CERVICAL CANCER KNOWLEDGE AND RISK BEHAVIORS AMONG STUDENTS OF UNIVERSITY OF PORT HARCOURT, NIGERIA

BY

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CERTIFICATION

This thesis study on Cervical Cancer Knowledge and Risk Behaviors Among Students of University of Port-Harcourt, Nigeria was written by Mac-Fiberesima Gborieneomie (Reg No. 2013/4873898) as been certified as meeting the requirements for Master's Degree projects in Public Health, in Post Graduate School, Federal University Of Technology, Owerri.

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DEDICATION

This research thesis is dedicated to God Almighty and to my parents Rt Rev (Dr) S.A.I Iwo JP Rtd and late Mrs Margret Ogere Iwo.

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ABSTRACT

Cervical cancer is a global public health problem that has claimed the lives of several women. However, information on level of knowledge about the disease and the behaviors that predisposes to the infection is scarce especially among tertiary female students in south-south Nigeria. The objectives of the study were to assess cervical cancer knowledge, elicit the types of risk behaviors practiced among the students and to give recommendations based on findings. Descriptive cross sectional studies were employed and a systematic sampling technique was used to select 330 female students. Data was collected using a validated structured questionnaire based on the objectives with reference to Literature reviews. Our findings recorded a poor knowledge level (50.91%). Also a positive outcome of association was seen among students in level 300 and 400 concerning consumption of birth control pills. In a setting where cervical cancer knowledge and behavioral practices of the disease is poor, it is necessary that health officials and school authorities include cervical cancer screening as part of preschool admission examination. Formation of cervical cancer clubs also will be an added advantage. Nevertheless, there is need to improve cervical cancer knowledge through education. Also Government and NGOs to formulate policies to strengthen cervical cancer knowledge and advocacy of cervical cancer and risk behaviors through the media and social networks will be very helpful.

CHAPTER ONE

INTRODUCTION

Cervical cancer is a cancer affecting the cervix. It is due to the abnormal growth of cells that have the ability to invade or spread to other parts of the body. Cervical cancer usually develops slowly over time. Before cancer appears in the cervix, the cells of the cervix go through changes known as dysplasia, in which cells that are not normal begin to appear in the cervical tissue. Later, cancer cells start to grow and spread more deeply into the cervix and to surrounding areas. (National Cancer Institute, 2014). It is a global public health problem for women in developing countries in which Nigeria is one of them. It remains the most preventable cancer of the female genital tract and also the second most leading cause of cancer deaths among women. (Denny, 2008).

Worldwide, cervical cancer is the fourth-most common cause of cancer and the fourth-most common cause of death from cancer in women. In 2012, an estimated 528,000 cases of cervical cancer occurred, with 266,000 deaths. This is about 8% of the total cases and total deaths from cancer. About 70% of cervical cancers occur in developing countries. In low-income countries, it is the most common cause of cancer death (World Cancer Report, 2014).

The early stages of cervical cancer may be completely free of symptoms (Canavan and Doshi, 2000). Vaginal bleeding, contact bleeding (one most common form being bleeding after sexual intercourse), or (rarely) a vaginal mass may indicate the presence of malignancy. Also, moderate pain during sexual intercourse and vaginal discharge are symptoms of cervical cancer. In advanced disease, metastases may be present in the abdomen, lungs, or elsewhere. Symptoms of advanced cervical cancer may include: loss of appetite, weight loss, fatigue, pelvic pain, back pain, leg pain, swollen legs, heavy vaginal bleeding, bone fractures, and/or (rarely) leakage of urine or feces from the vagina. (Nanda, 2006). Bleeding after douching or after a pelvic exam is a common symptom of cervical cancer.

According to National Cancer Society (2014) a risk factor is anything that changes the chance of getting a disease such as cancer. Several risk factors increase the chance of developing cervical cancer. Women without any of the risk factors rarely develop cervical cancer. Although the risk factors increase the odds of developing cervical cancer, many women with these risks do not develop this disease. When a woman develops cervical cancer or pre-cancerous changes, it may not be possible to say with certainty that a particular risk factor was the cause.

Knowledge about risk factors, helps to focus on those that can be changed or avoided (like smoking or human papilloma virus infection), rather than those that cannot (such as age and family history). However, it is still important to know about risk factors that cannot be changed, because it's even more important for women who have these factors to get regular Pap tests to detect cervical cancer early.

Infection with Human Papilloma Virus (HPV) is the most important risk factor for cervical cancer. HPV is a group of more than 150 related viruses, some of which cause a type of growth called *papillomas*, which are more commonly known as *warts*. HPV can infect cells on the surface of the skin, and those lining the genitals, anus, mouth and throat, but not the blood or internal organs such as the heart or lungs. It can spread from one person to another during skin-to-skin contact. One way HPV is spread is through sex, including vaginal, anal, and even oral sex. In most cases the body can clear the infection by itself. Sometimes, however, the infection does not go away and becomes chronic. Chronic infection, especially when it is caused by certain high-risk HPV types, can eventually cause certain cancers, such as cervical cancer. Although there is currently no cure for HPV infection, there are ways to treat the warts and abnormal cell growth that HPV causes.

Also Smokers and those around them are exposed to many cancer-causing chemicals that affect organs other than the lungs. These

harmful substances are absorbed through the lungs and carried in the bloodstream throughout the body. Women who smoke are about twice as likely as non-smokers to get cervical cancer. Tobacco by-products have been found in the cervical mucus of women who smoke. Researchers believe that these substances damage the DNA of cervix cells and may contribute to the development of cervical cancer. Smoking also makes the immune system less effective in fighting HPV infections.

There is evidence that taking oral contraceptives (OCs) for a long time increases the risk of cancer of the cervix. Research suggests that the risk of cervical cancer goes up the longer a woman takes OCs, but the risk goes back down again after the OCs are stopped. In one study, the risk of cervical cancer was doubled in women who took birth control pills longer than 5 years, but the risk returned to normal 10 years after they were stopped.

It is advisable however for a woman and her doctor to discuss whether the benefits of using OCs outweigh the potential risks. A woman with multiple sexual partners should use condoms to lower her risk of sexually transmitted illnesses no matter what other form of contraception she uses.

Women who have had 3 or more full-term pregnancies have an increased risk of developing cervical cancer. No one really knows why this is true. One theory is that these women had to have had unprotected intercourse to get pregnant, so they may have had more exposure to HPV. Also, studies have pointed to hormonal changes during pregnancy as possibly making women more susceptible to HPV infection or cancer growth. Another thought is that pregnant women might have weaker immune systems, allowing for HPV infection and cancer growth.

Nevertheless women who were younger than 17 years when they had their first full-term pregnancy are almost 2 times more likely to get cervical cancer later in life than women who waited to get pregnant until they were 25 years or older. Cervical cancer may run

in some families. Chances of developing the disease are 2 to 3 times higher than if no one in the family had it. Some researchers suspect that some instances of this familial tendency are caused by an inherited condition that makes some women less able to fight off HPV infection than others. In other instances, women from the same family as a patient already diagnosed could be more likely to have one or more of the other non-genetic risk factors.

Statement of Problem

Cervical cancer is a problem of increasing magnitude in developing countries in which Nigeria is one. It is the second most leading cause of cancer related morbidity and mortality among women. Mortality and morbidity arising from cervical cancer has continued to pose threat to the life of women and young female teenagers. This condition being life threatening, does not only affect the health of lives of these girls who are in their most useful and productive years but has become a social challenge due to the effect of the infection and related death of women and young university girls. Its perpetual negative influence on labor and social status of the family, community and the country at large cannot be over emphasized.

Researchers have shown that a wide range of the female population is yet to be aware of the incidence and prevalence of cervical cancer not to talk about the risk behaviors. Many women are uninformed or misinformed on the nature of this disease, the risk factors and the related risk behaviors that predispose to this infection. Consequently, possible preventive behaviors are not also known. It has been noted that women generally show nonchalant attitude towards screening of cervical cancer. Screening facilities are not also readily provided or available to a small select group of women. Health care givers do not also consider it a point of necessity to advice their clients to go for screening in the developing countries.

However, all these problems have invariably led to the increase in the mortality and morbidity as well as incidence and prevalence of this disease. To the best of the knowledge of the researcher, there has been no study on cervical cancer using this population. It is against this background that this study on the awareness and risk

behaviors of cervical cancer among students of University of Port Harcourt is designed. It is hoped that the findings of this study will provide meaningful approach to solving the identified problems.

Objective of the Study

The broad objective of this study is to assess the knowledge and elicit the risk behaviors of cervical cancer practiced by students of University of Port Harcourt, Rivers State Nigeria.

Specific Objectives

1. To assess cervical cancer knowledge among University of Port Harcourt students of different socio demographic characteristics

2. To determine the types of risk behaviors of cervical cancer practiced by University of Port Harcourt students. of different socio demographic characteristics

3. To recommend based on findings measures to reduce cervical cancer at risk behaviors.

Research Questions

Research questions of the study include:

1. What is the knowledge level of cervical cancer among University of Port Harcourt students of different socio demographic characteristics.?

2. What are the types of risk behaviors of cervical cancer practiced by University of Port Harcourt students of different socio demographic characteristics.

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3. What are the recommendations based on findings to reduce cervical cancer?

Research Hypothesis

Hypothesis I

Null hypothesis (H_0) - There is no significant difference in the level of knowledge of cervical cancer amongst female students of University of Port Harcourt in relation to their socio-demographic factors

Hypothesis II

Null hypothesis (H_0) - There is no significant difference in the risk behaviors of cervical cancer practiced by female students of University of Port Harcourt in relation to their socio-demographic factors

Significance of the Study.

The findings of this study will be beneficial to young women of school age and to the population at large. It will provide information on cervical cancer for women that have not heard about cervical cancer. Also to re address the minds of those who have been misinformed on its nature. This will reduce the negative impact of cervical cancer on the social status of the population and especially young girls of school age. To the health providers, it will update them on the need to advice their clients to engage in cervical cancer screening exercise. It will also help them to provide counsel and focus on the age group that is most affected. The findings will further help Government Agencies and Non-Governmental Organizations (NGOs) in the planning and implementation of intervention programs that are related to the control and prevention of cervical cancer. Finally, it will be of immense help to students and researchers who are interested in carrying out further studies on cervical cancer by serving as a guide and template for direction.

Policy makers will also find it as an important tool to formulate new policies and ideas to improve the health of the masses.

Scope of Study

This study is limited to female students of University of Port Harcourt which is a Federal Tertiary Academic Institution with a large number of students offering a wide range of courses. The dependent variables of interest are knowledge and risk behaviors of cervical cancer practiced among students of University of Port Harcourt and the independent variables are age, sex, level of education, and religion.

OPERATIONAL DEFINITION OF TERMS

Cervix: The cervix is a cylinder-shaped neck of tissue that connects the vagina and uterus.

Cancer: This means the growth of abnormal cells in a part of the body which is able to spread to other parts of the body.

Study: This is the ability to learn or acquire knowledge

Awareness: This is the ability to perceive, to feel, or to be conscious of events, objects, thoughts, emotions, or sensory patterns.

Behaviors: The way in which one acts or conducts oneself, especially toward others.

Risk: This is the potential of gaining or losing something of value. Value can be status or health.

Cervical Cancer: Cervical cancer is a type of cancer that develops in a woman's cervix (the entrance to the womb from the vagina).

Risk Behavior: A risk behavior is a lifestyle activity that places a person at increased potential of suffering a particular condition, illness injury or disability.

Preventive Behavior: This is a lifestyle activity that excludes a person from suffering a particular condition, illness, injury or disability.

Student: A student is a person who is attending or undertaking a course of study at an educational facility. This includes study at any level whether at school, college, university, or some other establishment such as a training hospital.

Tertiary Institution: This is an education facility that teach specific capacities of higher learning such as colleges, technical training institutes, community colleges, nursing schools, research laboratories, centers of excellence, and distance learning centers.

CHAPTER TWO

LITERATURE REVIEW

This chapter discusses the Literature review of this study. It comprises conceptual frame work, theoretical studies/frame work, and empirical studies.

Conceptual Frame Work

Cancer is a disease in which cells grow and divide with little or no control. There are many different types of cancer. Cancers are typically named for the organ or the cell where the cancer begins. Some cancers can spread from the original site and move to other places in the body (National Cancer Institute, 2014).

According to National Youth Policy, (2009) Youth in Nigeria includes citizens of the Federal Republic of Nigeria aged 18–35 years. Variance in chronologies are used in defining youth and are addressed by members of the state in accordance to their particular society (Furlong and Andy 2013). Nigeria is the most populous country in Africa with one of the largest populations of youth in the world, compromising 33,652,424 members. Excessive mortality from HIV/AIDS results in low life expectancy in Nigeria. As a result, the median age is 17.9 (The CIA World Factbook, 2014)

Chief Olusegun Obasanjo, former President of Nigeria from 1999 until 2007, believes that identifying and addressing issues that would enhance the lives of the youth would improve overall national development. He stated that, Youth constitute Nigeria's only hope for a real future. The Nigerian government characterizes youth as ambitious, enthusiastic, energetic and promising. They are considered vulnerable in society because of the rapid pace of change they experience at this time in their lives (National Youth Policy, 2009). A National Youth Development Policy was created and designed to advocate for youth and youth development. The policy views youth welfare as vital to the Nigerian nation and its socioeconomic development. This policy is seen as a youth participation project, versus a project identifying problems and needs.

