Assessment of Knowledge and Attitude Towards Cervical Cancer Screening Among Female Students in Lead City University, Oyo State, Ibadan.

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Being a MPH Thesis Submitted to the Department of Public Health, Faculty of Basic Medical and Applied Sciences, Lead City University, Ibadan, Oyo State, Nigeria.

In Partial Fulfilment of the Requirements for the Award of Master Degree (MPH) in Public Health

2022

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Certification Page

This is to certify that Ayobami-Fadele Elizabeth Abiodun with matriculation number LCU/PG/001511 carried out this research work titled "Assessment of Knowledge and Attitude towards Cervical Cancer Screening among Female Students "in the Department of Public Health, Faculty of Basic Medical and Applied Sciences, Lead City University, Ibadan, Oyo State, for the award of Master degree (MPH) Public Health and that this has not been previously submitted.

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Dr. Salako Abideen (Supervisor)	Date
Dr. Olowolafe (Head of the Department)	Date

Dedication

This research work is dedicated to God Almighty for seeing me through the program successfully, for the life and opportunity, that I was able to do this to the end.

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Acknowledgement

First and foremost, I would like to thank Health Research Ethical Committee of Lead City University Ibadan, Oyo State: for the due permission given to me to carry out this study, department of Public Health, Faculty of Basic Medical and Applied Sciences, Lead City University, Ibadan, Oyo State, Nigeria. I want to use this medium to recognize the effort of the females' students in Lead City University from which the study was carried out for the time taken to fill the self-administered questionnaires.

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"Even though the above-mentioned institutions and persons have assisted in the process of this research work, I alone stand responsible for the errors, if any, found in the work"

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Abstract

One of the 15 high-risk HPV kinds, which is linked to one of the more prevalent and recurrent infections of the lower genital tract, is referred to as the "major" cause of cervical cancer with an expected 311,000 fatalities and 570,000 new cases in 2018.It has been found that female students in low-income nations have a limited understanding of the disease and screening and that the knowledge among Nigerian university students was much worse. Sixth-generation health belief model (HBM) theory was applied. It is a conceptual framework that has been applied in numerous research on health behavior for the early diagnosis and prevention of disease[26] the study design was cross-sectional. A self-administered questionnaire and a purposeful sampling method was used. The study included 230 female students between the ages of 16 and no older than 40. After the surveys were coded and entered, the data was input and analyzed using SPSS version 20 statistical software. The knowledge and attitude regarding cervical cancer screening were each described using a descriptive statistic, such as frequency or proportion. The study established a good knowledge towards cervical cancer screening (77%) while some show a fair knowledge of it (23%). The study reveals that the majority of female students have a good attitude toward cervical cancer screening (74%) while a minority have a poor attitude toward cervical cancer screening (26%).Furthermore, part of female students has undergone cervical cancer screening with a fair utilization recorded (68%) while some minorities are yet to have it done with a poor utilization been documented (32%).Moreso, there was a significant association with age, marital status, ethnicity, tertiary level of education, and exposure to sex for cervical cancer screening. There needs to be ongoing sensitization of the students to the disease.

Keywords: Knowledge, Attitude, Utilization, Significant association.

Word Count = 290

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Table Of Contents

Title		Page
Certification		i
Dedication		ii
Acknowledgement		iii
Abstract		iv
Table Of Contents		v
List Of Tables		ix
Lists Of Figures		x
List Of Acronyms		xi
Chapter One: Introduction		1
1.1	Background to the Study	1
1.2	Statement of the Problem	3
1.3	Justification of the Study	4
1.4	Aim and Objective of the Study	4
1.5	Research Questions	5
1.6	Significance of the Study	6
1.7	Scope of the Study	6

DO NOT COPY. LEAD CITY UNIVERSTY, NIGERIA

1.8 Limitation of the Study 7

1.9 Operational Definition of Terms 7

Endnotes 9

Chapter Two: Literature Review 12

2.1 Conceptual Review 12

2.1.1 Introduction 12

2.1.2 Global Epidemiology of Cervical Cancer 14

2.1.3 Anatomy of Female Genitals Understanding 15

2.1.4 What is Cancer 19

2.1.5 Essentials for Cervical Cancer Prevention and Control Programs 24

2.1.6 Development of Effective Cervical Cancer Prevention and Control Strategies Challenges 27

2.1.7 Screening and Treatment of Cervical Pre-Cancer 29

2.1.8 Invasive Cervical Cancer Diagnosis and Treatment 38

2.1.9 Summary 40

2.2 Theoretical Review 45

2.3 Empirical Review 57

2.3.1 Other View 64

DO NOT COPY. LEAD CITY UNIVERSITY, NIGERIA

2.3.2 Self Determination 76

2.3.3 Situating Cervical Cancer Screening in Public Health 71

2.3.4 Ensemblers Methods 76

2.3.5 Conclusions 76

2.4 Conceptual Framework 76

2.4.1 Application of The Health Belief Model to Cervical Cancer Screening Behaviour 76

2.4.2 Health Belief Model 80

2.5 Summary of the Gaps in Literatures 81

Endnotes 89

Chapter Three: Methodology 96

3.1 Research Design 96

3.2 Population of the Study 96

3.3 Sample and Sampling Techniques 96

3.4 Description of The Research Instruments 97

3.5 Validity and Reliability of Research Instrument 97

3.6 Data Collection 97

3.7 Data Analysis 97

3.8 Ethical Consideration 98

DO NOT COPY. LEAD CITY UNIVERSTY, NIGERIA

Endnotes 99

Chapter Four: Results and Discussion of Findings 106

4.1 Demographic Data Analysis 106

4.2 Presentation of Data 108

4.2.1 Research Questions 122

4.3 Discussion of Findings 123

Chapter Five: Conclusion 125

5.1 Summary of Findings 125

5.2 Conclusion 125

5.3 Recommendations 126

5.4 Contributions to Knowledge 127

5.5 Suggested Areas for Further Research 128

Bibliography 129

Appendices 136

Biodata 136

University Compliance Certificate 137

Consent For Participation in the Study 139

Questionnaires 140

DO NOT COPY LEAD CITY UNIVERSITY, NIGERIA

List Of Tables

Table	Title	Page
Table 2.4.2	Health Belief Model	80
Table 4.1	Percentage Distribution of Sociodemographic Characteristics	107
Table 4.2	Knowledge of Respondents About Cervical Cancer Screening	109
Table 4.3	Association Between the Knowledge of Cervical Cancer and Sociodemographic Characteristics	112
Table 4.4	Respondents' Attitude Towards Cervical Cancer Screening	114
Table 4.5	Association Between Attitude and Socio-Demographics Characteristic	117
Table 4.6	Level of Utilization of Cervical Cancer Screening	119
Table 4.7	Association Between Levels of Utilization and Socio Demographic Characteristic	121

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List Of Figures

Figure	Title	Page
4.1	The Knowledge of Cervical Cancer Screening	111
4.2	The Attitude Towards Cervical Cancer Screening	116
4.3	The Level of Cervical Cancer Utilization	120

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List Of Acronyms

Abbreviation	Meaning
WHO	World Health Organization
LCU	Lead City University
HPV	Human Papilloma Virus
SCJ	Squamo Columnar Junction
OC	Oral Contraceptives
STI	Sexually Transmitted Disease
VIA/VILI	Visual Inspection with Acetic Acid/ Visual Inspection with Lugol's Iodine
LBC	Liquid Based Cytology
FDA	Food and Drugs Administration
IPC	Infection Prevention and Control
TTAH	The Total Abdominal Hysterectomy
TTVH	The Total Vaginal Hysterectomy
TRAH	The Radical Abdominal Hysterectomy
PH	Public Health
NHIS	National Health Insurance

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ASSESSMENT: AN OPINION OR A JUDGEMENT ABOUT SOMETHING THAT HAS BEEN THOUGHT ABOUT CAREFULLY ACCORDING TO THE OXFORD DICTIONARY.

KNOWLEDGE: ACCORDING TO THE OXFORD DICTIONARY, IT IS THE INFORMATION, UNDERSTANDING AND SKILLS YOU GAINED THROUGH EDUCATION OR EXPERIENCE.

ATTITUDE: ACCORDING TO THE OXFORD DICTIONARY, IT IS THE WAY YOU THINK AND FEEL ABOUT SOMETHING OR SOMEBODY.

FEMALE: BEING A WOMAN OR A GIRL.

UNIVERSITY: AN INSTITUTION AT THE HIGHEST LEVEL OF EDUCATION WHERE YOU CAN STUDY FOR A DEGREE OR DO RESEARCH.

STUDENTS: A PERSON WHO IS STUDYING AT A UNIVERSITY OR COLLEGE.

CERVIX: THIS IS THE NECK OF THE UTERUS BETWEEN THE ISTHMUS AND OPENING OF THE UTERUS THAT ENTERS THE VAGINA.

CERVICAL CANCER- A DISEASE FROM WHERE THE CANCER CELLS GROW.

CERVICAL CANCER SCREENING – ANY METHOD USED TO DETECT ABNORMAL CELLS IN THE CERVIX.

SCREENING -THIS IS A SYSTEMATIC TESTING OR EXAMINING OF A LARGE NUMBER OF PEOPLE TO IDENTIFY ANY ABNORMALITY FOR PROMPT ACTION AMONG PEOPLE WHO HAVE COME TO SEEK FOR MEDICAL ATTENTION[18]

HUMAN PAPILLOMA VIRUS: VARIOUS COUNTLESS SPECIES THAT LEAD TO WARTS ESPECIALLY VIRAL AND PLANTAR WARTS EITHER BY DIRECT OR

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INDIRECT CONTACT ON THE SKIN AND MUCOUS MEMBRANES IN HUMAN TRANSMITTED DISEASE

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Chapter One

Introduction

1.1 Background to the Study

One out of the high-risk fifteen Human Papilloma Virus (HPV) types, is referred to as the "important" reason for cervical Cancer which is due to an infection that is recurrent and uncommon to the lower genital tract[2] Apart from breast, colorectal and lung cancer. Cervical cancer is the fourth most frequent cancer among women with an estimated 311,000 deaths and 570,000 new cases in 2018, representing 6.6% of all cancers in women[1]

Ten in one hundred women came up with this disease and in every two minutes, death is always recorded from a woman globally. There is a highest incidence of the disease fatality among 30 - 40 years middle-aged women. The age-standardized calculated incidence of the disease is 13:1 per 100,000 in all women across the countries and changes largely among nations, with rates going from less than 2 to 75 per 100,000 of women all over the eastern, western and southern Africa respectively[4]

This is very rampant in low and middle-income countries. It is the main prevalent cancer disease incidence among our women and also the third most rampant talking of mortality. In Nigeria, almost 15,000 new cases of cervical cancer occur annually and age-standardized incidence rate is 27.1 per 100,000. Similarly, the incidence and fatality (approximately 85% and 90%) happens in low resource area or among people coming from low socio-economic level of the society. Cervical cancer will be responsible for the death of 443,000 women worldwide by the year 2030[3] Also 98% of the propounded death will happens in low-income countries and sub-Saharan Africa will have the largest number of deaths.

