

Nelson, A. and Jones, R. 1998. Women's Lay Knowledge of Cervical Cancer/Cervical Screening: Accounting for Non-Attendance at Cervical Screening Clinics. *Journal of Advanced Nursing*. 28: 571-575.

Nish M., Ben Ahmed, S. and Marzouki M. 1994. Cancer of the Breast and Uterine Cervix: Knowledge Level and Preventive Practices in a Segment of the Tunisian Population. *Sante*, 4, 299-302.

Nwogu C. E., Ezeome E. E., Mahoney M., Okoye I. and Michalek A. M. 2010. Regional Cancer Control in South-Eastern Nigeria: A Proposal Emanating from a UICC-Sponsored Workshop. *West Afr J Med*. 29, 408-411.

Odida M., Sandin S., Mirembe F., Kleter B., Quint W. and Welderpass E. 2011. HPV Types, HIV and Invasive Cervical Carcinoma Risk in Kampala, Uganda: A Case-Control Study. *Infect Agent Cancer*. 6, 8.

Odunuga T., Balogun V. And Ojo, K. 1999. (Ed) Lagos State In Maps. Rex Charles Publication, Ibadan, Pg 1-50

Ogunbowale T. and Lawoyin T. O. 2008. Cervical Cancer Risk Factors and Predictors of Cervical Dysplasia among Women in South-West Nigeria. *Aust J Rural Health* 16, 338-342.

Ogundipe S. and Obinna C. September 2010. Cervical Cancer: Every sexually active woman is at risk. *The Punch*

Ogunbiyo O., Zayyan M., Kolawole A., Adewuyi S., [illegible] H. & Kolodziej K. 2011. Cancer of the Cervix in Zaria, Northern Nigeria. *cancermedicalscience*. 5.

Ogunlola S. October 2011. Vaccination: Easy Way Out Of Cancer. *Nigerian Tribune*

Omar T., Schwarz S., Hanrahan C., Modisenyane T., Tsabangu N., Golub J. E., McIntyre J. A., Gray G. E., Mohapi L. and Martinson N. A. 2011. Progression and Regression of Premalignant Cervical Lesions in HIV-Infected Women from Soweto: A Prospective Cohort. *Aids*. 25, 87-94.

Onajole A.T., Ajetunobi A.O., Odeyemi K.A., et al. The socio-demographic characteristics and level of awareness of prevention of cancer of the cervix among commercial sex workers in Lagos, Nigeria. Nigerian Medical Practitioner 2004;45:52-55

P. R. B. 2004. Preventing Cervical Cancer Worldwide

Parkin D. M., Bray F., Ferlay J. and Pisani P. 2001b. Estimating the World Cancer Burden: Globocan 2000. *International Journal Of Cancer*. 94, 153-156.

Parkin D. M., Vizcaino A. P., Skinner M. E. and Ndhlovu A. 1994. Cancer Patterns and Risk Factors in the African Population of South-Western Zimbabwe, 1963-1977. *Cancer Epidemiol Biomarkers Prev*. 3, 537-47. P. R. B. 2004. Preventing Cervical Cancer Worldwide.

Parkin D.M., Pisani P. and Ferlay J. 1999. Estimate of Worldwide Incidence of 25 major Cancers in 1990. Int. J. Cancer. 80, 827-841.

Parkin D., Bray F. and Devesa S. 2001a. Cancer Burden in the Year 2000. The Global Picture. *European Journal Of Cancer*. 37, 553-566.

PATH. 2001. Cervical Cancer Prevention Fact Sheet [Online]. Available at http://www.path.org/files/cxca-factsheetVIA.pdf [Accessed March.2014]

Peters R.K., Thomas D., Hagen D. C.,: *J Natl Cancer Inst* 77:1063, 1986.Prevalence and Risk Factors of Sexually Transmitted Infections and Cervical Neoplasia in Women from a Rural Area of Southern Mozambique. *Infect Dis Obstet Gynecol*. 2010.

