Chapter One

Introduction

Background to the Study

The burden of cervical cancer (CC) was discovered amongst women infected with Acquired Immune Deficiency Syndrome (AIDS) after the discovery of AIDS in 1981. This discovery came with the identification of the increased occurrence of HPV disease and cervical dyspelsia[1]. Although, the introduction of antiretroviral therapy (ART) has reduced the growth of other opportunistic infections, and increased the survival rate of people living with HIV. HPV infections are more prevalent and persistent in HIV-infected women compared to HIV-negative women. Women living with HIV have a higher risk of cervical cancer [2].

About 85% of cervical cancer cases are found in developing countries, and this is a result of reduced cervical cancer prevention and control programs [3]. The burden of cervical cancer been one of the common causes of cancer death, especially among African women is increased with the HIV epidemic [4].

The development and introduction of the HPV vaccine, cervical cancer screening, and early diagnosis have helped to reduce cervical cancer-related mortality but this is more of a success story in developed countries.

Nigeria is a developing country faced with HIV infection and the issue of CC is on the rise, especially in women infected with HIV. The key preventive methods for cervical cancer disease are the HPV vaccine, cervical cancer screening, and early detection which is not

given for free at present in the country, leading to the major driver for this study which is to determine the knowledge of women infected with HIV on the issue of the relationship between HIV, HPV and cervical cancer and also to determine their willingness to pay for the available HPV vaccine which has been proven to be effective in the prevention of cervical cancer.

There are about forty sub sorts of Human Papilloma Virus (HPV) which represents a giant family of viruses. Majority of ladies acquire HPV within 2-5 years of initiating sexual activities, this shows that the virus is highly transmissible [5], although the body system of 90% of women who got infected with the virus clear it off within 2 years of obtaining it. Although the danger of getting infected is that women who are unable to clear the HPV are at higher risk of growing chronic infection, potentially cancerous cervical lesions, and cervical cancer [6].

Cervical cancer had an estimated 630,000 new instances in 2018 representing 7.5% of all female cancer deaths worldwide, and it is the fourth most everyday cancer in women. More than 85% of the estimated 31,000 deaths due to cervical every year, are said to appear in low and middle-income countries indicating that more attention is to be given to cervical cancer cases in those regions to drastically reduce the mortality rate from the disease [12]. According to GLOBOCAN 2020, it was estimated that, worldwide, there were about 604,000 new cases of cervical cancer, with 342,000 deaths annually. Women living with HIV are six instances extra in all likelihood to get cervical cancer compared to women without HIV, and an estimated 5% of all cervical cancer cases are attributable to HIV (2).

Globally, from diagnoses carried out, 5.8% of the new instances of cervical cancer in 2018 (33,000 new cases) had been in women living with HIV, and 4.9% of new cases (28,000 new cases) had been related to HIV infection. The most affected areas had been southern and eastern Africa. In southern Africa, 63.8% of new cases of cervical cancer (9200 new cases) were recognized in women living with HIV, and in eastern Africa, this percentage was 27.4% (14,000 new cases) [13].

In 2008, it was estimated that about 14,550 new cases of HPV were seen in Nigeria. According to the WHO records posted in 2018, Cervical Cancer Deaths in Nigeria reached 9,191 of whole deaths.

Cervical cancer development and cancer morbidity and mortality can be prevented through timely screening and vaccination with the human papillomavirus (HPV) vaccine [14]. It is also necessary to note that although cervical cancer screening can notably reduce the incidence of cancer, its impact is limited in regions that lack a comprehensive population-based screening program [15].

The advice of HPV vaccine for young female children from age 9 and adults up to 26 years old was given by the US Food and Drug Administration (FDA) in the year 2006. The license was extended through the age of 45 years in 2018, considering the risk that adult women face and also primarily based on research displaying that the HPV vaccination is effective, safe, and antibody-mediated in women up to the age of 45 years [16]. HPV vaccine scale still requires more effort and one of the main barriers to the scaling up of HPV vaccination worldwide is the charge (price) of the HPV vaccine because the international

average fee for the three doses collected is on the high facet making the vaccine generally unobtainable to individuals who were predicted to benefit the most [17].

World Health Organization (WHO) in 2018 called for a global action to completely kick out cervical cancer, and it was suggested that 90% of girls aged 9-14 years get vaccinated with the HPV vaccine, 70% of women are screened twice in a lifetime for cervical cancer, and pre-cancer and cancer. 90% of identified women are treated by 2030 [18].

The three brands of HPV vaccines, namely the first generation bivalent Cervarix (three doses) HPV vaccine and quadrivalent Gardasil (three doses) HPV vaccine, targets mainly HPV-16 and -18 high-risk infections which contributes to about ~75% of all cervical cancers and the second generation nonavalent Gardasil 9 (three doses) HPV vaccines targeting HPV-6/11/16/18/31/33/45/52/58 that progressively add to ~90% of all cervical cancers [19]. Gardasil (4vHPV) is registered for use in females aged 9-45 years, while Cervarix (2vHPV) is licensed for use in females aged 20-45 years, and Gardasil 9 (9vHPV) is recommended for females from 16-26 years of age [35].

All three vaccines have been tested to be protective and of very high quality in providing a stop to infection with HPV 16 and 18 [20]. Although, the first Chinese domestic bivalent human papillomavirus (HPV) vaccine Cecolin (two doses) was released in 2019 and is believed to have the same effect as the bivalent Cervarix vaccine (three doses) but cost half as much in price as compared to Cervarix.

It is advised that when HPV vaccines are administered to young adolescents earlier before they get exposed to the human papillomavirus, it is most effective [21]. The massive question now is how far character beneficiaries are willing to get vaccinated/pay for the vaccine.

The case of cervical cancer in Nigeria, is not just limited to the high level of incidence and mortality rate of the disease, but other areas that contributes to the burden of the disease in Nigeria is the aspect of low adaptation and implementation of methods to stop females from having cervical cancer which could be either through the use of the Human papilloma virus vaccine (Primary prevention) or through cervical cancer screening (Secondary prevention).

One of the most commonly used public health strategies to reduce the risk of infection, and limit the prevalence of cervical cancer disease-causing agent (HPV) is vaccination and the approval of parents to vaccinate /pay for the vaccine for their daughter(s)/sister(s) and this is significant for HPV vaccine uptake. The level at which the HPV vaccine is accepted and taken will influence reduction in cervical cancer incidence, which can be achieved via non-stop HPV sensitization, vaccination, and screening. It is additionally imperative to note that the success of an HPV vaccination program depends on the mindset of local stakeholders toward the vaccine. And it is of paramount importance to also note that countries with an existing national cervical cancer program have been reported to significantly have reduced the number of cervical cancers, especially in HIV-positive women.

1.2 Statement of the Problem

Cervical cancer is a disease of public health importance to women of all age groups in Sub-Saharan Africa [9]. Most cervical cancer cases are discovered in late tiers which contributes to making the case in Sub-Saharan Africa worse and this can be linked to certain factors such as low level of knowledge, unhealthy cultural beliefs, and non-availability of preventive services [10]. It is very vital to note that women continue to have a threat of

obtaining HPV later, but younger ladies are extra inclined to get infected with the virus [11]. A wide variety of risk factors contributes to the prevalence of cervical cancer which may encompass the lifetime quantity of sex companions of women and associated infection. Cancer of the cervix for which screening is one of the most comparatively cheap manipulation strategies for the disease is one of the high reasons for most cancers deaths among women in developing countries [22]. About 10,000 new cases of cervical cancer are evaluated yearly in Nigeria and 8,000 deaths due to the disease are mentioned among women [23]. In the obstetrics and Gynecology Department of the University of Ilorin Teaching Hospital, Ilorin Nigeria, it was recorded in 2014 that cervical cancer accounted for 63% of all gynecological cancers seen [25]. The reduction in mortality in developed countries may not be far from challenges associated with awareness, knowledge, attitude, and willingness to get vaccinated which directly play on their response to prevention and management. This study evaluates the knowledge of HPV, cervical cancer, and willingness to pay for the vaccine among women living with HIV in Nigeria either for themselves, their daughter(s), and/or sister(s). Under the National Immunization Program (NIP) in Nigeria, HPV vaccines are not amongst the vaccines given to the general public for free, and as such it is paid for out of pocket. And besides the cost of the HPV vaccine, there is a need for the development of HPV vaccine delivery services most especially for adolescents in order for proper monitoring for the required dose to be taken as at when due. Presently, there is no establishment of such structure existing in the country[30].

1.3 Justification of the Study

The study after well done was an eye-opening document for epidemiological measure to viral infection control. The result presented is targeted at supplying useful information for

prevention, management, and control measures which should be repackaged by health-based policymakers. This clearly includes the addition of the HPV vaccine in the National Immunization Program (NIP) or better still, subsidizing the price of the vaccine for affordability, development of appropriate distribution channels for easy accessibility and follow-up for complete and timely uptake of the vaccine, and proper sensitization of women on the relationship between HIV, HPV and cervical cancer and the severity of the disease.

1.4. Research Questions

1. What is the level of knowledge of HPV and cervical cancer among HIV-positive women in Lagos Nigeria?

2. Are HIV-positive women willing to vaccinate their daughters/wards/sisters against HPV?

3. What are the barriers to willingness to pay for the HPV vaccine among HIV-positive women?

4. What is the relationship between the cost of the HPV vaccine and willingness to pay?

1.5 Aim and Objectives of the Study

The aim of the study id to assess HIV-positive women's level of knowledge of cervical cancer prevention and willingness to pay for the HPV vaccination for their daughters/wards/sisters in Lagos Nigeria.

The objectives are to;

1.) Determine the level of knowledge of cervical cancer prevention among HIV-positive women in Lagos Nigeria.

2.) Assess the willingness of HIV-positive women to vaccinate their daughters/wards/sisters against HPV.

3.) Assess the barriers to a willingness to pay for the HPV vaccine among HIV-positive women.

5.) Determine the relationship between the cost of the HPV vaccine and willingness to pay.

1.6 Hypotheses

$H_0$1: Good knowledge of HPV and cervical cancer will help in proper decision-making in the prevention of cervical cancer and reduction of mortality due to the disease.

$H_0$2:The willingness to pay for the HPV vaccine and get vaccinated will go a long way in preventing HPV infection.

$H_0$3: Appropriate discussion and sensitization on the regular screening for cervical cancer, early detection, and effectiveness of the vaccine can increase the survival rate.

1.7 Scope of the Study

The study centers on providing information for solving one of the major global health challenges of adolescent girls and women, and only generated information on HPV and HPV vaccine meaning that another serious viral infection is not captured, although they also pose some threat to humanity.

Women living with HIV are six times more likely to develop cervical cancer compared to women without HIV, this study will concentrate on this group of individuals.

1.8 Significance of the Study

This study is significant as it will help at both institutional and individual levels in the understanding of awareness, knowledge, attitude, and willingness to get vaccinated/pay for

the HPV vaccine due to the rising case of cervical cancer amongst women in Nigeria especially those living with the HIV.

Although, certain research have been carried out making use of available instruments to get necessary and available information on the knowledge of individuals on cervical cancer, knowledge of the HPV and, willingness to pay for the vaccine. This study expatiates more on the response of women living with HIV in Nigeria, their knowledge of HPV and cervical cancer, and their willingness to pay for the HPV vaccine for themselves and their daughters/sisters for the prevention, management, and control of cervical cancer in Nigeria.

This study will also help policymakers in decision-making in imputing cervical cancer screening programs and vaccination into their health strategy program to relieve the citizens of the burden of paying out of pocket or paying too much for the vaccine.

1.9 Operational Definition of Terms

HPV: Human papillomavirus is the name for a group of viruses that affect your skin. Genital HPV infections are those affecting areas around the vagina, penis, and anus.

CC: Cervical cancer is a malignant tumor of the cervix, the lower part of the uterus (womb) that can be prevented by PAP smear screening and an HPV vaccine.

HIV: Also called human immunodeficiency syndrome which causes AIDS and interferes with the body's ability to fight infection transmitted through contact with infected blood, semen, and vagina fluid.

AIDS: Acquired Immune Deficiency Syndrome

ART: Antiretroviral Therapy. This is a treatment with drugs that inhibits the ability of the human immunodeficiency virus (HIV) or other types of retroviruses to multiply in the body.

Preventive Services: Routine health care that includes screening, check-ups, and patient counseling to prevent illnesses, diseases, or other health problems.

Prevalent: Widespread in a particular area or at a particular time.

Incidence: The proportion or rate of persons who develop a condition during a particular period.

Vaccination: The administration of a vaccine to help the immune system develop protection from disease.

Vaccine: A biological preparation that provides active acquired immunity to a particular infectious disease.

Morbidity: The condition of suffering from a disease or medical condition.

Mortality: The state of being subject to death.

Infection: The invasion and growth of germs in the body.

Adolescents: (Of a young person) in the process of developing from a child into an adult.

Disease: A disorder of structure or function in a human, animal, or plant, especially one that produces specific symptoms or that affects a specific location and is not simply a direct result of physical injury.

WHO: World Health Organization

FDA: Food and Drug Administration

FMOH: Federal Ministry of Health

Gavi: Vaccine Alliance

NCCP: National Cancer Control Program

NHIS: National Health Insurance Scheme

NIP: National Immunisation Program

NPHCDA: National Primary Health Care Development Agency

ACIP: Advisory committee on immunization practices

Endnotes

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Chapter Two

Literature Review

The entrance to the womb is the main area affected by cervical cancer. This type of cancer occurs in the cells of the cervix. The narrow part of the lower uterus often referred to as the neck of the womb which is connected to the vagina is called the cervix.

Cervical cancer is a disease of public health interest, and this is linked to the fact that it can be prevented easily and primarily affects women of ages 15 – 44 years of age. And this is considered the age at which women contribute greatly both socially and economically [1]. The disease is known to affect women in the prime of their lives and elimination is strongly believed to be through collective efforts of countries and partner organizations to ensure effective interventions to reach all girls and women.

WHO in 2019 gave the estimate that each year, about half a million women are affected by cervical cancer which causes over a quarter million death. To prevent and control cervical cancer, WHO promotes a comprehensive approach whose basis are primary, secondary, and tertiary prevention initiatives to fight the disease.

Different studies carried out at different locations in different countries have shown various knowledge gaps and attitudes of cervical cancer and the prevention of cervical cancer. Most studies have also shown that the majority of women in developing countries had poor knowledge of what cervical cancer is and the ways to prevent it as compared to women in developed countries. The cervical cancer screening test is also low in developing countries, and women from some of these regions prefer to patronize traditional medicine instead to treat the early stage of cervical cancer [2].

Definitive verification that cervical cancer is a sexually transmitted disease that occurs as a result of infection with certain high-risk, oncogenic types of the human papillomavirus has been derived from scientific conclusions over a few decades[16,17].

Most of the immunosuppressed individuals infected with HPV can clear the viral infection and stay without showing symptoms (asymptomatic). In a few patients, HPV infection remains and leads to clinically obvious lesions that can advance to intruding cancer over a long period, typically measured in years to decades [17, 18].

Due to large-scale epidemiologic data and clinical trials based on a better understanding of the natural course of HPV infection and accompanying cervical premalignant disease, considerations have been given to upgrade screening, including new clinical tests for oncogenic HPV infection and treatment protocols. And this has given birth to several success stories in the reduction of cervical cancer death especially in developed countries.