Educating youth in Nigeria is prioritized with the goal of reducing poverty, inequality, and overall increasing economic growth. Youth in Nigeria school system consists of six years of primary education, three years of junior secondary, three years of senior secondary, and four years of tertiary education (Mayfield and Merry, 1989

It is a requirement for every child in Nigeria to receive a minimum of nine years of free education. The government's dominant role with funding provides funds from the Universal Basic Education Commission (UBEC), and Education Trust Fund (ETF). Some of the problems Nigerian youths face in education are unbiased access to junior secondary, and senior secondary education for the poor, and the need to adjust the school curriculum to focus on the transition from school to labour economics. The National Youth Policy has implemented a variety of focuses in hopes to improve overall quality of education. These focal points include: development of critical fields of knowledge in applied science and technology, technical skills, vocational skills in agriculture, and promotion of the use of Information and Communication Technology (ICT) (National Youth Policy, 2009)

Nigerian youth have experienced increasing rates of sexually transmitted_diseases (STD's) and HIVand AIDS. Prevalence of female youth sexually transmitted diseases contraction is 17.2%. HIV and AIDS prevalence among all youth is 5.2%, compared to the national prevalence at 4.4%. The Federal Government of Nigeria National Youth Policy attempts to mitigate prevalence by providing care, treatment and support for infected young people. In doing so, government promotes prevention activities through risk reduction, abstinence, and condom use.

STD and HIV/AIDS contraction can cause serious, permanent health issues, infertility, death and social consequences such as social exclusion. Many social factors contribute to the rates of contraction (Adebowale, *et al*, 2013). Advancements in information communication technology expose youth to a variety of values and ways of thinking which differ from their elder generations. Cultural norms serve as barriers to protect themselves in many cultures. Condom use is not a common practice.

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Epidemiology of Cervical Cancer

Epidemiologic studies indicate that the risk of contracting genital HPV infection and cervical cancer is influenced by a variety of factors. High-risk HPV infection is necessary but may not be sufficient for the development of cervical cancer. Cervical cancer depends on a variety of additional factors that act in concert with cancer-associated HPV types.

Some studies clearly indicate that the risk of contracting genital HPV infection and cervical cancer is influenced by sexual activity. An individual is at greater risk of becoming infected with HPV if he or she had multiple sexual partners at any time or is the partner of someone who has had multiple sexual partners (Peyton, Gravitt, Hunt, Hundley, and Zhao, 2001) Sexual activity at an early age also have an increased risk of HPV infection, as does a history of other sexually transmitted infections, genital warts, abnormal Pap smears or penile cancer in an individual or sexual partner (Franco, Duarte and Ferencz, 2001) Condom usage may not adequately protect individuals from exposure to HPV since the virus can be transmitted by contact with infected tissues that are not protected by a condom. In addition to sexual activity, age is an important determinant of risk of HPV infection (Biswas *et al* 1997)

Most cervical cancers arise at the squamo columnar junction between the columnar epithelium of the endocervix and the squamous epithelium of the ectocervix. At this site, there are continuous metaplastic changes. The greatest risk of HPV infection coincides with greatest metaplastic activity. Greatest metaplastic activity occurs at puberty and first pregnancy and declines after menopause. The HPV prevalence reaches its peak in young adults (18 to 30 years of age) and declines at older ages (Baue *et al* 1996) . As many as 46% of college women may have an HPV infection of the genital tract. However, cervical cancer is more common in women older than 35 years, suggesting infection at a younger age and slow progression to cancer

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Viral factors of Cervical Cancer- Persistent cervical infection (often defined as an infection that is detected more than once in an interval of 6 months or longer) with an oncogenic HPV type (especially HPV-16 and HPV-18) is the most important risk factor for progression to high-grade dysplasia and invasive cancer. The risk of progression depends on the HPV type. A 4-6year follow-up of 1.643 women with normal cytology showed that women with a positive PCR high-risk HPV DNA test at baseline were 116 times more likely to develop CIN 3 that women with a negative DNA test (Rozendaal *et al* 1996). The risk of progression for HPV-16 and HPV-18 is greater than for other HPV types, approximately 40%(Kiviat, and Koutsky 1993). It has been proposed that the viral load correlates directly with the severity of disease. Studies using quantitative type-specific PCR for high-risk HPV and low-risk HPV have shown that HPV-16 can reach much higher viral loads than the other types, and that only for HPV-16 high viral loads correlate with increased severity of cervical disease (Swan *et al* 1999).

Other studies have shown an increased viral load of high-risk HPV types in high-grade lesions (Tena *et al* 2005). However, high-risk HPVs are able to induce malignant tumors even when they are present at low levels. An important emerging factor in the development of cervical neoplasia is the role of HPV variants. HPV variants differ in biological and chemical properties and pathogenicity (Giannoudis *et al* 2000). The oncogenicity of specific HPV variants appears to vary geographically and also with the ethnic origin of the population studied. Based on sequence variation of L1, L2 and URR regions of HPV-16, five variants have been defined for HPV-16: European (E), Asian (As), Asian-American (AA), African-1 (Af1) and African-2 (Af2). Asian-American variants might have enhanced oncogenic activity compared to European isolates due to an increased transcriptional activity(Hyacinth, Oluwatoyosi, Adekeye, and Ibeh 2012).

Several studies have shown that infections with multiple types of HPV can occur (33, 34). The majority of multiple infections contain two HPV types, but samples with two, three, four or five types were also seen (Quint *et al* 2001). The presence of multiple HPV types

tended to increase with the severity of cervical disease. Multiple HPV types, usually with at least one type classified as high-risk, where found in 12% of patients with normal cytology and in 35% of patients with mild or moderate dysplasia (Kleter *et al* 1999).

Nonviral factors of Cervical Cancer

The primary immune response to HPV infection is cell mediated; therefore, conditions that impair cell-mediated immunity such as renal transplantation or HIV disease, increase the risk of acquisition and progression of HPV. (Ho, Burk, Fleming and Klein, 1994), and (Sun *et al* 1997). The URR region of HPV contains sequences similar to the glucocorticoid responsive elements that are inducible by steroid hormones such as progesterone (the active component of oral contraceptives). Long-term use of oral contraceptives is a significant-risk factor for high-grade cervical disease according to some studies (WHO 1993). Cervical cancer risk also seems to be independently influenced by other variables including current smoking and parity (Local immune suppression induced by smoking and the mutagenic activity of cigarette components have been demonstrated in cervical cells, and may contribute to persistence of HPV or to malignant transformation similar to that seen in the lung.

It appears that smoking is the most important risk factor independent of HPV infection for higher grades of cervical disease. Multiple pregnancies were a significant independent risk factor among women with histopahologic evidence of HPV infection in biopsy specimens and among women with CIN 2/3 (Adam *et al* 2000). Other factors such as alcohol consumption and diet have not been well established. There has been some suggestion that sexually transmitted viruses may serve as cofactors in the development of cervical cancer. It has been postulated that co-infection with herpes simplex virus type 2 may play a role in the initiation of cervical cancer (Hausen 1992). Cytomegalovirus (CMV), human herpes virus 6 (HHV-6) and HHV-7 have also been detected in the cervix. Co- infection offers the opportunity for these viruses to interact with HPV. Recent studies using PCR to detect CMV, HHV-6 and HHV-7 in women with abnormal cytologic test results indicate that these viruses are only bystanders rather than cofactors in the development of cervical cancer (Chan *et al* 2001).

Chlamydia trachomatis infection has been associated with cervical cancer, but the meaning of this association remains unclear. Some authors have suggested that the association between *C. trachomatis* infection and cervical cancer may be due to an effect of Chlamydia infection on persistence of high-risk. (Samoff., Koumans, Markowitz, Stemberg, Sawyer, and Swan, 2005)

Genetic predisposition was found to be a great component in cervical cancer. Genetic heritability was found to account for 27% of the effect of underlying factors for tumor development. Heritability could affect many factors contributing to the development of cervical cancer, including susceptibility to HPV infection, ability to clear HPV infection, and time to development of disease. The effect of shared familial environment was shown to be small at 2% and was found only between sisters and not between mother and daughter. (Magnusson, Lichtenstein and Gyllenstein, 2000).

Worldwide Report on Cervical Cancer

According to World Cancer Report, (2014), Worldwide, cervical cancer is both the fourth-most common cause of cancer and deaths from cancer in women. In 2012, 528,000 cases of cervical cancer were estimated to have occurred, with 266,000 deaths. It is the second-most common cause of female-specific cancer after breast cancer, accounting for around 8% of both total cancer cases and total cancer deaths in women. About 80% of cervical cancers occur in developing countries.

According to National Cancer Institute 2015, an estimated 12,900 new cervical cancers and 4,100 cervical cancer deaths will occur in the United States. In the United States, it is the eight-most common cancer of women. The median age at diagnosis is 48. Hispanic women are significantly more likely to be diagnosed with cervical cancer than the general population. In 1998, about 12,800 women were diagnosed in the US and about 4,800 died. Among cancers **of** the female reproductive tract it is less common than endometrial cancer and ovarian cancer. Cervical cancer deaths decreased by

approximately 74% in the last 50 years, largely due to widespread Pap smear screening. The annual direct medical cost of cervical cancer prevention and treatment prior to introduction of the HPV vaccine was estimated at $6 billion(Amstrong, 2010**)**

In the European union about 34000 new cases per year and over 16000 deaths due to cervical cancer occurred in 2004(Arbyn *et al* 2010).

According to Cancer Research 2014, Cervical cancer is the 12th-most common cancer in women in the UK (around 3,100 women were diagnosed with the disease in 2011), and accounts for 1% of cancer deaths (around 920 died in 2012) .With a 42% reduction from 1988-1997, the NHS-implemented screening programme has been highly successful, screening the highest-risk age group (25–49 years) every 3 years, and those ages 50–64 every 5 years**.**

In Canada, an estimated 1,300 women may be diagnosed with cervical cancer in 2008 and 380 may die. (MacDonald, Stanbrook, and Hébert, 2008).

Australia had 734 cases of cervical cancer. Regular twice-yearly Pap tests can reduce the incidence of cervical cancer up to 90% in Australia, and save 1,200 Australian women from dying from the disease each year. Women diagnosed with cervical cancer has dropped on average by 4.5% each year since organized screening began in Australia**.**

In India, the number of people with uterine cervix cancer are rising, but overall the age-adjusted rates are decreasing. Improvement of education in the female population has improved the survival of women with cancers of uterine cervix **(**Krishnatreya, Kataki, Sharma, Nandy, and Gogoi, 2015).

In Nigeria, it is the 2nd most common cancer in Nigerian women and the most common female genital cancer constituting a major cause of mortality among Nigerian females in their most productive years. It was the commonest cancer reported from Ibadan, Eruwa, Zaria, Jos, Benin and Calabar and in the early years, 2nd to breast

cancer in Enugu and Ife-Ijesha. A steady increase was reported by Babarinsa *et al* in Ibadan in between 1975-1995 which was attributed to poor screening facillities, and lack of organized national screening programme. It was recently shown that it has however been overtaken by breast cancer; except in Kano where it was reported as the most common cancer in both sexes. In Jos, it is the most common female cancer. (Fatimah, Abdulkareem 2009)

Types of Cervical Cancer**.**

There are two main types of cervical cancer

- Squamous cell cancer
- Adenocarcinoma

They are named after the type of cell that becomes cancerous.

Squamous cells are the flat, skin like cells that cover the outer surface of the cervix (the ectocervix). Around 7 to 8 out of 10 cervical cancers are squamous cell cancer (70 to 80%).