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For the fact that the government of Nigeria has implemented a national cancer control policy that allows for cervical cancer awareness, implementation of HPV-DNA testing/VIA with the management of pre-cervical lesions and carrying out of HPV vaccination programs, the incidence of the disease kept growing[6]

The utilization of Human Papilloma Virus vaccines in the management of cervical cancer disease is low and lack of awareness of the disease in Sub-Saharan Africa has move across different socio-economic status[6]. It is also said that only 4.2% of the 500 maternal and child health clinic attendees in Lagos have good knowledge of cervical cancer disease and more than 80% from the 139 cervical cancer advanced patients knew anything about the disease likewise 9% of the them knew that it was cancer-related in Nigeria[5]

It has been documented that female student in low-income countries have a poor knowledge towards cervical cancer and the screening, the final knowledge of cervical cancer was very poor among female university students in Nigeria. It is said that sexual intercourse before 18 years of age, previous history of sexually transmitted disease, multiple sex partners are the predisposing factors of cervical cancer in women. However, due to recent changes in population dynamics globally, with a 4-fold rise in cervical cancer disease associated mortality, its therefore calls for immediate public health intervention to fill the gap towards awareness and its preventive health service[7,8,9]

Due to deficiency in health system training, facilities and personnel shortages in the developing world, cervical cancer disease prevention remains basically random, so finding out of cases is subjected to low-resource visual inspection methods by using Lugol's iodine (VILI) , acetic acid (VIA) a same day service and see and treat method[10,11]though, the

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documented implementation of the above screening services is still very low, which implies that various cultural, economic and social hindrances stops women from being screened[12]

In view of the above, the researcher decided to carry out the study on the topic: assessment of the knowledge and attitude towards cervical cancer screening among female students in Lead City University, Ibadan, Oyo State, Nigeria.

1.2 Statement of the Problem

As it is today in Nigeria, cervical cancer screening is an opportunistic procedure that is subjected to the women's demand or her health care provider; and without doubt has led to lack of utilization of screening facilities and follow-up of bad results[15] Recently there is no mass screening program for the disease detection in Nigeria. The services are only access majorly in teaching hospitals and are not patronized adequately [11]

For the fact that Nigerian government has implemented a national cancer control policy that allows for cervical cancer disease awareness, HPV-DNA implementation testing/VIA, management of pre-cervical lesions and that HPV vaccination programs, the incidence of the disease kept growing[6]

Students' poor knowledge towards cervical cancer screening in developing countries has been documented, it is also noted that there is low awareness of knowledge towards cervical cancer among Nigeria female university students[19]

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It has been found that previous history of sexually transmitted diseases {STD), multiple sexual partners, early sexual intercourse before 18 years of age can influence women to cervical cancer disease [19]

Despite the high burden of new cases and deaths, there is a scarcity of data on knowledge, attitude and practices towards cervical cancer screening among female university students[18,20]

1.3 Justification of the Study

One of the commonest cancers in Nigeria is cervical cancer. Fortunately, it is be prevented by detecting precancerous lesions early through the use of various screening tools [17] This screening can be possible if students are assess on their knowledge and attitude towards cervical cancer screening.[13]Because of its high burden and high mortality, cervical cancer is considered a priority cancer for intervention.[14] There is need for the students to be aware that primary prevention will prevent them from getting exposed to the HPV and secondary prevention through screening will lead to early detection of the disease process and subsequent management to prevent invasive cancer and also guide the university health authority on the possible need in promoting awareness on cervical cancer screening.[8,9] This study aimed to assess knowledge and attitude towards cervical cancer screening among female University Students in Lead City University, Ibadan.

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1.4 Aim and Objective(s) of the Study

This study aims to assess knowledge and attitude towards cervical cancer screening among female students in Lead City University, Ibadan, Nigeria.

Objectives

- To assess the knowledge of female students towards cervical cancer screening in Lead City University, lbadan.
- To examine the attitude of female students towards cervical cancer screening in Lead City University, lbadan.
- To determine the level of cervical cancer screening utilization among female students in Lead City University, lbadan.
- To express the association towards cervical cancer screening between knowledge, attitude and level of utilization and sociodemographic characteristics

1.5 Research Question(s)

This will be based on:

1. What is the knowledge of cervical cancer screening with female students at Lead City University.

2. What is the attitudes of cervical cancer screening with female University Students at Lead City University?

3. What is the level of cervical cancer screening utilization among female students at Lead City University?

4.What is the association towards cervical cancer screening between knowledge, attitude and level of utilization and sociodemographic characteristics

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1.6 Significance of The Study

- This study sought to assess the knowledge and attitude towards cervical cancer screening. Some studies have reveals that if cervical cancer disease is detected early, it will pave way for early treatment, yet it still remains one of majorly common disease affecting women today.
- The outcome from this study will serve as fact that more awareness campaigns of cervical cancer disease especially in the institution is needed.
- The research outcome may be used as a reference point for other studies that may be carried out in the future.
- The research findings will help to ascertain the level of awareness of female university students towards cervical cancer screening and also guide the university health authority on the possible need in promoting awareness on cervical cancer screening.

1.7 Scope of the Study

This research aims to assess knowledge and attitude towards cervical cancer screening among female students in Lead City University, Ibadan. This research is restricted to female students in Lead City University, Ibadan.

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1.8 The Limitation of the Study

Micro geographical area and not too large sample size. There was an experienced of spending of more time with respondents while filling the questionnaires. Many questions were raised in the process of filling the questionnaires as well and was answered respectively.

1.9 Operational Definition of Terms

The following definitions was applied and used within the context in which they are explained:

Assessment: An opinion or a judgement about something that has been thought about carefully according to the Oxford dictionary.

Knowledge: According to the Oxford dictionary, it is the information, understanding and skills you gained through education or experience.

Attitude: According to the Oxford dictionary, it is the way you think and feel about something or somebody.

Female: Being a woman or a girl.

University: An institution at the highest level of education where you can study for a degree or do research.

Students: A person who is studying at a university or college.

Cervix: This is the neck of the uterus between the isthmus and opening of the uterus that enters the vagina.

Cervical cancer- A disease from where the cancer cells grow.

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Cervical cancer screening – Any method used to detect abnormal cells in the cervix.

Screening -This is a systematic testing or examining of a large number of people to identify any abnormality for prompt action among people who have come to seek for medical attention (Wald, 2018).

Human Papilloma Virus: Various countless species that lead to warts especially viral and plantar warts either by direct or indirect contact on the skin and mucous membranes in human transmitted disease.

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Chapter Two

Literature Review

2.1 Conceptual Review

2.1.1 Introduction

Why Is Cervical Cancer In Focus?

According to 26, over 266 000 women die from cervical cancer each year, which is why we need to focus on the disease. In Eastern and Central Africa, this is the factor that most frequently results in cervical cancer mortality. Access to comprehensive cervical cancer prevention and control programs that can provide all females with Human Papilloma Virus (HPV) vaccinations and who are at risk with pre-cervical cancer screening and treatment will help reduce the largest number of fatalities from the disease.

There is evidence that one or more of the "high-risk" or (Oncogenic) forms of the human papillomavirus, which are known to cause the development of tumor(s), is what typically leads to cervical cancer. It has been demonstrated that the HPV infection has a very slow, natural progression in immunocompetent women from normal to pre-cancer to invasive cancer, which has the potential to be quite devastating[21] Similar to this, a 10- to 20-year lag between pre-cancer and cancer provides plenty of time for screening, detection, and treatment of pre-cancer and the ability to stop (a stoppage of movement or activity) its progression to cancer. Immunocompromised women (women with HIV) typically advance quickly to pre-

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cancer and malignancy. We provide a wide range of accessible and inexpensive pre-cancer studies, as well as a wide range of economical treatment options. There are HPV vaccines that can be given to all females before they become sexually active. It has been demonstrated that the HPV infection has a very slow, natural progression in immunocompetent women from normal to pre-cancer to invasive cancer, which has the potential to be quite devastating.[21] Similar to this, a 10- to 20-year lag between pre-cancer and cancer provides plenty of time for screening, detection, and treatment of pre-cancer and the ability to stop (a stoppage of movement or activity) its progression to cancer. Immunocompromised women (women with HIV) typically advance quickly to pre-cancer and malignancy. We provide a wide range of accessible and inexpensive pre-cancer studies, as well as a wide range of economical treatment options. The HPV vaccines are readily available and, if given to all girls before they begin sexual activity, will aid in the prevention of a significant proportion of cervical cancer cases.[24,25]

The enormous differences in incidence rates and mortality rates that exist in various settings will continue to be a significant indicator of the lack of comprehensive and efficient services even in the presence of cervical cancer preventive and control programs that are free from current injustices [25]. It has been determined that a high-risk Human Papillomavirus infection that is ongoing is the main contributor to cervical cancer illness [21,22]. The cervical cancer disease poses a severe threat to the health of women globally and has been declared to be the second most prevalent female malignant tumor. A thorough system of cervical cancer prevention and control was developed as a result of this obvious cause. World Health Organization (WHO) issued a call in May 2018 for the eradication of cervical cancer globally, and more than 70 countries and international academic societies responded quickly. Then, on

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November 17, 2020, WHO released the global strategy to accelerate the eradication of cervical cancer as a pressing public health issue, and about 174 countries committed to working cooperatively in close proximity to each other to eradicate the disease.[15]

2.1.2 Global Epidemiology of Cervical Cancer Disease

"Epidemiology is the study of the distribution and determinants of health-related states or events (including disease), and the application of this study to the control of diseases and other health problems, "[29] Cervical cancer is the most prevalent cancer among women in 45 of the world's nations, and it kills more women than any other type of cancer in 55 of them, notably Asia, which includes India, sub-Saharan Africa, and a few Central and South American nations.

In 2018, 528 000 new instances of cervical cancer were reported worldwide, with 85% of those cases occurring in sub-Saharan Africa [27]. In a similar vein, over 9 out of every 10 women, or 231 000 women overall, who died from cervical cancer lived and died in low- to middle-income nations, with the disease accounting for about 266 000 of those deaths [27]

In addition, only 35 000 of these women—or 1 in 10—lived and passed away in high-income nations for reasons related to the complete absence of effective prevention, early identification, and management programs, as well as the lack of equal access to such programs. Without these involvements, cervical cancer is typically discovered when it is already advanced, making it impossible to treat effectively and increasing the risk of death[22]Executing secondary prevention measures, such as efficient screening, early detection, and care of pre-cancer and early cancer[24] has affected mortality and the number of cases diagnosed during the past 30

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years, respectively. In countries where economic and social standing has improved, there has been a decrease in the incidence of cervical cancer during the past 30 years as well as death rates. According to the statistics presented here, women in low- and middle-income nations are surprisingly neglected, necessitating the establishment of efficient services for all[24].