HPV types are tissue tropic, and also mostly lesion-specific, meaning that pre-malignant and malignant lesions of the cervix diagnosed in the clinical setting are linked with different HPV types than those seen in benign extragenital warts, for example. HPV types are classified as ‘low-risk’ and ‘high-risk’ of their clinical ‘oncogenic potential.’ The ‘oncogenic potential’ is a function of the propensity of the respective HPV-associated lesions to progress to causing cervical cancer over time. It should be noted that approximately 95% of interfering cervical cancers are squamous cell cancers, while less than 5% are adenocarcinomas, and each is connected with a different spectrum of HPV types. The remainder of cervical cancers is made up of different uncommon histologic subtypes [19,20].

Both HPV 16 and 18 are particularly likely to continue and advance from high-grade premalignant cervical disease to invasive cancer and are categorized as high-risk oncogenic types and as such, they cause about 70% of cervical cancer cases. HPV types 31, 33, 45, 52 and 58 are also recognized as oncogenic, but are less prevalent in cervical cancer 11,14,21,22.

Epidemiologic studies indicate that HPV genital-tropic types are seen in both people showing symptoms (symptomatic) and those not showing any symptom of the disease (asymptomatic patients) and that the larger part of infections are voluntarily clear. Having multiple HPV types present in the same patient is not unusual in the clinical setting. Multiple, simultaneous or constant genital infections can occur, and in adolescent girls, it is often difficult to tell the difference between persistent infections and new infections by different subtypes of HPV[23].

The likelihood of persistence of an oncogenic HPV infection and its sequelae are raised in Immunosuppression, which occurs in Human Immunodeficiency Virus (HIV) co-infection and chronic steroid therapy following organ transplantation [14,24]. For HIV patients, cervical cancer is a criterion for making a clinical diagnosis of Acquired Immune Deficiency Syndrome (AIDS).

Due to extensive studies on tumor viruses, valuable information on the mechanisms by which tumor viruses initiate carcinogens and the regulation of the cell cycle in human cells have been derived.

2.1 Concept of Cervical Cancer

Cervical cancer is a type of cancer that develops in the cervix. Most cervical cancers are on the surface of the cervix in cells. Many women with cervical cancer do not realize they have the disease early enough because usually, cervical cancer doesn't cause symptoms until the late stages. The average age at diagnosis is 50 but cervical cancer is most frequently diagnosed in women between the ages of 35 and 44. It seldom develops in women younger than 20 [42].

The symptoms of cervical cancer include unusual bleeding, such as after sex, or after menopause, vaginal discharge that looks or smells different than usual, vaginal discharge tinged with blood, pain in the pelvis, and needing to urinate more often and pain during urination. It should be noted that symptoms of one disease might mimic symptoms of another. It is very important to visit your doctor when you start noticing symptoms that are suspicious for proper investigation to be carried out to be sure of your health status at that moment.

2.1.1 Challenges in Managing People with Cervical Cancer

Some of the challenges in managing people with cervical cancer are patient-related challenges, large workload, which has to do with taking care of a large number of patients which greatly interferes with the quality of care provided by the healthcare providers to the cervical cancer patient, and could be overwhelming on the few available doctors and nurses thereby affecting their inputs[1]. Low screening levels and poor attitude towards cervical cancer screening procedures which is a big challenge for health care workers [3].

Patients present in a late stage, and this contributes to the reason why some women seek medical attention when the cancer is already in stage three (3) or four (4) and it could be very difficult to tell a patient that even though they have come, it is already too late and there is nothing that can be done to save the situation [4,5]. This can be related to a study carried out in sub-Sahara Africa on Challenges in Prevention and Care Delivery for Women with Cervical Cancer[1].

Lack of finances leads to some women being unable to pay for their treatment due to poverty and the high cost of chemotherapy and radiotherapy. Some women die before they can get the treatment, and most do not have dependents who are capable of shouldering the bills. This is also in line with reports from a systematic search that was conducted in MEDLINE, EMBASE, and the Cochrane Central Register of Controlled Trials. English peer-reviewed articles.

Women's knowledge of the low threat of disease and over-burdened health care facilities which lack equipment and staff, infrastructure as well as the barrier in the distance between facilities and client's homes, transportation being on the high side, and delay in reporting results [6], expensive screening procedure which might not be affordable to most women [7] all contribute to challenges in managing cervical cancer patients.

There is also the issue of poor training and development in the area of cancer management which compromises patient care because not many healthcare providers are trained specially in narcotic analgesics to manage cases. This is analyzed in the article 'current situation in education and training of healthcare professionals across Africa to optimize the delivery of palliative care for cancer patients. It was emphasized that developing material

for education and professional development needs to continue in close collaboration with that already in production in order to optimize available resources[36].

An inadequate number of healthcare workers and constant change of team members also lead to management decision change which leads to a lack of continuity of healthcare teams resulting in default inpatient care. The Nigerian healthcare system is already having serious issues when it comes to record-keeping, adding the issue of inconsistency in the healthcare provider team will affect the treatment of patients which might not end well, especially on the part of the patient.

Some healthcare providers are not conversant with the use of ICT equipment and as such, they have serious difficulty using it for the management of cervical cancer. And these include a lack of computerized data management systems, lack/poor internet skills, inadequate access to computers and the internet, poor security of computers and other ICT assets within hospitals, inaccessibility to technology as well as lack of websites approved by the government. All these issues can lead to one form of delay or the other in handling patients with cervical cancer cases. The application of mobile technologies (mHealth) to health services delivery has the potential to reduce inequalities, empower patients to control their health, and improve the cost-effectiveness of health care delivery. This can be linked to a study carried out on "Impact of mobile technologies on cervical cancer screening practices in Lagos, Nigeria (mHealth-Cervix) and this was a randomized controlled trial[52].

It was argued that healthcare institutions in East and Central Africa have the necessary infrastructure for cervical cancer screening, but these facilities experience frequent shortages of materials needed for taking Pap smears [8] and could lead to delays in patient

visits especially when the next available facility is far from the patient's location and worse in a case when the patient does not know the next line of action.

Most women, especially in developing countries, might not be able to afford the HPV vaccination due to its price tag and there is also limited knowledge and proper information on HPV vaccination. There are cases where even healthcare workers have little or no knowledge of cervical cancer and the vaccine and this makes it even more difficult for the issue to be addressed properly to the general public[36].

There is a lack of consistency in cancer registries with incomplete risk factors pointing toward challenges in the Health Information System. And this curtails reliable population-based estimates for incidence rates, mortality rates, and the effectiveness of interventions [9,] and this stands as a big barrier in preventing policymakers from taking the right decisions and steps in tackling the challenges faced to proffer proper solutions to the problem being faced. There are also the issues of poor data management systems, lack of resources, and limited training among healthcare providers [10]. Healthcare workers who are not well trained and who don't upgrade themselves in their field will give epileptic services at the end of the day. This can be linked to a study carried out in Zaria, Nigeria "A Systemic also emphasized Review of Incidence of Cancer and Challenges to its Treatment in Nigeria[43]. It was also revealed in the study that the challenges facing cancer care in Nigeria include: poor health system, lack of human resources lack of screening centers, and cost of drugs.

There has been a great decline in mortality in developed areas of the world, due to the success of the implementation of cervical cancer screening protocols and treatment of HSIL (high-grade squamous intraepithelial lesions) although cervical cancer continues to be a leading cause of cancer-related deaths in developing countries due to a combination of

the high popularity of HPV infection and the non-availability of cervical Papanicolau smear (Pap smear) testing of vulnerable women [11].

2.1.2 Risk Factors for Cervical Cancer

Results gotten from research have shown that it is a small fraction of about 1-2% of all cases of high-risk HPV infections that lead to cervical cancer, and this goes to show that there are other factors contributing to HR HPV infection leading to invasive cancer [12,13]. Although these factors are also linked to HPV infection.

The main factor responsible for the development of cervical cancer is persistent infection with high-risk oncogenic HPV types [14]. Most females get infected when they become sexually active and most also clear the virus without problems. When the chances of exposure to HPV are increased, the risk of developing cervical cancer is most likely affected and this includes becoming sexually active at a young age (especially younger than 18 years old), having many sexual partners, having one partner who is considered high risk (someone with HPV infection or who has many sexual partners), having a weakened immune system. Other known risk factors for cervical cancer are related to the sexual acquisition of HPV as well as immune dysfunction, exposure to mutagens, and hormonal factors. Studies in twins suggest that genetic background typically plays a small role in the development of cervical cancer. Cigarette smoking, human immunodeficiency virus infection and immunosuppressive drug therapy, long term use of oral contraceptives (birth control pills) increase the risk of cervical cancer. The risk of cervical cancer is said to be on the high side when a woman takes oral contraceptives but goes back down again after the oral contraceptives are stopped, and brought back to normal many years after stopping [15.]

Some studies have seen a higher risk of cervical cancer in women whose blood tests and cervical mucus showed confirmation of past or current chlamydia infection indicating that HPV growing and living in the cervix which may increase the risk of cervical cancer can be supported by the presence of Chlamydia bacteria.

Having multiple full-term pregnancies can also lead to a female being susceptible to having cervical cancer. Women who have had three (3) or more full-term pregnancies are at a higher risk of developing cervical cancer. Hormonal changes during pregnancy can make women more susceptible to HPV infection or cancer growth, and also, the immune system of pregnant women might be weaker allowing for HPV infection and cancer growth. An article written on the diagnoses and treatment of cervical cancer in pregnant women illustrated the incidence of cervical cancer is not very high, and the symptoms are easily confused with other diseases in pregnancy. During pregnancy, the gynecological examination is limited, and therefore, the rate of misdiagnosis is higher[34].

Economic status is another risk factor, especially in low-income countries where women do not have easy access to adequate healthcare services, including cervical cancer screening with Pap tests and HPV tests, and also not being able to afford the HPV vaccine which might lead to late detection supporting rapid progress of precancerous lesions already developing to grow into full-blown cancer.

Women whose diets is lacking enough vegetables and fruits can also be at increased risk of developing cervical cancer. It is therefore important for women to watch their diet at all times which in turn also help in boosting their immune system and aid in the fight not only against precancerous lesions but against other infections. The contribution of diet to cancer risk has been considered to be higher in advanced countries than in developing countries

and this can be compared with findings from a study on effects of the dietary and nutrient intake on gynecologic cancers. This study was carried out on three types of gynecologic cancer (cervical, endometrial, and ovarian cancers)[42].

2.1.3 Cervical Cancer Stages

Cervical cancer occurs in five stages (5) depending on the severity of the disease. The staging helps to determine how far the cancerous cells have spread and to determine if any internal organs or nearby structures have been affected.

Stage 0: This is not a true interfering cancer stage, but precancerous cells are present.

Stage 1: Here, the cancer cells have grown from the surface of the cervix into deeper tissues of the cervix, and possibly into the uterus and nearby lymph nodes.

Stage 2: In this stage, cancer has moved beyond the cervix and uterus, but not far as the walls of the pelvis or the lower part of the vagina. It may or may not affect nearby lymph nodes.

Stage 3: Here cancer cells are present in the lower part of the vagina or the walls of the pelvis, which may be hindering the tube that carries urine from the bladder, and the ureters. Also, in this stage, the cancer cells may or may not affect nearby lymph nodes.

Stage 4: In this stage, cancer affects the bladder or the rectum as it grows out of the pelvis. It also may or may not affect the lymph nodes. Later on, in stage 4, the cancer cells will spread to other distant organs including the liver, bones, lungs, and lymph nodes.

For cervical cancer that is caught in the early stages, when it is still confined to the cervix, the five (5) year survival rate is 92%. Once cancer has spread within the pelvic area, the five (5) year survival rate drops to 56%. If cancer spreads to distant parts of the body, the survival rate is just 17%.

2.1.4 HPV Infection Cycle

HPV mostly occur in the epithelial cells of the cervix, which are layered into a non-differentiated basal monolayer and a suprabasal differentiated non-proliferating epidermis. The basal layer is located above the basement membrane, below which is the cervical stromal layer. Dividing immature basal cells move upward through to the epidermal layer where they are taken off as part of the natural process of epithelial maturation. Damaging micro-abrasions, such as occur during sexual intercourse, expose the naïve basal layer cells to HPV [25, 26].

2.1.5 Cervical Cancer Screening Methods

Cervical cancer can be screened for, using several methods which includes Pap Smear, Visual inspection with acetic acid and Lugol's iodine (VIA/VILI), Liquid-based cytology (LBC), and HPV testing.

2.1.6 Cervical Cancer in Nigeria

The second leading cause of cancer death in Nigeria is CC while breast cancer is number one. In 2018, 70,327 deaths in women were caused solely by cancer of which 14.8% of that death were caused by CC [28.] Cervical cancer keeps reoccurring in Nigeria as a result of poor cervical cancer implemented programs leading to ridiculously low knowledge of the disease[22]. From the findings I got after reading several articles, I wasn't able to lay hands on a study carried out to estimate the amount parents of known HIV status are willing to pay for the HPV vaccine. The objective of this study focuses on accessing the knowledge of women with known HIV status on cervical cancer and linking it with their willingness to pay for the HPV vaccine.

2.1.7 Human Immunodeficiency Virus in Nigeria

One of the major public health challenges in the world today is HIV infection which does not have a cure or vaccine but drugs to suppress the viral load. With over 196,000 adolescents representing 10% of the global burden epidemic, Nigeria was ranked by World Health Organization as second among all countries worldwide in the total number of people infected with HIV in 2016.

To ascertain the true distribution of HIV and AIDS in Nigeria, the National AIDS survey was launched in June 2018 by the Federal government. The outcome of the survey shows that about 1.9 million Nigerians were living with HIV.

2.2 The Connection Between HIV, HPV, and Cervical Cancer

Among women living with HIV, cervical cancer has been discovered to be the most common cancer, and the overall risk of getting infected with HIV in women is doubled when they have been exposed to HPV infection. The issue of HIV and cervical cancer is highest in sub-Saharan Africa. Chronic persistent HPV infection is the most important risk factor for the development of cervical cancer, and women with HIV infection are 5 – 6 times more likely to have persistent HPV infection resulting in precancerous growth in the cervix which can eventually lead to cervical cancer.

The relationship between HIV and Cervical Cancer is now a major public health challenge binding to the major reason that most especially in Sub-Saharan African Countries where cervical cancer is endemic, one of the leading causes of death in women with HIV [30, 31].

The active immune system of healthy individuals tends to eliminate the HPV after some time but people who have collapsed or weak immune systems have the HPV persisting may be because their body cannot control the steady replication of HPV and this fact

exposes women with HIV to be more vulnerable to developing CC as compared to HIV-negative women. It is therefore concluded that although it takes a long time for HPV infection to develop into pre-cancer, it takes less time in HIV-positive women [32].

The current guideline according to World Health Organization (WHO) is that cervical cancer screening should be done immediately for girls and women who are sexually active as soon as they test positive for HIV and that the screening interval for repeat screening should be within three years for women who are of HIV-positive status or unknown HIV status in areas with high endemic HIV infection when a screening test is negative. And women, no matter their HIV status, who have been treated before should be given post-treatment follow-up screening at one year to ensure that the treatment given is effective. This is a perfect guideline by WHO. The fact that the majority of the problem is centered in low- and middle-income countries where there are serious issues of access to facilities that do the screening, high price of vaccines/unavailability of vaccines which gives rise to the big question "How can all these issues be addressed and handled to eliminate this disease from developing countries?".