Ramirez A., Suarez L., Laufman L., Barroso C., And Chalela P., (*2000*) Hispanic Women's Breast and Cervical Cancer Knowledge, Attitudes, and Screening Behaviours. *American Journal of Health Promotion*: May/June 2000, Vol. 14, No 5, Pp 292-300

Reagaswamy S., Neerja B., Potti G., Partha B., Pulikottil E., S, A K., Yasantha, A., Anna, S. and Bhagwan N. 2008. Human Papillomavirus Infection and Cervical Cancer Prevention in India, Bangladesh, Sri Lanka and Nepal. *Vaccine*. 26.

Roberts A.A., Anyakogbe O.O., Ostsanya T.F. et al. Knowledge of cervical risk factors among refugee women in Ors camp. Nigerian Medical Practitioner 2004;46:67-70

Rotkin I. D.,1967. Epidemiology of Cancerof the Cervix. Sexual Characteristics of A Cervical Cancer Population. *American Journal Of Public Health And The Nations Health* : Vol. 57, No. 5, Pg. 815-829.

Sankaranarayan R.,Budukh A.M., Rajkumar R. 2001. Effective Screening Programmes for Cervical Cancer in Low- And Middle-Income Developing Countries. *Bulletin of The World Health Organisation*. 79(10), 954-962.

Sankaranarayan R. and Wesley R. 2003. *A Practical Manual on Visual Screening for Cervical Neoplasia*. Lyon, France: International Agency for Research On Cancer.

Saslow D., Runowicz D.C., Solomon D., Moscicki A., Smith R.A., Eyre H. J., Cohen C., 2009. American Cancer Society Guideline for the Early Detection of Cervical Neoplasia and Cancer. CA A Cancer Journal for Clinicians. Vol. 52 (6), 342-362

Schulmeister L., Lifsey D. 1999. Cervical Cancer Screening Knowledge, Behaviors, and Beliefs of Vietnamese Women. Oncology Nursing Forum. 26(5):879-887

Schwartz P.E., Hadjimichael O., Lowel D.M., Merino M.J and Jaretich D. 1996. Rapidly Progressive Cervical Cancer. The Connecticut Experience. Am J. Obstet. Gynecology 175:1105

Screening for squamous cervical cancer: duration of low risk after negative results of cervical cytology and its implication for screening policies. IARC Working Group on evaluation of cervical cancer screening programmes. Br Med J (Clin Res Ed) 293 (6548): 659-664. 1986

Sherris J., Herdman, C. and Elias C. 2001. Cervical Cancer in the Developing World. *West J Med*. 175, 231-233.

Shingleton H., Patrick R., Johnston W. and Smith R. The Current Status of the Papanicolaou Smear. *Ca: A Cancer Journal for Clinicians*, 45, 305-320.

Slattery M., Overall J., Abbott T., French T., Robinson L., Gardner J 1988. Sexual Activity, Contraception, Genital Infections, and Cervical Cancer: Support for a Sexually Transmitted Disease Hypothesis. American Journal of Epidemiology, Volume 130, Pg 248- 258

Szarewski A., Jarvis M., Sasieni P., Anderson M., Edwards R., Steele S., Guillebaud J. and Cuzick J. 1996. Effect of Smoking Cessation on Cervical Lesion in Size. *Lancet*. 347, 941-946.

Thomas J. O., Herrero R., Omigbodun A. A., Ojemakinde K., Ajayi I.O., Fawole O.I., Oladepo O., Smith A. S., Arslan A., Munoz N., Snijders P. J. F., Meijer C. J. L. M. and Franceschi S. 2004. Prevalence of papillomavirus infection in women in Ibadan, Nigeria: a population-based study. *British Journal of Cancer*. 90, 638-645.

Thomas J. O., Ojemakinde K. O., Ajayi I. O., Omigbodun A. O., Fawole O. I. and Oladepo O. 2012. Population-Based Prevalence of Abnormal Cervical Cytology Findings and Local Risk Factors in Ibadan, Nigeria: Implications for Cervical Cancer Control Programs and Human Papilloma Virus Immunization. *Acta Cytol*. 56, 251-258

Transparency for Nigeria. 2010. *Lagos State*.[Online]. Available: www.transparency.com [Accessed February 2013].