529,000 new instances of cervical cancer were reported to have been detected globally in 2008, according to estimates from the World Health Organization (WHO) and International Agency for Research on Cancer (IARC). Cervical cancer had 452,000 new cases in sub-Saharan nations, placing it second among female patients' malignancies. Most crucially, among female malignancies, cervical cancer ranked 10th with 77,000 new cases in developed nations. [7,15]

With an anticipated 570,000 cases and 311,000 fatalities worldwide in 2018, cervical cancer disease ranks as the fourth most often diagnosed cancer and the main reason for cancer death in women. However, sub-Saharan Africa accounts for over 85% of all cervical cancer deaths globally, and mortality rates in underdeveloped nations are 18 times greater than those in wealthy nations [15]. In low Human Development Index (HDI) settings, cervical cancer disease ranks second in incidence and mortality after breast cancer; however, it is the most frequently diagnosed cancer in 28 countries and the leading cause of cancer death in 42 countries that are present in South Eastern Asia and Sub-Saharan Africa. Africa has the highest regional incidence and fatality rates[30]

2.1.3 Anatomy of Female Genital Understanding

It was discovered that having a thorough grasp of the female pelvic organs can help medical personnel working on cervical cancer screening programs to conduct the following [26]:

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• Complete their duties regarding community education, pre-cancer screening, diagnosis, and treatment.

• At the provider level, refer females with lesions that cannot be treated to the proper higher-level facilities.

• To analyze test results, treatment-procedure reports, and clinical advice given by healthcare professionals at upper echelons of the system.

• To provide each patient with individualized counseling by educating them about their illness and the planned course of their follow-up care.

• To offer efficient communication with healthcare professionals at all levels of care by incorporating a two-way referral system that includes, respectively, community health workers and tertiary-level referral providers.

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Identification of the External and Internal Organs.

External Organs

The external organs include both those that can be seen without a speculum and those that can. Included in this is the vulva, which is the region between the figure's upper border and the level of the Bartholin glands. The vaginal opening, or introitus, along with adjacent structures make up the vulva.

The major and minor labia serve as its safe guides, and the clitoris is a tiny, delicate organ that fosters pleasure during sexual activity. On the other hand, the urethra, or opening to the urinary system, is a tiny orifice located above the introitus, perineum, and anus. The perineum is the region that lies between the anus and the vaginal entrance. When a woman is sexually

excited, Bartholin glands secrete clear mucus to lubricate the introitus [33]. The Labia minora, Labia majora, Bartholin gland, clitoris, urethra, and vaginal introitus perineum anus make up the majority of the female external genitalia.

Internal Organs

Except when the female pelvis is opened through an incision or a laparoscopy, the internal organs are not visible. The uterine body is above the cervix, the rectum and bottom of the colon are behind the genital structures, and the urine bladder and urethra are in front of the vagina and cervix as well as at the back of the pubic bone. The ligaments or thickenings in the abdominal lining hold the uterus in place (peritoneum). On either side of the uterus are the ureters, which are tiny tubes that convey urine from the kidneys to the bladder [34].

Brief Description of the Pelvic Organs

Vagina - The vagina is an elastic muscular tube with multiple folds, leading from the introitus to the cervix. The lower portion of the cervix (ectocervix) protrudes into the upper end of the vagina and the vaginal area surrounding it is called the vaginal fornix.

Cervix- The cervix is the lower third of the uterus. In a non-pregnant woman of fertile age, it measures approximately 3 cm in length and 2.5 cm in diameter. The lower part of the cervix (ectocervix) lies within the vagina and is visible with a speculum; the upper two thirds of the cervix (endocervix) lie above the vagina and is not visible. Most cervical cancers originate in the area where the endocervix and ectocervix join. The cervix is composed of dense fibro-muscular tissue. The cervical canal runs through the Centre of the cervix from the internal os (the opening at the entrance to the cavity of the uterus) to the external os (the opening in the

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cervix seen with a speculum). This appears to be a giant uneven slit inside of a multipara lady[35].

The uterus is a muscled, hollow, pear-shaped organ with thick walls. The uterus can measure up to 10 cm from the top, or fundus, to the bottom, or ectocervix, depending on whether there is no tumor or pregnancy. It is controlled by a number of ligaments connected to the female pelvic wall and created as a result of the peritoneum thickening. The parametrium is the region that lies between the uterus and the pelvic wall. The uterine cavity's lines are formed by the endometrium, which also houses many glands. It changes dramatically both throughout pregnancy and the menstrual cycle [36].

The ovaries are two paired organs located on either side of the pelvis. With very few exceptions, an egg is generated by either ovary (ovulation) in a female with regular monthly periods every month.

The fallopian tubes are both the path the egg takes from the ovary to the uterus and are thin, hollow tubes. If a woman and her man have unrestricted sexual contact in the days leading up to and/or the following ovulation, the egg is fertilized in this fallopian tube (contraception). Along the length of the cervix, arteries and veins that nourish the uterus and cervix sit on either side. It is crucial to keep the vessel location in mind when administering cervical anesthesia to prevent accidentally injecting a local anesthetic into a vessel [29]. The lymph nodes and ducts that drain the pelvic organs and are located close to the blood vessels may serve as a route for cervical cancer to spread. When cancer is advanced, wide tumors may obstruct lymphatic drainage, which causes lymphoedema, or swelling of the legs. Since the ectocervix lacks any pain nerve endings, procedures like cryotherapy and biopsy that exclusively involve this area can be done successfully without the use of anesthetic. In

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contrast, the endocervix possesses a variety of sensitive nerve endings that will make a woman feel pain when this area is managed, such as during endocervical curettage, damage, and stretching [23].

History of Natural Cancer of the Cervix.

Cells of the transformational zone Squamous Columnar Junction (SCJ) are particularly vulnerable to human papillomavirus infection, and the majority of squamous cell carcinomas originate from there [36].

For instance, girls are born with the original Squamous Columbia Junction, which is located at or near the external. The cervix enlarges and the columnar cells in the endocervix with the original Squamous Columnar Junction become apparent on the ectocervix at puberty when the eggs start to exude estrogen. When estrogen is present, women in their 30s either go through a normal aging process or squamous metaplasia has taken place, leaving both their original and new SCJs intact[18].

The transitional zone lies between the two SCJs. When a woman reaches menopause, her cervix shrinks as estrogen levels drop, and the columnar epithelium with transformation zone retreats from the ectocervix and enters the cervical canal[30]. Some postmenopausal women's cervixes may resemble those of premenopausal women (perimenopausal), with the new SCJ remaining partially or entirely visible as well[28,29].

2.1.4 What is Cancer?

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The aggressive, independent, and unchecked development of cells and tissues is referred to as cancer. Such proliferation results in tumors, which can infect the tissues surrounding cancer and lead to metastases—new growths that resemble primary cancer in other parts of the body. Normal tissues are destroyed as cancer spreads and compete with it for oxygen and nutrients.

What is Cervical Cancer?

The majority of cervical cancers are brought on by persistent infection with cancer-causing HPV strains. The transformation zone of the ectocervix is where 90% of cervical cancers start, while the glandular columnar layer of the endocervix is where 10% of cervical cancers, or adenocarcinomas, start. By immunizing our young girls against the Human Papilloma Virus and screening for the discovery and treatment of precancerous lesions in our women, we can avoid cervical cancer [36]. Furthermore, cervical cancer can still be cured with early detection and treatment [31].

Cervical Pre-Cancer

In the presence of ongoing or prolonged human papillomavirus infection, the epithelial cells of the cervix's transformational zone undergo a crystalline shift, and cells start to develop in the opposite direction. 28 Cervical cancer is a pre-cancer that takes many years to progress to invasive cancer, providing plenty of time for early discovery and effective treatment. Despite the fact that cervical cancer is preventable, there are still a lot of women who pass away from it in many countries. This may be because they lack access to services for prevention and treatment due to a variety of reasons, including barriers to access like distance, hours of

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operation, and a lack of transportation with an increasing gender gap. Given cultural obstacles, poverty sometimes serves as a primary factor [32].

The primary cause of cervical pre-cancer and squamous cervical carcinoma is an ongoing, asymptomatic infection with one or more high-risk forms of the human papillomavirus [27]. The most prevalent sexually transmitted infection is HPV. Many of the more than 100 different varieties of the human papillomavirus are unrelated to cervical cancer. Only two kinds of the Human Papilloma Virus, types 16 and 18, respectively, are known to cause seven out of ten, or (70%) of all occurrences of cervical cancer illness. Types 31, 33, 45, and 58 of the Human Papilloma Virus are four high-risk variants that are only sporadically linked to cervical cancer. In some specific places, we also have some distinct varieties that are significantly more common than the others: Types 6 and 11 of the human papillomaviruses, which carry modest risks, cannot be linked to cervical cancer, although they are the main cause of condylomas and genital warts [29]. After initiating sexual contact, both men and women are typically infected with the virus. It is not necessary for the penis to penetrate the vagina before coming into contact with the virus because it can spread through skin-to-skin contact between the area around the penis and the vagina. Men are more likely than women to contract the human papillomavirus, and the majority of infections last only a few months. Cancer of the anus is quite common in men and is frequently linked to HPV type 16, which is frequently present in same-sex relationships. Many male genital warts are reported to be caused by Human Papilloma Virus types 6 and 11. The transformation zone of a woman's ectocervix enlarges throughout puberty and pregnancy [21]. Early pregnancy, sexual activity, childbirth, and a history of several pregnancies are all associated with squamous cell cervical cancer. Contact with HPV during these times may hasten the infection and explain these associations [35].

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Having partnered with various partners and having several sexual partners are practices that can increase the risk of HPV infection. Due to the fact that many infections associated with each HPV type have a short life span and the body passes them out gradually over the course of two years, many women who have acquired a high-risk HPV do not get cancer. High-risk HPV infection persists in a tiny proportion of women, and only a small proportion of chronic infections result in pre-cancer [40]. Accordingly, it is predicted that less than 2% of women in low-income countries will get cervical cancer disease in their lifetimes [30].

Risk Factors for Cervical Cancer

This comprises:

HPV Type

These discussions on the power of infection or the capacity of tumor formation to cause cancer.

The Immunological Status refers to those who have compromised immune responses (immunocompromise).

Other Sexually Transmitted Agents' Coinfection: E.g., Herpes syphilis, Chlamydia, and Gonorrhea. For instance, those who have HIV are more likely to experience frequent HPV infections and more rapid development of pre-cancer and malignancy [32].

Parity: This information includes the number of births.

Smoking Tobacco: The use of harmful substances to one's health.

The Order of the Disease

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The International Federation of Gynecological and Obstetrics uses the following orders on its platform for clinical illness classification [36].

Order O: An In-situ Carcinoma that Cannot Be Avoided

Order 1: Cancer cells that are sort of in the cervix.

Order 1A: The depth of the disease when viewed from above is no more than 5 mm, and its width when viewed horizontally is no more than 7 mm.

Order 1B: The lesions that can be clearly observed to be larger than 1A, either under a microscope or in a clinical setting.

Order II: Associated upper two-thirds exclusively for Cancer involving the cervix and vagina but not the pelvic wall.

Order IIA: Absence of uterine tissue

Order IIB: Uterine tissue is included

Order III: Include the lowest portion of the vaginal or pelvic wall

Order IIIA not adding any implants to the pelvic wall region.

Order IIIB: Increasing the pelvic wall further, which may result in hydronephrosis (kidney atrophy caused by the obstruction of the flow of urine to the kidney).

Order IV Cancer of the bladder, rectum, and numerous pelvic organs.

Order IVA a metastatic spread to nearby organs.