It is of great importance to note that whatever strategy is being introduced, the success of the strategy and the reduction of morbidity and mortality linked with invasive cervical cancer will greatly rely on the expansion of access to all HIV-infected women, making sure of high follow up rate from the point of screening, vaccination and through the course of treatment as the case may be and also positioning cervical cancer screening and vaccination program within the context of comprehensive HIV care [33, 34].

2.3 Current Clinical Management Recommendations

To refer for advanced colposcopic evaluation of the cervix, HPV testing among women with ASC-US cervical Pap smears is useful in making clinical decisions. While avoiding the unnecessary costs of sending every patient for colposcopy, HPV testing had a tolerable detection rate for high-grade lesions [35].

The American College of Obstetricians and Gynecologists (ACOG), and the American Society for Colposcopy and Cervical Pathology (ASCCP) have approved the follow up on cervical Pap smear screening and management as follows: The time interval for Pap smear testing of women considered to be at low risk (using risk factor screening and prior Pap smear results) has been extended from one- to two-yearly.

Women over the age of 30 years who have negative HPV tests, preceded by at least two consecutive negative Pap smears are allowed to be screened once every three years. Among women in this group, the 10-year risk of CIN 2 is 2–5%, and of CIN 3 is <2%.

Women who are between 65–and 70 years old, with a low-risk profile, may discontinue Pap smear screening altogether.

To confirm that the lesion has reduced in adolescent girls, low-grade dysplasia is now managed moderately by observation and surveillance. LSIL is managed by carrying out colposcopy (27% have CIN 2 on colposcopic evaluation) in older women of reproductive age. HPV testing is usually not done, and the results of prior HPV tests do not influence the management.

ASC-US (atypical, unknown significance) Pap smears, the most common category, are now triaged by performing high-risk type HPV testing to determine the need for

colposcopic examination and biopsy in patients who test positive for HPV. Women who test negative for HPV are managed moderately with repeat Pap smears. ASC-H (atypical, suspect high grade) is managed by colposcopic examination and biopsy to remove high-grade dysplastic lesions in the cervix or endocervical canal (67–85 are HPV positive, and have a significantly higher chance of bearing CIN 2, 3 on colposcopic evaluation). High-grade dysplastic lesions on Pap smears (HSIL) are assessed with immediate colposcopic examination and biopsy (data has shown that 53–66% of women with HSIL harbor CIN 2, 3 on colposcopic evaluation). Also, very important in these patients is HPV testing for high-risk HPV types.

In women who have past their reproductive years, HSIL can be controlled by surgical removals such as cold knife conization or loop electrosurgical excision. Removal procedures are avoided because of the potential stumbling blocks of cervical conization such as infertility, cervical incompetence, and premature labor and delivery in younger women

2.4 Human Papillomavirus Vaccines

Human papillomavirus vaccines being made available serve as a source of assurance for the prevention of cervical cancer, especially among younger women and also including those who are infected with HIV through mother-to-child transmission and blood transfusion [36].

Routine human papillomavirus vaccination is recommended for females 11-12 years by The Advisory Committee on Immunization Practices, but the fact remains that the rate of vaccination is still low in Nigeria as compared to other types of vaccines. Amongst those who have ventured into taking the first dose, it is recorded that not up to 50% of this

population have completed the three (3) dose series of the vaccine. And this is found mostly among the minority population which happens to be the set of persons who are at higher risk of getting cervical cancer.

Compared with other vaccines, the human papillomavirus (HPV) vaccine is more expensive, and other major factors affecting its uptake, especially in a country like Nigeria where proper documentation of data is low. Even when proper documentation is on the high side, the health authorities might not be able to gain access to the document due to reason been that the document is put together either by academic institutions or international bodies. Another factor is not knowing the burden of cervical cancer. This as a result has led to slow decision-making in the health sector on proper ways to handle and reduce the disease/ the mortality rate caused by the disease.

The introduction of HPV vaccination will yield little or no gain in the path of decision-makers in the health care field (eg, the minister of heahealthcarel director of health, etc) and as such, it is placed at the bottom of their priority list. This can be related to in the issue of the HPV vaccination program in Nigeria which is still a promise and not yet a reality.

There is also the issue of the burden of cervical cancer not being known thereby leading to negligence as far as tackling the disease is concerned.

From research carried out, it was concluded that about 118 million women have received the HPV vaccine of which 1% of these women are from low - to middle–income countries with too many barriers reported [37] ranging from not being aware of information on HPV/HPV vaccine, lack of information on where to receive the vaccine, settlement being

far from health facilities or inability to access transportation, fear of the safety of the vaccine, cultural and religious sensitivities targeted towards prevention of sexually transmitted diseases (STD) eg. the vaccine being a license to premarital sex, and spouse/partner influences in taking a decision as far as HPV vaccination is concerned, etc. even though the vaccine is supposed to serve as an escape route from getting infected with HPV in the first place. The irony of it all is that just 10% of girls in low and middle-income countries have access to the HPV vaccine as compared to 90% in high-income countries making it an issue of concern as to possible measures to be taken to bridge this gap to greatly control the disease and reduce the spread and infection to a large extend. If it is achievable in developed countries, it is also achievable in low and middle-income countries too if and only if the right measures are followed and proper support is given to the target population.

It was discovered from studies done in Nigeria and other countries that the percentage of women willing to pay for the HPV vaccine whether for themselves or their daughters most times, increases after proper enlightenment/sensitization pointing to the fact that high acceptance and demand for the vaccine is greatly linked to high likelihood of HPV vaccination program. Although, studies have also shown that in some regions of the world, despite the high level of education, knowledge of the association between HPV and cervical cancer and relevant preventative method is still low, thereby pointing to the basis of this study which aims to properly highlight the level of awareness of women (specifically those living with HIV) on the relationship between HIV, HPV and CC and their willingness to pay for the HPV vaccine and get vaccinated and also get first-hand information on the possible barriers leading to low vaccination in the country to fill all gaps as related to issues that have to do with vaccine uptake [40].

The level of acceptability of cervical cancer screening and vaccination are key indicators of the possible success of cervical cancer management in all regions of the world.

To reduce the burden of cervical cancer, a well-strategized population-based HPV vaccination program will be effective. When trying to uncover the strength, weaknesses, and cost-effectiveness of vaccination programs, the level of acceptability of the vaccine by the populace should also be assessed[23].

Two (2) licensed vaccines in Nigeria are Cervarix and Gardasil which are proven to be effective in preventing non-stop HPV infection and successive precancerous lesions due to infection with both HPV-types 16 and 18 that cause about 70% of cervical cancer worldwide15.

2.5. Safety of the HPV Vaccine

The latest data on the cervical cancer vaccine has been reviewed by the World Health Organization (WHO) and they concluded that there is no safety concern regarding the HPV vaccines. Among young women, there has been evidence of proven effective HPV vaccination in the reduction of the occurence of hrHPV types, anogenital warts, and high-grade cervical abnormalities (CIN2+), and this is recorded to be caused by the vaccine types with some evidence of cross-protection against nonvaccine types also [41].

The effectiveness and safety of the HPV vaccination in significantly reducing the risk of invasive cervical cancer has recently been proven in a Swedish follow-up evaluation of 1 672 983 girls and women who were 10–30 years of age. The follow-up was done on females from 2006 through 2017. At the end of the study, Cervical cancer was diagnosed in only 19 vaccinated women and 538 unvaccinated women [42]. This goes a long way to show the effectiveness and safety of the vaccine.

2.5.1 HPV Vaccine Licensure and Policy

There have been some changes in the vaccination policy after the first HPV vaccine was licensed in 2006 [29]. The United State Food and Drug Administration (FDA), and some other authorities first licensed Cervarix and Gardasil for use by girls and women from ages 9 or 10 to 25 or 26 years of age [32].

The licensed age for the HPV vaccine was later extended to age ≥ 45 years after the completion of trials for persons who are older than 26 years of age. This was done by authorities outside the United States. Later on in 2018, the FDA approved the human papillomavirus (HPV) vaccine for use by people above age 26 when a supplemental application to extend the age through 45 years by the manufacturer of Gardasil 9 was submitted[42].

Routine vaccination was then recommended for boys and men aged 11-12 through 21 years in the year 2011. Later in late 2016, a 2-dose series (the second dose to be taken 6-12 months after the first dose), was recommended by ACIP (Advisory committee on immunization practices) for those starting the HPV vaccination before their 15th birthday[50]. To increase direct protection and herd immunity, World Health Organization (WH0) in 2017 recommended that girls of age 9-14 years should be vaccinated when the vaccine is first introduced[48]. This led majority of developing countries that accepted the use of the HPV vaccine to follow the WHO guidelines on a single age cohort of young adolescent girls. 2019, came with the most recent recommendation change after Gardasil 9 was licensed for use by persons up to the age of 45 years[30].

2.5.2 Predictors of HPV Vaccine Acceptability

Knowledge: Having greater knowledge of HPV may be said to affect the uptake of the HPV vaccine [43,44]. In instances where participants have not heard of HPV, it becomes quite difficult for the participant to understand the link between cervical cancer and HPV.

Experience: Some studies have shown that women who have a history of an abnormal pap smear may likely take the HPV vaccine. Although there is an unstable relationship between abnormal pap smears with the level of vaccine acceptance as illustrated in other studies [45].

Perceptions of Risk: Referring to perception, women who believe that they are at higher risk of getting the HPV which may or may not lead to cervical cancer are more likely to go for the HPV vaccine as compared to women who believe that they are less likely to get HPV or come down with cervical cancer [43,45,46].

Other studies have also shown that there was no correlation between the number of sexual partners and their willingness to get the HPV vaccine [43,46]. This goes a long way to show that there is a mixed result relating to willingness/non-willingness to pay for the vaccine.

Demographics: Studies have also shown that acceptability and uptake of the HPV vaccine decrease with an increase in age, which is believed to be linked to the fact that older women might believe that it is too late for them to get vaccinated [47,48]. And also, women who are in a relationship with just one man see the HPV vaccine as unnecessary [43,47,48]. Although, other studies have also clearly stated that demographic factors are not reliably predictive of attitudes about the HPV vaccine [43,49].

Cost: The cost of the HPV vaccine affecting its uptake has been a consistent finding with results of several studies of attitudes about HPV vaccination indicating that lower acceptability of the vaccine is linked with the cost of the vaccine [50].

Misinformation: Getting wrong information from several sources like the media and the internet might negatively affect the perception of the public about the HPV vaccine, just as it has affected the uptake of other vaccines [51].

2.6 Medication Administration

If diagnosed on time, cervical cancer is very treatable, and the four main treatments are;

- **Surgery**: This is carried out to get rid of as much cancer as possible. Sometimes, the area of the cervix with the cancerous cells can be removed or if the cancer is widespread, there will be complete removal of the cervix and other organs in the pelvis
- **Radiation Therapy**: Here, cancer cells are killed through the use of high-energy x-ray beams, which could be delivered through a machine outside the body or inside the body using a metal tube placed in the uterus or vagina.
- **Chemotherapy**: This involves the use of drugs to kill cancerous cells throughout the body. It is done in cycles to give the body time to recover. According to the American Cancer Society, the chemotherapy drugs most commonly used for treating cervical cancer include; Topotecan (Hycamtin), Cisplatin (Platinol), and Paclitaxel (Taxol), Gemcitabine (Gemzar), Carboplatin (Paraplatin).
- **Targeted Therapy**: The growth of new blood vessels that help cancer grow and survive is blocked using Bevacizumab (Avastin), a drug that works differently from chemotherapy and radiation but is given together with chemotherapy.

2.6.1 Treatment for Precancerous Cervical Lesions

There are several ways to treat precancerous cells found in the cervix. These include;

Cryotherapy: Which involves the destruction of abnormal cervical tissue through freezing. And this can be performed using local anesthesia and the procedure can be done at the primary health care level by mid-level providers such as nurses or midwives trained specially to carry out the procedure [52, 53].

Loop Electrosurgical Excision Procedures for Cervical Lesions: This uses electricity that is run through a wire loop to remove abnormal cervical tissue by freezing the affected tissue with cryotherapy and it is performed majorly by trained providers in outpatient clinics at provincial or referral level hospitals [54].

Cold Knife Conization: This procedure uses a scalpel to remove abnormal cervical tissue and general anesthesia may be required. This procedure is initiated for the removal of lesions that cannot be effectively treated with LEEP and cryotherapy [55].

2.6.2 Medication Resistance

Tumor cells often show cross-resistance to multichemotherapy drugs with various structures and different mechanisms during chemotherapy even though chemotherapy is an important means to nurse cervical cancer. The major cause of chemotherapy failure, tumor recurrence, and even patient death is the multidrug resistance (MDR) of tumor cells. The chemotherapy effects of cervical cancer can be greatly improved through proper research on the mechanism of MDR and to prevent or reverse MDR [56].

With treatments of cervical cancer becoming more and more faultless and chemotherapy drugs being continuously produced, people are beginning to realize that chemical treatments play an important role in cervical cancer. However, MDR of cervical cancer has greatly reduced the effectiveness of chemotherapy drugs, leading to the failure of chemotherapy and even tumor recurrence [56].

2.7 Cervical Cancer Stigma

Cervical cancer is one of the most frequent cancers among women worldwide and much of the global burden of this cancer is in low and middle-income countries where about 85% of cervical cancer cases happen. [57]. The negative influence of stigma on health is most documented in HIV, and stigma is continuously been seen as a very significant

psychosocial barrier and an important factor of health determinants [58,59,60] which has caused quite a several people their lives or prolonged suffering. The major fact that cervical cancer is caused by HPV which is sexually transmitted has added to the reason for stigmatization in some places [61].

Stigma is considered a powerful social process that according to Link and Phelan begins with labeling, followed by stereotyping, and then leads to separation resulting in loss of status and discrimination [37]. Stigma occurs in several ways and can be classified into many types and every one of these types can lead to negative health and social outcomes for cervical cancer patients and survivors.

Some studies made it clear that some of the causes of cancer stigma are very similar to those of other diseases like HIV, with the major reason being that it is caused by a sexually transmitted virus, and then it affects the genital area. And as such, the person suffering from the disease might be seen as a bad influence or one being punished for a reckless life, especially in religious settings.

2.8 Prevention of Cervical Cancer

The best way to prevent cervical cancer is to get vaccinated early and have regular screening tests. Other steps to help in the prevention of cervical cancer include avoiding/quitting smoking, using condoms during sex, and limiting the number of sexual partners.

Changes in the cells of the cervix that could lead to cancer are diagnosed by making use of cervical cancer screening. And this includes cervical cytology (also called the Pap smear), testing for human papillomavirus (HPV), or both which should be done constantly.

The US Preventive Services Task Force (USPSTF) recommends the following screening schedule for women by age:

- Ages 21 to 29: Get a Pap smear once every three (3) years
- Ages 30 to 65: Get a Pap smear once every three (3) years, get a high-risk HPV (hr HPV) test every five (5) years, or get a Pap smear plus hr HPV test every five (5) years.

Another way to properly handle and prevent the spread of cervical cancer is through public health education and enlightenment. Educating parents (both father and mother), young women, and adolescents whether infected with HIV or not on the importance of HPV vaccination and the efficacy of the vaccine will help in increasing the uptake of the vaccine and in turn reduce the number of females with HPV infection and cervical cancer.