Twinn, S; Shiu, A., and Holroyd, E. 2002. Women's Knowledge about Cervical Cancer and Cervical Screening Practice: A Pilot Study of Hong Kong Chinese Women. *Cancer Nursing*: Volume 25 - Issue 5 - pp 377-384

Urban M., Banks E., Egger S., Canfell K., O'Connell D., Beral V. and Sitas F. 2012. Injectable and Oral Contraceptive Use and Cancers of the Breast, Cervix, Ovary, and Endometrium in Black South African Women: Case-Control Study. *Plos Medicine*, 9.

Wellensiek, N., Moodley, M., Moodley, J. and Nkwanyana, N. (2002). Knowledge of cervical cancer screening and use of cervical screening facilities among women from various socioeconomic backgrounds in Durban, Kwazulu Natal, South Africa. International Journal of Gynecological Cancer, 12: 376-382.

Were E., Nyaberi Z. and Buziba N. 2011. Perceptions of risk and barriers to cervical cancer screening at Moi Teaching and Referral Hospital (MTRH), Eldoret, Kenya. *Afr Health Sci*. 11, 58-64.

Were E., Nyaberi Z. and Buziba N. 2010. Integrating Cervical Cancer and Genital Tract Infection Screening into Mother, Child Health and Family Planning Clinics in Eldoret, Kenya. *Afr Health Sci*. 10, 58-65.

WHO. 2008. Core Health Indicators *Nigeria* [Online]. Available: http://apps.who.int/whosis/database/core/core_select_process.cfm [Accessed June 2012].

WHO. 2012a. Cancer. *World Cancer Day: "Together it is possible"* [Online]. Available: http://www.who.int/cancer/en/index.html [Accessed June 2012].

WHO. 2012b. Sexual and Reproductive Health Matters. *Cancer of the Cervix* [Online]. Available: http://www.who.int/reproductivehealth/topics/cancers/en/ [Accessed June 2012].

WHO/ICO. 2010. Human Papillomavirus and Related Cancers in Africa. *Summary Report 2010.* [Online].

WHO/IVM. 2005. Report of the Consultation on Human PapillomaVirus Vaccine. *Immunisation Vaccines and Biologicals* [Online]. Available: http://www.who.int/vaccines-documents/DocsPDF05/814ssrsen.pdf [Accessed June 2012].

WHO/UNFPA. 2006. Preparing for the introduction of HPV vaccines: policy and programme guidance for countries. Available: http://whqlibdoc.who.int/hq/2006/WHO_RHR_06.11_eng.pdf [Accessed June 2012].

Wong, Y.-L., Chinna, K., Mariapun, J. & Shuib, R. 2013. Correlates between Risk Perceptions of Cervical Cancer and Screening Practice. *Preventive medicine*, 57, S24-S26.

World Health Organization. 1986. Control of cancer of the cervix uteri: review article based on a report of a WHO meeting. November 1985, Geneva. Bull World Health Organisation;64: 607-618.

Wright K., Kuyinu Y.A., Faduyile F.A. 2010. Community Education on Cervical Cancer Amongst Market Women in an Urban Area of Lagos, Nigeria. *Asian Pacific Journal of Cancer Prevention*, 11, 137-140.

QUESTIONNAIRE

Risk Factors for Cervical Cancer and Prevalence of Precancerous Cervical Changes among Sexually Active Women in Lagos

Date of interview..... Questionnaire No.....