Adenomatous cells are gland cells that produce mucus. The cervix has these gland cells scattered along the inside of the passageway that runs from the cervix to the womb (the endocervical canal). Adenocarcinoma is a cancer of these gland cells. It is less common than squamous cell cancer, but has become more common in recent years. More than 1 in 10 cervical cancers are adenocarcinoma (10 to 15%). It is treated in the same way as squamous cell cancer of the cervix. However there are Other rarer types of cancer which can occur in the the cervix. One of such is lymphoma, which is a cancer of the lymphatic system. (Cancer Research, 2014 **)**

Staging of Cervical Cancer

According to American Joint Committee on Cancer (2010), Staging is a way of describing where the cancer is located, if or where it has spread, and whether it is affecting other parts of the body. Doctors use diagnostic tests to find out the cancer's stage, so staging may not

be complete until all of the tests are finished. Knowing the stage helps the doctor to decide what kind of treatment is best and can help predict a patient's prognosis, which is the chance of recovery. There are different stage descriptions for different types of cancer. One tool that doctors use to describe the stage is the TNM system. TNM is an abbreviation for tumor (T), node (N), and metastasis (M). Doctors look at these three factors to determine the stage of cancer:

- How large is the primary tumor and where is it located? **(**Tumor, T**)**
- Has the tumor spread to the lymph nodes? **(**Node, N**)**
- Has the cancer metastasized to other parts of the body? **(**Metastasis, M**)**

The results are combined to determine the stage of cancer for each person. For cervical cancer, there are five stages: stage 0 (zero) and stages I through IV (one through four). A stage provides a common way of describing the cancer, so doctors can work together to plan the best treatments. Here are more details on each part of the TNM system for cervical cancer:

Using the TNM system, the "T" plus a letter or number (0 to 4) is used to describe the size and location of the tumor. Some stages are divided into smaller groups that help describe the tumor in details. The Roman numerals in parentheses are stages used in another widely used staging system from the Federation of International and Obstetrics (FIGO).

Etiology of Cervical Cancer

According to National Health Service 2015, in almost all cases, cervical cancer is the result of a change in cell DNA caused by the human papilloma virus (HPV). Cancer begins with a change in the structure of the DNA that's present in all human cells. DNA provides the cells with a basic set of instructions, including when to grow and reproduce.

A change in the DNA's structure is known as a mutation. It can alter the instructions that control cell growth, which means the cells continue growing instead of stopping when they should. If the cells reproduce uncontrollably, they produce a lump of tissue called a tumour.

More than 99% of cervical cancer cases occur in women who have been previously infected with HPV. HPV is a group of viruses, rather than a single virus. There are more than 100 different types. HPV is spread during sexual intercourse and other types of sexual activity (such as skin-to-skin contact of the genital areas, or using sex toys) and is thought to be very common. It's estimated that 1 in 3 women will develop a HPV infection within two years of starting to have regular sex, and about 4 in 5 women will develop the infection at some point in their lives (Clifford, Franceschi, Deaz, Munoz, and Villa, 2006).

Some types of HPV don't cause any noticeable symptoms and the infection will pass without treatment. Other types of HPV can cause genital warts, although these types aren't linked to an increased risk of causing cervical cancer. About 15 types of HPV are considered high-risk for cervical cancer. The two types known to have the highest risk are HPV 16 and HPV 18, which cause about 7 out of every 10 cervical cancers (Dunne and Park, 2013).

High-risk types of HPV are thought to contain genetic material that can be passed into the cells of the cervix. This material begins to disrupt the normal workings of the cells, which can eventually cause them to reproduce uncontrollably, leading to the growth of a cancerous tumour. As most types of HPV don't cause any symptoms, a partner could have the virus for months or years without knowing it (Feyi-Waboso, Kamanu and Aluka 2005)

Cancer of the cervix usually takes many years to develop. Before it does, the cells in the cervix often show changes known as cervical intraepithelial neoplasia (CIN) or, less commonly, cervical glandular intraepithelial neoplasia (CGIN). CIN and CGIN are pre-cancerous conditions. Pre-cancerous conditions don't pose an immediate threat to a person's health, but they can potentially develop into cancer in the future.

However, even if you develop CIN or CGIN, the chances of it developing into cervical cancer are very small, and if the changes are discovered during cervical screening, treatment is highly

successful. The progression from becoming infected with HPV to developing CIN or CGIN and then developing cervical cancer is very slow, often taking 10 to 20 years (National Cancer Institute, 2009).

The fact that HPV infection is very common but cervical cancer is relatively uncommon suggests that only a very small proportion of women are vulnerable to the effects of an HPV infection. There appear to be additional risk factors that affect a woman's chance of developing cervical cancer. These include:

Women who smoke are twice as likely to develop cervical cancer than women who don't; this may be caused by the harmful effects of chemicals found in tobacco on the cells of the cervix. Cigarette smoking both passive and active increases the risk of cervical cancer. Among HPV infected women, current and former smokers have approximately two to three times the incidence of invasive cancer. Passive smoking is also associated with increased risk but to a lesser extent (Gadducci *et al*.,2011). There are a few different ways that smoking can increase the risk in women which can be by direct and indirect methods of inducing cervical cancer. When CIN3 lesions lead to cancer, most of them have the assistance of HPV virus. Heavy smoking and long term smoking seam to have more of a risk of getting the CIN3 lesions than lighter smoking or not smoking at all. Although smoking has been linked to cervical cancer, it aids in the development of HPV, but if the woman is already HPV positive she is at greater likelihood of developing cervical cancer.

According to International Collaboration of epidemiological studies on cervical cancer (2006), smoking exposes the body to many cancer causing chemicals that affects organs other than the lungs. When someone smokes, he or she and those around them are exposed to many cancer causing chemicals (carcinogens) that affect organs other than the lungs. The harmful substances are absorbed through the lungs and carried in the blood stream through out the body. Some have been found in the cervical mucus of women who smoke. Researchers believe that these substances damage the DNA of the

cervix cells and may contribute to the development of cervical cancer. (Gadducci *et al*., 2011).

Cervical Cancer diagnosis occurs in women ages 35-54, and about 20% occur in women over 65years of age. The median age of diagnosis is 48years. About 15% of women develop cervical cancer between the ages of 20-30. Cervical Cancer is extremely rare in women younger than 20years. However many young women become infected with 50% multiple types of HPV which then can increase their risk of getting cervical cancer in the future(Kaufmann, *et al* 2013).

Having a weakened immune system can occur as a result of taking certain medications, such as immunosuppressant, which are used to stop the body rejecting donated organs, or as a result of a condition such as HIV or AIDS. Women whose diets do not include protective anti oxidants and photochemical such as vitamin A, C, and E and beta-carotene which have shown to prevent cervical cancer and other forms of cancer (Gadducci *et al*., 2011).

Taking the **oral contraceptive pill** for more than five years can make a women to have twice the risk of developing cervical cancer than those who don't. Although it's not clear why long term use of oral contraceptives is associated with cervical cancer (Gadducci *et al* 2011). Research suggests that the risk of cervical cancer goes up the longer a woman takes oral contraceptives, but the risk goes back down again after oral contraceptives are stopped. In one study, the risk of cervical cancer was doubled in women who took birth control pills longer than 5years, but the risk returned to normal 10years after they were stopped. The American Cancer Society (2014) believes that a woman and her doctor should discuss whether the benefits of OCs outweigh this very slight potential risk (Remschmidt *et al*, 2013).

The more children a woman has, the greater the risk of getting cervical cancer compared with women who don't have any children. The reason for the link between cervical cancer and childbirth is unclear. One theory is that the hormonal changes that occur during pregnancy may make the cervix more vulnerable to the effects of HPV. Other factors include:

Chlamydia is a relatively common kind of bacteria that can infect the reproductive system. It is spread by sexual contact. Chlamydia infection can cause pelvic inflammation, leading to infertility. Some studies have seen a higher risk of cervical cancer in women whose blood test results show evidence of past or current Chlamydia infection (compared with women who have normal test results). Women who are infected with Chlamydia often have no symptoms In fact, they may not know that they are infected at all unless they are tested for Chlamydia during a pelvic exam. (Dunne and Park, 2013, Anttila, Saikku, and Koskela, 2001)

Having sex with lots of people or different partners' increases one's chances of coming in contact with a person who is carrying the HPV virus. Therefore, the probability of encountering an infected partner increases as the number of partners you have increases (National Cancer Institute, 2009). On the other hand, having fewer sexual partners means you simply have fewer chances to get busy with a person that has an HPV (or any other infection).

Women whose diets don't include enough fruits and vegetables may be at increased risk for cervical cancer (American Cancer Society, 2015)

Overweight women are more likely to develop adenocarcinoma of the cervix (American Cancer Society, 2015).

A recent study found that women who had ever used an intrauterine device (IUD) had a lower risk of cervical cancer. The effect on risk was seen even in women who had an IUD for less than a year, and the protective effect remained after the IUDs were removed. Using an IUD might also lower the risk of endometrial (uterine) cancer. However, IUDs do have some risks. A woman interested in using an IUD should first discuss the possible risks and benefits with her doctor. Also, a woman with multiple sexual partners should use condoms to lower her risk of sexually transmitted illnesses no matter what other form of contraception she uses (American Cancer Society, 2015)

Women who have had 3 or more full-term pregnancies have an increased risk of developing cervical cancer. No one really knows

why this is true. One theory is that these women had to have had unprotected intercourse to get pregnant, so they may have had more exposure to HPV. Also, studies have pointed to hormonal changes during pregnancy as possibly making women more susceptible to HPV infection or cancer growth. Another thought is that pregnant women might have weaker immune systems, allowing for HPV infection and cancer growth (American Cancer Society, 2015).

Also women who were younger than 17 years when they had their first full-term pregnancy are almost 2 times more likely to get cervical cancer later in life than women who waited to get pregnant until they were 25 years or older. One theory is that these women had to have had unprotected sexual intercourse to get pregnant, so they may have had more exposure to HPV (Remschmidt, *et al* ,2013)

Poverty is also a risk factor for cervical cancer. Many low-income women do not have ready access to adequate health care services, including Pap tests. This means they may not get screened or treated for cervical pre-cancers (National Cancer Institute, 2009).

Diethylstilbestrol (DES) is a hormonal drug that was given to some women to prevent miscarriage between 1940 and 1971. Women whose mothers took DES (when pregnant with them) develop clear-cell adenocarcinoma of the vagina or cervix more often than would normally be expected. This type of cancer is extremely rare in women who haven't been exposed to DES. There is about 1 case of this type of cancer in every 1,000 women whose mothers took DES during pregnancy. This means that about 99.9% of "DES daughters" do not develop these cancers.

DES-related adenocarcinoma is more common in the vagina than the cervix. The risk appears to be greatest in women whose mothers took the drug during their first 16 weeks of pregnancy. The average age of women when they are diagnosed with DES-related clear-cell adenocarcinoma is 19 years. Since the use of DES during pregnancy was stopped by the FDA in 1971, even the youngest DES daughters are older than 35 − past the age of highest risk. Still, there is no age cut-off when these women are safe from DES-related cancer. Doctors do not know exactly how long women will remain at risk.

DES daughters may also be at increased risk of developing squamous cell cancers and pre-cancers of the cervix linked to HPV(Hoover, Hger, Pfeiffer, Adam, Bond and Chevillle, 2011).

Cervical cancer may run in some families. If your mother or sister had cervical cancer, your chances of developing the disease are 2 to 3 times higher than if no one in the family had it. Some researchers suspect that some instances of this familial tendency are caused by an inherited condition that makes some women less able to fight off HPV infection than others. In other instances, women from the same family as a patient already diagnosed could be more likely to have one or more of the other non-genetic risk factors previously described (American Cancer Society ,2015).

Having sexual intercourse without any protective equipment as condom increase one's risk of having cervical cancer. When a woman has sexual intercourse with a man already infected with HPV or other sexual infectious disease that can cause cervical cancer and who is not presenting any symptoms such women can contact HPV (Luhn, *et al* 2013).

The Spread of Cervical Cancer

If cervical cancer is undiagnosed and untreated, it will slowly spread out of the cervix and into the surrounding tissue and organs. The cancer can spread down to the vagina and the surrounding muscles that support the bones of the pelvis. Alternatively, it can spread upwards, blocking the tube that runs from the kidneys to the bladder (ureters). The cancer can then spread into your bladder, rectum (back passage) and eventually into the liver, bones and lungs. Cancerous cells can also spread through the lymphatic system. The lymphatic system is a series of nodes (glands) and channels spread throughout your body in a similar way to the blood circulation system.

The lymph nodes produce many of the specialized cells needed by the immune system (the body's natural defense against infection and illness). If you have an infection, the nodes in your neck or under your armpits can become swollen. In some cases of early cervical cancer, the lymph nodes close to the cervix contain cancerous cells.

In some cases of advanced cervical cancer, lymph nodes in the chest and abdomen can be affected. (National Health Service,2015). To effectively prevent and control cervical cancer, the following strategies are to be employed:

Primary Prevention of Cervical Cancer

The following are primary ways of preventing cervical cancer:

Vaccination enhances resistance to the effects of exposure to the agent through the use of vaccines. It involves the administration of Human papilloma virus (HPV) vaccine into the body in order to produce immunity against HPV which is the causative agent of cervical cancer. There are currently since 2006 two vaccines that are available while since 2014, many countries have received market approval on the use of these two vaccines(Schwart,2012). They are:

Gardasil which is a type of vaccine that is quadrivalent. It contains and gives protection against the four strains of HPV which are Hpv 6, 11, 16, and 18 and Cervarix which is a bivalent vaccine which contains and also gives protection against the two strain of HPV which are Hpv 16 and 18.