2.9 Summary of Gaps in Literature Reviewed

From literatures that were reviewed for this study, several gaps were identified relating to the knowledge of HPV and the HPV vaccine. Although not much has been done in respect to assessing the willingness of women of known HIV status in acceptance of payment for the HPV vaccine in Nigeria. Studies have been done to assess the knowledge of women on cervical cancer in several regions of the world including Nigeria but some questions have still not been answered due to lack of literature in Nigeria. Such questions includes: What is the level of knowledge of HIV positive women of cervical cancer prevention in Nigeria?, What is the willingness of women with known HIV status in Nigeria to pay for HPV vaccination for their daughters/wards/sisters?.

The studies assessed several areas like factors affecting uptake of the vaccine, of which several feedbacks were collated using structured questionnaires. Most of these studies focus

on responses given mostly by women. Further studies should be done involving men whose decisions can also affect the willingness of the uptake and decision to pay for the HPV vaccine.

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Chapter Three

Methodology

3.1 Research Design

The research design method adopted for this research is a cross-sectional study that assessed the knowledge of cervical cancer prevention and willingness to pay for HPV vaccines among HIV-Positive women in Lagos State, Nigeria.

3.2 Study Settings

Nigerian Institute of Medical Research (NIMR), Yaba Lagos

The study was conducted at the HIV treatment center, Nigerian Institute of Medical Research (NIMR). NIMR is an agency of the Federal Ministry of Health, and when the ART program was introduced by the Nigerian government in 2002, NIMR was one of the pioneering centers charged with providing comprehensive HIV care, treatment, and support to the Nigerian population. NIMR also has a cervical cancer screening clinic that serves patients of the HIV clinic and the general population at large.

3.3 Population of the Study

The population of this study was made up of Nigerian women living with HIV aged 18 years and above receiving treatment at the Nigerian Institute of Medical Research (NIMR).

Inclusion Criteria

Women of known HIV status aged 18 years and above in Lagos State, Nigeria.

Exclusion Criteria

Females of all age groups who are not living with HIV, Males of all age groups whether or not they are of known HIV status, Females of known HIV status from 0 to 17 years

3.4 Sample and Sampling Technique

The purposive sampling method was adopted for this study. This is because the Nigerian Institute of Medical Research (NIMR) Lagos State HIV treatment center as an apex

medical research institute in Nigeria is charged with the responsibility to conduct research into diseases of public health importance, and the institution currently provides comprehensive HIV care, treatment, and support for over 20,000 patients of whom 62.9% are women.

3.5 Sample Size

The study sample size was calculated according to the following formula: N = Zα2P (1-P)/d2 where Zα is the Z statistics for a 95% confidence level, N is the sample size, P is the prevalence of HR HPV: 18.3% and d is the precision (Kish L. Survey Sampling. New York). Based on this calculation, 233 women aged 18 years and above were interviewed to get needed information on their willingness to pay for the HPV vaccine.

3.6 Instrument of Data Collection

The main instrument used in data collection for this study was a semi-structured questionnaire containing both closed and open-ended questions. The questionnaire contained four (4) sections. Section A of the questionnaire contains items that were designed to get the socio-demographic characteristics of the respondents.

Section B focused on questions that established the knowledge of the Human Papillomavirus (HPV) among the respondents.

Section C had items designed to give information about the respondent's knowledge of cervical cancer.

Section D focused on questions that established the knowledge and willingness of the respondents to get vaccinated/pay for the HPV vaccine in Nigeria.

3.7 Validity of the Research Instrument

The questionnaire was constructed based on the literature review on the knowledge, willingness to pay for the HPV vaccine and willingness to get vaccinated with the vaccine among women both for themselves and their daughter(s) / sister(s) in Nigeria. The

questionnaire was first vetted by the project supervisor and then by the ethical committee at the Nigerian Institute of Medical Research (NIMR), Lagos State. Some structured corrections and suggestions were incorporated into the questionnaires before ethical approval was given to move on with the study, and then the questionnaires were administered.

3.8 Reliability of the Research Instrument

Questions were drawn from questionnaires used in various studies of knowledge of cervical cancer and willingness to pay for the vaccine to create the questionnaire which was used for the study thus proving its validity to access the knowledge of cervical cancer prevention and willingness to pay for HPV vaccine among HIV-Positive.

This was done in two phases. In the first phase, eighty items concerning HPV, cervical cancer, its prevention and willingness to pay for the vaccine were generated through a literature review. In phase 2, the questionnaire was validated through calculating the content validity index (CVI) for all item level (I-CVI) and the scale level (S-CVI). In this phase a shortened questionnaire of 58 items was formed. The questionnaire was tested for reliability. A total of 58 out of 80 items formed the final version of the questionnaire. The final instrument had an S-CVI/Ave of 0.92. The Cronbach alpha coefficient was 0.940 for the whole questionnaire, and ranged between 0.57 to 0.93 for each of the domains. The KCCPM-58 has been successfully developed and found to be a valid and reliable instrument for assessing the level of knowledge about HPV, cervical cancer and prevention methods and willingness to pay for the cervical cancer vaccine among women of known HIV status among women from age 18 and above.

3.9 Administration of Research Instrument and Method of Data Collection

The semi-structured questionnaire which contains both closed and open-ended questions were interviewer-administered by the researcher for this study**.** And the questionnaires were retrieved immediately after the respondents were done filling the questionnaires. In cases where the respondents were not literate enough to fill out the questionnaires themselves, the respondents were helped by the researcher reading out the questions to them and filling out the replies in the questionnaires herself for accuracy purposes.

3.10 Method of Analysis

The completed questionnaires were collected on the spot and cleaned. Descriptive statistics examining frequencies and percentages were conducted on survey responses using the appropriate statistical tests (Pearson $\chi 2$, Fisher exact, Wilcoxon rank-sum tests).

Open-ended questions were reviewed and thematically categorized and compared across demographic characteristics and behavioral risk factors. All statistical analysis was performed using SPSS version 27.0 (SPSS Inc. Chicago, IL) statistical packages. P values < 0.05 was considered statistically significant.

Ethical Approval

This study was granted ethical consideration by the Research Ethics Review Committee, Nigerian Medical Research Institute (NMIR) Lagos, and also from the Health Research Committee, Lead City University Ibadan (LCU-HREC). Permission was also granted by the Institute to the researchers to conduct the study. Participants were also informed about the details of the study including the objectives and they were made to sign two written informed consent and also gave verbal consent. One was theirs as respondents and the other was retrieved by the investigator before the questionnaires were filled by the

respondents. The anonymity and confidentiality of the respondent's responses were assured.

Participants also had the choice to decline participation in the study and were also allowed to decide whether or not to proceed or withdraw from the study without any given consequences

Endnotes

1. M Jacob, FF Broekhuizen, W Castro, J Sellors**.** *Experience using cryotherapy for treatment of cervical precancerous lesions in low-resource settings***. Int J Gynaecol Obstet Off Organ Int Fed Gynaecol Obstet.** 2019

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Chapter Four

Results and Discussion of Findings

This chapter presents the analysis and interpretation of findings based on the data that was collected with the results discussed. The study investigated the knowledge of cervical cancer prevention and the willingness of women with known HIV status in Lagos State, Nigeria to pay for the HPV vaccine either for themselves, their daughters, and/or other females around them.

A total of 233 questionnaires were administered to women of known HIV status who attended the Nigerian Institute of Medical Research (NIMR) clinic at Yaba, Lagos, and 233 questionnaires were duly filled and returned, which made up 100% of the respondents. This was so because the questionnaire was researcher administered.

4.1 Demographic Data Analysis

The sociodemographic characteristics of the 233 study participants are shown in Table 1. The average age of the participant was 42.4 ± 8.46 with the majority being between the 31-40 age groups. The participants constitute more of the Igbo tribe (43.9%) while other non-majority tribes constitute about 27% of the total population. 47.9% of the respondents had tertiary education (47.9%) while 42.8% had secondary education. Also, the participants are mostly self-employed with about 35% earning between 18000-35000 monthly. Most of the participants were married (149; 66.5%) and about 167; 83.1% had been living with HIV for over 5 years.

4.2 Presentation of Data

Table 4. 1. Sociodemographic Characteristics of Study the Participants

Sociodemographic	N(%)
Age Group	
≤30	16 (8.0)
31-40	89 (39.4)
41-50	82 (36.3)
51-60	32 (14.2)
>60	5 (2.2)
Age (Mean ± SD)	42.24 ± 8.46
Ethnicity	
Igbo	98 (43.4)
Yoruba	65 (28.8)
Hausa	2 (0.9)
others	61 (27.0)
Education Level	
Primary	20 (9.3)
Secondary	92 (42.8)
Tertiary	103 (47.9)
Working Status	
Not working	63 (31.3)
Working	138 (68.7)

Employment Status	
Unemployed	15 (7.0)
Self-employed	150 (70.4)
Professional	48 (20.3)
Civil servant	6 (3.0)
Marital Status	
Single	70 (33.5)
Married	149 (66.5)
Income(N)	
<50000	155 (77.5)
50000-100000	33 (16.5)
>100000	12 (6.0)
Number of Sexual Partners	
None	14 (7.5)
1	159 (84.9)
>1	14 (7.5)
Years with known HIV status	
<5	34 (16.7)
>5	167 (83.3)

Source: Field survey, 2021

Knowledge and Belief in Human Papilloma Virus (HPV)

Knowledge and belief of the Human Papilloma Virus (HPV), cervical cancer, and HPV vaccine of the 233 HIV-positive participants are shown in Table 2.

Regarding knowledge and belief of HPV, about 68 percent of the respondents claimed not to have heard about HPV as against 33 percent who accepted to have heard of HPV. 79.8 percent of the respondents agreed to smoking been a predisposing factor to getting the virus as against 20.2 percent who didn't agree. 70.6 percent of the respondents also accepted the fact that HPV can cause genital warts as against 29.4 percent who disagreed. 62.3 percent agreed to HPV been transmitted sexually while 37.7 percent of the respondents disagreed. Also, 51.3 percent respondents agreed to one having the HPV virus for a long time without knowing as against 48.7 percent of respondents who disagreed.

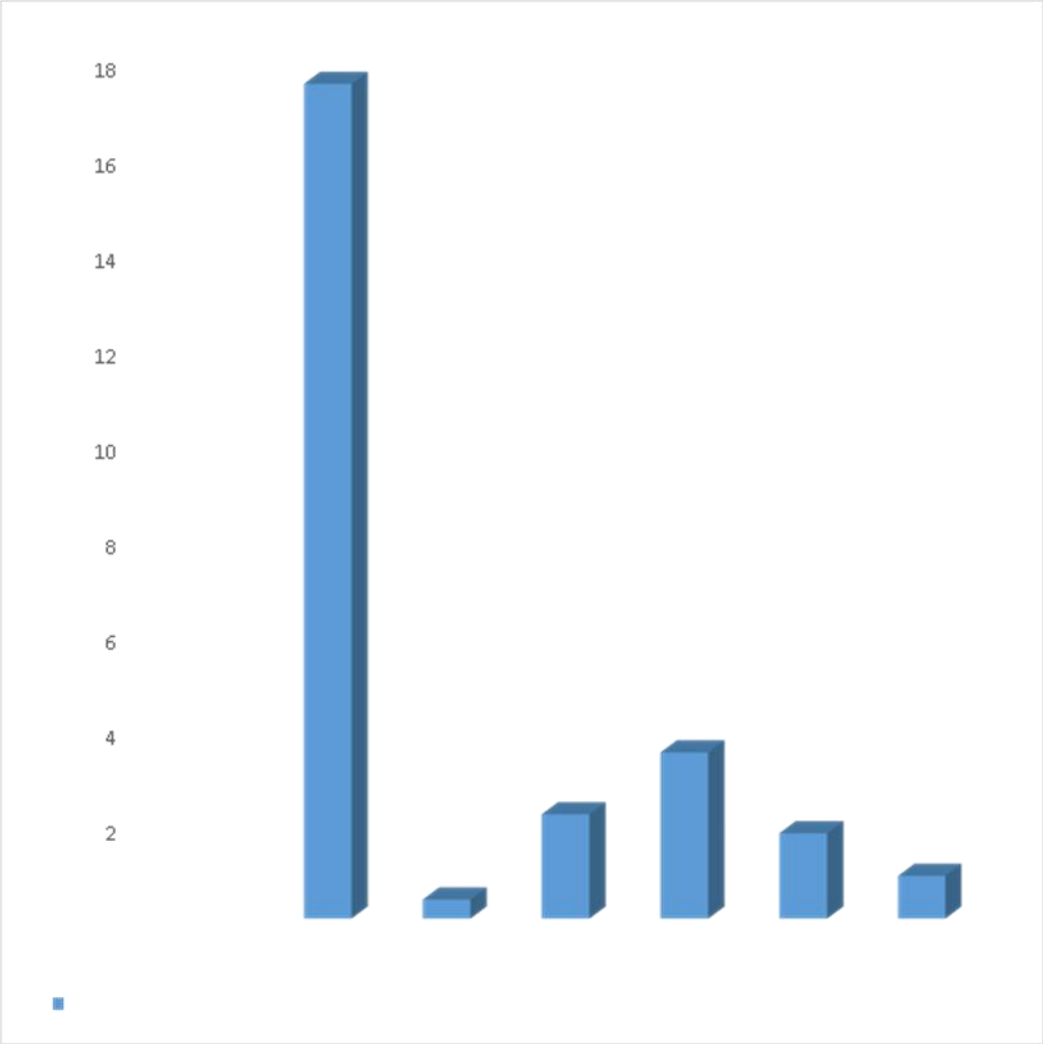
Table 4.2 knowledge and Belief of Human Papillomavirus (HPV), Among Participants

Knowledge/Belief	**No N(%)**	**Yes N(%)**
Heard of HPV	157 (68.9)	71 (33.1)
Smoking can be related to HPV	182 (79.8)	46 (20.2)
HPV can cause genital wart	161 (70.6)	67 (29.4)
HPV can be transmitted during sexual intercourse	142 (62.3)	86 (37.7)
People can get HPV infection for a long time without knowing	117 (51.3)	111 (48.7)
Tested for HPV	199 (87.3)	29 (12.7)
Screening for cervical cancer in women with HIV can prevent developing cancer	124 (54.4)	104 (45.6)
Negative HPV result depicts that a woman has a low chance of cervical cancers	181 (79.4)	47 (20.6)

Source: Field survey, 2021

Major Sources of Information About HPV

The bar chart in Fig 1. illustrates the 233 respondent's sources of information about HPV of which information from health workers got the highest percentage after analysis and the least was friends.



Source of Information	Health worker	Friends	Media prints	Social Media	TV/ Radio	Others
Series 1	17.5	0.4	2.2	3.5	1.8	0.9

Fig 4.1: Sources of Information about HPV

Source: Field Survey, 2021

Overall Knowledge of HPV among the 233 Participants

Figure 2 below illustrates the knowledge of the respondents showing that 32% of them had a good knowledge of HPV. But a good number of the respondents which amounted to about 68% had little or no knowledge of HPV.