Introduction to the client:
My name is Dr. Olawunmi Adeoye. I am a Resident Doctor working for the University College Hospital and also doing a Masters Programme with the Nigeria Field Epidemiology and Laboratory training Programme (NFELTP) and presently attached to the Nigerian Institute of Medical Research (NIMR), Yaba. I am interested in assessing the risk factors for cervical cancer among sexually active women not seeking health care. Therefore, I would like to inquire on knowledge of cervical cancer, the risk behaviours, the practices of its preventive measures and also do Visual Inspection with Acetic acid (VIA) of the cervix with or without Visual inspection with Lugol's iodine (VILI). It is important for you to understand that your participation in this study is completely voluntary. I would be really grateful if you would agree to participate in this study, but do feel free to refuse. If you refuse, there will be no consequence for you. If you choose to participate in this study, you need to know that you may withdraw from the study at any stage without giving any explanation for your withdrawal. Your answers will be kept confidential. At some point, I will ask you some very personal questions. I will NOT provide this information to anybody either during or after the study.
This survey will take about 10 minutes.
If you have questions or further clarifications, feel free to call me on 08051031748

SECTION A: Socio-demographic data

1. Age at last birthday _____
2. Tribe: 1. Yoruba 2. Ibo 3. Hausa 4. Others (please specify) _____ ☐
3. Marital status: 1. Single. 2. Co-habiting 3. Married 4. Separated 5. Divorced 6. Widowed ☐
4. Religion: 1. Islam 2. Christian 3. Traditional religion 4. Others _____ ☐
5. Highest level of education: 1. No formal education 2. Primary school 3. Secondary 4. Tertiary education ☐
6. Occupation _____
7. Average monthly income.....
8. Type of housing (1) Rented (specify pls).....(2) Owned (specify pls) .....(3) Employer provided ..... (4) others.....
9. What do you use in cooking at home? (1) gas cooker (2) kerosene stove (3) firewood (4) others.....

SECTION B: Knowledge of Cervical Cancer

10. Have you heard about cervical cancer? (1) Yes (2) No (If NO, skip to section D)

If yes, how did you hear about it? (multiple response allowed)

	Source of information	1. Yes	2. No
A	Health workers		
B	Mass media- Radio Television Newspaper		
C	Church/mosque		
D	Neighbours/friend		
E	Those that have had the disease		

Others (please specify)_____

11. In your own words what is cervical cancer?

_____

(For questions 13 – 20 don't read out the "I don't know" options)

12. Are there screening methods that can prevent cervical cancer? (1.) Yes (2.) No (3.) I don't know

13. Cervical cancer may be associated with having multiple sexual partners (1.) Yes (2.) No (3.) I don't know

14. Cervical cancer is associated with obesity/ overweight (1.) Yes (2.) No (3.) I don't know

15. It is only seen in elderly people (1.) Yes (2.) No (3.) I don't know

16. Cervical cancer can be cured if detected early. (1.) Yes (2.) No (3.) I don't know

17. It usually presents with symptoms early (1.) Yes (2.) No (3.) I don't know

18. It is not associated with having sexual intercourse early in one's life (1.) Yes (2.) No (3.) I don't know

19. Cervical cancer is communicable (1.) Yes (2.) No (3.) I don't know

SECTION C: Screening for Cervical Cancer

20. Are you aware of any screening method for Cervical Cancer? (1).Yes (2) No (If **NO**, skip the rest of the section and go to **section D**, If yes continue with **section C**)

21. Which one? (1.) VIA (2.) Pap smear (3.) HPV DNA (Don't read out the options, allow client to mention them)

22. Have you ever been immunized with Human papilloma virus vaccine? (1) Yes (2) No

23. Have you ever been screened for cervical cancer in the past (1.) Yes (2.) No (If **NO**, skip to Question **28**)

24. If yes, how many times? .....

25. When was the last time? .....

26. What was the finding of the last screening (1.) Normal (2.) Abnormal (skip question 28 and go to question 29)

27. Give reasons why you have never been screened (1) I don't think it's important (2.) I am believe it will hurt (3.) Centre for screening is not availabe (4) Screening is expensive (4) because I believe I can never have it (5) Other reasons.....

28. Is there any facility that you know of, with cervical cancer screening services? (1) Yes (2) No (If NO, go to section D)

29. How close is this facility from where you live or work? (1) Walking distance (2) takes about 30 minutes or less of driving (3) takes more than 30 minutes of driving

SECTION D: Risk factors for cervical cancer

30. Age at first sexual intercourse.....

.....