Diagnostic Test For Cervical Cancer: This can be a confirmatory test which is a medical test to aid in the diagnosis or detection of a disease. This is because not all women with positive results on cervical screening tests actually have pre-cancer, a subsequent diagnostic test is sometimes used for definitive diagnosis or confirmation of pre-cancer or cancer.

Behavioral Change: Many health conditions are caused by risk behaviors just as it is in Cervical Cancer. Such behaviors include drinking alcohol, substance use, smoking, unprotected sexual intercourse, having sex earlier than age 17, having sex with HIV and Genital Warts infected persons, reduced immunity as a result of organ transplant and Tuberculosis. The key question in health behaviors research is how to predict and modify the adoption and maintenance of health behaviors. Fortunately, human beings have, in principle, control over their conduct. Health-compromising behaviors can be eliminated by self-regulatory efforts, and health-enhancing behaviors can be adopted instead, such as physical

exercise, weight control, preventive nutrition, condom use and abstaining from sex. Health behavior change refers to the motivational, volitional, and actioners processes of abandoning such health-compromising behaviors in favor of adopting and maintaining health-enhancing behaviors (Private Sector Partnership_Designing for Behavior Change Curriculum & Barrier Analysis website)

Theoretical Studies/ Framework

The theoretical frame work chosen for this study is the Health Belief Model. It is a psychosocial model pro-posed by Rosenstock (1966) in Stanhope and Lancaster for studying and promoting the uptake of health services like screening. The model explains preventive behaviour. The model assumes that belief and attitudes of people are critical determinants of their health-related actions. It holds that when cues to actions are present, the variations in uptake behaviour can be accounted for by beliefs concerning four sets of variables. These include

The individual's view of own vulnerability to illness: If an individual does not see himself or herself as being at risk of any problem, he or she will not seek care

Belief about severity of the illness: The associated problem could be seen as little, therefore little attention will be required.

The person's awareness of the benefits associated with action to reduce the level of threat or vulnerability.

The individual's evaluation of the potential physical, psychological, financial and social barrier.

Framework of the Three Major Components of Health Belief Model

The three major components of the health belief model are:

Individual awareness; modifying factors or behaviours; and variables affecting likelihood of action:

Individual awareness: Awareness is the process of becoming informed about a thing. One becomes acquainted of objects, qualities or relation by the way of sense organ. The individual's awareness of being at risk of cervical cancer will motivate the person to preventive services.

Modifying factors: These are variables that change or improve likelihood of action. They include demographic variables such as age, sex, marital status, religion and level of study, etc. They affect perception of threat; increased awareness will result in correct perception of threat based on scientific knowledge of cervical cancer.

Likelihood of action**:** An individual will take action if he or she understands that there is a need and that the particular action will help in meeting the need. Also if barriers to the utilization of such services are minimized. Since cervical cancer is not usually noticed until late stage, the call to go for screening seems to be ignored. Some women may not consider it as important because they have other competing needs. While others who may perceive screening as needful preventive health behaviour.

Review of Empirical Studies on Cervical Cancer**.**

Several studies have been carried out by different authors concerning cervical cancer and risk behaviors. Nevertheless, these studies have varying results. In a study carried out by Syed *et al* 2010 on Knowledge and Awareness about Cervical Cancer and Its Prevention amongst Interns and Nursing Staff in Tertiary Care Hospitals in Karachi, Pakistan. It was found out that only 3% of the health professionals know postcoital bleeding as a common presenting feature of cervical cancer, although it is one of the pathognomic symptoms of cervical neoplasia. Eighty-nine respondents did not know of any presenting symptom of the disease, and one hundred and

fourteen did not know about any risk factor. This emphasizes on the need to increase the awareness about cervical cancer.

In another study carried out by Hyacinth *et al* (2012) in Cervical Cancer and Pap Smear Awareness and Utilization of Pap Smear Test among Federal Civil Servants in North Central Nigeria which was done among female federal civil servants showed that cervical cancer awareness was 50.9%, a value that was slightly less than what was reported among women in South Eastern Nigeria. And significantly lower than was reported (71% awareness) among female undergraduates in South Western Nigeria.

In a study shown by Willey Peer Reviewed Resources (2015) on Awareness of cervical cancer risk factors and symptoms: A cross-sectional community survey in post-conflict northern Uganda showed that ninety-nine percent of participants (444/448) had heard about cervical cancer. Of these, 70.3% reported that cervical cancer is preventable while 92% reported that cervical cancer can be cured in the hospitals when diagnosed at an early stage. However, there was limited awareness that cervical cancer can be prevented through Pap smears (41%) or vaccination of young girls against HPV (8.3%). While about 1 in 3 (30.5%) participants had heard about the role of a sexually transmitted virus the development of cervical cancer, a larger proportion (85%) of participants believed that cervical cancer itself is sexually transmitted. The notion that cervical cancer spreads when a patient with cervical cancer has surgical treatment was reported by about 1 in 4 participants (29.9%). The odds of believing that cervical cancer spreads once operated on was 2.5 to 5 times higher among older participants (aged 45–59 and ≥60 years) compared to participants aged 18–29 years.

A national survey on Understanding Cervical Cancer Screening Among Lesbians in a Public Health Journal 2013 showed that Sixty-two percent of the weighted sample of respondents were routine screeners. Lack of a physician referral (17.5%) and lack of a physician (17.3%) were the most commonly-cited top reasons for lack of screening. Adjusting for age, education, relationship status,

employments status, and insurance status, women who had disclosed their sexual orientation to their primary care physician (adjusted odds ratio [OR] 2.84 [95% confidence interval 1.82–4.45]) or gynecologist (OR 2.30 [1.33–3.96]) had greater odds of routine screening than those who did not. Those who knew that lack of Pap testing is a risk factor for cervical cancer were also more likely to be routine screeners (OR 1.95 [1.30–2.91]), although no association with screening was apparent for women who had more knowledge of general cervical cancer risk factors. Physician recommendation appeared to be a potent determinant of regular screening behavior. Routine screeners perceived more benefits and fewer barriers to screening, as well as higher susceptibility to cervical cancer

Determinants of sexual activity and its relation to cervical cancer risk among South African Women a case-control study of hormonal contraceptives and cervical cancer risk carried out by Diane *et al* 2007 showed that the median age of sexual debut and number of sexual partners was 17 years and 2 respectively. Early sexual debut was associated with lower education, increased number of life time partners and alcohol use. Having a greater number of sexual partners was associated with younger sexual debut, being black, single, higher educational levels and alcohol use. The adjusted odds ratio for sexual debut < 16 years and ≥ 4 life-time sexual partners and cervical cancer risk were 1.6 (95% CI 1.2 – 2.2) and 1.7 (95% CI 1.2 – 2.2), respectively.

Sexual risk factors for cervical cancer among rural Indian women: a case-control study carried out by Biswas, Manna, Maiti, and Sengupta 1997 showed that the risk factors found to be associated with cervical cancer were early age at first coitus, extramarital sex partners of women and the time interval since first exposure. In a multiple logistic regression model, independent effects were observed for early age at first coitus, showing maximum risk in women who reported their first intercourse at < 12 years of age, compared to that of women at > or = 18 years (odds ratio [OR] = 3.5. 95% confidence interval (CI): 1.1-10.9). Increased risk was also seen for women who had extramarital sex relationships (OR **=**

5.5, 95% CI: 1.5-19.5). The significant effect of early age at first coitus persisted after adjustment for latency period which also showed its independent risk association with cervical cancer in the multivariate analysis.

Knowledge of risk factors and utilization of cervical cancer screening services among healthcare workers in a Teaching Hospital in Southwestern Nigeria. A descriptive cross sectional study among female health workers in Lagos Teaching Hospital Osogbo by Fasanu *et al* 2014 showed that a total of 250 copies of questionnaire were taken to the field and 240 were returned filled, giving a response rate of 96.0%. Mean age of respondents in this study was 34.53 (+7.4) years. Statistical significant association exists between ever heard of cancer of the cervix and age, and educational status ($p<0.05$). It also exists between heard about Pap smear and age, marital status, educational status, early age at first sexual intercourse and having multiple sexual partners.

The WHO Reproductive Health Library 2012 carried out a study on Interventions for encouraging sexual behaviors intended to prevent cervical cancer. A total of 5271 were screened, and out of these 23 randomized controlled trials met the inclusion criteria. Most of the trials had been conducted in the USA in health-care clinics (e.g. family planning). The majority of interventions involved providing information about STIs and teaching safer sex skills (e.g. communication), occasionally supplemented with provision of resources (e.g. free sexual health-care services). The trials were heterogeneous in terms of duration, contact time, type of providers, behaviour change objectives and outcomes. The effectiveness of behavioural interventions was mixed: statistically significant effects for behavioural outcomes (such as condom use, or improved knowledge) were frequently reported in the trials, while there were very few significant effects for biological outcomes (such as STI incidence). The review authors did not find any studies that had specifically evaluated impact of interventions on cervical cancer or even HPV infection. STIs and HIV incidence were used as a proxy for biological markers,

supposing that decrease in STI will relate to the decrease on HPV and therefore impact on cervical cancer.

A series of studies conducted by the International Agency for Research on Cancer (IARC) in eight countries (Brazil, Colombia, Morocco, Paraguay, Peru, the Philippines, Spain and Thailand). In addition, in two countries (Colombia and Spain), using a case control study in 2002 on Long-Term Pill Use, High Parity Raise Cervical Cancer Risk Among Women with Human Papillomavirus Infection revealed that one-third of both cases and controls who were HPV-positive had ever used oral contraceptives; the average duration of use was 6.1 years. The data suggest that ever-users of oral contraceptives were slightly more likely than never-users to have developed cervical carcinoma (odds ratio, 1.4), although this increase was not statistically significant. Among women who had used oral contraceptives for no more than four years, the odds of cervical cancer were no different from those among never-users. However, women who had taken the pill for 5-9 years had a significantly elevated risk of cervical cancer (odds ratio, 2.8), and those who had done so for 10 or more years had even further increased odds (4.0).

A study that assessed racial differences in survival among cervical cancer patients from Surveillance Epidemiology and End Results (SEER) areas between 1988 and 1994, the authors found that widowed, divorced, or
separated women had poorer survival (aHR 1.15; 95% CI = 1.02-1.29) compared to married women. Single women had a 10% increase in death risk, although, this risk did
not approach statistical significance (aHR 1.10; 95% CT = 0.93-1.29) (Howell, Chen, & Concato, 1999). Lai *et al*.showed similar poorer survival in single women in relation to married women in the 1973-1990 period (HR 1.25; 95% CI = 1.04-1.5) Lai et al., 1999.

Determinants of Cervical Cancer Screening Uptake among Women in Ilorin, North Central Nigeria: A Community-Based Study by Ajibola *et al* (2016) showed that out of the 360copies of questionnaires distributed, 338 were returned satisfactorily

completed, giving the response rate of 94%. It revealed that the mean age of the women who participated in the study was 30 ± 8 years. More than three-quarters (88.8%) of them were in the 21–35years age range. Two hundred and twenty-seven (67.2%) of them were married; most (43.2% and 36.7%) were in the lower and middle socioeconomic classes, respectively. Majority (68.0%) of the respondents practiced Islam and were resident within Ilorin Township (79.0%). At the bivariate level, the proportion (45.5%) of women who had ever been screened for cancer of the cervix was significantly higher among respondents who had positive attitude towards screening compared to those who had negative attitude. The proportion (12.0%) was also significantly higher among those who were aware of cancer of the cervix as well as those who were aware of cervical cancer screening (11.2%, p= 0.001).

Based on the above studies, it is believed that respondents lacked knowledge about cervical cancer risk factors, risk behaviors, and prevention strategies. There is therefore a wide range to conduct research on the risk behaviors of cervical cancer and advocate for preventive practices to minimize or eradicate cervical cancer.

CHAPTER THREE

Materials and Methods

This chapter discusses the method employed by this study which includes the following: Study Design, Area of Study, Population of the Study, Sample and Sampling Techniques, Instrument for Data Collection, Validation of the Instrument, Reliability of the Instrument, Method of Data Collection and Method of Data Analysis, Ethical consideration/ Informed Consent and Hypothesis.

Study Design

This study adopts a descriptive comparative study. According to Shields, Patricia and Rangarjan, (2013), a Descriptive study is used to describe characteristics of a population or phenomenon being studied. It does not answer questions about how/when/why the characteristics occurred. Rather it addresses the "what" question (what are the characteristics of the population or situation being studied?). The above design is appropriate for the study because is versatile, practical and permits the collection of original data from the respondents to investigate the knowledge and risk behaviors of cervical cancer.