Order IVB distant organ metastatic spread. (Metastasis to distant organs)

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Clinical Manifestations

The first signs of cervical cancer go unnoticed for many years; the sole clinical indicator is an aberrant cell found during a pap smear. Cervical lesions, painful coitus, vaginal bleeding, and dysuria are signs of cervical cancer disease that may spread locally and with invasion [31].

2.1.5 Essentials for Cervical Cancer Prevention and Control Programmes

The following are crucial for initiatives to prevent and control cervical cancer [28].

- The link between screening services and post-treatment follow-up and treatment.
- The incidence, morbidity, and mortality of cervical cancer are to be reduced by the initiatives.
- Since there are considerable disparities in access to efficient cervical cancer screening and therapy, women without access to these services are disproportionately affected by invasive cervical cancer.
- Primary, secondary, and tertiary prevention initiatives should be a part of the comprehensive program, in addition to management and quick access to palliative care.
- The implementation of a national cervical cancer prevention and control program must be done in accordance with the WHO's "six building blocks" in order to strengthen the entire health system.
- Monitoring and evaluation are helpful strategies for preventing and controlling cervical cancer.

Comprehensive Cervical Cancer Prevention and Control Programme

The prevention and control program for cervical cancer consists of a coordinated collection of initiatives aimed at avoiding and reducing the disease's morbidity and

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mortality. Cervical cancer prevention and control is one of the top priorities listed in the Global Action Plan for the Prevention and Control of NCDs 2013-2020. This program provides space for an action plan that includes specifics on what must be done, who must do it, when it must be done, and the resources or methods that must be employed to carry out the program as intended. The program's development is constantly and frequently assessed [21].

Goals

The purpose of a comprehensive cervical cancer prevention and control program is to reduce the incidence of cervical cancer by:

- Identifying and treating cervical pre-cancer lesions.
- Completely eliminating human papillomavirus (HPV) infections
- Giving invasive cancer patients prompt management and palliative care [22].

Components Of Comprehensive Cervical Cancer Prevention and Control

Primary Prevention

This emphasizes lowering the danger of HPV infection because persistent HPV infections can result in cervical cancer illness. Reducing HPV infections is a public health priority. Interventions at the level include:

- Healthy sexuality education for both boys and girls, centered on age appropriateness and culture, with an important message on delaying sexual initiation and minimizing high-risk sexual behaviors;
- Vaccinations for girls between the ages of 9 and 13 or in accordance with the national criteria for the age at which they can begin sexual engagement; promotion of male

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circumcision where appropriate; and promotion of condoms or other forms of contraception for individuals who engage in sexual activity [14,40].

Secondary Prevention:

This involves the detection and treatment of pre-cancer. By stopping the progression from pre-cancer to invasive cancer, public health aims to decrease the incidence, prevalence, and related mortality of cervical cancer.

- Effective counseling and information exchange are part of interventions at this level. Appropriate screening for all women between the ages of 30 and 49, or as specified by national criteria, is part of interventions at this level as well.
- Prompt treatment of discovered precancerous lesions to prevent the development of invasive cancer. When women reach the target age of 40, it's crucial to continue screening and treatment even if they've had an HPV vaccination [40].

Tertiary Prevention

This involves the detection and treatment of pre-cancer. The goal of public health is to reduce the number of deaths from cervical cancer. This level of intervention entails Appropriate management in accordance with each order of diagnosis,

- An efficient method for referring patients to facilities that offer cancer diagnosis and management; Accurate and prompt cancer diagnosis by determining the extent of invasion. Early cancer that has spread only to the pelvic region may be managed so that it can be cured. This offers the best available care and helps with any symptoms brought on by cancer or its management of it.

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- Management can enhance the quality of life, manage symptoms, and lessen suffering in patients with advanced cancer that has spread to tissues outside the cervix and pelvic area and/or metastases.
- Providing palliative care to lessen misery and pain. The frequency and incidence of cervical cancer, as well as suffering.

2.1.6 Development of Effective Cervical Cancer Prevention and Control Strategies Challenges

When a nationwide program for the prevention and control of cervical cancer is first devised, difficulties are to be expected at every level of the health system pyramid. To reduce the negative effects of all the issues, there are activities that may be taken at all levels.

Challenges to take in order to lessen numerous harmful effects include:

- Poor awareness and placement of issues affecting women's sexual and reproductive health, such as cervical cancer and STDs. To address this, program managers and members of advisory groups should work together to minimize the visibility of cervical cancer-related stressors, such as high rates of morbidity and mortality among young women, socioeconomic disparities, negative effects on society, and high costs to the health system. advocacy activities to raise awareness among decision-makers of the need to properly position women's sexual and reproductive health.
- Ineffective leadership: Finding and supporting higher-level advocates for cervical cancer disease reduction as well as national coordination and accountability
- Updated national regulations and policies are required. Create, modify, or update necessary national policies and guidelines.
- Inadequate use of local/national resources

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Key Five Messages on the HPV Vaccine:

The HPV vaccine should be administered to all the females who have been designated by the national program as the target population. It can prevent cervical cancer and is secure and reliable.

- Although it may be less effective, girls who are already sexually active can also receive the HPV vaccine
- The HPV vaccines do not treat or cure HPV infections that have already developed.
- The HPV vaccine functions best when given before any sexual intercourse.

Key Five Messages on Screening and Treatment:

- You don't have to pass away from cervical cancer. The condition of cervical cancer can be avoided.
- At least once every three years, all women aged 30-49 should be checked for cervical cancer.
- All of these early modifications may be managed in a secure and efficient manner.
- There are several tests to find pre-cancerous alterations in the cervix that may develop into cancer if not treated right once.

Key Points on Vaccination with HPV

- An essential primary prevention strategy in a complete program to prevent and control cervical cancer is immunizing girls before they begin the sexual activity.

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- Human Papilloma Virus is the most typical sexually transmitted infection (STI).
- Most nations have approved two vaccines that protect against high-risk HPV types 16 and 18 infections; they both have great safety records and can be administered with other vaccines, such as those for diphtheria, tetanus, and pertussis (DTP) and hepatitis B, respectively.
- Girls who have received the HPV vaccine will still need to undergo cervical cancer screening later in life because the vaccines do not provide protection against all HPV strains that can cause cervical cancer.
- It is advised to get vaccinated before beginning sexual activity because the vaccines do not address pre-existing HPV infection or HPV-associated illness.
- The quadrivalent vaccine, which protects against HPV types 6 and 11, which are responsible for 90% of anogenital warts or condyloma infections, is another HPV vaccine.
- The two high-risk HPV strains that primarily and frequently result in cervical cancer are types 16 and 18, which collectively account for over 70% of cervical cancer incidence in all nations worldwide[45].
- Girls who have received the HPV vaccine will still need to undergo cervical cancer screening later in life because the vaccines do not provide protection against all HPV strains that can cause cervical cancer[45]

2.1.7 Screening and Treatment of Cervical Pre-Cancer

Based on the history of the worldwide eradication of cervical cancer illness, cervical cancer screening is a crucial component of comprehensive prevention and control, second only to the

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Human Papilloma Virus vaccination as the most essential clinically effective preventative measure.

What is Screening?

A population with no symptoms is the objective of the public health initiative. Instead, then being used to make a diagnosis, screening is done to find those who have a higher likelihood of having the disease or a precursor to the disease. We must be aware that not all diseases are suitable for screening programs.

Overview Methods of Cervical Cancer Screening

The following tests are used for cervical cancer screening:

- Pap smear, liquid-based cytology (LBC),
- Visual inspection with acetic acid
- Lugol's iodine (VIA/VILI), and
- HPV testing.

Since 1950, pap smears have greatly reduced the burden of cervical cancer in developed nations, particularly in the United States. The following elements can easily affect how accurate a Pap smear is, specifically:

- The cytological room's condition;
- The technicians' professionalism.
- Sampling technique,
- slide quality,
- dyeing abilities, and cytological personnel's experience.

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Technical level cytology sensitivity in developed nations with suitable experimental settings can range from 80% to 90%, while in areas with adequate resources, it can be as low as 30% to 40%. Liquid Base Cytology was developed and given FDA approval in 1996, primarily for clinical usage, in order to get over this obstacle to the Pap smear in cervical cancer screening. The sensitivity of Liquid Base Cytology for Pap smear was significantly increased. Additionally, developed nations have started a structured and practical LBC screening program to ensure that cervical cancer disease screening is done consistently and effectively [39].

The FDA approved HPV (Human Papilloma Virus) detection for use in cervical cancer disease screening in 2014. All the techniques remained the most reliable way to identify and characterize clinically relevant Human Papilloma Virus (HPV). Identification of the Human Papilloma Virus (HPV) is crucial to the process of cervical cancer screening. At the moment, more than 425 HPV (Human Papillomavirus) tests have been created globally to limit and standardize as necessary.

Cervical cancer can be prevented and controlled by screening and early management, according to studies conducted all around the world. For instance, when resources are scarce for health, it is crucial to compare and analyze the input and output of various programs from the standpoint of health economics, including:

- The best screening programs should be chosen based on the availability of local health resources, and
- They should emphasize cancer intervention strategies to minimize the use of scarce medical resources.

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Additionally, based on the principle of cost-effectiveness, we can choose a screening method that can effectively prevent and control disease [44,46].

Cervical cancer is still a severe issue in less developed nations and regions despite recent declines in incidence rates in wealthier nations and regions. In many areas, there are still significant obstacles to effective preventative interventions. Currently, a variety of very cost-effective, scientifically supported preventative and control techniques are available to meet the needs of locations with different economic statuses. There is still a long way to go until cervical cancer is completely eradicated. Cervical cancer will undoubtedly be the first disease in the history of humans to be completely eradicated by widespread ongoing promotion and global adoption of proven prevention and control strategies [20,21,22].

Any of the following screening techniques can be used on women who are HIV-positive: cytology, HPV testing, and VIA. HIV testing should be done in areas with a high incidence of HIV infection so that people are aware of their status; individuals who receive positive results should be educated and given the proper management and follow-up treatment. Patients in countries with a high incidence of HIV will benefit greatly from the control of cervical cancer services, particularly if there is two-way collaboration with HIV services, which would allow HIV patients who are unaware of their HIV status or who have not recently undergone cervical cancer screening to receive periodic offers of screening for other diseases. When undergoing a cervical cancer disease screening, a woman may discover for the first time that she is HIV-positive [40,41,45].

The following factors should be considered before a screening program is conducted to ensure that an ethical and equitable approach is taken, specifically:

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The management should be accessible to the patients as well.

After the test is performed, the diagnostic or confirmatory results must be available with pertinent follow-up.

- The providers must to have thorough training and fair procedures for handling and monitoring women who have positive screening findings.
- Providers and communities should obtain enough health education to ensure that decisions about screening services and management are made with knowledge.
- The confidentiality of patient records should be guaranteed.
- All women in the target age group, especially the most vulnerable, the poorest, and those who are hardest to reach, should have access to cancer disease screening and management of cervical cancer.
- In order to effectively handle all health issues identified throughout the screening process, a referral system should be in place.

Informed Consent

This is a clearly stated verbal or written authorization for a person/patient to undergo a test, procedure, or participate in research after receiving enough information about the screening to make an educated decision [45].

Patients are provided sufficient information so they can decide for themselves whether to accept or reject the procedure, test, or action suggested by providers. The information is intended to be repeated and verified before any action is performed [46].