31. How many times have you been married (if married).....

32. How many wives does your husband have (if married).....

33. How often does your partner use protection during sexual intercourse with you (1.) Never (2.) Rarely (3.) Often

34. No of lifetime partners .....

35. Have you ever used Oral Contraceptives for at least 1 year? (1) Yes (2) No (If NO. skip to question 40)

36. If yes, for how long in all?.....

37. Do you currently use oral contraceptives? (1) Yes (2) No (If NO, skip to question 40)

38. How often do you currently use oral contraceptives? (1) every month (2) some months

39. How many pregnancies have you ever carried?.....

40. How many babies have you ever delivered?.....

41. Have you ever been treated for a foul smelling vaginal discharge or vaginal sore or growth (Sexually transmitted Disease or Gynecological infection before)?

42. Have you ever smoked? (at least 1 cigarette at any time)? (1) Yes (2) No (If NO. Skip to question 47)

43. Do you currently smoke? (1) Yes (2) No (If NO, skip to question 47)

44. How often do you currently smoke? (1) every day (2) some days

45. On the average, how many sticks per day?.....

46. Has anybody in your family ever developed cervical cancer? (Sister, Mother, Aunty etc) (1) Yes (2) No (Specify who.....)

SECTION E: Visual Inspection with Iodine and Acetic acid (VILIA'IA) findings

47. (1)NORMAL (2) ABNORMAL

48. ABNORMAL:

Comments.....

EWI TI OLE SOKUNFA JEJERE ENU ONA ILE OMO LAARIN AWON OBINRIN TI ONTOJU IBALOPO PELU OKUNRIN NI ILU EKO

Ojo isi oro wani lenu wo..... Nomba iwe ibeere.....

Lihan fun awon oni baara.

Orukọ mi ni dokita Olawunmi Adeoye. Emi ni dokita agbeegbe ti nse ise fun ile iwosan ile-eko giga beemi mosi keko lati gboye si ipele to ga ju eyi ti mo wa yi lo lodo awon omo egbe isele ati idunwon arisan ti ori papa pelu iwadi, idanileko imo ijinle ni Nijina. Lowo lowo, mo wa pelu awon egba iwadi imope ijile onisegun oyinbo ti Nijiria ati Yaba. Mo nse iwadi lati mo nipa jamba tabi emi ti o wa laarin awon eniyan to kii wa alafia ati itoju ni ile-iwosan oyinbo lori arisan jejere ti o ndoyuko enu ona ile omo, bi o se maa nse, bi won se nse itoju re mo si fe se ajewo ojukooju pelu asidi ti egungun eyin.

Ose pataki fun yin lati mo pe ikopa yin ninu iwadi ati imoyi kii se lipatipa, bi o ba wun yin ni. Inu mi yio dun lopolopo bi e ba yan lati kopa ninu iwadi yi. sibe bi e ko ba fe je alabapin. eni ife inu yin lati se bee eyi ko bu yin ku ni ona kona. Bio ba si wuo lati kopa ninu iwadi yi. mo fe ki e mo wipe e le pinnu lati jawo tabi yowo minu re ni igba kii igba ti e ba le lai se alaye idire lun enikeni.

Awon idahun yin ni eli keta ko le mo tabi gbo nipa re. Ni ipile kan. a o jbere awon nkan nipa yin. Emi si ti da yin loju pe enikeni ko ni mo idahun yin boya ni asiko iwadi yi tabi lehin re.

Iin ajo yio je bi iseju meiwa.

Bi e ba ni ibere tabi ohun ti o fe ru yin loju. elee pe mi si ori ago yi 08051031748.