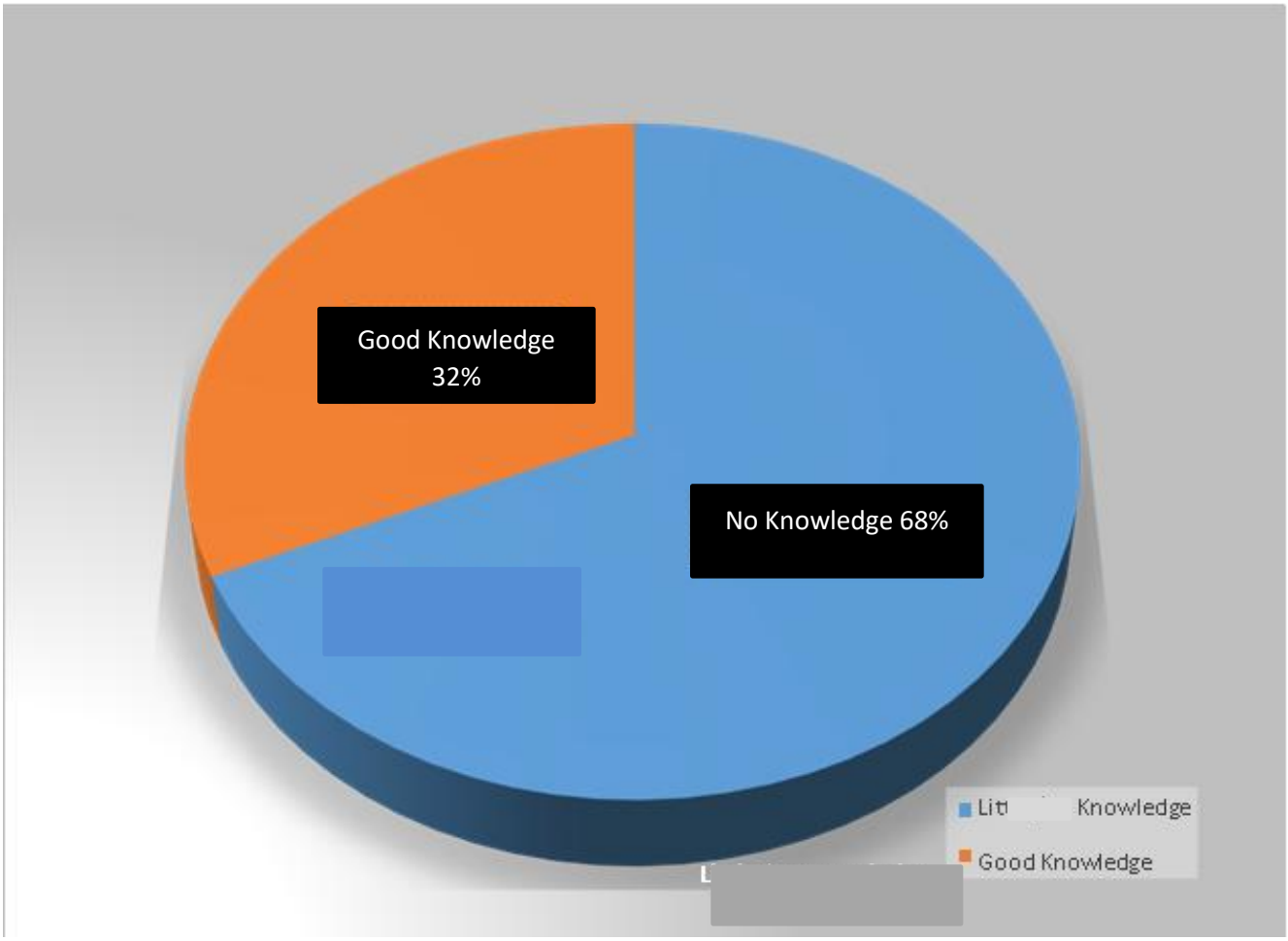


Figure 4.2: Overall knowledge of HPV of Respondents

Source: Field Survey, 2021

Knowledge of Cervical Cancer

The knowledge of cervical cancer of the 233 respondents in the study is shown in table 3 below. 32% of the respondents claimed not to have heard of cervical cancer as against 68% who admitted to having heard of cervical cancer. Analysis of data from the study shows that 49.6% of the respondents have never received proper information about cervical cancer as against 50.4% who agreed to have been well informed about the disease. 68% of the respondents do not agree to HPV been a causal agent of cervical cancer but 32% of the respondents were in agreement. 61% of the respondents agreed to cervical cancer been cured if detected on time but 39% disagreed with the statement. 31% of the respondents also agreed that women living with HIV are more likely to get cervical cancer, while over 68% of the respondents disagreed with the statement. Over 61% of the respondents accepted that cervical cancer can be prevented against 3.6% of the respondents who disagreed.

Table 4.3 Knowledge of Cervical Cancer

Knowledge/ belief	**No N (%)**	**Yes N (%)**
Heard of cervical cancer	73 (32.0)	155 (68.0)
Received information about cervical cancer	113 (49.6)	115 (50.4)
People who drink alcohol content are more likely to have cervical cancer	163 (71.5)	65 (28.5)
People who smoke are more likely to have cervical cancer	157 (68.9)	71 (31.1)
Cervical cancer is caused by a type of HPV	155 (68.0)	73 (32.0)
Cervical cancer can be cured if detected early	89 (39.0)	139 (61.0)
Cervical cancer can be transmitted during sexual intercourse	128 (56.1)	100 (43.9)

Having sex early in life increases the chances of having cervical cancer	155 (68.0)	73 (32.0)
Early detection can increase the rate of cervical cancer	97 (42.5)	131 (57.5)
Women living with HIV are more likely to have cervical cancer compared to those who are HIV negative	157 (68.9)	71 (31.1)
Having more sexual partners increase the rate of cervical Cancer	115 (50.4)	113 (49.6)
Poor diet increase the chances of cervical cancer	181 (79.4)	47 (20.6)
Cervical cancer can be prevented	88 (38.6)	140(61.4)

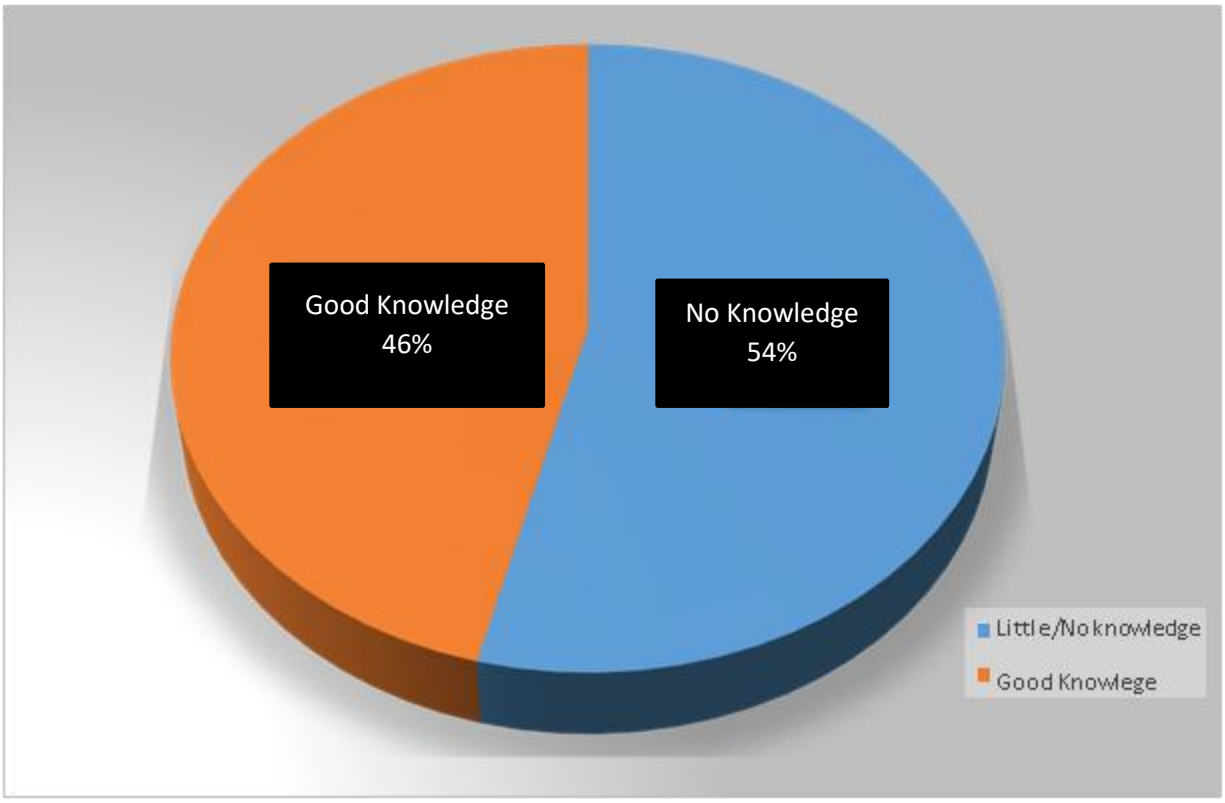


Fig 4.3 Overall Knowledge of Cervical Cancer among Respondents

Source: Field survey, 2021

The knowledge of respondents on cervical cancer was illustrated using the pie chart above. The respondents were classified into those with good knowledge and those with little/no knowledge about cervical cancer. Those with good knowledge of the disease after analysis were 46%, while those with no knowledge were 54%.

Major Sources of Information about Cervical Cancer

The bar chart in Figure 4 illustrates the 233 respondent's sources of information about cervical cancer of which information from health workers got the highest percentage with a little above 69%, followed by social media which had 12.1%. The third was TV/radio with a percentage of 8.3, followed by media prints and others at 3.8% and the least was friends with 2.3%.

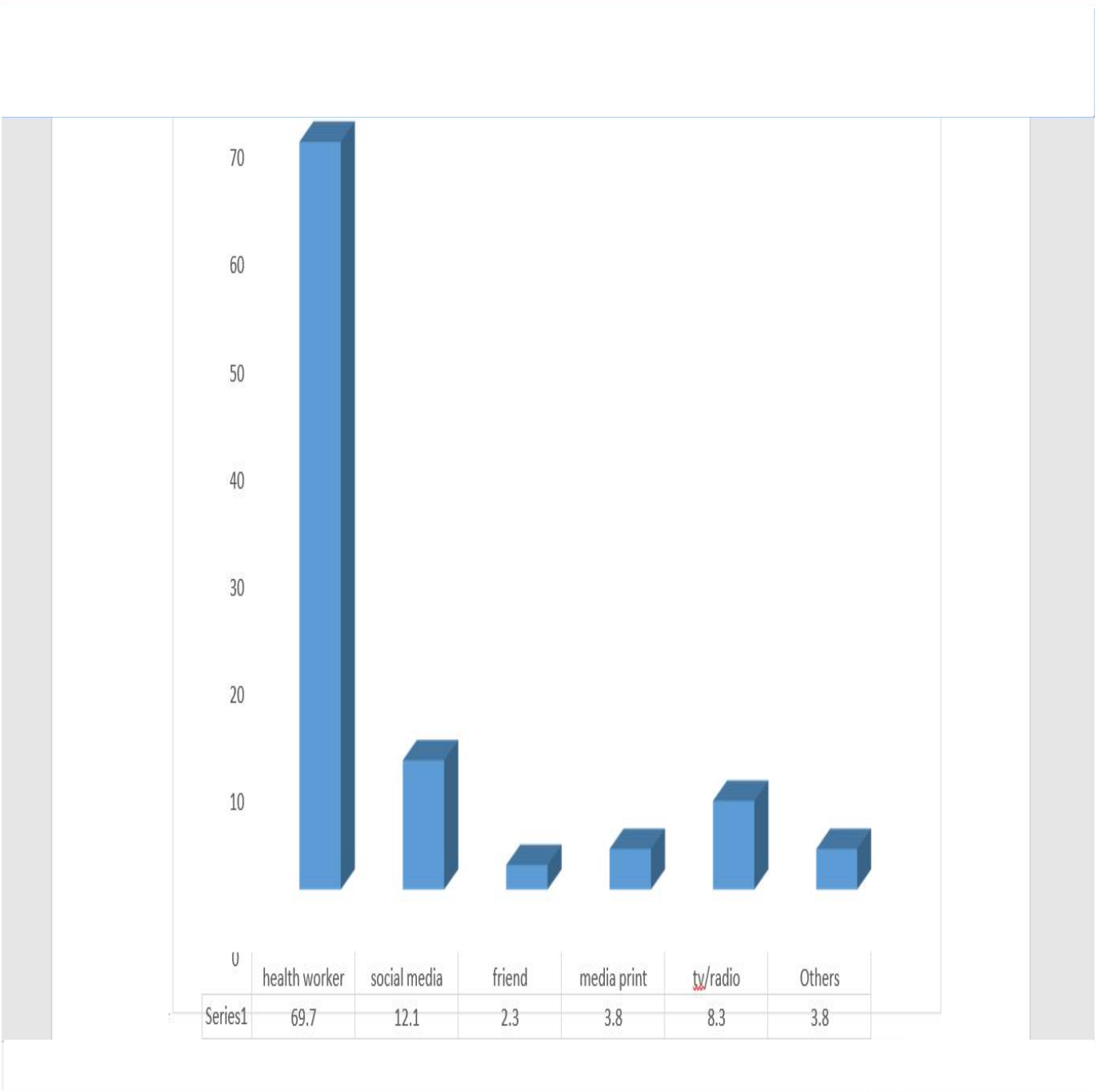


Fig 4.4: Major Sources of Information about Cervical Cancer

Source: Field Survey, 2021

Knowledge of HPV Vaccine

The knowledge of the HPV vaccine of the 233 respondents in the study is illustrated in table 4 below. Results of this study showed that knowledge of respondents on HPV vaccine showed strong negative response rate (77.1%). Respondents who accepted to have heard of the HPV vaccine recorded 22.8.

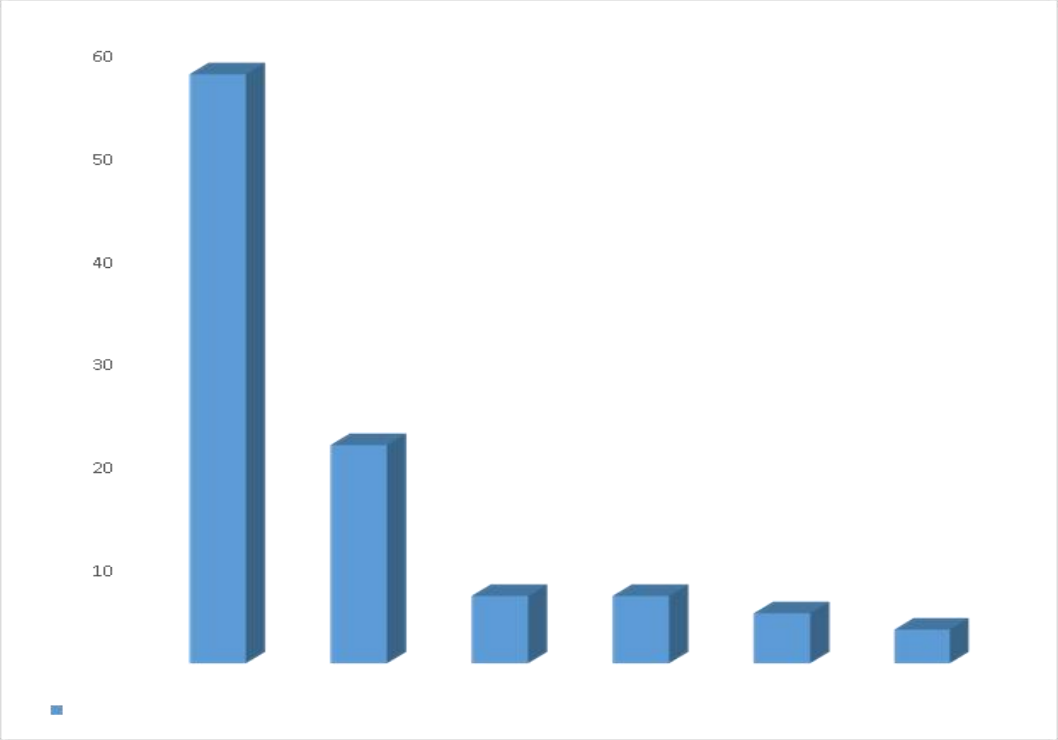
Table 4.4: Knowledge of HPV Vaccine

Knowledge/Belief	No N (%)	Yes N (%)
Heard of the HPV vaccine	175 (77.1)	52 (22.8)
HPV vaccine cure cancer	171 (75.0)	57 (25.0)
Regular screening for cancer is still needed even though you have been vaccinated with HPV	124 (54.4)	104 (45.6)
HPV vaccine is highly effective	135 (59.2)	93 (40.8)
HPV vaccine is highly effective in preventing HPV	134 (58.8)	94 (41.2)
HPV vaccine is highly effective in preventing cervical cancer	43(18.9)	104(45.6)

Source: Field Survey, 2021

Major Source of Information about HPV Vaccine

The bar chart in figure 5 below analyses the major sources of information of the 233 respondents on the HPV vaccine. After analysis of the data gotten, 57.4% of the respondents stated that they got information about the vaccine from health workers which is the highest as against, 4.9% of the respondents who stated that they got HPV vaccine information from TV/Radio.