Providers should always wear clean gloves on both hands when performing bimanual or speculum examinations, collecting specimens, or carrying out procedures like

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cryotherapy. To stop the spread of infections like HIV, appropriate instrument handling and correct disposal of used objects must be rigorously adhered to. It's critical to follow conventional infection prevention and control (IPC) procedures when in touch with any patients, regardless of whether they are ill or not or whether they have HIV. This ensures that both patients and physicians are protected from infection. Making the lady aware of the need of infection control measures, such as hand washing and using fresh gloves, will help her feel less concerned about safety and cleanliness [44,45].

Screening Methods for Cervical Pre-Cancer

Pap Smear

This method for detecting cervical cancer disease is practical, ideal, and economical. The American Cancer Society advised sexually active women who are 18 years of age or older to undergo a Pap smear and pelvic exam once a year. Numerous infections, cellular anomalies, and reactive alterations can all be found with a Pap smear. Other tests are crucial for diagnosing issues when pap smear results are not favorable [47,48].

Cervical Biopsy

This is done to check for serious diagnoses in a person on abnormal areas discovered during colposcopy.

Colposcopy

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After a negative Pap smear test, this diagnostic procedure is performed to evaluate the cervix. Applying a 3% acetic acid solution to the cervix enables the examiner to see any abnormal or dead tissue.

Intravenous Pyelogram (IVP) or Cystoscopy

This is done to determine whether the person has bladder or renal involvement.

Proctoscopy, Sigmoidoscopy, or Barium Enema

When gastrointestinal involvement in the patient is suspected, this is done.

Supraclavicular Lymph Node Biopsy

This is done once a person's nodes become palpable.

Chest X-Ray

This is done to determine whether the subject has pleural cavity metastasis [49]

Molecular Methods of HPV Testing

This focus is on the identification of DNA from high-risk HPV types in the vaginal or cervical samples. Testing younger females that are less than 30 years of age for the viruses is not advisable because younger women get infected with the viruses. A lot of Human Papilloma Virus infections will spontaneously be eradicated from their bodies before reaching 30 years of age. Thus, HPV testing in younger women will identify a lot of women with transient Human papillomavirus infections and may put them to procedures and treatment that is not necessary that can cause anxiety, discomfort, harm, and expenses[49] as a woman

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increases however in age, if a high-risk HPV is identified, it is more certain that her HPV infection is so regular. Since this regular/persistent HPV infection is the major cause of mostly all cases of cervical cancer disease, therefore a positive result test from a woman above the age of 30 denotes that she might have been keeping an existing lesion or falls at risk of future pre-cancer disease and cancer disease. When this is to be used for a screening program, it is very important to use a human papillomavirus test that has been clinically and standardly validated.

Visual Inspection with Acetic Acid (VIA)

This is a method for identifying early cell changes that are visible to the eyes when using a speculum to examine the cervix with the naked eye after the application of diluted acetic acid of 3–5% to it. VIA is good to be undergone in women whose (SCJ) Squamous Columnar Junction is visible especially in those younger than 50 years of age. It is because Squamous Columnar Junction easily goes back into the endocervical canal when menopause happens, making it certain to miss lesions when depending on visual inspection. Screening for VIA requires the use of a speculum and light source and an experience health provider. The examination is done by the provider with careful inspection of the cervix for visual signs suspected of cancer or pre-cancer disease.

3 to 5% acetic acid solution is applied liberally to the cervix with a cotton swab. The provider waits for at least one minute after removing the cotton swab, during the waiting time any part that became white faintly as a result of physiological cell changes (metaplasia) or inflammation will go or move back [24] the changes to act white on the cervix that does not go back after one minute are certain to be linked with cervical pre-cancer disease or cancer disease. When changes are identified in the transformation zone with a well-defined border, it

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is said to be a positive result but when there are no regular act white changes seen, a negative result is documented[24]

Acetic acid is a component of virtual vinegar all through; 3–5% vinegar acidity must be used to correctly identify positive lesions. Immediate results will make the patient be given immediate treatment. Otherwise, if the patient prefers not the immediate treatment, it can also be done in the next visit as soon as possible. If during the examination, the cervix shows any unusual signs or suspects of cancer, the patient can be referred for further examination[49] This method is quite not expensive and uses locally available resources vinegar and cotton with a non-reliance on laboratory services. It can be done by experienced providers, with good visual acuity at any level of the health care system. Training can be completed in a few days using a reliable-based approach[49]

VIA is a personal test that depends on the skills and experience of health providers carrying out the test. The Skills must be regularly used and there is need for a refresher courses[31]

Cytology-Based Aspect of Screening Method

The screening is based on taking a sample of cells from the whole transformational zone. The cells are arranged either in a transport medium (liquid-based cytology) or attached on a slide at the facility before sending to the lab where experienced cytotechnologists examine the cells under a microscopy[49] When abnormal cells are identified on a microscope, the Bethesda system is used to make a classification of the length of their abnormality. Cytology-based screening services can use more than one available method namely the liquid-based cytology (LBC) or conventional Pap smear.

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Using conventional cytology, a sample of cells is marked or coated on a glass slide, and preserved by a stabilizing or preservative agent (fixative agent). Liquid Base Cytology was used largely in high and mid-resource settings, initiated in the mid-1990s, and purification of conventional cytology. Liquid Base Cytology is placed in a container with an already preservative solution before sending to the laboratory for microscopic examination.

Cytology-based screening can be done on women within the target population. The gathering of a cytology sample involves a speculum and good lighting to see clearly the entire area of the cervix. The examiner takes specimens from the outer surface of the cervix and endocervix using a brush or spatula and moves the specimen to an (LBC) preservative solution or (Pap smear) slide. The sample must be well labeled before moving to the lab, where experienced personnel will work on it and explain it. Good implementation of cytology programs can prevent successfully cervical cancer disease.

Cytology programs always involve various steps and experience significant obstacles, especially in an area of low settings resources. The specimen on collection must be done properly, well placed, preserved, safely transported to the laboratory, perfectly processed, and explained with reliable results delivered to the provider. It is important that patients get the results and are backed with necessary follow-up or management. We have various opportunities for logistical obstacles that might interrupt a successful screening program[32,33]

Individual specimen takes little time to explain, and the material collected can also be examined for Human Papilloma Virus DNA and other categories of STIs. It should be noted that this technique is costly expecting modern technology with a well-equipped lab and trained technicians[49]

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2.1.8 Invasive Cervical Cancer Diagnosis and Treatment

Women detected with early invasive cervical cancer disease can easily be cured with appropriate treatment. Healthcare providers at all levels should identify and quickly handle common symptoms and signs of cervical cancer disease. Women with invasive cervical cancer disease get the chance for referral to tertiary-level facilities management. Management options include radiotherapy, surgery, and chemotherapy though can be combined. Potential side-effects of treatment should be made known to them, such as menopause, infertility, pain during intercourse, or discomfort with likely bladder or bowel changes. Informing patients about the long-term follow-up of care is a very important and regular meeting with the cancer unit where treatment was given.

Providers at the tertiary level should forward complete written records of the management and follow-up of care to providers closer to the home of the patient that will be responsible for the continuation of the patient's follow-up care. Invasive cervical cancer disease is deadly if left untreated[32]

Cervical Cancer Presentation and Diagnosis

From time to time, a patient that attends a pre-cancer disease screening clinic will be seen to have an abnormality that can be seen on her cervix. When the necessary equipment and supplies are available with an experienced provider at the clinic facility, a biopsy can be collected and moved to the laboratory for determination of cancer cells[49] If this is not practicable the patient will be referred to a secondary level of care for the biopsy and its diagnosis.

Invasive Cervical Cancer Symptoms

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- ❖ Vaginal discharge, sometimes with foul-smelling
- ❖ Lower abdominal pain
- ❖ Weight loss
- ❖ Reduction in urine output due to renal failure or obstruction of the ureters
- ❖ Severe back pain
- ❖ Women with irregular bleeding of any reproductive age e.g. postcoital bleeding or spotting as well as young women, postmenopausal bleeding or spotting when we talk of abnormal perimenopausal bleeding, cervical cancer disease should always be looked at, most especially if bleeding fails to react to necessary treatment
- ❖ Swelling of the lower limbs
- ❖ Breathlessness
- ❖ Leakage of faces or urine through the vagina (As a result of fistulae) [47,48]

2.1.9 Summary

Cervical cancer disease is the top cause of death in women.

Women who have been exposed to sexual intercourse are in danger of the disease.

A woman that has been exposed to sexual intercourse is in danger of developing cervical cancer. Infection with a virus called Human Papilloma Virus is the cause of cervical cancer disease.

The virus is transferred during sexual intercourse and is very rampant among men and women.

Virtually there is exposure to the human papillomavirus by men and women in their lifetime. Most Papilloma Virus infections go away in a short time without any management. Human

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Papilloma Virus infection in some women continues and can gradually change the cells in the cervix. The so-called changes are referred to as pre-cancer.

If the precancer is not managed promptly can develop into cancer of the cervix[40]

Cervical cancer disease can be prevented through vaccination, screening, early identification, and treatment. Cervical cancer disease is a thing that can be prevented.

There are various tests to identify early changes in the cervix called pre-cancers which may lead to cancer if not managed promptly.

Every woman within the reproductive age and who has been exposed to sexual intercourse should be screened for cervical cancer at least once in three years.

Girls should be vaccinated with the Human Papilloma Virus vaccine at any time between 9 to 13years of age.

Vaccination helps to fight against the infection with types 16 and 18 of the Human Papilloma Virus that causes most cervical cancers disease.

Human Papilloma Virus vaccines are safe and effective with a minor adverse reaction. The vaccine has no reaction on the fertility of the girls and cannot prevent them from getting pregnant in the future.

For the Human Papillomavirus vaccine to be very effective, it should be given in according to the number and time of doses as stated by the instructions of the manufacturer.

ALL women of reproductive age and who have been exposed to sexual intercourse will need cervical cancer screening even after vaccination [30]

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Any screening method for the detection of cervical cancer is quick, simple, and not hurtful. When the screening result is positive, it denotes that there is a tendency for early change that is pre-cancer changes that can be managed. Positive screening result doesn't say cancer but to prevent cervical cancer, women with positive screening results should receive management.

It is important that women get screened at least once every three years. It is necessary that the recommendation of providers is followed on when to return for screening. Patients especially women living with HIV are in danger of cervical cancer. The screening for pre-cancer and cancer disease should be done in girls and women that have started sexual intercourse as soon as they tested HIV positive irrespective of age and be re-screened one year after management for pre-cancer, or between three years after negative results screening [36]

Women with these symptoms like vaginal discharge, foul-smelling, bleeding after sexual intercourse, vaginal bleeding, and bleeding after menopause should seek medical attention as quickly as possible. Screening is the only avenue to identify pre-cancer in you. Women have a right to their own decisions about their own health. In making an informed decision, there is a need for correct information by the woman who may involve their families or partners in their decision-making as well.

A disease caused by the uncontrolled growth of certain cells in the body causing growths or tumors is what is called cancer. It is not all growths that are referred to cancer. When cancer is left to grow and expand it can affect the normal functioning of the body. Infection with a virus called Human Papilloma Virus (HPV) causes cervical cancer, a virus that is common and transferring sexual intercourse, many people will get it at any time in their lives time.