Area of Study

The study was conducted in University of Port Harcourt Choba, in Obio Akpor Local Government Area of Rivers State. The University of Port Harcourt, Unique UNIPORT as it is popularly known by her students, staffs and alumni is an institution of higher learning owned by the Federal Republic of Nigeria. It is located in a strategic point along the popular east west road in Choba community, a community 20KM northwest of the garden city of Port Harcourt, the oil and gas capital of Nigeria. The university is a foremost center of teaching and research in the oil rich Niger Delta region of Nigeria. The University was established in 1975 as a College of the University of Lagos. It attained the full status as a university in 1977 when it gained full autonomous status from the University of Lagos. The University has since grown into a full blown university offering quality education and moral succor to the thousands of youths from

the Niger Delta region, the Country and abroad with her motto as "For Enlightenment and Self-Reliance

It is made up of 30,000 Student Population plus 3850 Graduate Students(male and female) and a total Staff Strength of 3802 (Ajienka 2013). The Academic Structure consists of Faculty of Agriculture; College of Continuing Education; College of Health Sciences; Faculty of Dentistry; Faculty of Education; Faculty of Engineering; Faculty of Humanities; Institute of Science Laboratory Technology, and Faculty of Management Sciences. It also has affiliation and membership of Association of Commonwealth Universities (ACU) and Association of African Universities (AAU).

Rivers State, also known simply as Rivers, is one of the 36 states of Nigeria. According to census data released in 2006, the state has a population of 5,185,400, making it the sixth-most populous state in the country. Its capital, Port Harcourt is the largest city and is economically significant as the centre of Nigeria's oil industry. Rivers State is bounded on the South by the Atlantic Ocean, to the North by Imo, Abia and Anambra States, to the East by Akwa Ibom State and to the West by Bayelsa and Delta states. It is home to many indigenous ethnic groups: Ikwerre, Ibani, Opobo, Eleme, Okrika, and Kalabari, Etche, Ogba, Ogoni, Engenni and others. The people from Rivers State are known as "Riverians". (City Population ,2014)

The inland part of the state consists of tropical rainforest; towards the coast the typical Niger Delta environment features many mangrove swamps. Rivers State, named after the many rivers that border its territory, was part of the Oil Rivers Protectorate from 1885 till 1893, when it became part of the Niger Coast Protectorate (Daily Independent, 2009). In 1900 the region was merged with the chartered territories of the Royal Niger Company to form the colony of Southern Nigeria. The state was formed in 1967 with the split of the Eastern Region of Nigeria. Until 1996 the state contained the area now known as Bayelsa State. Rivers State is currently consisted of 23 Local Government Areas including Obio Akpor LGA, the local area surrounding University of Port Harcourt. All LGAs handle local administration, under an elected Chairman. Each of the

local government areas has its own administrative seat (Rivers State Government website, 2009)

In 1956 crude oil was discovered in commercial quantities at Oloibiri, and Port Harcourt's economy turned to petroleum when the first shipment of Nigerian crude oil was exported through the city in 1958. Through the benefits of the Nigerian petroleum industry, Port Harcourt was further developed, with aspects of modernization such as overpasses and city blocks. Oil firms that currently have offices in the city include Royal Dutch Shell and Chevron (Ekeinde, 2010)

The main educational establishment in the city is the University of Port Harcourt, and the current Mayor of Port Harcourt is Chimbiko Akorolo. Port Harcourt's primary airport is Port Harcourt International Airport, located on the outskirts of the city; the Nigerian Air Force (NAF) base is the location of the only other airport in the city and is used by commercial airlines Aero Contractors and Virgin Nigeria (now Air Nigeria) for domestic flights.

Port Harcourt is the leading hub for medical services in Rivers State. Many healthcare facilities including hospitals and research facilities are located in Port Harcourt. The city has a prominent tertiary health institution University of Port Harcourt Teaching Hospital (UPTH) which is situated on the East West Road.

Study Population

The population of this study comprised 16500 (55%) registered female undergraduate students of University of Port Harcourt Rivers State Nigeria excluding female students from the Faculty of Health Sciences for purpose of bias.

Sample Size and Sampling Methods

Sample Size

The sample size of this study comprised 330 female students drawn from 7 Faculties which were Administration, Agriculture, Arts,

Humanities, Education, Engineering / Technical Environment, and Social Sciences. The sample size was determined using Fischer formula (Araoye, 2003):
$n = Z^2pq/e^2$. See sample size calculation in Appendix A.

Sampling Technique

The Seven Faculties with Seventy three Departments were included in the study. Multistage sampling technique was employed to select the desired sample size (respondent). The first stage was clustering the Departments by Faculties. The second stage was to stratify the Departments into study levels and taking 30% of each department. There were five study levels which were study level 100/year one, level 200/year two, level 300/year three, level 400/year four, and level 500/year five. Systematic random sampling was used to select 30% of females to get the sample frame. The sampling flow chart is illustrated in Appendix B

Instrument for Data Collection

The material used for this study was a well structured closed ended questionnaire which was written in English Language and designed from reviewed Literature. The questionnaire consisted three sections which includes socio demographic characteristics of students (Section A), which included age, study level, marital status and religion. Section B tests the knowledge of cervical cancer of the respondents. It comprised 10 sets of awareness questions which require respondents to answer yes, no or not sure and Section C addressed 10 risk behaviors of cervical cancer. A total of 24 items were designed to be answered by respondents. The questionnaire used for this study is shown in Appendix C

Validation of the Instrument

To ensure face validity and content validity of the questionnaire, the questionnaire was structured with the specific research questions based on literature review. It was assessed by the researcher's project supervisor who checked it for relevance and coverage of content in relation to the purpose of study, research questions and

the hypothesis. Her constructive suggestions, contributions and corrections were used to modify the final composition of the instrument. The marking scheme is shown in Appendix D

Reliability of Instrument

Reliability of the instrument was determined using pre-test method. 10 copies of the questionnaire were given to some respondents at the Rivers State University of Science and Technology Port Harcourt Nigeria. This Institution share similar characteristics with the Institution that was used for this study. Combats test was used to test the reliability of the questionnaire and a reliability coefficient of 0.9 was obtained. Reliability computations are found in Appendix E

Method of Data Collection

Administration of the questionnaire took place in the month of February 2016. The copies of the questionnaire were administered to consented female students who were recruited during their lecture hours on the University Campus. They were informed of the details of the study by the researcher and its importance to the control and elimination of cervical cancer among females. They were assured of absolute confidentiality of their information as it will only be for academic purposes.

Method of Data Analysis

Data was entered and analyzed using statistical package for social sciences (SPSS21.0). Descriptive statistics of cervical cancer risk behaviors, and knowledge of respondents towards cervical cancer were determined and reported in the form of mean, , proportions and percentages. Chi square test was carried out to test for significance between variables for categorical data with the level of statistical significance set up at P> 5% (0.05).

Ethical Consideration and Informed Consent

A letter of authorization was collected from the Head of Department of Public Health, Federal University of Technology, Owerri which

was taken to the ethical committee of University of Port Harcourt. The letter of authorization is shown in Appendix E. Institutional approval was obtained from the Ethical Committee of University of Port Harcourt Rivers State, Nigeria. Informed verbal consent was obtained from participants after been informed about the details of the study and its working methods. In order to ensure confidentiality and anonymity, names and address of the respondents were not included in the questionnaire.

CHAPTER FOUR

RESULTS

The results of this study are presented in this chapter.

Socio-Demographic Characteristics of Respondents

Three hundred and thirty **(**330) females of University students completed the demographic characteristics of respondents. The result of their age showed that (30·91%) of the respondents were between 18-21, (25·76%) were between 22-25, (20·90%) were between ≤17, (13·33%) were between 26-29, and (9·09%) were between 30-34.

Level of study of respondents (32·12%) were in Year 1, (18·48%) were in Year 2, (16·97%) are in Year 3, (16·67%) were in Year 4, and (9·09%) were in Year 5.

Marital status of respondents (68.48%) were single (22.73%) are married, (4.55%) were separated and (4.24%) were divorced.

The religion affiliation of the respondents showed that all participants in the survey were Christians (100%), Muslims (0%), African traditionalists (0%) and free thinkers (0%). Table 1

Table 1: Distribution of Respondents by Socio-Demographic Characteristics

Variables	**Frequency (n=330)**	**Percentage (%)**
Age		
≤17	69	20.9

18-21		102	30.91
22-25		85	25.76
26-29	33		
30-34		30	9.09
Level of Study			
Level One/Year 1		106	32.12
Level Two/Year 2		61	18.48
Level Three/Year 3		56	16.97
Level Four/Year 4		55	16.67
Level five/Year 5		52	15.76
Marital status			
Single		226	68.48
Married		75	22.73
Separated		15	4.55
Divorced		14	4.24
Religion			
Christian		330	100.0
Islam		0	0.0
African Traditional Religion		0	0.0

Knowledge of Respondents on Cervical Cancer

The result of the respondent's knowledge about cervical cancer showed that (72.42%) have heard of cervical cancer while (27.58%) have not heard of cervical cancer. (29.09%) are aware that Human Papiloma Virus (HPV) infection can predispose to cervical cancer while (70.91%) are not aware that HPV infection can pre dispose to cervical cancer. (40.91%) are aware that cervical cancer can be inherited where as (40.91%) are not aware that cervical cancer can be inherited. (48.48%) are aware that Sexually transmitted infections (STIs) can cause cervical cancer where as (51.52%) are not aware that STIs can pre dispose to cervical cancer. (51.52%) are not aware that previous cancer on other sites can cause cervical cancer while (82.73%) are aware that previous cancer on other sites cannot cause cervical cancer, while (17·27%) are not aware that previous cancer on other sites cannot cause cervical cancer. (71.21%) are aware that cervical cancer is curable where as (28.79%) is not aware that

cervical cancer can be cured. (28.79%) is aware that use of condom can prevent cervical cancer where as (68.48%) is not aware that condom use can prevent cervical cancer. (38.79%) is aware that pain during sexual intercourse is a symptom of cervical cancer while (61.21%) is not aware that pain during sexual intercourse is a symptom of cervical cancer. (45·45%) have heard about cervical cancer vaccination while (55·55%) have not heard of cervical cancer vaccination. (77 ·88%) are aware that cervical cancer vaccination is not a way to cure cervical cancer where as (22·12%) are not aware that cervical cancer vaccination is not a way to cure cervical cancer. Table 2

TABLE 2: Knowledge of Respondents On Cervical Cancer

Variables	**Frequency (n=330)**	**Percentage (%)**
Have you ever heard of cervical cancer?		
Yes	239	72.42
No	91	27.58
Knowledge on if Human papilloma virus (HPV) infection predispose to cervical cancer		
Yes	96	29.09
No	234	70.91
Knowledge on if cervical cancer can be inherited		
Yes	135	40.91
No	195	59.09
Knowledge on if Sexually Transmitted Infections (STIs) can cause cervical cancer		
Yes	160	48.48

No	170	51.52
Knowledge on if previous cancer on other sites can cause cervical cancer		
Yes	57	17.27
No	273	82.73
Knowledge on If there is a cure for cervical cancer?		
Yes	235	71.21
No	95	28.79
Knowledge on if condom use is a method of preventing cervical cancer		
Yes	104	31.52
No	226	68.48
Knowledge on if pain during sexual intercourse is a symptom of cervical cancer		
Yes	128	38.79
No	202	61.21
Knowledge on if they have ever heard of cervical cancer vaccination		
Yes	150	45.45
No	180	54.55
Knowledge on if Cervical cancer vaccination is one way to prevent cervical cancer		
Yes	73	22.12
No	257	77.88

Knowledge Score of Respondents on Cervical Cancer

The mean Knowledge score of the respondents is 4.17± 2.41. Majority of the respondents show medium level of Knowledge on cervical cancer (50.91%) compared to Low knowledge level (34.24%) and High knowledge level (14.85%). Table 3.

TABLE 3: Knowledge Score of Respondents on Cervical Cancer

Variables	**Knowledge level score on Cervical Cancer (n=330)**
	Freq (%)
Knowledge score (Total score 10)	
Mean ± SD	4.17 ± 2.41
Low Knowledge level (0-3)	113 (34.24)
Medium level (4-6)	168 (50.91)
High Level (7-10)	49 (14.85)
Chi-square (χ2) (*p-value*)	**96.74 (*0.001*)***

**Statistically significant (p<0.05)*

Risk Behaviors of Cervical Cancer Practiced by Respondents

The result of the respondents practices on ten different risk behaviors that can predispose them to cervical cancer are as follows: Number of sexual partners

do you have? one (43·64%), two (19·39%), three (12·12%), >three (1·52%) and none (23·33%). Which sex/gender are you sexually attracted to? (sexual orientation) lesbian (12·73%) heterosexual (50·30%) bisexual (13·64%) none (23·33%). At what age did you have your first sexual intercourse? ≤10 (0·0), 11-15 (40.91%), 16-20 (30.0 %), 21-25 (8.48%), still a virgin (20.61%). How often do you take birth control pills (contraceptives)? regularly (5.15%), occasionally (16.36%), rarely (15.45%), not at all (63.03%). At what age did you have your first child? ≤ 14 (3.03%), 15-19 (7.58%), 20-24 (10.0%), 25-29 (0.0%). ≥ 30 (0.0%). How many children do you have? 0ne (50.75%), two (22.39 %), three (16.42%), 4(10.45%). How often do you consume alcohol? regularly (23.33%), occasionally (36.67%), rarely (0·0%), not at all (40.0%) How often do you smoke? regularly (0.0%), occasionally (13.94%), rarely (0.0%), not at all (40.0%). Table 3.