	Health Worker	Social Media	Friend	Media Print	TV/Radio	Others
Series 1		21.3	6.6	6.6	4.9	3.3

Figure 4.5: Major Sources of Information about the HPV Vaccine

Source: Field Survey, 2021

Attitude/Willingness towards HPV Vaccine

Table 5 below illustrates the attitude/willingness of the 233 respondents toward the HPV vaccine. From the final analysis, it was registered that 53.9% (123) of the respondents were not willing to pay for the HPV vaccine but 46.1% (105) agreed to pay for the vaccine. 43% (98) of the respondents declined to get their daughters vaccinated as against 57.0% (130) who accepted getting their daughters vaccinated. 55.3% (126) of the respondents rejected payment for the HPV vaccine for their daughters, but a percentage of 44.7 (102) agreed to pay for their daughters. 23.7% (54) of the respondents were not willing to allow females around them to get vaccinated

even if the vaccine was given for free. 76.3% (174) accepted allowing any females around them to get vaccinated if the vaccines were to be given for free. 94.3% (215) of the 233 respondents have not been vaccinated with the HPV vaccine as against 5.7% (13) of the respondents who agreed to have taken the HPV vaccine. The mean amount respondents were willing to pay for the HPV vaccine was between 2700 naira and 3800 naira.

Table 4.5 Attitude/ Willingness toward HPV Vaccine

Attitudes	No N (%)	Yes N (%)
Willing to pay for the HPV vaccine	123 (53.9)	105 (46.1)
Willing to get daughter vaccinated	98 (43.0)	130 (57.0)
Willing to pay for daughter's Vaccine	126(55.3)	102 (44.7)
Willing to allow all females around you to get Vaccinated if the vaccine is free	54 (55.3)	174 (76.3)?
Vaccinated with HPV vaccine	215 (94.3)	13 (5.7)
Amount willing to pay (Mean ± SD)	3389.26 ± 2705.05	

Source: Field survey, 2021

Overall Knowledge of HPV Vaccine

The knowledge of the 233 respondents about the HPV vaccine was illustrated using the pie chart below. The respondents were classified into those with good knowledge and those with little/no knowledge. Those with good knowledge of the vaccine after analysis were 24%, while those with little/no knowledge were 76%

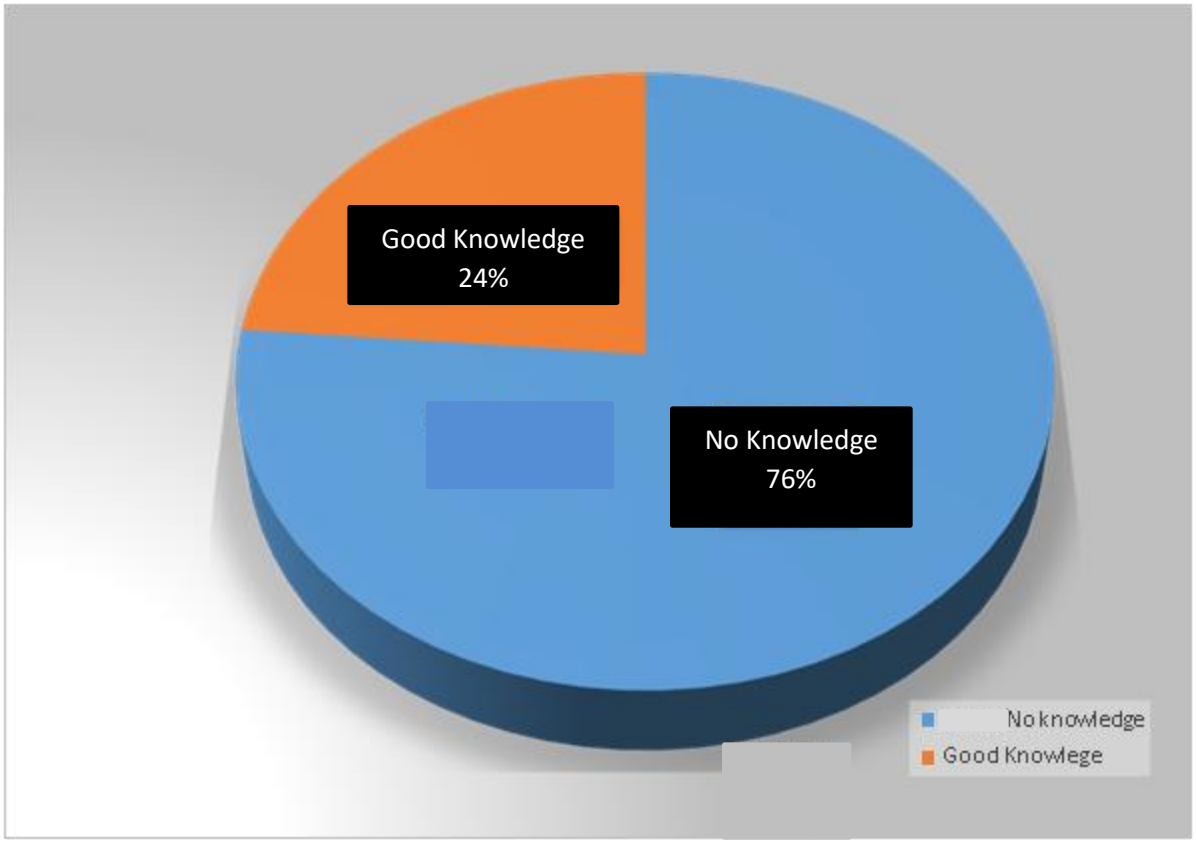


Figure 4.6 Overall Knowledge of Respondents about the HPV Vaccine

Source: Field Survey, 2021

Factors Associated with Willingness to Pay for the Vaccine

Table 4.6 Factors Associated with Willingness to Pay for HPV Vaccine

	Bivariate Analysis			**Multivariate**	
	No	**Yes**	**P-Value**	**Logistic Regression odd ratio (95% CL)**	**P-value**
Age					
≤30	9 (7.4)	9 (8.7)		(Reference)	
31- 40	45 (36.7)	44 (42.3)		0.52 (0.04-6.18)	0.61
41-50	48 (39.3)	34 (32.7)		0.34 (0.03-3.96)	0.39
51-60	17 (13.9)	15 (14.4)	0.86	0.47 (0.03-7.03)	0.59
>60	3 (2.5)	2(1.9)		5.09 (0.04-749.90)	0.52
Ethnicity					
Igbo	52 (42.6)	46 (44.2)			
Yoruba	32 (26.2)	33 (31.7)			
Hausa	1 (0.8)	1 (1.0)	0.63		
Others					
Education Level					
Primary	7 (6.1)	13 (12.9)		6.21 (1.18-32.65)	0.03
Secondary	52 (45.6)	40 (39.5)		2.29 (0.82-6.41)	0.11
Tertiary	55 (48.3)	43 (47.5)	0.22	(reference)	
Profession					
Unemployed	11 (9.8)	4 (4.0)		Reference	
Self Employed	72 (64.3)	78 (77.2)	0.08	18.13 (0.95-345.84)	0.05
Professional	29 (25.9)	19 (18.8)		7.44 (0.38-145.24)	0.19

Marital Status					
Single	28 (23.3)	12(11.5)		Reference	
Married	92 (76.7)	92 (88.5)	0.02*	1.72 (0.96-3.09)	0.07
Income					
<50000	88 (82.2)	67 (72.0)		0.08 (0.01-0.92)	0.04
50000-100000	16 (15.0)	17 (18.3)	0.09	0.18 (0.02-2.48)	0.18
>100000	3 (2.8)	9 (9.7)		(Reference)	
Years with HIV					
<5	22 (20.2)	12 (12.8)		0.41 (0.11-1.54)	
>5	87 (74.8)	82 (87.2)	0.16	(Reference)	0.19
B. Knowledge of HPV					
Poor knowledge	100 (21.3)	74 (70.5)		(reference)	
Good Knowledge	23 (18.7)	31 (29.5)	0.06	0.10 (0.22-4.47)	0.10
C. Knowledge OF HPV Vaccine					
Poor knowledge	72 (66.7)	2 (4.3)		(Reference)	
Good knowledge	36 (33.3)	45 (95.7)	<0.0001	36 (0.58-9.63)	0.0001
D. Knowledge of cervical cancer					
Poor knowledge	69 (56.1)	54 (51.4)		(reference)	
Good Knowledge	54 (43.9)	51 (48.6)	0.48	88.76 (13.31-591.91)	0.32
E-Health belief (Model)					
Perceived screening benefit					
Screening for cervical cancer in women with HIV can prevent development of					

cancer					
No	74 (60.2)	50 (47.6)		Reference	
Yes	49 (39.8)	55 (52.4)	0.06	1.13 (0.31- 4.14)	
Regular Screening for cervical cancer needed even though you have been vaccinated against HPV					
No	79 (64.2)	45 (42.9)		Reference	
Yes	44 (35.8)	60 (57.1)	0.0001**	2.08 (1.11- 3.91)	0.02
Early detection of cervical cancer can increase the survival rate					
No	60 (48.8)	37 (35.2)		Reference	
Yes	63 (51.2)	68 (64.8)	0.04*	1.33(0.73-2.43)	0.35
Susceptibility to Cervical Cancer and HPV Infection					
The germ that can cause cervical cancer can be transmitted through sexual intercourse					
No	89 (56.1)	59 (56.2)		Reference	

Yes	54 (43.9)	46 (43.8)	0.99	0.42 (0.09-1.85)	0.42
Women living with HIV are more likely to have cervical cancer					
No	84 (68.3)	58(55.3)		Reference	
Yes	39 (31.7)	47 (44.8)	0.43	0.54 (0.16-1.88)	0.33
HPV is transmitted during sexual intercourse					
No	84 (68.3)	58 (55.2)		Reference	
Yes	39 (31.7)	47 (44.8)	0.04*	2.40 (0.55-0.48)	0.24
People can get HPV without for a long time knowing it					
No	67 (54.5)	50 (47.6)		Reference	
Yes	56 (45.5)	55 (52.4)	0.30	0.82 (0.19-3.52)	0.79
Perceived benefit of vaccine					
HPV vaccines highly effective against HPV infection					
No	85 (69.1)	50 (47.6)		reference	
Yes	38 (30.9)	52.4	0.0001**	0.42 (0.05- 3.09)	0.40
HPV vaccines highly effective against cervical cancer					

No	83 (67.5)	51 (48.6)		reference	
Yes	40 (32.5)	54 (51.4)	0.004**	0.44 (0.07-2.89)	0.39

n = 233, $p < 0.05$

Source: Field Survey, 2021

Differences in Knowledge of the HPV Vaccine of Respondents in Relation to Acceptance and Willingness to Pay for the Vaccine

Table 4.6 describes factors associated with willingness to pay for the HPV vaccine. There was a significant correlation between the knowledge of respondents about the HPV vaccine and the willingness to pay for the vaccine. P value is < 0.0001 for (66.7) and (33.3). Since good knowledge of HPV and HPV vaccine are favorable for the uptake of the vaccine, there is a correlation between poor knowledge of HPV and HPV vaccine and the willingness to pay for the vaccine.

Factors that Affect Willingness to Pay for HPV Vaccine for Daughter(s)/Sister(s)

Table 4.7 Factors that Affect Willingness to Vaccinate Daughter(s)/Sister(s)

	Bivariate Analysis			**Multivariate**	
	No	**Yes**	**P-value**	**Logistic Regression odd ratio(95% CL)**	**P-value**
Age					
≤30	11 (8.8)	7 (6.9)		Reference	
31- 40	48 (38.4)	41 (40.6)		0.66 (0.07- 6.11)	0.66
41-50	46 (36.8)	36 (35.6)		0.57 (0.06- 5.59)	0.57
51-60	18 (14.4)	14 (13.9)	0.94	0.93 (0.075- 11.45)	0.93
>60	2 (1.6)	3 (3.0)		3.10 (0.005- 1876.88)	3.10
Ethnicity					
Igbo	54 (43.2)	44 (43.6)		0.79 (0.23-2.68)	

Yoruba	34 (27.3)	31 (30.7)		1.84 (0.51-6.69)	0.71
Hausa	1 (0.8)	1 (1.0)	0.90	0.0001(0.0001-0)	0.35
Others	36 (28.8)	25 (24.8)		Reference	1.00
Education Level					
Primary	7(6.1)	1 (13.0)		2.57(0.45- 14.48)	
Secondary	54 (47.0)	38(38.0)		1.10 (0.40- 3.45)	
Tertiary	54(47.0)	49(49.0)	0.15	Reference	0.28
Profession					
Unemployed	11(9.4)	4(4.3)		Reference	
Self Employed	79(67.5)	71(74.0)	0.30	9.67 (0.15- 644.58)	0.29
Professional	27(23.1)	21 (21.9)		7.30 (0.11- 509.071)	0.36
Marital Status					
Single	40(37.4)	29 (28.7)		Reference	
Married	77 (62.6)	72 (71.3)	0.17	1.09 (0.38- 3.12)	0.87
Income					
<50000	90(81.1)	65(73.0)		Reference	
50000-100000	17(15.3)	16(18)	0.22	0.03(0.002- 0.623)	0.02
>100000	4 (3.6)	8(9.0)		0.05(0.002- 0.995)	0.05
Years with HIV					
<5	23(20.4)	11(12.2)	0.12	0.57(0.16-2.06)	
>5	90(79.6)	79(87.8)		Reference	0.39
Knowledge of HPV					
Poor knowledge	102(81.0)	72(70.6)		Reference	
Good Knowledge	42 (19.0)	30(29.4)	0.07	12.92(2.18- 76.54)	0.0005
Knowledge of HPV Vaccine					
Poor knowledge	73(64.6)	1(2.4)		Reference	