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HPV will go away on its own for many people, but in a little number of infected women, the virus will prolong. For a little number of people, the virus can cause changes in the cells of the cervix which can lead to cervical cancer disease if they are not identified ring the screening test and taken away.

Human Papilloma Virus causes genital warts in both women and men and is caused by different types of Human Papilloma Virus than that cervical cancer. If genital warts didn't go away on their own may turn to cancer, though they may need to be treated. Quite unusual, the human papillomavirus can cause other types of cancers like cancer of the vulva, vagina, anus, or penis. Virtually all women who have experienced sexual intercourse and none can be infected with it and therefore are at risk of cervical cancer disease.

Those who have never been screened are at greater risk as well as those living with HIV because it will make them more likely to develop cancer when they are still younger. The good news is that screening is the only way to know who may develop the disease[33,34]Cervical cancer disease is not mostly detected in women until in their 40s and 50s so the best time to get a screen for it is between 30 and 49 years of age before it turns cancer. The best ways to fight against cervical cancer disease are the vaccination of girls before they start sexual intercourse and screening of women 30–49 years of age. When a screening test is positive there is a need for quick treatment. All those that are sexually active should engage in behaviors that curb the spread of sexually transmitted infections e.g., using condoms, delaying the beginning of the sexual activity, and having as few sexual partners as possible tobacco smoking can accelerate the risk of cervical cancer in HPV-infected women [45,46,47]

The testing of all women in danger of cervical cancer disease to detect if they have pre-cancer is cervical screening. If it is seen and not treated on time may further lead to cancer from 10 or

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there about. Human Papilloma Virus stayed in women's bodies for several years before it starts causing problems. After several years is the beginning of changes in the cells of the cervix refers to as pre-cancer.

Most women with pre-cancer will not have any symptoms[30,31] You can have pre-cancer for 10–15 years without feeling anything abnormal before it becomes cancer. When symptoms do occur – such as pain in the pelvic region or a foul odor from the vagina – they often are the result of advanced cervical cancer, which is difficult to treat. To avoid advanced cancer, women must be screened for pre-cancer at least once between the ages of 30 and 49 years and must be treated if there are signs of disease. Treatment of pre-cancer is easy and very effective[29]

When you are diagnosed with cancer disease it doesn't mean is the end of your life, if it is detected early, it can be handled with available management. In the case of pre-cancer, it can be treated on the same day of the screening[24]

The very seen treatment for pre-cancer is CRYOTHERAPY through the freezing of the cancer cells. It is not a painful treatment unlike a pelvic examination it can also be uneasy. It is very safe. And effective and in many cases, your cervix will be as healthy and normal as possible after the treatment [22]

Another type is (LEEP) meaning Loop Electrosurgical Excision Procedure though not often reachable on the same day. The test is painless, though you may feel a little uneasy during the pelvic examination. There is no part of the womb or cervix that will be removed at the time of the screening. Getting at least one screening done between the ages of 30 and 49 years is very good. If there is a chance to be screened again, it can be best done in every 5–10 years[20,21]

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Encouragement can come from men for their eligible female ones to be screened. Men need to know that cervical cancer disease is majorly a woman's disease, but they can play a major role in fighting against it. Many cervical cancer diseases are caused by an infection called human papillomavirus and are usually asymptomatic or nonproblematic, but among the few infected women will end up in pre-cancer for many years to come and if it is not managed, some of them will end up in cervical cancer. This Infection is easily transferred during sexual intercourse and so can help to fight against it. Human Papilloma Virus that causes not the disease can cause genital warts in both women and men though warts don't lead to cancer. Very unusual, the HPV type that can cause cervical cancer disease in women can also cause cancers of the anus, penis, or mouth.

Human Papilloma Virus is transmitted via sexual intercourse though the virus can live on the skin around the genital area so penetration is not the only avenue for its transmission[19,18]. Smoking Tobacco smoking can increase the risk of many cancers in women and men as well as women infected with HPV. There is a need for emotional and physical support for the woman when she is diagnosed and managed for pre-cancer or cancer[25] by helping her to access her compulsory treatment and also following her to the clinic on appointment days to as well learn more about the disease.

2.2 Theoretical Review

In the study on attitude and knowledge towards cervical cancer screening in the UK with Sub-Saharan African female University Students, It discovered that one in ten women was seen with cervical cancer and a woman dies of it worldwide every 2 min which makes it the second most usual recognize gynecological cancer[28] It associated death has the largest incidence and happens among middle age women of 30–40 year of age[27] 80% of it are seen

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among the 273,505 mortality recorded among the middle and low-income countries of the world[35]

Also, 61,671 deaths were recorded of the 78,897 women seen with cervical cancer yearly in Sub-Saharan Africa (SSA) making the disease prevalent cancer among others. When talking of Mali, Uganda, Zimbabwe, and Nigeria, cervical cancer happens to be the most prevalent second cancer among women from 15–44 years of age. The poor attitude and knowledge towards the disease have passed various literacy levels in Africa. Some lies have been said in the management of cervical cancer as the cutting and replacement of the womb which has been believed to cause inevitable death Cervical cancer is still recognized as a necessary public health issue[6]

In Nigeria, among 500 attendances at a maternal and child health clinic in Lagos, only 22 (4.3%) were seen to have a good attitude and knowledge towards cervical cancer disease, and 9% of them knew the disease was related to cancer which a case that requires an urgent medical care[28,49] A Poor knowledge and attitude towards the disease and recognizing the symptoms to little health conditions makes up 98% of them Patients with further invasive cervical cancer also makes them accept that their health problem was not able to be cured[28]

Of the one hundred and thirty-nine patients with further cervical cancer disease more than 80% were seen to have poor knowledge and attitude towards the disease but 10%–30% admitted that their symptoms were associated with the menstrual cycle, lower genital infection and irregular menses as documented in Tanzania and Kenya respectively[49]

It has been documented a poor attitude and knowledge of cervical cancer disease screening among students, mainly in developing parts of the world[47] Furthermore, the overall attitude

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and knowledge of cervical cancer disease screening were very poor among female University Students in South Africa[46] Previous history of sexually transmitted diseases (STD), multiple sex partners and Sexual intercourse before 18 years of age were major risk factors of cervical cancer. It is very important, to give room for the promotion of awareness of the disease among younger ones. There is an important reason for public health action to balance preventive services thereby bringing to light more community involvement among the population generally in other to enlighten them [48]

Cervical cancer is one of the cancers suffered globally by young women especially in childbearing age in the developing and underdeveloped countries[48] and the second most commonly found cancer among women in Nigeria[25] The disease incidence in Nigeria among women is 250 /100,000 and women greater than fifteen years of age that falls around 36.59 million are in danger of developing cervical cancer[24]

The health status of female undergraduate students constitutes an important socio-economic aspect and development of any country. Therefore assessing their attitude and knowledge toward cervical cancer will be of immense contribution to the management and prevention of the disease.[26] Researchers have reported that Human Papilloma Virus infection is one of the risk factors responsible for cervical cancer infection which constitutes up to 90% of invasive cervical cancer and is related to 80% of the pre-cancerous changes in the cervix globally[11]and directly due to infection with HPV-16 and 18 strains thus making it the only human cancer with known causative agent[11,26,36]

It was estimated that every year 14,550 women are diagnosed with cervical cancer and 9,659 die from the disease. It is Projected that in 2025, there will be 22,914 new cervical cancer cases and 15,251 cervical cancer deaths in Nigeria[15] The national Age-standardized incidence

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rate for cervical cancer in Nigeria was estimated to be 33.0 cases per 100,000 women per year[2]

In spite of the fact that cervical cancer is preventable and treatable, many women are neither aware nor knowledgeable about the route of contact, the signs and symptoms, and ways of preventing it. A number corresponding three-quarters of cervical cancer patients are diagnosed at advanced stages leading to poor prospects of long-term survival and cure[1] This is a result of the non-existence of a national algorithm for screening cervical cancer, lack of infrastructure, inadequately trained health staff, inability to access health early, poor knowledge about the risk factors, and huge presumed financial cost for screening. There is a significant correlation with age, education, sex, marital status, ethnicity and ever heard sexual intercourse with knowledge, attitude, and utilization of cervical cancer screening.

Consequently, a significant public health burden is ensured as the attendant loss of lives is needless due to its preventable and treatable nature[2] Good Awareness, good Attitude, and good knowledge are currently viewed as the most effective approach for cervical cancer control which will ultimately reduce the incidence and mortality from the disease[41]

A very long-term result of regular infection of the lower genital tract is cervical cancer disease. It is identified as a necessary cause of cervical cancer and has been part of the high-risk 15 Human Papilloma Virus (HPV) kinds. 530,000 out of the roughly calculated incidence of cervical cancer disease cases yearly, Human papillomavirus 16 and Human Papilloma Virus 18 report for 71% of outcomes while Human Papilloma Virus 31,33, 45, 52, and 58 kinds reports for 19% of cervical cancer disease outcomes as well[21] The fourth most persisting cancer in women after colorectal, lung and breast cancer is cervical cancer disease

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with overall outcomes stating 570,000 of incidence and 311,000 mortality value in 2018 denoting 6.6% of overall cancer that is related to women.

The most recorded incidence of cervical cancer disease associated to death happens among women of middle-aged of 30 - 40 years of age[23,] worldwide it is stated that 1:10 women live and die of the disease in two minutes.

It is so usual in middle-income and low and countries where cancer incidence among women is most obvious and mostly third common death[29]

The overall quality age incidence of cervical cancer disease is 13:1 per 100,000 women worldwide and differs largely between countries with ranging rates from lower than 2 to 75 per 100,000 women in all the zones in Africa respectively[49]

Furthermore, worldwide studies conducted in various regions reveal that majority of women accepted self-sampling as a method of sampling for HPV testing. In one of the studies conducted in South Africa, Cape Town comprising of 822 women, many of the respondents gave an attitudinal positive disposition for self-sampling. The majority of the sample population 93.6% represent no embarrassment, while 89.4% represented no discomfort during the self-sampling. Some respondents show total readiness to conduct self-sampling of about 93.9%, but part of them like to have it done in the clinic as a result of the transportation of samples to the clinic after the application

Similarly, the incidence and mortality rates of 85% and 90% respectively occurred in low-resource areas or among the population of poor socio-economic status society. Cervical cancer is predicted to be responsible for the death of about 443,000 women in the year 2030 globally according to World Health Organization[2]. Also, among the predicted mortality 98% will be

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found in the low-income region of the countries and sub-Saharan Africa will be having the highest amount of mortality. In Nigeria, almost 15,000 incidence report of cervical cancer disease are identified yearly and the quality age-incidence rate amount to 27.1 per 100,000[2]

Nigeria has implemented a national cancer control policy that incorporated cervical cancer awareness, implementation of HPV vaccination programs, and implementation of HPV-DNA testing/VIA with the treatment of pre-cervical lesions, but the persistence of the disease in the country is increasing[1] the Level of the utilization of Human Papilloma Virus vaccines in the prevention of the infection is low according to a study conducted[4]

Another study identifies a poor awareness of the disease, and a poor attitude towards screening and utilization as well in Africa goes around the various levels of literacy levels.