APA KINNI

1. Ojo ori gege bi ojo ibi ti e se gbeyin (ni odun).....

2. Eya – 1 Yoruba 2. Ibo 3. Hausa 4. Imiron (eje ki a so).....

3. Ipo Idile – 1. Apon 2. A la jo gbe 3. Mo ti se iyawo

4. A ko jo gbe po 5. A tituka 6. Opo

5. Esin – 1. Musulumi 2. Omoleyin Kristi 3. Abalaye

4. Imiran

6. Ise .....

7. Owo oya ososu.....

8. Iru ie ti a un gbe 1. Ayalc gbc..... 2. Teni meni.....

3. Ile ibi ise..... 4. Imiran.....

9. Kini a fi nda ina ni ile 1. Aaasi..... 2. Sitofu oni kerosin.....

3. Igi idana..... 4. Imiran.....

APA KEJI: Ohun ti a mo nipa jejere enu ona ile omo.

10. Nje ati gbo nipa jerere enu ona ile omo 1. Beeni 2. Beeko

(bi idahun re baje beeko, e lo taara si apa kerin)

Bi o ba se pe beeni, bawo ni o ti se gbo nipa re?

Aaye wa fun idahun orisirisi.

		Beeni	Beeko
A	Awo onise imototo		
B	Agbohun safefe – A soro ma gbesi mohunmaworan Iwe iroyin		
C	Ile ijosin omo leyin Kristi/musalashi		
D	Alajogbepo/Ore		
E	Awo tio ti ni nisan yi		

Omiran (Ejowo eso)

11. Kil bi o ti se lee so, kini jejere enu ona ile omo

(Fun ibeere itetala titide ogun e ma se ka awon idahun "emo komo"

12. Nje awon ayewo wa ti koni je ki eniyan ni aisan jejere enu ona ile omo?

1. Beeni 2. Beeko 3. Emi ko mo

13. Aarun jejere enu ona ile omo nii se pelu ni ni opolopo ore abani lo poo

1. Beeni 2. Beeko 3. Emi ko mo

14. Jejere enu ona ile omo nii se pelu eni titobi tabi ti o te iwun re koja

1. Beeni 2. Beeko 3. Emi ko mo

15. Laarin awon agbalagba ni ati maa nri

1. Beeni 2. Beeko 3. Emi ko mo

16. Ahe wo jejere enu ona ile omo san bi a ba tete mo ni ibere/

1. Beeni 2. Beeko 3. Emi ko mo

17. O maa n fara han nipa aami ni ibere

1. Beeni 2. Beeko 3. Emi ko mo

18. Ko nii se pelu ti tele ni ibalope ni ibere pepe aye eni

1. Beeni 2. Beeko 3. Emi ko mo

19. Jejere egungun chin ama ran elomiran?

1. Beeni 2. Beeko 3. Emi ko mo

APA KETA: ayewo fun jejere enu ona ile omo

20. Nje e gbo nipa ayewo kan tabi omiiran nipa jejere enu ona ile omo?

1. Beeni 2. Beeko

(Bi idahun yin ba je beeko, e fi awon ibeere ti o te le eleyi sile ki esi losi Apa kerin)

21. E mo? 1. VIA 2. Pap smear 3. HPV DNA

(Ema se ka awon idahun wonyi eje ki awon eniyan dahun arawon)

22. Nje e ti gba abere aje sara ti (HPV) Human Papilloma bi?

1. Beeni 2. Beeko 3. Emi ko mo

23. Nje won ti se ayewo kan fun yin ri nipa jejere no igba koa ri?

1. Beeni 2. Beeko

(Bi idahun re baje beeko, fi awon ibeere tio a tele eleyi sile ki esi dahun ibeere ikeji logbon)