Variables	Frequency (n=330)	Percentage (%)
How you many sexual Partners do you have?		
One	144	43.64
Two	64	19.39
Three	40	12.12
Greater than three	05	01.52
None	77	23.33
Which sex/ gender are you sexually Attracted to?(sexual orientation)		
Same sex with you (Lesbian)	42	12.73

Person of opposite sex with you (Heterosexual)	166	50.30
Both person of opposite sex (Bisexual)	45	13.64
At what age did you have your first sexual intercourse?		
≥10	0	0.00
11-15	135	40.91
16-20	99	30.00
21-25	28	08.48
Still a virgin	68	20.61
How often do you take birth Control pills(Contraceptives)		
Regularly	17	05.15
Occasionally	54	16.36
Rarely	51	15.45
Not at all	208	63.03
At what age did you have your first child?		
≤ 14	10	02.03
15-19	25	07.58
20-24	33	10.00
25-29	0	0.00
≥ 30	0	0.00
How many children do you have (n=67)		
1	34	50.75
2	15	22.39
3	11	16.42
4	7	10.45

How often do you		
Consume alcohol?		
Regularly	77	23.33
Occasionally	121	36.55
Rarely	0	0.00
Not at all	133	40.00
How often do		
do you smoke?		
Regularly	0	0.00
Occasionally	46	3.94
Rarely	49	14.85
Not at all	235	71.21

Age and Cervical Cancer Knowledge

Respondents and cervical cancer knowledge of different age groups is demonstrated in the table below. Age group 18-21 had the highest knowledge level score while age group 30-34 had the lowest knowledge score. Table 5.

Table 5: Age and Cervical Cancer Knowledge

Table 5: Age and Cervical cancer Knowledge

Age	Cervical cancer knowledge level score			Total	Chi-square ($\chi 2$)	*p-value*	*df*
	Low knowledge level (0-3)	**Medium level (4-6)**	**High level (7-10)**				
<17	13 (11.50)	43 (25.60)	13 (26.53)	69 (20.91)			
18-21	45 (39.82)	41 (24.40)	16 (32.65)	102 (30.91)			
22-25	31 (27.43)	44 (26.19)	10 (20.41)	85 (25.76)	13.11	*0.01**	8
26-29	12 (10.62)	25 (14.88)	7 (14.29)	44 (13.33)			
30-34	12 (10.62)	15 (8.93)	3 (6.12)	30 (9.09)			
TOTAL	**113**	**168**	**49**	**330**			

Level of Study and Cervical Cancer Knowledge

Table 6 : Level of Study and Cervical Cancer Knowledge

Level of study	Cervical cancer knowledge level score			Total	Chi-square ($\chi 2$)	*p-value*	*df*
	Low awareness level (0-3)	**Medium level (4-6)**	**High level (7-10)**				
Level One	29 (25.66)	58 (34.52)	19 (38.78)	106 (32.12)			
Level Two	27 (23.89)	26 (15.48)	8 (16.33)	61 (18.48)			
Level Three	22 (19.47)	25 (14.88)	9 (18.37)	56 (16.97)	7.09	*0.527*	8
Level Four	18 (15.93)	30 (17.86)	7 (14.29)	55 (16.67)			
Level five	17 (15.04)	29 (17.26)	6 (12.24)	52 (15.76)			
TOTAL	**113**	**168**	**49**	**330**			

Marital Status and Cervical Cancer Knowledge

Respondents knowledge of cervical cancer of different marital status is represented in the table below. Singles had the highest knowledge level (71.43) while divorced had the lowest knowledge level (8.16). Table 7.

Table 7 : Marital Status and Cervical Cancer Knowledge

Marital Status	**Cervical cancer knowledge level score**			**Total**	**Chi-square ($\chi 2$)**	***p-value***	***df***
	Low knowledge level (0-3)	**Medium level (4-6)**	**High level (7-10)**				
Single	78 (69.03)	113 (67.26)	35 (71.43)	226 (68.48)	63.90	*0.001**	8
Married	23 (20.35)	44 (26.19)	8 (16.33)	75 (22.73)			
divorced	5 (4.42)	5 (2.98)	4 (8.16)	14 (4.24)			
Separated	7 (6.19)	6 (3.57)	2 (13.33)	15 (4.55)			
TOTAL	**113**	**168**	**49**	**330**			

Respondents association between the independent variables with number of sex partners is demonstrated in the table below. Respondents that are in age group 25 and below had a significant P value (P = 0.001). Table 8

Table 8: Association Between the Independent Variables (Age, Level of study and Marital Status) with Number Of Sex Partners Using Odds Ratio.

Characteristics	**Total**	**Sex Partners Freq (%)**		***Odds Ratio (OR)***	**p-value**	***95% Confidence Interval (CI)***
		Predispose To (2, 3 & > 3)	**Not Predispose To** (1 and none)			
Age Category (Years)	**256**	73 (28.52)	183 (71.48)	0.42	0.001*	0.24-0.74
25 & below	**74**	36 (48.65)	38 (51.35)			
26 & above						
Total	**330**	**109**	**221**			
Level of study						
Level 3 & below	**223**	71 (31.84)	152 (68.16)	0.85	0.533	0.50-1.43
Level 4 & 5	**107**	38 (35.51)	69 (64.49)			
Total	**330**	**109**	**221**			
Marital Status						
Single & Separated	**241**	78 (32.37)	163 (67.63)	0.89	*0.693*	0.53-1.51
Married	**89**	31 (34.85)	58 (65.17)			
Total	**330**	**109**	**221**			

Respondents association between the independent variables (Age, Level of study and Marital Status) with sex gender attracted using is demonstrated below. There was a less odds association between respondents in age group 25 and below with lesbians and bisexuals (OR= 0.42, P=0.001) Table 9.

Table 9: Association Between the Independent Variables (Age, Level of studies and marital status) with sex gender attracted to using Odds Ratio.

Characteristics	Total	Sex gender attracted to		*Odds Ratio (OR)*		*95% Confidence Interval (CI)*
		Predispose To (lesbian, bisexual)	**Not Predispose To** (none, heterosexual)			
Age Category (Years)	**256**	61 (23.83)	195 (76.17)	0.57	0.04*	0.32-0.99
25 & below	**74**	26 (35.14)	48 (64.86)			
26 & above						
Total	**330**	**87**	**243**			
Level of study						
Level 3 & below	**223**	59 (26.46)	164 (73.54)	1.0	0.938	0.59-1.79
Level 4 & 5	**107**	28 (26.17)	79 (73.83)			
Total	**330**	**87**	**243**			
Marital Status						
Single & Separated	**241**	70 (29.05)	171 (70.95)	1.73	*0.09*	0.92-3.36
Married	**89**	17 (19.10)	72 (80.90)			
Total	**330**	**87**	**243**			

Respondents association between the independent variables with age at first sexual intercourse is demonstrated below. Respondents in level 3 and below had a less Odds association with age < 10, and 11 -15) (OR = 0.53). Single and separated also had a less Odds association with age group <10 and 11-15. Table 10

Table 10: Association between the independent variables (Age, Level of study and Marital Status) with Age at first sexual intercourse using Odds Ratio.

Characteristics	Total	Age at first Intercourse Freq (%)		*Odds Ratio (OR)*	p-value	*95% Confidence Interval (CI)*
		Predispose To (<10,11-15)	**Not Predispose To** (16-20,21-			

			25, virgin)			
Age Category (Years)	**256**	99 (38.67)	157 (61.33)	0.67	0.16	0.38-1.16
25 & below	**74**	36 (48.65)	38 (51.35)			
26 & above						
Total	**330**	**135**	**195**			
Level of study						
Level 3 & below	**223**	80 (35.87)	143 (64.13)	0.53	0.01*	0.32-0.86
Level 4 & 5	**107**	55 (51.40)	52 (48.60)			
Total	**330**	**135**	**195**			
Marital Status						
Single & Separated	**241**	87 (36.10)	154 (63.90)	0.48	*0.01**	0.29-0.79
Married	**89**	48 (53.93)	41 (46.07)			
Total		**135**	**195**			

Characteristics	**Total**	**Birth control pills**		***Odds Ratio (OR)***	**p-value**	***95% Confidence Interval (CI)***
		Predispose To (regularly, occasionally)	**Not Predispose To** (rarely, not at all)			
Age Category (Years)	**256**	26 (10.16)	230 (89.84)	0.074	0.001*	0.04-0.14
25 & below	**74**	45 (60.81)	29 (39.19)			
26 & above						
Total	**330**	**71**	**259**			
Level of study						0.12-0.39
Level 3 & below	**223**	28 (12.56)	195 (87.44)	0.21	0.001*	
Level 4 & 5	**107**	43 (40.19)	64 (59.81)			

Total	**330**	**71**	**259**			
Marital Status						
Single & Separated	**241**	39 (16.18)	202 (83.82)	0.35	*0.001**	0.19-0.62
Married	**89**	32 (35.96)	57 (64.04)			
Total	**330**	**71**	**259**			

Respondents association between the independent variables with use of birth control pills is demonstrated below. Respondents that took birth control pills regularly and occasionally had a less Odds ratio for age group 25 and below, (0.074) level of study 3 and below (0.21) and singles and separated (0.35). Table 12

Table 12: Association between the independent variables (Age, Level of study and Marital Status) with use of birth control pills using Odds Ratios.

Characteristics	**Total**	**Birth control pills**		***Odds Ratio (OR)***	**p-value**
		Predispose To (regularly, occasionally)	**Not Predispose To** (rarely, not at all)		
Age Category (Years)					
25 & below	**256**	26 (10.16)	230 (89.84)	0.074	0.001*
26 & above	**74**	45 (60.81)	29 (39.19)		
Total	**330**	**71**	**259**		
Level of study					
Level 3 & below	**223**	28 (12.56)	195 (87.44)	0.21	0.001*
Level 4 & 5	**107**	43 (40.19)	64 (59.81)		
Total	**330**	**71**	**259**		
Marital Status					
Single & Separated	**241**	39 (16.18)	202 (83.82)	0.35	*0.001**
Married	**89**	32 (35.96)	57 (64.04)		
Total	**330**	**71**	**259**		

Respondents association between the independent variables with age at first child birth is demonstrated below. Respondents that had children at age < 14, and 15-19 had a less odds association (OR=0.26) for singles and separated. Table 13.

Table 13: Association between the independent variables (Age, Level of study and Marital Status) with Age at first child birth using Odds Ratio.

Characteristics	**Total**	**Age at first child Freq (%)**		***Odds Ratio (OR)***	**p-value**	***95% Confidence Interval (CI)***
		Predispose To (<14, 15-19)	**Not Predispose To** (20-24, 25-29,>30)			
Age Category (Years)	**256**	23 (8.98)	233 (91.02)	0.51	0.117	0.22-1.19
25 & below	**74**	12 (16.22)	62 (83.78)			
26 & above						
Total	**330**	**35**	**295**			
Level of study						
Level 3 & below	**223**	21 (9.42)	202 (90.58)	0.69	0.44	0.32-1.54
Level 4 & 5	**107**	14 (13.08)	93 (86.92)			
Total	**330**	**35**	**295**			
Marital Status						
Single & Separated	**241**	16 (6.64)	225 (93.36)	0.26	*0.001**	0.11-0.57
Married	**89**	19 (21.35)	70 (78.65)			
Total	**330**	**35**	**295**			

Respondents association between the independent variables with alcohol consumption is demonstrated below respondents that consumed alcohol regularly and occasionally had a less odds association for age group 25 and below. (OR = 0.48). Also a less odds association was seen among singles and married with age group 25 and below (OR = 0.53). Table 14,

Table 14: Association between the independent variables (Age, Level of study and Marital Status) with alcohol consumption using Odds Ratios.