In a developing part of the world among female university students, studies have identified students with a poor level of knowledge about cervical cancer screening[5]

It has been observed that previous history of sexually transmitted diseases, multiple sex partners, and sexual intercourse before 18 years of age has the chance of leading to cervical cancer disease. Hence, with the recent population dynamics and global changes, a 4-fold acceleration in cervical cancer disease-associated death is predicated upon and thereby calls for a prompt public health plan to accelerate awareness and balance health preventive services.[5]

. Similarly, some participants showed a 64.7% positive attitude toward involvement which reveals more assurance in the samples carried out in the clinic compare to outside the clinic samples. Expression of fear about the state of samples brought to the clinic, sample

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contamination, and anxiety for the dryness of samples before it gets to the clinic were reported from some[25,26]

Studies conducted on cervical cancer disease screening in Brunei involved one hundred and seventy-four nonregular attendees with ninety-seven involvement rates in self-sampling HPV respectively. People involved in self-sampling had good feedback from the self-sampling kits usage. The majority amounting to 94.8% reveals that guidelines were clear to them, 93.8% says cotton ball was not difficult to do while 91.7% felt it was comfortable compared to the Pap smear test.[19,20]

The largest number amounting to 93% of respondents in a trial study using colposcopy clinics of five done in Belgian on five hundred and fifteen between 25 to 64 years of age women recorded a high rate of involvement among yet-to-be-screened women through self-sampling. About 95% were seen among them that the guidelines of the self-sampling were easy to be followed by them. Carrying it out was not difficult for them, and display boldness in the perfection of the usage.

Here, about 44% of respondents show boldness in the perfection of the sample collected at the clinic to the self-collected one with a percentage of women considering cotton wool swabs or plastic brushes self-sampling not pleasant. On the other hand, the majority of respondents 57% show their readiness for self-sample in the nearest future to come than the people that prefer their samples is taken by the clinic health provider. [34]

In a study taken in Nicaragua, India, and Uganda, a number of 19,340 participants of women were examined, and among them that did self-sampling about 75% saw the procedure was not difficult, 52% reveals quick anxiety from being handled but later see it as not being painful,

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24% have the desire for the effectiveness of collected self-sample. The majority of respondents like clinic self-sampling to home base for the fact that the clinic is so private, and neat and allows for easy collection and quick testing of samples as well as management[35]

Nevertheless, in a study done in Australia about 34% of 3,000 respondents recorded a desire for self-sampling, the majority have not done any testing for a pap smear for more than 3 years and the reason identified based on their choice was that it is easy, so private, convenience, not time-consuming and not embarrassing. 57% and fifty-seven percent declared their acceptance of their own samples to be taken by the clinic provider. About 8% of them were not sure of it due to fear of reliability or accuracy, doubts over self-ability to do it right and lack of trust in the skill of clinic providers[40,41]

Some present obstacles to the taking of Homebase self-samples existed but the majority of facilities of care in developing countries need effective human resources for the collection of the sample in the cervix of the people that are to be examined. From the situation, facility of health care self-sampling can remarkably assist to minimize the reduction of skilled personnel, overcrowding, and longtime staying in health care centers in line with the taking of clinical samples. Fear and misconception of Human Papilloma Virus screening to self-sampling can be adequately solved through proper counseling, good health education, and proper spreading of information. Additionally, it will be an added advantage to investigate a pilot study for the implementation of the self-sampling method before the assumption and combination to screening programs respectively[45,46,47]

Screening barriers mostly known with non-participation and under-served women can be addressed by Self-sampling hence the rise in irregular screening involvement with women that are not participating.[15]. These hindrances include embarrassment, sex of the person taking up

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screening, dislike or pain, and relation to the examination of the pelvic[19] the evaluation of studies that were carried out in major industrialized settings.

The assessment of research done in significant industrialized contexts came to the conclusion that women didn't screen because of their prior experiences with conventional sampling techniques, which they perceived as negative due to their cultural background and beliefs, the pain and discomfort associated with conventional sampling, their personal histories of abuse, their lack of knowledge, their low perceived susceptibility, and the socioeconomic difficulties associated with attending conventional clinical appointments. Self-sampling is suggested as a remedy for these difficulties that prevent cervical screening participation. As a result, it has been noted to enhance the practice of cervical screening[40,41]

In research conducted in India, Nicaragua, and Uganda with 19,340 women, 90% provided samples they had obtained themselves; 78% opted not to have a doctor collect the same samples. Another study from Nicaragua found that self-sampling was far more acceptable for HPV testing than clinical collection. The majority of participants (81.1%) stated that they would be willing to self-sample in the future because they found it to be more convenient, less uncomfortable, less invasive, and less embarrassing[49].

On the other hand, a study conducted in Mexico on women from low socioeconomic backgrounds found that 74.6% of respondents chose to self-sample. Self-sampling was chosen by 64.7% of participants in a rural Mississippi study, and 80.5% of them returned their samples. In contrast, only 35.3% of participants chose Pap smears, and only 40.5% of them showed up for their clinic appointments. Nearly 4 times as many under-screened women chose to self-sample for HPV testing as those who chose a Pap smear (78.4% vs. 21.5%). However, in these trials, nurses visited the participants' homes and helped them with

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paperwork and sample collection. The higher degree of involvement in this research is due to the participants receiving more specialized treatment. However, this is not always possible.[49]

In a Canadian study, 88.8% of the female participants who self-collected their samples said they were extremely satisfied with the procedure; 15.5% of them had never undergone screening or had inconsistent screening procedures observed. When self-collection kits were made available, more people were willing to take part in screening. Furthermore, despite the low response rate, cervical cancer screening increased by 15.2% to 67.4% in areas where self-sampling was available, compared to a 2.9% increase in regions where educational efforts alone were used[48]

Studies on women's awareness, attitudes, and practices on HPV and self-sampling for HPV testing are also lacking, particularly in Africa, where little to no research has been done. In five Zimbabwean provinces, a study examining young people's knowledge, attitudes, and practices regarding cervical cancer was predominantly conducted in sub-Saharan Africa.

HPV knowledge among individuals was extremely low. Less than half (47%) of the participants in the survey, which included 751 males and females from high schools and universities, were informed about HPV transmission and prevention[53,54]

In a Canadian study, 88.8% of the women who self-collected their samples said the process was extremely good; 15.5% of these women had either never been screened before or had irregular screening practices. When self-collection kits were made available, more people were willing to take part in screening. Furthermore, despite the low response rate, cervical cancer screening increased by 15.2% to 67.4% in areas where self-sampling was available, compared to a 2.9% increase in regions where educational efforts alone were used[48]

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Studies on women's awareness, attitude, and practices on HPV and self-sampling for HPV testing are also lacking particularly in Africa where little or no research has been done.

When measuring young people's knowledge, attitudes, and practices around cervical cancer, a study that was predominantly conducted in five Zimbabwean regions found that participants' understanding of HPV was extremely low. Less than half (47%) of the participants in the survey, which included 751 males and females from high schools and universities, were informed about HPV transmission and prevention [53,54]

Therefore, it is crucial to promote self-sampling and spread awareness of its viability, and accuracy utility, particularly in Africa[21,22]

Prior research evaluated the occurrence of HPV, the efficacy of self-sampling, and the accuracy of tests carried out using self-collected samples.

Since there is currently no other study of this kind, it is very crucial that the best of our knowledge, a study that evaluates female university students' knowledge, attitudes, and practices about HPV and self-sampling for HPV testing in KwaZulu-Natal, South Africa, and in Africa as a whole[24]

An important issue for public health is cervical cancer, a preventable noncommunicable illness. There is a high risk of infection for women between the ages of late adolescence and early 30s[2.49]

The second most frequent type of cancer in women worldwide is invasive cervical cancer, however, 80% of cases are found in underdeveloped nations. When women connect with one another, they frequently learn about cervical cancer and screening[26.]

This is consistent with research conducted in Ibadan in Eastern Nigeria. The majority of responders (77.7%) have previously been pregnant. Primiparousness is present in about 8.8%

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of the respondents who reported a history of conception. Multiparity is one of the risk factors for cervical cancer.

Contrary to the bulk of findings from Nigerian communities, which discovered that most participants had never heard of cervical cancer or cervical cancer screening, this is not the case.

Only 19.7% of market women in Ibadan who participated in a study knew about cervical cancer screening. Only 16% of participants in another survey conducted in Aba were aware of screening programs. However, investigations conducted among hospital employees produced findings that were consistent with this study[25].

Women in their series were multiparous or grand multiparous, with the majority of them being in their third or fourth decades. Due to the majority of respondents being from the Hausa ethnic group, where early marriage is very customary and modern contraception is not widely used, parity is noticed in this study.

Of the participants, only 66.9% had ever heard of cervical cancer, and of those, 68.6% had actually heard of cervical cancer screening. [36]

The fact that community health outreach initiatives frequently target market women and that American cancer experts recently paid a visit to the market may account for the high level of a wareness seen in this study. Dissemination of information about a disease will minimize incidence and outbreak[48]

Additionally, cervical cancer screening was offered at the neighboring Sabon Gari Comprehensive Health Center were many respondents believed that improved facilities, more female employees, and more affordable service at the screening centers would increase utilization[25] Another study claimed that the two main causes of underutilization were a lack of

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physician referrals and a lack of knowledge of the locations of service centers. [47] The reasons why women skipped screening, according to a study include an outright denial, fear of cancer discovery, and religious convictions[32] Most respondents to the current survey learned about this via healthcare professionals, whereas only a small number learned about it from friends, family, and the media. Changes in behavior can propel without experiencing the disease46 This differs from earlier studies which discovered that the majority of respondents obtain their information through radio, family, and friends[31]

In a study in Uganda, out of the 35,36, respondents (43.5%) were knowledgeable about cervical cancer screening. Some believe the causes were due to misconceptions and ignorance affecting people's attitude and provision of more female staffs, adequate structure in place, cheaper services in place will enhance participation for the screening,[448]

2.3 Empirical Review

It has been observed that some women are unaware of the purpose of Pap smear tests. Many women mistakenly think that the objective of the Pap smear test is to find cancer becaus e they are unsure of what an abnormal smear or the idea of precancerous alterations signifies. Up to 92% of people dying from this type of cancer have never been screened, hence it was th ought that women's understanding of cervical cancer screening was important[34]

When German women's knowledge of cervical cancer, its risk factors, and preventive services was examined, it was discovered that only 3.2% of them were aware of the Human Papilloma Virus (HPV) as a risk factor and that 69.9% of the women felt that they were not sufficiently knowledgeable on the subject[29].

This was also mentioned in other international surveys that were conducted.

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It was also discovered that the majority of participants in the study they conducted (68%) had no idea what a cervical smear was[31]

Because of several factors,

some people who were aware of it did not know what it was for and were not interested in hav ing a cervical screening done.

In a study carried out among female students in one of the universities in Nigeria,

most of them had never undergone a Pap smear examination. Fear, humiliation, and shyness b rought on by cultural pressures were the reasons why the exam was not taken[36]

In a similar vein, attitudes toward cervical cancer screening among Jordanian women were inv estigated and it was seen that

600 of the participants were female and ranged in age from 20 to 40.