Good knowledge	40(35.4)	41(97.6)	0.0001	36.36(5.80- 253.58)	0.0001
Knowledge of cervical cancer					
Poor knowledge	73(57.1)	51(50.0)		Reference	
Good Knowledge	54(42.9)	50(50.0)	0.28	4.72(0.73- 30.63)	0.10
E-Health belief (Model)					
Perceived screening benefit					
Screening for cervical cancer in women with HIV can prevent development of cancer					
No	74(58.7)	60(49.0)	0.14	Reference	
Yes	52(41.3)	52(51.0)		1.28(0.39-4.25)	0.68
Is regular Screening for cervical cancer needed even though you have been vaccinated against HPV					
No	79(63.7)	45(44.1)	0.005	Reference	
Yes	47(37.3)	57(55.9)		1.51(0.37 -6.26)	0.50
Early detection of cervical cancer can increase the survival rate					

No	65(51.6)	32(31.4)	0.002	Reference	
Yes	61(48.4)	70(68.6)		0.39(0.11-1.38)	0.14
Susceptibility to cervical cancer and HPV infection					
The germ that can cause cervical cancer can be transmitted through sexual intercourse					
No	72(57.1)	56(54.6)		Reference	
Yes	54(42.9)	46(45.1)	0.74	0.15(0.03- 0.82)	0.03
Women living with HIV is more likely to have cervical cancer					
No	85(67.5)	32(31.4)		Reference	
Yes	41(32.5)	70(68.6)	0.61	0.80 (0.21- 2.98)	0.7
HPV is transmitted during sexual intercourse					
No	85(65.9)	59(57.8)			
Yes	43(34.1)	43(42.2)	0.21	0.27(0.050-1.488)	0.13
People can get HPV without for a long time					

knowing it					
No	66(52.4)	51(50.0)		Reference	
Yes	60(47.6)	51(50.0)	0.72	0.54(0.12-2.48)	0.43
Perceived benefit of vaccine					
HPV vaccines are highly effective against HPV infection					
No	84(66.7)	51(50.0)		Reference	
Yes	42(33.3)	51(50.0)	0.02	0.53(0.07- 4.06)	0.54
HPV vaccines are Highly effective against cervical Cancer					
No	84(66.7)	50(49.0)	0.007	Reference	
Yes	42(33.3)	52(51.0)		1.46(0.21- 10.21)	0.69

n = 233, $p < 0.05$

Source: Field Survey, 2021

Table 4.7 describes factors that affect the willingness to pay for the HPV vaccine for daughter(s)/sister(s). The table demonstrates the relationship between mother's knowledge of HPV and HPV vaccines and the willingness to pay for the vaccine for their daughter(s)/sister(s). There is a significant correlation between the knowledge of HPV and HPV vaccines and the willingness to pay for the vaccine for daughter(s) and or sister(s).

4.3 Research Question(s)

Q1. What is the level of knowledge of HPV and cervical cancer among HIV-positive women in Lagos Nigeria?

With regards to the research question on the level of HPV and cervical cancer among HIV-positive women in Lagos Nigeria, no related study was found by the researcher on knowledge of women with known HIV status in Lagos state to establish a baseline status. However, the study recorded good knowledge of the disease after analysis which was 46%, while those with no knowledge were 54%. This goes to show that a little below the average of the population of women living with HIV in Lagos Nigeria have good knowledge the cervical cancer disease, thereby establishing a baseline status for Lagos State for other similar studies.

Q2. Are HIV-positive women willing to vaccinate their daughters/wards/sisters against HPV?

With respect to HIV-positive women's willingness to vaccinate their daughters/sisters against HPV, 43% (98) of the respondents declined to get their daughters vaccinated as against 57.0% (130) who accepted getting their daughters vaccinated, and this is more than average of the total respondents. This goes to show that the number of HIV-positive women who agreed to get their daughters/sisters/wards vaccinated is likely to increase if more enlightenment about the vaccine is done.

Q3. What are the barriers to the willingness to pay for the HPV vaccine among HIV-positive women?

The major barrier to accepting and paying for the Human Papillomavirus (HPV) vaccine is the high price of the HPV vaccine and this is illustrated in Table 4.1, where 75% (155)

have a monthly income of < 50,000.00 naira, 17% (33) have a monthly income which is between 50,000.00 – 100,000.00 naira and just 12% (6) have a monthly income > 100,000.00 naira. And one dose of the vaccine is between 10,000 to 15,000 naira. The mean amount the respondents agreed to pay was between 2,700.00 naira and 3,800.00 naira as against the current market price. This can be related to findings from other studies both high in Nigeria and outside Nigeria which emphasized their findings on the high price of the vaccine to been a barrier to the uptake of the vaccine

Another barrier is lack of knowledge of HPV/cervical cancer and the HPV vaccine and this also go a long way in affecting the willingness to pay for the vaccine and also get vaccinated[1].

Q4. What is the relationship between the cost of the HPV vaccine and willingness to pay?

The higher the cost of the HPV vaccine, the lower the interest of the respondents to get vaccinated. Some of the respondents might indicate their interest in getting the vaccine initially, but their financial status might stand as a barrier to achieving that because they can't afford to pay for the vaccine.

4.4 Test of Research Hypotheses

The researcher hypothesized that there will be a significant relationship between knowledge of HPV/cervical cancer and proper decision-making in the prevention of cervical cancer and reduction of mortality due to cervical cancer disease. After data collection and analysis, there was a significant relationship between knowledge of HPV/cervical cancer and proper decision-making in the prevention of cervical cancer and reduction of mortality due to the cervical cancer disease [r = 0.10 (0.22 – 4.47), n = 233, p

= 0.05]. This implies that an increase in the level of knowledge of HPV/cervical cancer will influence and lead to an increase in proper decision-making by people (women) living with HIV to aid the prevention of cervical cancer and reduction of mortality due to cervical cancer disease.

Hypothesis 2: There is a significant relationship between knowledge of the HPV vaccine and willingness to pay for the HPV vaccine [r = 36 (0.58 – 9.63), n = 233, p = 0.05]. This also indicates that an increase in the level of knowledge of the HPV vaccine among women living with HIV in Lagos State, Nigeria will lead to an increase in their level of acceptance to pay for the HPV vaccine and get vaccinated. The null hypothesis is therefore rejected.

Hypothesis 3: There is also a significant relationship between perceived screening benefits and willingness to pay for the HPV vaccine and get vaccinated. This implies that an increase in regular screening for cervical cancer and an increase in early detection of cervical cancer will lead to an increase in willingness to accept, pay for the HPV vaccine, and get vaccinated among women living with cervical cancer.

4.3 Discussion of Findings

In this study, the primary objective was to strengthen the evidence base for willingness to pay for HPV vaccine among women of known HIV status in Lagos State, Nigeria. To this end, the study assessed the knowledge of cervical cancer prevention and the willingness of women to pay for the Human Papilloma Virus (HPV) vaccine either for themselves, their daughters/wards, or sister(s), focusing on women from age 18 and above, which happens to be the main objective of the study.

The study was able to highlight the fact that there is a gap in knowledge of HPV, cervical cancer, and cervical cancer vaccine among the respondents. 68% of the respondents have heard about cervical cancer, and their knowledge of the disease was on average which was 50% (being able to identify some of the risk factors and symptoms of the disease), although they couldn't tell the relationship between HPV, cervical cancer and the fact that they (the respondents) with known HIV status are 5 to 6 times at risk of getting the cervical cancer disease as compared to women not living with HIV. They knew about the disease as it affects women but they were not well equipped with knowledge of the virus that causes the disease. The majority of the respondents don't have any idea that the HPV vaccine is highly effective in the prevention of HPV infection, and this is linked to their not being aware of the vaccine (only 23% knew the vaccine against 77% who had no idea of the vaccine) and lack of sensitization. The study was also able to identify that only 6% of the total respondents have taken the vaccine as against 94% showing poor uptake of the vaccine.

In comparison with other studies where financial constraints and the high price of the vaccine is a barrier to the HPV vaccine uptake[12]. It was concluded in this study that one major barrier to accepting and paying for the Human Papillomavirus (HPV) vaccine is the high price of the HPV vaccine and this can be linked to the basic income of the respondents as seen in Table 4.1, where 75% (155) have a monthly income of < 50,000.00 naira, 17% (33) have a monthly income which is between 50,000.00 – 100,000.00 naira and just 12% (6) have a monthly income > 100,000.00 naira.

Among the mothers who were willing to pay for the vaccines either for themselves, their daughters/wards, and/or sister(s), the majority were not willing to pay at the current price

at which the vaccine is being administered. This can be seen in Table 5 where the mean amount the respondents agreed to pay was between 2,700.00 naira and 3,800.00 naira as against the market price of the vaccine which goes from between 10,000.00 naira to 15,000.00 naira.

Human Papillomavirus (HPV) vaccine is not currently among the vaccines being given for free in the National Immunization Program, and this goes to show that to get the vaccine, the full price of the vaccine must be paid for out of pocket and this, therefore, indicates that many mothers with low income may not be able to afford the vaccine if the vaccine is to serve as a preventive measure against cervical cancer.

Compared with other Nigerian-based population studies which have reported high HPV vaccine acceptance[13] 57% (130 respondents) of the respondents were willing to obtain the vaccine for their daughters showing that the more the enlightenment about the vaccine, the more women will get to know about the vaccine and there will be a steady increase in the vaccine coverage.

Although the percentage of knowledge score of cervical cancer was on average among the respondents in this study, specific knowledge deficits were identified and that should be the target of awareness-raising education programs for women with known HIV status. And this includes a lack of knowledge of the following: Sexual transmission of HPV infection, women living with HIV being more exposed to HPV infection and coming down with cervical cancer disease if their system doesn't clear off the virus over some time, HPV infection being asymptomatic (that is having the disease for some time and not knowing as a result of symptoms not manifesting). If all these areas are buttressed in the

enlightenment of these women, the level of awareness about the disease will increase amongst these women.

Older age women and those who were less educated contributed mostly to the low level of knowledge seen in this study, and this goes to show that there is a need for HPV-related health education for older women and those of lower socioeconomic groups.

In this study, although a higher percentage of the few who knew about the disease heard from health workers, social media and TV/radio were also useful in providing information about HPV, cervical cancer, and the HPV vaccine. This goes to show that, there is need for interventions to increase the level of knowledge and willingness to pay for the vaccine among older women and those with lower socioeconomic status.

This study has brought out information that involves the mother's knowledge of HPV/cervical cancer and financial considerations for the willingness to accept the HPV vaccine.

While this study contributed key findings, some limitations were observed. In this study, when the respondents were being asked about their willingness to pay, the specific kinds of vaccines were not classified, and these different vaccines have a quite different ranges of costs. This factor can influence the way these women might respond to a willingness to pay or not willing to pay. Also, there was no specific question on the sexes and ages of mothers' children, which can also influence the answers on the respondent's willingness to pay. For example, a respondent who has sons only might consider the issue of HPV and cervical cancer less serious than mothers with daughters. Therefore, the rate of willingness

to pay may reduce. For future studies, I would suggest that the aforementioned questions be added.

Furthermore, studies to analyze fathers' willingness to pay and accept the HPV vaccines for their wives/daughters should be carried out also, as they happen to be the main decision-makers for most families. Women might have high acceptance of the HPV vaccine, but their husband's or partner's acceptance of the vaccine might be lower and this will affect the uptake of the vaccine. And in the society we belong to, most women are financially independent and they expect that the decision to vaccinate their daughter(s) would be made by both parents together especially when it involves payment[14].

It is therefore necessary to investigate vaccination acceptance among fathers of adolescent girls and husbands of women which may be important for future studies.

A large majority of 215 positive women (94.3%) have not been vaccinated as against only 13 (5.7%) who have been vaccinated with the HPV vaccine. This can be compared with past research which showed that about 118 million women have received the HPV vaccine globally, of which 1% of these women are from low - to middle–income countries with too many barriers reported[15].

With the Nigeria Institute of Medical Research HIV clinic being an apex clinic that attends to thousands of women outside men with known HIV status, it is expected that these women should have been properly enlightened about HPV, cervical cancer, and the existence and effectiveness of the HPV vaccine because these women are at higher risk and they visit the facility whenever they have an appointment and also for their drug pick up where enlightenment is supposed to be done regularly.

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Chapter Five

Conclusion

5.1 Summary of Findings

This research work set out to examine the knowledge of cervical cancer prevention, and the willingness of women living with HIV in Lagos State, Nigeria to pay for the HPV vaccine. The findings of the study imply that the knowledge of HPV/cervical cancer and the HPV vaccine affects the willingness to pay for the vaccine and also get vaccinated. Knowledge and positive attitude toward HPV and HPV vaccination is a key factor that plays an important role in HPV vaccine acceptance.

In the same vein, it is also concluded that the amount at which the vaccine is being given also affects the final decision to pay for this vaccine which can be seen in the mean amount the respondents are willing to pay (3389.26 $\pm$ 2705.05 naira) as against the original price (10,000 – 15,000 naira) and the percentage of women willing to allow all females around them get vaccinated was 76.3% as against 55.3%. The high cost of the HPV vaccine is also a great barrier to its use. If we want to improve HPV vaccine coverage in Nigeria, more effort should be put in by the government to finalize solutions to make the HPV vaccine cheaper and quite affordable for all. One possible way to achieve this is to carry out proper cost-benefit studies to provide convincing evidence for policy advocates in the country.

The knowledge of HPV, cervical cancer, and HPV vaccine cost appeared as the most important determinant of a mother's willingness to pay for her daughter/sister or themselves. This finding is similar to almost all relevant studies on willingness to pay among mothers of female teenagers, young women, students, and physicians.

A large majority of 215 positive women (94.3%) have not been vaccinated as against only 13 (5.7%) who agreed to have taken the HPV vaccine. Succinctly, it could be affirmed that a greater number of the population will accept and pay for the HPV vaccine if the entire

population is properly educated on the causes and factors responsible for HPV/cervical cancer and the effectiveness of the HPV vaccine in preventing HPV infection which might later lead to cervical cancer. A consciously designed health promotion intervention to provide a basic awareness of the HPV vaccine should be adopted and carried out regularly particularly among women in lower socio-economic strata as they appear to be the most uninformed group of persons. And this should include the high effectiveness of the HPV vaccine, the high likelihood of HPV infection without the vaccination, etc. These health promotion interventions should be communicated through TV broadcasts, health staff, and community loudspeakers.

The result from the study also suggests several similarities in participants' reasons for willingness/non-willingness to pay for the HPV vaccine. However, the results indicate important differences in the reasons for willingness to pay/ non-willingness to pay for the HPV vaccine among women of known HIV status in Lagos State.

Generally, it can be concluded that the participant's willingness/ non-willingness to pay for the HPV vaccine is primarily linked to a deficiency of effective communication from the healthcare providers these participants visit thereby leading to a lack of knowledge of the risks and benefits of HPV vaccination, and the need to complete the three (3) doses of the vaccine for full protection from HPV.

There are several implications linked to these findings. And above all, it shows that health care providers need to put more effort into their level of communication, most especially to women of known HIV status about the high risk of HPV infection, the safety of the HPV vaccine, and the course of the three (3) dose series vaccine. The ubiquity of the HPV infection should also be included in this sensitization, to help these women get a good insight into the importance of vaccination. These healthcare providers should also have a

proper follow-up guide to aid the uptake of both the second and third doses of the vaccine. This very approach has been proven to be effective in the promotion of HPV vaccination among US Hispanics, and this approach is seen as most effective because most of these women rarely listen to radio/news or even follow up on social media on issues relating to HPV, cervical cancer and HPV vaccine.