Characteristics	**Total**	**Use of Alcohol**		***Odds Ratio (OR)***	**p-value**	***95% Confidence Interval (CI)***
		Predispose To (regularly, occasionally)	**Not Predispose To** (rarely, not at all)			
Age Category (Years)	**256**	144 (56.25)	112 (43.75)	0.48	0.001*	0.26-0.87
25 & below	**74**	54 (72.97)	20 (27.03)			
26 & above						
Total	**330**	**198**	**132**			
Level of study						
Level 3 & below	**223**	126 (56.50)	97 (43.50)	0.63	0.08	0.38-1.05
Level 4 & 5	**107**	72 (67.29)	35 (32.71)			
Total	**330**	**198**	**132**			
Marital Status						
Single & Separated	**241**	135 (56.02)	106 (43.98)	0.53	*0.02**	0.30-0.91
Married	**89**	63 (70.79)	26 (29.21)			
Total	**330**	**198**	**132**			

CHARPTER FIVE

DISCUSSION

Assessing Cervical Cancer Awareness Among University of Port Harcourt Students of Different Socio Demographic Characteristics**.**

This study showed a medium level awareness (50.91%) for cervical cancer which is statistically significant (p=0.05). Age and Marital status (single) has a statistical significance of knowledge(p=0.05). The reason could be that teenagers are more accessible to information especially on social media. In this study, 72.42% indicated that they have heard of cervical cancer. This is considerably high compared to the result published by Muhammed *et al* 2014 where 55.2% was shown to have heard of cervical cancer. Out of this only 37.2% got the awareness from television. Also in a cross sectional survey of 650 women conducted in London showed that 76.2% had heard of cervical cancer. This is in line with this present study. A larger proportion of respondents 91.6% also indicated having heard of cervical cancer which was published by Samura *et al* 2015 in Gabon. In his survey, only 8% are aware that HPV infection can predispose to cervical cancer. This is low when compared to this study where 29.09% of respondents indicated HPV infection as a predisposing factor to cervical cancer. Wright *et al* 2014 in his study reported 5.1% HPV as a predisposing factor for cervical cancer. A relatively similar proportion 7.9% was also reported in a cross sectional survey among college women in a Ghana University. In another study by Muhammed 2013 revealed that over half (53.3%) of the participants had heard about cervical cancer and its detection method. More than half (60%) and over a third (37.8%) of the participants knew about human papilloma virus (HPV) as a risk factor for cervical cancer.

A survey from United States (US) reported (Lambert, 2001) 40% of American women aged 18-75 years to have heard of HPV. None of the Malaysian women respondents (Wong *et al*., 2009) aged 21-56 years had heard of HPV. Only 19.0% of adult Korean women reported to know that HPV infection was a risk factor for cervical cancer (Oh *et al*., 2010). In yet another Korean study a mere 9.5% of female high school and university students reported that they had ever heard of HPV (Han *et al.*, 2007).

In this study, 48.48% know that sexually transmitted infections can predispose to cervical cancer. Only 19% and 7% of participants in a study by Cristina *et al* 2010, knew that HPV is a Sexually Transmitted Infection (STI) and that it can cause cervical cancer respectively. Knowledge for condom use as a means of preventing cervical cancer was 31.52%. This low level of awareness of condom use is in contrast to the high level of awareness about STI in the respondents. It showed an awareness practice disconnect which can be fuelling the transmission of sexually transmitted diseases within the

population. It establishes a strong case for education, knowledge and other interventions in the population against HPV infections, especially the pathogenic strains which can predispose to cancer.

Awareness on having heard of cervical cancer and cervical cancer vaccination as a way of preventing cervical cancer was reported in this study to be 45.45% and 22.12% respectively. This result is in line with the report of Mouallif *et al* 2014 14.3% and Pandey *et al* 2013 28.1% for vaccination as a way of preventing cervical cancer. Amos *et al* 2015 reported that 70% of the respondents know that cervical cancer can be prevented and 92% declared that it can be cured if diagnosed early. Awareness on symptom of cervical cancer for bleeding after intercourse was reported to be 38.79%. This awareness level is a little higher than that reported by Priyan in India (11%) but higher (64%) in what was reported by Eve 2010. Although a general medium level awareness was recorded by the respondents of this study, a consistent education is needed by the population to increase their awareness above medium level.

To Elicit the Types of Risk Behaviors of Cervical Cancer among University of Port Harcourt Students of Different Socio Demographic Characteristics.

In this study, Odds ratio (OR) was used to elicit the relationship between cervical cancer risk behaviors and socio-demographic characteristics. A positive outcome between sex partner as a risk behavior of cervical cancer and age was 0.42 with a 95% confidence interval ranging from 0.24-0.74, and the associated *p-value is 0.001*. Odds Ratio less than one (OR<1) with a statistically significant p-value, has a poor risk association or odds of students between the ages of 25 and below having two sex partners and above, at risk behaviors for cervical cancer. There was no statistically significant association for sex partner as a risk behavior of cervical cancer in either level of study *(OR=0.85, 95%CI=0.50-1.43, p-value=0.533)* or marital status *(OR=0.89, 95%CI=0.55-1.51, p-value=0.693).* Also a positive outcome between sex gender attracted to as a risk behavior of cervical cancer and age was 0.57 with a 95% confidence interval ranging from 0.32-0.99, and the associated *p-value is 0.04*. It showed that there

was a poor risk association or odds of students between the ages of 25 and below being lesbians and bisexuals, at risk behaviors for cervical cancer. No statistically significant association was seen for sex gender attracted to as a risk behavior of cervical cancer in either level of study *(OR=1.0, 95%CI=0.59-1.79, p-value=0.938)* or marital status *(OR=1.73, 95%CI=0.92-3.36, p-value=0.09).* A positive outcome showed no association between age at first intercourse as a risk behavior of cervical cancer and age of student *(OR=0.65, 95%CI=0.38-1.16, p-value=0.16)* but there was a significant association between level of study and marital status. Students that were 300 level and below were significantly less likely to have first sexual intercourse at a younger age of 15 years and below than those that were in their 400 level and above *(OR=0.53, 95%CI=0.32-0.86, p-value=0.01).* Also, those that were either single or separated were less likely to have first sexual intercourse at a younger age of 15 years and below *(OR=0.48, 95%CI=0.29-0.79, p-value=0.01),* and this finding was statistically significant. Students on birth control pills as a risk behavior of cervical cancer showed a significant association with age *(OR=0.074, 95%CI=0.04-0.141, p-value=0.001).*, level of study *(OR=0.21, 95%CI=0.12-0.39, p-value=0.001)* and marital status *(OR=0.35, 95%CI=0.19-0.62, p-value=0.001).* The findings showed that students that were between the ages of 25 and below, level of study 300 and below and those that were either single or separated were less likely to be taking birth control pills, a risk behavior of cervical cancer over students that were above 25 years, level of study 400 and above and married. This could be linked to a preventive measure against unwanted pregnancy which may negatively affect their academic carrier.

Age at first child birth in this study had a significant risk association or odds between single and separated students (OR 0.26, P value 0.001, and 95% CI 0.11-0.57) with students under age 14, and 15-19 but no significant risk or odds for level of study. A significant association was recorded with alcohol consumption and age (OR 0.48. P value 0.001, CI 0.26-0.87) but no association was seen with level of study and marital studies. There was no positive association between age, level of study, marital status and smoking.

What are the recommendations based on findings to reduce cervical cancer?

The knowledge about cervical cancer, its risk behaviors and the methods of prevention is limited in the 20 to 30 years old women in University of Port Harcourt Rivers State. It was discovered that the women who have a knowledge of some of these risk behaviors, had a gap between knowledge and actual practices. One of the crucial reasons for the moderately low level of knowledge could be that there was no cervical cancer screening program in the State. Hence there was no concerted effort to make the women know of the disease or its prevention. This is in spite of the fact that the exposure of the women to the risk behaviors of cervical cancer was high and the disease is prevalent in the University. There is a reason for optimism in the observations that with improved education women will have a knowledge of the common risk behaviors and try to avoid them. The national policy of providing mandatory free education to all the citizens in the country will be an added advantage. Inclusion of cervical cancer screening as part of preschool admission requirement will also improve knowledge.

CONCLUSION

Participants only have a moderately medium level awareness time, a reasonable proportion of participants engaged in practices that can predispose to cervical cancer although the odds ratio was not significant in some of the practices. Awareness regarding best practices such as dietary intake of foods rich in vitamin C and E, maintaining one sexual partner, having sex with a barrier to STIs such as condom, and anti smoking habits to reduce cervical cancer should be emphasized. The females in Port Harcourt city and Rivers State at large should be informed about the disease and encouraged to do cervical screening (Pap smear test) and to perform HPV vaccination. Knowledge of cervical cancer has to be raised through education (awareness lectures, posters and wall papers in the streets) and campaigning because nowadays the media (TV and radio) alone is not sufficient to increase awareness or practice.

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RECOMMENDATION

!) Effective strategies are needed to ensure that women get screened at the appropriate ages and intervals. It is necessary to include cervical cancer test in the preschool admission screening.

2) There is a need to promote cervical cancer screening among women by informing them on their susceptibility to cervical cancer and encouraging a belief that active and regular screening can detect cervical cancer at the precancerous stage, hence enabling the early treatment and prevention of cancer development.

3) All females should be informed about the disease and encouraged to do cervical screening (Pap smear test) and to perform HPV vaccination after marriage periodically for their safety and also should be advised to overcoming barriers to having the test such as fear and embarrassment because screening women for precancerous conditions will ever remain necessary

5) Step up the campaign for the control of cervical cancer in this region.

6)Women to be encouraged to practice behaviors such as condom use, maintaining a single sex partner free from sexually transmitted diseases, consumption of diet rich in fruits, and avoid early sexual practice.

7) Women to form cervical cancer prevention clubs in schools that will promote cervical cancer awareness and prevention.

8)Local sex education programmes to be organized by Government, Non- Governmental Organizations, Voluntary Associations and Community groups.

9) Government policies on anti smoking to be encouraged and advocated to promote a smoke free culture to safeguard the health of the community.

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Appendix A

Sample Size Determination

The sample size of this study comprised 330 female students drawn from 7 Faculties which are Administration, Agriculture, Arts, Humanities, Education, Engineering / Technical Environment, and Social Sciences. The sample size was determined using Fischer formula (Araoye, 2003):

$n = Z^2pq/e^2$ where n = the minimum sample size

Z = the standard normal deviate corresponding to the level of significance

p = the proportion of the sample population, which was gotten from a study by Durowade *et al*.,2013

q = (1-p)

e = level of precision or maximum error of estimate at 95% confidence level, with e = 0.05

p = 0.265

Z = 1.96

q = 0.735

Therefore,

$n = Z^2pq/e^2$

$= 1.96^2 \times 0.265(0.735)/ 0.05^2$

3.84 x 0.195/0.0025

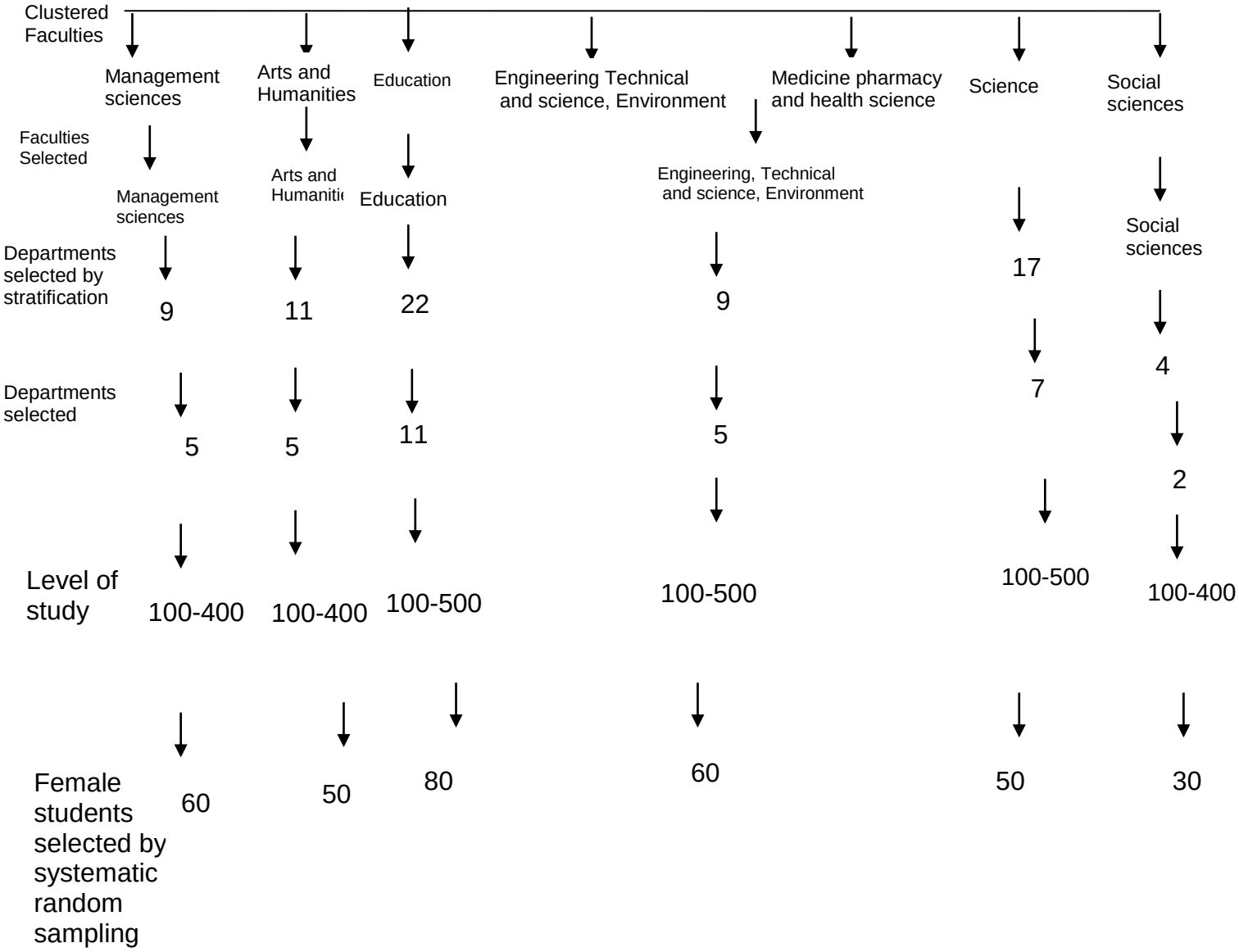
= 299.52, approx. 300

For reliability or non-response, therefore; increase by 10%

= 300 + 30 = 330

Appendix B

Flow Chart of University of Port Harcourt Faculties and Departments



Appendix C

Questionaire

Dear Respondent,
I am a post graduate student of Public Health from Federal University of Technology Owerri, Imo State. The questionnaire is designed to help in a STUDY OF CERVICAL CANCER AWARENESS AND RISK BEHAVIORS AMONG STUDENTS OF UNIVERSITY OF PORT HARCOURT, RIVERS STATE, NIGERIA**.** The exercise is purely for academic purpose and confidentiality of any information given is highly guaranteed any where in this questionnaire. Kindly be honest in your responses. Thank you for your commitment and co-operation.
Mac-Fiberesima Gborieneomie.