24. Bi o ba je jbeeni, igba melo ni? .....

25. Ni igbawo ni ayewo ti o gbehin? .....

26. Ki ni awon abajade ayewo ti o gbehin?

1. Odara 2. Kodara

27. So idi ti iwo ko ti fi se ayewo

1. Emi ko mo pe ose pataki 2. Eru m ba mi, mo lee farapa

3. Ibi ayewo jina 4. Owo ayewo won

28. Nje awon irinse kan wa ti o mo pelu awon ile-ise ti o nye eniyan wo nipa jejere enu ona ile omo?

1. Beeni 2. Beeko (Bi idahun re ba je beeko, lo taara si apa keerin)

29. Ba wo ni irinse naa se jina si ibi ise re ta bi ile re?

1. Ose e fi ese rin 2. O to iwon ogbon iseju 3. Oju iwon ogbon iseju lo ni oko wiwa

APA KERIN: Awon wu to wa ninu jejere opa chin

30. Ojoori re ni igba ti o koo ni ibalopo.....

31. Igba melo ni to ti se igbeyawo? (bi oba ti gbeyawo) .....

32. Iyawo meloni oke re ne? (Bi o ba to gbeyawo).....

33. Ba jwo nooko re se maa nlo ohun idabobo to ni igba ti e ba ni ibalopo?

1. Kii loo 2. Ekoo kan 3. Gbogb igba

34. Nle lo no olulufe ti o ni?.....

35. Njee ti to awon oogun idan bobo fun ibalopo,

1. Beeni 2. Beeko (Bi idahun re baje beeko, tesiwaju si ibeere ogoji)

36. Bi idahun ba je beeni a to lati igba wo? .....

37. Nje o si nlo awon oogun idabobo fun ibalopo lowo lowo?

1. Beeni 2. Beeko (Bi idahun re ba je beeko, tesiwaju si ibeere ogoji)

38. Bi igba wo siara won ni o ma bloo? A. Ososu 2. Awon osu

39. Oyun melo nooti ni ri?.....

40 Omo melo ni o ti beiri??.....

41. Nje won ti se itoju re fun arun ibalopo kan ri?.....

42. Nje o ti mu siga ri? (Yala eyo siga kan ni igba kan)

1. Beeni 2. Beeko (Bi idahun re baje beeko, tesiwaju si ibeere ketadinlgdotu)

43. Nje osi n mu sija? 1. Beeni 2. Beeko (Bi idahun re baje beeko, tesiwaju si ibeere ketadinlaota)

44. Bawo ni mimu siga re se ji na si ara won to? 1. Ojoojumo 2. Awon ojo

45. Bi o ba fiarabale wo, bi melo ni ojo kan?.....

46. Nje enikeni ninu ebo yin ti ni arun jejere enu ona ile omo ri (Yala, egbon re, obirin, iya re tabi aburo iyare). 1. Beeni 2. Beeko (so fun wa, tani.....)

APA KARUN: Ayewo pelu iodine ati asidi acetic (VIA) ati ayodini (VILI)

47. 1 Odara 2. kodara

48. Biko ba dara, se alaye.....

INFORMED CONSENT FORM

Dear participant,
You are being asked to participate in a research study titled "Risk Factors for Cervical Cancer among sexually active women in Lagos"

The investigators in this study and their affiliations are

- Dr. Olawunmi Adeoye- Masters student and Resident of the Nigeria Field and Laboratory Training Programme, Asokoro, Abuja and University of Ibadan, Ibadan
- Dr Olufunmi I. Fawole- Lecturer, Department of Epidemiology and Medical Statistics, University of Ibadan.
- Dr Ikeoluwa Ajayi – Lecturer and Head of Department of Epidemiology and Medical Statistics, University of Ibadan
- Dr Patrick Nguku – Resident Advisor, Nigeria Field Epidemiology and Laboratory Training Programme ,Asokoro, Abuja

The sponsor of this research is Dr. Olawunmi Adeoye

This study will involve the following:

- Completing a questionnaire which will take about 10 minutes
- Visual Inspection with Acetic Acid will be done on you - this would involve
    1. removing your underwear and lying down on your back to expose your private part
    2. Inserting a sterile plastic disposable speculum into your private part to view your cervix
    3. Cleaning the cervix of any discharge using sterile swab
    4. Spraying Acetic acid into the cervix and waiting a few minutes to observe changes if there are any.
    5. The speculum will then be removed and discarded
    6. Your perineum will then be cleaned up
    7. You may or may not be required to do Visual inspection with Lugol's iodine

I wish to draw your attention to the fact that

- Your participation is voluntary
- You do not have to take part in the study
- If you do not wish to participate, there will be no punitive measures
- You can withdraw from the study at any stage;