5.2 Conclusion

The study finding implies that the government should be ready to face squarely the responsibility of controlling and eradicating the disease. This study along with other studies has shown the relationship between the cost of the HPV vaccine and the willingness to pay for the vaccine. It is clear that the high cost of the vaccine poses a major barrier to the uptake of the vaccine hence the low uptake and willingness to pay. Also, the expected roles of the health/social workers cannot be overemphasized. They have significant roles to play which include counseling advocacy among others. This is in line with the study findings which show that there is a gap in knowledge about cervical cancer disease and the causal agent which is HPV, and the cervical cancer vaccine which is proven to be effective in the prevention of the disease. The level of knowledge of cervical cancer prevention among HIV-positive women in Lagos Nigeria affects the willingness of mothers to pay for the vaccine as seen in this study. The general populace should be well informed on the prevalence, mode of transmission, method of prevention, and control of the disease because the introduction of the HPV vaccine is highly protective against HPV 16 and 18 infections. And it is expected that it will go a long way in the fight to reduce the future burden of cervical cancer to a large extent, particularly in a low-income country like Nigeria and this is because HPV infection and cervical cancer are evident worldwide.

Access to and acceptance of available HPV/cervical cancer services should be at the highest. Diagnosed HPV/cervical cancer patients irrespective of their economic status should be attended to immediately without delay or bias of any sort. And cervical cancer screening results should always be released on time for fast actions to be taken to save the lives of these women.

The populace should also be enlightened on possible symptoms and also be educated on the public health services available within the confines of their living environment.

Healthcare providers should collaborate efforts to ensure the eradication of HPV/cervical cancer from the society as the prevention of cervical cancer is part of the sexual and reproductive rights of every female all over the world.

The result from this study and other studies have also proven that HPV vaccination is likely to be accepted if participants are given sufficient information about the virus and the vaccine, and also if the vaccine should go for an affordable price.

If the issue of proper implementation of HPV vaccine uptake and follow-up is addressed, this will go a long way in getting a good number of the population vaccinated.

An impact can only be made as far as HPV vaccination is involved if the rate of HPV vaccination achieved is quite high enough. As it is right now in Nigeria, there is no well-packaged cervical cancer control program properly monitored for good delivery and continuity of the vaccination program.

5.3 Recommendation

i. The low uptake of the HPV vaccine amongst women of known HIV status in Nigeria reveals that HPV vaccination should be integrated into cervical cancer preventive strategies/HIV treatment services with regard to knowledge, attitude, practice, and willingness to pay for the HPV vaccine and carried out by healthcare workers.

ii. Health workers, health educators, parents, teachers, and other health care providers should work collaboratively to ensure the adequate dissemination of information aimed at controlling and eradicating HPV infection. This can be done by organizing an HPV vaccination program which should be built upon already existing healthcare infrastructures with relevant invitations being sent to mothers who are of known HIV status when their daughters get to the age to be vaccinated with the HPV vaccine.

iii. Existing HIV programs can be used as a platform to educate and raise awareness on the importance of being knowledgeable on particularly HPV, its characteristics and associated risk, and the benefits of the HPV vaccine.

iv. HPV vaccine should be recommended by health care practitioners (most persons prefer provider recommendation) with the benefit of the vaccine well explained to encourage women of known HIV status on its uptake due to the low uptake of the vaccine.

v. There should be non-stop education/sensitization of the public and healthcare workers on new and improved information about the vaccine and proper ways to counsel and convince patients by healthcare practitioners.

vi. Policymakers should endeavor to make cervical vaccine part of the vaccine given for free in the National Immunization Program or subsidize the price of the vaccine to make it affordable and accessible to all,

v. Policymakers should also endeavor a proper structure where there is proper follow-up on vaccine uptake to ensure compliance for proper reduction of the burden of the disease.

5.4 Contribution to Knowledge

This research has helped in enlightening women on the importance and effectiveness of the cervical cancer vaccine. From the research carried out, very few women have been

vaccinated with the vaccine but after enlightenment, the majority of the women agreed to get vaccinated both for themselves and their daughter(s)/sister(s).

5.5 Suggested Area for Further Research

1. Father's willingness to pay for HPV vaccine for their daughters and/or wife

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Appendix

Informed Consent Form

This informed consent form is for women living with HIV aged 18 years and above participating in the research titled "Willingness to pay for HPV vaccine among women of known HIV status in Lagos States."

Names, Affiliations and Positions of the Researchers conducting the study:

a.) Name: **ODONGHANRO Dorinda**

Affiliation: Lead City University, Ibadan, Nigeria.

Position: Principal Investigator

You will be given a copy of the full informed consent form

PART 1: Information Sheet

My name is Odonghanro Dorinda and presently, a master's student of Public Health at the Lead City University, Ibadan. I am conducting a study to examine the willingness to pay for vaccine and to evaluate the willingness to vaccinate their daughters against HPV among women of known HIV status in Lagos State, Nigeria.

Purpose of the Research

The purpose of the study is to investigate the integration of HPV vaccination into cervical cancer preventive strategies with regards to knowledge, attitude, practice, and willingness to pay for the HPV vaccine.

Participant Selection

I am inviting all women living with HIV aged 18 years and above receiving treatment at Nigerian Institute of Medical Research HIV Treatment Clinic, Yaba, Lagos State.

Voluntary Participation

Your participation in this research is entirely voluntary. It is your choice to choose whether to participate or not. Whether you choose to participate or not, all the services you receive at this clinic will continue and nothing will change. You may change your mind later and stop participating even if you agreed earlier.

Duration

The research takes place over a period of two weeks in total. During that time, you are only expected to fill the questionnaire once. At the end of the two weeks, the research will be finished.

Risks

There is no known risk involved in participating in this research

Benefits

There may not be any immediate and direct benefit for you but your participation will help us find the answer to the research questions.

Confidentiality

I will not be sharing the identity of participants of this research. Any information that I collect from this research project will be kept confidential. Participants information will be coded with numbers which only the researcher will have access to and it won't be shared except with necessary stakeholders.

Sharing the Results

Only what is permitted by law and research ethics will be shared, participants of the research will be notified through meetings in the NIMR Clinic after which results will be published in academic journals for academics.

Contact Information

Who can I contact about this study? If I have questions or concerns about this research study, whom can I call?

You can call us with your questions or concerns. Our telephone numbers are listed below. Ask questions as often as you want

Odonghanro Dorinda

Department of Public Health,

Leadcity University, Ibadan.

+234 703 121 9501

rinopezwestdbest@yahoo.co.uk

If you want to speak with someone not directly involved in this research study, please contact:

Dr. Olayemi Nwogbe

IRB Secretary,

NIMR Ethics Committee,

Nigerian Institute of Medical Research, Lagos

+2348023513399

yeminmogbe@gmail.com

You can talk to them about:

1. Your rights as a research subject

2. Your concerns about the research

3. A complaint about the research and also, if you feel pressured to take part in this research study, or to continue with it, they want to know and can help.

When you call or write about a concern, please provide as much information as possible, including the name of the researcher, the Ethics Committee number (at the top of this form), and details about the problem. This will help Ethics Committee officials to look into your concern. When reporting a concern, you do not have to give your name unless you want to.

Informed Consent Form for Study Participants on HPV Self Sampling Research

Certificate of Consent

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I consent voluntarily to participate as a participant in this research.

Name of Participant _____

Signature of Participant _____

Date _____

Day/month/year

If illiterate

A literate witness must sign (if possible, this person should be selected by the participant and should have no connection to the research team). Participants who are illiterate should include their thumb-print as well.

I have witnessed the accurate reading of the consent form to the potential participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

Name of witness_____ AND Thumb print of participant

Signature of witness _____

Date _____

Day/month/year

Statement by the Researcher/Person taking Consent

I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the participant understands.

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

A copy of this Informed Consent Form has been provided to the participant.

Print Name of Researcher/Person taking the consent_____

Signature of Researcher /Person taking the consent_____

Date _____

Day/month/year

Willingness to pay for HPV Vaccine among Women of Known HIV Status in Lagos State.

The study is conducted by a Public Health master degree student of the Lead city University, Ibadan, Oyo State to determine the willingness to pay for HPV vaccine. All information will be treated confidentially.

Section A: Sociodemographic Characteristics

1. **How old are you?** _____ (years)

2. **My ethic group is?** a. Yoruba b. Igbo c. Hausa/Fulani d. others_____

3. **What is the highest level of Education you have completed?**

a. No formal education b. Primary c. Secondary d. more than Secondary

4. **What is your current work status?** a. Working b. Not working c. Student d. Housewife

5. **What is your profession?** _____

6. **What is your main source of income?**

a. Salary and wage b. Partner's salary and wages c. from parent or family members

7**. What income is available to you on the average each month (in Naira)?**

a. Less than 18,000 b. 18,000 to 35,000 c. 36,000 to 50,000 d. 51,000 to 70,000 f. 71,000 to 100,000 f. Greater than 100,000

8. **What is your current marital Status?**

a. Single b. Married c. Cohabiting d. Separated e. Divorced f. Widowed

9. **In the last four years, how many sexual partners do you have?**

a. Just 1 b. Less than 3 c. More than 10.

10. **What is your HIV status?** a. Positive b. Negative c. Don't know

11. **If Positive, how long ago was the HIV+ confirmed**

a. < 1-year b. 1-2 years c. 3 – 4 years d. ≥5 years

12. **If positive, recent CD4 Count (Cells/mm)**

a. < 350 b. ≥ 350 c. missing

13. **Are you on ARV?**

a. Yes b. No c. missing

14. **What level is your viral load?**

a. Undetected b. Detected c. Don't know

Section B: Knowledge of Human Papillomavirus (HPV)

1. **Have you heard of HPV (Human Papilloma Virus)?**

a. No b. Yes c. Not sure

2. **If yes, from which source**?

a. Health workers b. Social Media c. Friends d. Media prints e. TV/Radio f. Others

3. **What behaviour or activity increase the chance of contacting HPV infections?**

_____

4. **How old were you when you first had sexual intercourse?**

a. ___ age in years b. Never had sexual intercourse c. Don't know

5**. Smoking can be related to HPV?**

a. No b. Yes c. Not sure

6. **HPV can cause genital warts? (*Genital warts are fleshy growths that develop around the genitals or anus)***

a. No b. Yes c. Not sure

7. **HPV can be transmitted during sexual contact?**

a. No b. Yes c. Not sure

8. **People can get HPV infection for a long time without knowing it**

a. No b. Yes c. Not sure

9. **Have you been tested for HPV?**

a. No b. Yes c. Not sure

10. **If yes to Q9 what was the result** ……

11. **If No to Q9 what is your reason(s)?**

a. Don't know about the test b. Don't know where to get the test c. Cannot afford the cost

d. Ashamed to do the test e. My partner will not allow me to do the test f. Others _____

12**. Screening for cervical cancer in women with HIV can prevent developing cancer of the cervix**

a. No b Yes c. Not sure

13. **Does a negative HPV result depict that a woman has a low chance of cervical cancer?**

a. No b. Yes c. Not sure

Section C: Knowledge of Cervical Cancer

1. **Have you heard of cervical cancer?**

a. No b. Yes c. Not sure

2. **Have you ever received any information about cervical cancer?**

a. No b. Yes c. Not sure

3. **If yes to Q 2, through what channel?**

a. Health workers b. Social Media c. Friends d. Media prints e. TV/Radio f. Others

4. **Are people who drink alcohol/alcoholic content more likely to have cervical cancer?**

a. No b. Yes c. Not sure

5**. Are people who smoke more likely to have cervical cancer?**

a. No b. Yes c. Not sure

6. **Cervical cancer is caused by a type of human papilloma virus**

a. No b. Yes c. Not sure

7. **Cervical cancer can be cured if detected early**

a. No b. Yes c. Not sure

8**. The germ that causes cervical cancer can be transmitted during sexual contact**

a. No b. Yes c. Not sure

9. **Does having sex early in life increases the chance of having cervical cancer?**

a. No b. Yes c. Not sure

10. **Early detection of cervical cancer can increase the survival rate**

a. No b. Yes c. Not sure

11. **Women living with HIV are more likely to have cervical cancer compared to those who are HIV negative?**

a. No b. Yes c. Not sure

12. **Can having more than one sex partner increase the chance of having cervical cancer?**

a. No b. Yes c. Not sure

13. **Can a poor diet increase the chance of having cervical cancer?**

a. No b. Yes c. Not sure

14. **Can cervical cancer be prevented?**

a. No b. Yes c. Not sure

15. **Cervical cancer is caused by?**

a. Germs b. Bad diet c. Evil spirit d. Too much sex e. others…….

Section D: Knowledge and Willingness to get Vaccinated/Pay for HPV Vaccine

1. **Have you ever heard about HPV vaccine?**

a. No b. Yes c. Not sure

2. **If yes, from what channel did you hear about it?**

a. Health workers b. Social Media c. Friends d. Media prints e. TV/Radio f. Others

3. **Does HPV vaccine cure cervical cancer?**

a. No b. Yes c. Not sure

4. **Is regular screening for cervical cancer still needed even though you have been vaccinated against HPV?**

a. No b. Yes c. Not sure

5. **Are HPV vaccines highly effective in preventing HPV infection?**

a. Yes b. No c. Not sure

6. **Are HPV vaccines highly effective in preventing cervical/vulvar cancer?**

a. Yes b. No c. Not sure

7. **Have you ever been vaccinated with the HPV vaccine?**

a. Yes b. No c. Not sure

8. **If No to question (7) above, why?**

a. Do not have time to take HPV vaccination b. I would have severe side effects after receiving HPV vaccination c. I need to communicate with my spouse/ partner to take HPV vaccine d. I have never heard of the vaccine e. Don't know where/how to get it f. The vaccine is expensive g. Other (Specify)

9. **Would you be willing to get your daughter vaccinated against HPV?**

a. No b. Not sure c. Yes

10. **Please give reasons** _____

11. **Are you willing to pay for HPV vaccine?**

a. No b. Yes c. Not sure

12. **Would you be willing to pay for your daughters HPV vaccine?**

a. No b. Yes c. Not sure

13. **At what age would you like your daughter to get the HPV vaccine?** _____

Please give reasons _____

14. **Which females around you would you be willing to pay for HPV vaccine?**

a. Sister b. Niece c. House helps/Nannies/Helps d. Others (Please specify) _____

15. **If HPV vaccines are free in Nigeria, would you allow females around you get the HPV vaccine?**

a. No b. Yes c. not sure

16. **How much will you be willing to pay per dose for HPV vaccine?**

a. 6,000.00 NGN b. 8,000.00 NGN c. 12,000.00 NGN d. 15,000.00 NGN e. 20,000.00 NGN

Updated 2022

FORM A

Student's BioData Form

Matric No: LCU/PG/OO1126

Session: 2020/2021

Faculty & Dept: BASIC MEDICAL AND APPLIED SCIENCES

Course of Study: MASTERS OF PUBLIC HEALTH (MPH)

Qualification in View (e.g. M.Sc Accounting): MPH

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	✓
MALE	FEMALE

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Marital Status:

	✓	
Married	Single	Others

Religion: CHRISTIANITY

Health Status: NORMAL

Full Name of Next of Kin: DEACON MICHAEL OTIMEYIN ODONGHANRO

Telephone No. & Address of Next of Kin: 08033903493 NO 2 TUNDE EBIYEMI STREET, EGBOKODO-UBEJI, WARRI, DELTA STATE

University Compliance Certificate

This is to certify that the thesis by ODONGHANRO Dorinda in the Department of Public Health, Faculty of Basic Medical and Applied Sciences, Lead City University, Ibadan is in full compliance with the approved University Format and Style

_____

_____

Name Date