INSTRUCTION: Please circle the appropriate option in all the sections.

SECTION A: SOCIO DEMOGRAPHIC CHARACTERSITICS

1) (a)What was your age (last birthday)? (a) ≤ 17 (b) 18 -21 (c) 22 -25 (d) 26-29 (e) ≥ 30

2)What is your level of study? : (a) 100 level/ Year 1 (b) 200 level/Year 2 (c) 300 level/Year 3 (d) 400 level /Year 4 (e) 500 level / Year 5

3) What is your marital status: (a) Single (b) married (c) Separated (d) Divorced (e) co-habiting

4) What is your religion affiliation: (a) Christianity (b) Muslim (c) African traditionalist

SECTION B: KNOWLEDGE OF CERVICAL CANCER

5) Have you ever heard of cervical cancer? : (a) Yes (b) No
6) Can Human papilloma virus (HPV) infection predispose to cervical cancer? **(a)** Yes (b) No

7) Can cervical cancer be inherited? **(a)** Yes (b) No

8) Can Sexually Transmitted Infections (STIs) cause cervical cancer? **(a)** Yes (b) No

9) Can previous cancer on other sites cause cervical cancer? (a) Yes **(b)** No

10) Is there a cure for cervical cancer? **(a)** Yes (b) No

11) Is condom use a method of preventing cervical cancer? **(a)** Yes (b) No

12) Is pain during sexual intercourse a symptom of cervical cancer? **(a)** Yes (b) No

13) Have you ever heard of cervical cancer vaccination? (a) Yes (b) No

14) Cervical cancer vaccination is one way to cure cervical cancer (a) Yes **(b)** No

SECTION C: AT RISK BEHAVIORS OF CERVICAL CANCER

14) **How many sexual partners do you have?** (a) 1 (b) 2 (c) 3 (4) >3 (d) none

15) **Which sex/gender are you sexually attracted to? (sexual orientation)** (a) Same sex with you (lesbian) (b) Person of opposite sex with you(heterosexual (c) Both person of opposite sex (bisexual) (e) None (not sexually attracted to any sex)

16) **At what age did you have your first sexual intercourse?**
(a) ≤ 10 (b) 11-15 (c) 16-20 (d) 21-25 (e) still a virgin

17) **How often do you take birth control pills (contraceptives)?**
(a) regularly (b) occasionally (c) rarely (d) not at all

18) **At what age did you have your first child?**
(a) ≤ 14 (b) 15-19 (c) 20-24 (d) 25-29 (e) ≤ 30 (f) none

19) **How many children do you have?**
(a) 1 (b) 2 (c) 3 (d) 4 (e) > 4 (e) none

20) **How often do you consume alcohol?**
(a) Regularly (b) occasionally (c) rarely (d) not at all

21) **How often do you smoke?**
(a) Regularly (b) occasionally (c) rarely (d) not at all

Appendix D

Questionnaire Marking Scheme Awareness of Cervical Cancer

5) Have you ever heard of cervical cancer?

6) Can Human papilloma virus (HPV) infection predispose to cervical cancer? **(a)**

7) Can cervical cancer be inherited? **(a)**

8) Can Sexually Transmitted Infections (STIs) cause cervical cancer? **(a)**

9) Can previous cancer on other sites cause cervical cancer? **(b)**

10) Is there a cure for cervical cancer? **(a)**

11) Is condom use a method of preventing cervical cancer? **(a)**

12) Is pain during sexual intercourse a symptom of cervical cancer? **(a)**

13) Have you ever heard of cervical cancer vaccination?

14) Cervical cancer vaccination is one way to cure cervical cancer **(b)**

NOTE: Each question carries one mark

GRADING**:** 1-3 marks Low Level Knowledge
4-6 marks Medium Level Knowledge
7-10 marks High level Knowledge

Appendix E

Statistical Representation of Reliability Test

The reliability of questionnaire was calculated using Cronbach alpha formular (2012)

Alpha = $Np/[1+p(N-1)]$

Where N=Number of items
P=mean inter item correlation

Using N= 23 items on questionnaire concerning cervical cancer awareness and risk behaviors.

P= calculated inter-item correlation (0.28) using computerized statistical package for social sciences (SPSS)

Alpha= $23(0.28)/[1+0.28(23-1)] = 6.44/6.16 = 0.899 \approx 0.9$ to be good.

At alpha = 0.899 the instrument reliability was found to be good.

According to George and Mallery Cronbach alpha Test (2012), test instrument calculation of 0.899 is good reliability.

Appendix F

University of Port Harcourt Ethical Clearance

Mrs Ebeu-
Monica
Daru (PHD)

UNIVERSITY OF PORT HARCOURT
RESEARCH ETHICS COMMITTEE

MEMORANDUM 804F01

From: Secretary	To: Provost (CHS), Deans of Faculty, Dean, SGS and HODs
UPH/CRMAD/REC/04/2015	HOD AEB
Date: November 9, 2015	

SUBMISSION OF PROPOSALS FOR ETHICAL CLEARANCE

In March 2013, the Research Ethics Committee sent out memos to all Colleges, Faculties and Departments, informing them of the need to send research proposals of their students for ethical clearance. A few Departments have complied while most other Departments are yet to do so.

I am directed to remind the College of Health Sciences, School of Graduate Studies, all Faculties and Departments, that the Research Ethics Committee is still operational, and to also emphasize the fact that **without ethical clearance, no postgraduate student will be allowed to do their external exams**. To this end, be informed that all research proposals of students of the University of Port Harcourt require ethical clearance and therefore, should be forwarded to the Research Ethics Committee for review in order to issue them with ethical clearance.

The Provost, CHS, Deans of Faculty, Dean, SGS and HODs are by this memo requested to ensure that students in their various domains comply with this memo. Also note that the Committee will not consider completed research work for ethical clearance.

Staff of the University who want to carry out any form of research are also requested to get ethical clearance from the Committee.

Attached is a format for submission of proposals.

The Directive of the Committee is hereby communicated to you for you information and necessary action please.

Thank you.

Akubom, S. T. Otami

See AEB
Pls copy for all staff notice boards and copy for each staff.
12/11/15

Distribution

1. Provost, College of Health Sciences
2. Dean, School of Graduate Studies
3. Dean, Faculty of Humanities
4. Dean, Faculty of Social Sciences

UNIVERSITY OF PORT HARCOURT
Office of the Center for Research Management and Development (CRMD)
RESEARCH ETHICS COMMITTEE

ETHICS REVIEW APPLICATION FORM
RESEARCHER'S TEMPLATE

SECTION A -- GENERAL INFORMATION

SUPERVISOR:
Name Dr. S.N.O. Ibe Qualification(s) PhD, MPH; MSc; BSc
Department Public Health year of Qualification(s)
Phone 08036751743 Email sallyibe@yahoo.com
Signature: Date: 12/01/2016

RESEARCHER DETAILS:
Name MACFIBERES, MA GBORIENEOMIE Matric/Reg. No. (If any) 2013/4873898
Department PUBLIC HEALTH TECHNOLOGY, FUTO
Phone 08037079310..... Email macfibs0fa@yahoo.com

Research Title: STUDY OF CERVICAL CANCER AWARENESS AND AT RISK BEHA
AMONG STUDENTS OF UNIVERSITY OF PORT-HARCOURT, RI
NIGE

Signature: Submission Date:

DEGREE IN VIEW (Student) M.PH EXPECTED YEAR OF GRADUATION 2016

HEAD OF DEPARTMENT/INSTITUTE/SCHOOL/CENTRE:
Name Rev Sr Prof E.T. Opreecha
Department Public Health
Phone 08038570741 Email tochievan@yahoo.com
Signature: Date: 12-01-16

PROJECT SITES:
Indicate the location(s) where the research will be conducted:

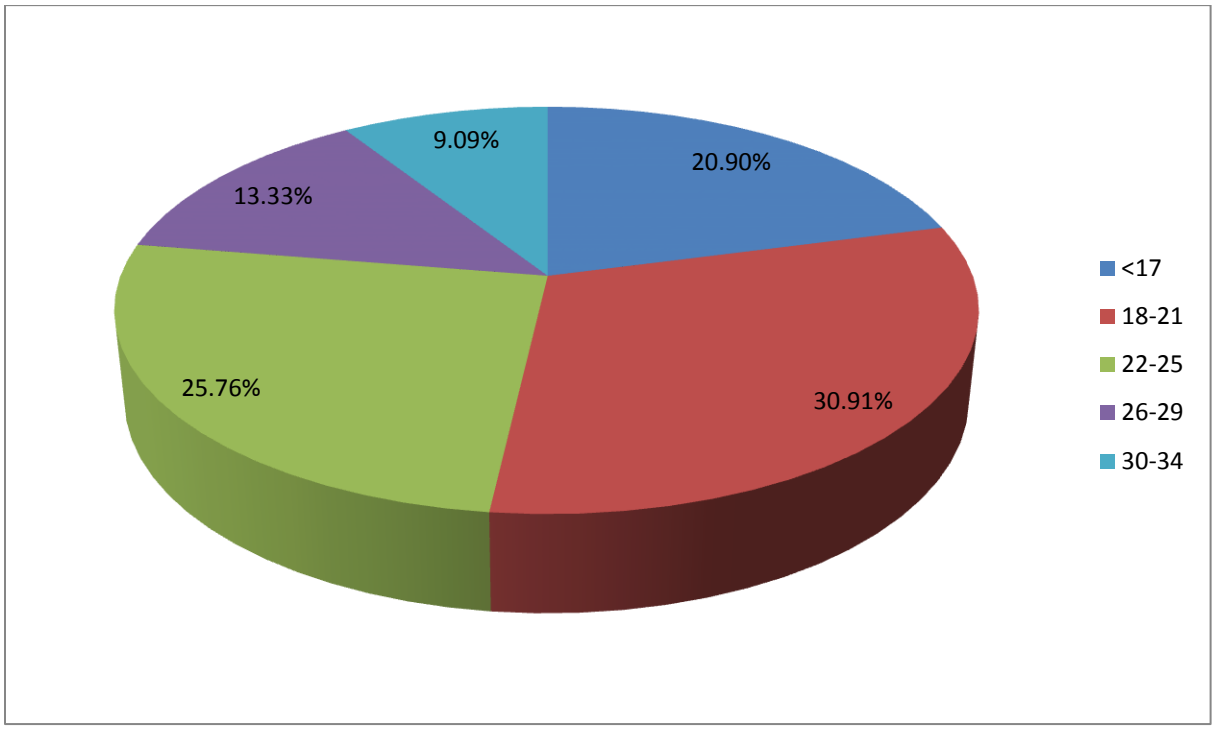
University of Port Harcourt	☑	
Affiliated Institution e.g. CCE, UPTH	☐	specify site(s)
Community within UNIPORT area	☐	specify site(s)
Other	☐	specify site(s)

N.B. If the research is to be conducted at a site requiring administrative approval/consent (e.g., in a school), it is the responsibility of the researcher to obtain such prior to starting the project.

OTHER RESEARCH ETHICS COMMITTEE APPROVALS:
(a) Does the research involve another institution or site? Yes ☐ No ☑
(b) Has any other REB approved this project? Yes ☐ No ☐

Appendix G

Figure 3: A pie-chart showing the different Age group of respondents



Appendix H

Map of Port Harcourt

Source: Google