The whole study will take about 30 minutes to 1 hour of your time.
You might feel some discomfort with the insertion of the speculum
The application of the Acetic acid into your cervix might give some tingling sensations.
The application of Lugol's iodine might stain your underwear

No experiments will be performed on you and Confidentiality will be maintained at all times and your name will not be linked to any information

Please feel free to contact the following persons if any problem arises or you are unhappy with the study

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Please feel free to contact the following persons if any problem arises or you are unhappy with the study

- Dr. Olawunmi Adeoye

Email; wunmiolat@yahoo.com
Phone no; 08051031748

- NIMR-IRB Contact:
  Mrs Nwogbe,
  Nigeria Institute of Medical Research,
  Yaba, Lagos

If you understand and agree to the above please sign below.

Participant: .....(Signature) .....(Date)
.....(Name Printed)
Researcher: .....(Signature) .....(Date)
.....(Name Printed)
Witness: .....(Signature) .....(Date)
.....(Name Printed)

INSTITUTIONAL REVIEW BOARD

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Secretariat: Room 207, Biochemistry Division, Research Block, NIMR

28th February, 2013

PROJECT TITLE: ASSESSMENT OF RISK FACTORS FOR CERVICAL CANCER AMONG WOMEN IN SELECTED LOCAL GOVERNMENTS AREAS IN LAGOS

PROJECT №: IRB/12/195

APPROVAL LETTER

The above named proposal has been adequately reviewed, the protocol and safety guidelines satisfy the conditions of NIMR-IRB. policies regarding experiments that use human subjects

Therefore the study under its reviewed state is hereby approved by Institutional Review Board, NIMR.

PROF. F. I. OKONOFUA
Name of IRB Chairman

Signature & Date

MRS. O. A. NWOGBE
Name of IRB Secretary

Signature & Date

This approval is given with the Investigator's Declaration as stated below:
By signing below, I agree/certify that

1. I have reviewed this protocol submission in its entirety and that I am fully cognizant of, and in agreement with, all submitted statements.
2. I will conduct this research study in strict accordance with all submitted statements except where a change may be necessary to eliminate an apparent immediate hazard to a given research subject.
   - I will notify the IRB promptly of any change in the research procedures necessitated in the interest of the safety of a given research subject.

- I will request and obtain IRB approval of any proposed modification to the research protocol or informed consent document(s) prior to implementing such modifications

3. I will ensure that all co-investigators and other personnel participating in the conduct of this research study have been provided a copy of the entire current version of the research protocol and are fully informed of the current (a) study procedures (including procedure modifications); (b) informed consent requirements and process; (c) potential risks associated with the study participation and the steps to be taken to prevent or minimize these potential risks; (d) adverse event reporting requirements; (e) data and record-keeping; and (f) the current IRB approval status of the research study.

4. I will respond promptly to all requests for information or materials solicited by the IRB or IRB Office.

5. I will submit the research study in a timely manner for IRB renewal approval.

6. I will not enroll any individual into the research study until such time as I obtain his/her written informed consent, or if applicable, the written informed consent of his/her authorized representative (i.e., unless the IRB has granted a waiver of the requirement to obtain written informed consent).

7. I will employ and oversee an informed consent process that ensures that potential research subjects understand fully the purpose of the research study, the nature of the research procedures they are being asked to undergo, the potential risks of these research procedures, and their rights as a research study volunteer.

8. I will ensure that research subjects are kept fully informed of any new information that may affect their willingness to continue participation in the research study.

9. I will maintain adequate, current, and accurate records of research data, outcomes, and adverse events to permit an ongoing assessment of the risk/benefit ratio of research study participation.

10. I am cognizant of and will comply with current federal regulations and IRB requirements governing human-subject research including adverse event reporting requirements.

11. I will make a reasonable effort to ensure that subjects who have suffered an adverse event associated with research participation receive adequate care to correct or minimize the consequences of the adverse event to the research subject.

12. I will ensure that the conduct of this research study adheres to Good Clinical Practice guidelines.

DR ADEOYE OLAWUMI
Principal Investigator's Name

Principal Investigator's Signature and Date