43 percent of those women were college graduates. Despite the fact that most people thought a Pap smear was crucial, researchers discovered that 75% had never had one.

Seventy-seven percent were unaware of the risk factors for cervical cancer.

When asked why they chose not to undergo the test, the women cited anxiety, shame, and a se nse that it wasn't necessary[52.]

It was found that women of low socioeconomic positions had an

inadequate understanding of cervical cancer. They cited cultural norms, secrecy, providers wh o did not inform the public, and policymakers' paucity of interest in the disease as the causes o f this poor knowledge.[33]

Only 15% of women aged 20 to 65 who attended outpatient clinics in a study done

at UCTH, Ibadan in 2003 heard of cervical screening, while 85% had never heard of it[12]

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It was also found

at Regina Mundy Health Centre in Lagos, data showed that 15.82% of the 196 respondents kn ew about cervical screening, 26.02% did not, and 6.63% had never heard of cervical cancer screening[19]

It was found that 83.0% of participants in their study from Ghana had a

high understanding of cervical cancer.

Despite the fact that 89% of respondents correctly identified the human papillomavirus as bein g connected with cervical cancer, only 77% of respondents had a

limited understanding of services for cervical cancer screening [22]

A study conducted among

focus groups was used to examine attitudes regarding cervical cancer screening among Musli m immigrant women in the San Francisco Bay region.

Middle Easterners made up the majority of the respondents.

Women stated that they were concerned about how the Pap smear would alter this because of t heir religion and culture, which places a high emphasis on virginity for single women.

The responders emphasized that, in this case, doctors were not culturally aware.

Despite the fact that respondents had adequate knowledge, only 35.5% of respondents had a p ositive attitude toward cervical cancer screening,

Using a thorough questionnaire to

investigate the knowledge, attitudes, and use of Pap smears among local school teachers in the United Arab Emirates.

350 married female teachers from 18 schools in Sharjah, United Arab Emirates, with ages ran ging from 20 to 59, participated.

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Making sure as many women as possible were examined was the main concern for several spe cialists in this study.

To this end, they believed that the ability to maximize the uptake of cervical screening in the p opulation through the wide distribution of the initial screening encounter was a major benefit of organized screening.

Disparities in cancer incidence and the

availability of cervical screening are also taken into consideration by experts.

Some professionals held this belief more firmly than others, but many experts had an intuitive but vague sense that it was crucial to reduce sociodemographic gaps in cervical screening and cancer.

When experts discussed screening distribution, they did so with two presumptions in mind: if there was a good opportunity to be screened, women would seize it as soon as possible; and se cond, if traditionally under-

screened groups participated in more initial screening encounters, there would be less of an S ES-based difference in screening rates, which would be advantageous.

To put it another way, experts seemed to assume that women would screen if they could and t hat greater uptake by under-

screened groups would subsequently result in less cervical cancer in those groups, reducing or eliminating cervical cancer inequalities [50,52,56]

The three widely accepted perspectives on what constitutes a justified coordinated cervical ca ncer screening program were studied by experts.

In order to increase participation in screening programs, professionals discussed under-screened populations.

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Increase overall benefits by providing the same services across all regions.

Some experts adopted a loosely utilitarian perspective on the screening program's objectives, a dvocating the idea that utility might be maximized by making sure all women could easily obt ain screening services.

According to these experts, the goal of screening was to increase the population's level of scre ening while staying within the constraints that were already in place.

This method did not presuppose that every single woman would or ought to be screened.

Simple utilitarian reasoning typically accepts that injuring a minority or failing to offer them a n advantage is acceptable as long as overall collective utility is maximized.

In this instance, it was assumed that a minority of women would never get screened, and as a r esult, would not benefit in any way from screening.

This was supposed to be (tacitly) ethically acceptable because it was both perceived as unavoi dable and believed not to reduce total utility.

There were two groups of women who were thought to invariably opt out of the

cervical screening.

According to some the experts

Women who were less involved due to cultural norms made up the second group. According t o this group, "If women are not well-

informed or services are not properly available to them, these are things that can and should b e remedied.

But eventually, we will reach a number of people.

We aren't going to change new immigrants from Pakistan, where it's considered taboo to revea l your private parts to anyone, so I mean, it's totally understandable.

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Ah, it's reasonable and proper that they are let to maintain their cultural values[15]

It was thought that these reasons for not participating would be difficult to overcome.

That is to say, overcoming these obstacles would be very costly (carrying a large opportunity cost and hence reducing overall utility), and it would even need violating other implicit moral commitments, such, for instance, respect for cultural differences.

Consequently, a program was justified if it: guaranteed that services were available in all geog raphic locations; and consistently delivered effective information without making additional at tempts to reach women who were highly unlikely to participate[49]

The majority of experts said that providing the same service across all geographies was insuffi cient to engage the under-

screened population and that screening programs had a duty to offer all women around the wo rld efficient options for participation.

Of this majority, the majority of experts favored identifying and eliminating obstacles to com monplace services.

The fundamental justification for this viewpoint was that not all women had the same ability t o access mainstream services, and as a result, not all women had the same opportunities to par ticipate.

In order to effectively provide women with the opportunity to engage in screening, it was nece ssary to identify a variety of access barriers that they might encounter, including things like co st, fear, and the lack of female screeners.

The reduction of costs or informational and educational initiatives, such as the translation of st andardized materials into multiple languages or information sessions for community groups, c ould be used as practical solutions to these obstacles[40,41]

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An expert provided instances of how some health system configurations may make screening more challenging for some women than others:

"I think, you know, we need to address those accessibility difficulties that people experience... you know, make sure it's free for everyone and that it can be offered by women,"

By removing obstacles, the program would become more "equitable" for everyone by ensurin g that services were not only available in all locations but also that optimal women had a mea ningful opportunity to access them[48]

According to a minority opinion, the program or screening service itself should be personalize d by providing distinct, separate screening programs for specific groups of women in a geogra phic area with general population services available.

The viewpoint was founded on the same rationale as that advanced by experts who supported t he elimination of the obstacle: all women should have access to competent cervical screening services in addition to having those services geographically available to them.

They acknowledged that removing barriers is essential to promoting access to mainstream ser vices, but believed that this strategy was insufficient to guarantee that all women could adequa tely get screening[47]

It was also

believed that certain groups of women had unique needs that could only be met by the deliver y of specialized services that went outside the norm. A

provided several illustrations of how providing services could significantly address the needs of underrepresented groups were addressed.

Therefore, it was set up so that their data was approached in a different way.

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Other experts discussed the risk that underscreened women would choose to acquire self-administered HPV testing instead of using standard services.

When experts advocated for this method, they meant what they meant when they said "equitab le": a program in which every woman, regardless of her circumstances, has the same effective access to screening as every other woman because different services are provided in parallel to address the different needs of different groups of women[46,47]

Despite sharing the opinion that cervical screening was not a service that could necessarily be relevant to the entire community as agreed by some experts

that it was necessary to make screening culturally relevant before expecting women to particip ate:

This expert promoted viewing cervical screening as a relatively insignificant component of a l arger public health picture; screening was merely a "nice to have," but the primary responsibil ity of public health was to address the pressing health needs that women in vulnerable commu nities would identify as being experienced at the time.

According to this outlier perspective, a program was justified if other health requirements wer e reliably and regularly provided, making preventative care like cervical screening relevant to women's lives[49]

2.3.1 OTHER VIEWS

We identified a pattern in expert language about responses to social disparities in cervical can cer and proposed that, at the very least in part, socio-

political discourses that influence public health norms and priorities influence experts' conside rations of equity.

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The Australian experts we spoke with tended to focus on the challenges of providing services in remote locations; in other words, they were generally more concerned with the logistical ch allenges of screening access was the most prevalent and had a wide geographic representation. The cervical screening policy in New Zealand reflects this position, which New Zealand exper ts tended to hold. "In practice, a service can be judged to be equitable 'when people are treated in as fair a manner as possible by ignoring irrelevant differences between them, but taking int o account relevant differences,'" the policy reads.

There are many different cultural groups in New Zealand, and these distinctions may be releva nt due to cultural issues[49]

As a result, a screening program must work within a context that participants can understand. particularly when it came to native women[44]

The option to participate in initial screening was specifically emphasized when experts discus sed under-screened communities and "equity" in the context of cervical screening.

This is hardly surprising considering that the interviewees were authorities in organized cervic al screening.

Their work was supported by a conviction in the worth and value of screening as a process, w hich was reflected in their opinions on the significance of increasing screening rates for traditi onally underscreened or hard-to-reach groups.

In this conversation, we contextualize experts' claims about reaching unscreened women in th e larger context of public health.

This essay is a good illustration of empirical bioethics.

We analyze expert opinions using the normative literature and also use expert accounts to find gaps in the normative literature.

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We derive inferences from this regarding how thinking about 'hard to reach groups in cervical screening can be informed by the opinions and silences of specialists.[42,43]

Smith urges empirical research that examines the normative presumptions held by public healt h professionals regarding what might be considered health equity[30]

According to the data, there are three different views among cervical screening specialists abo ut the characteristics of a fair cervical screening program.

Two of these perspectives placed an emphasis on giving special consideration to certain popul ation groups in order to reduce disparities in participation rates.

The goal of the special treatment was to elevate,

to bring screening rates in under-screened groups closer to those of the general population.

A screening program had an obligation to meet specific requirements universally, especially a standardized geographically accessible service and the provision of adequate information, but was not required to screen all women, in a "maximize the

aggregated benefit by making standardized services available in all geographic areas" scenario.

These professionals defended their opinions using arguments.

First, some women may logically view cervical screening as inconsequential because they hav e more pressing medical issues, cultural norms, or morals that forbid vaginal checks.

The use of substantial resources would be required to take action to urge these women to be sc reened; It costs money to convince truly resistant non-

screeners to participate in screening, which has an impact on opportunity costs.

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Second, it wasn't just a matter of excessive expense; it was also a matter of cultural appropriat eness; if a woman had a strongly held objection to participating because of a cultural or religio us belief, the program shouldn't have interfered with her convictions.[47]

The experts who held "maximize utility" viewpoints believed that under-

screening of people was mainly inevitable and that special efforts to reach them were usually i neffective.

This viewpoint lends some credence to arguments against special treatment based on financial and cultural propriety considerations.

High-quality cytology-

based cervical screening is costly, especially in planned programs like Australia's that promote screening earlier than every three years or at a young age46.

The program might not be cost-effective if it incurs additional expenses.

Many liberal traditions, including some linked to utilitarian reasoning, would acknowledge the moral necessity of not pressuring people to act against their own principles, even if doing so diminished the utility provided by a public program like cancer screening[47]

It would typically be claimed that the freedom of individual citizens is valuable and/or morall y significant in some way.

Having said that, the following issues are not properly addressed by reasons for offering infor mation and services that are known to appeal to a majority but not a discernible minority[48]

Women who are already struggling are disproportionately affected by cervical cancer.

This indicates that some members of society are less able to lower their risk of developing cer vical cancer as a result of their cultural background or social standing.

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It seems challenging to argue for the morality of a screening program from a moral standpoint that is mostly unconcerned with distribution because it does not sufficiently address the natur e of cervical cancer.

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A justifiable cervical screening program is likely to pay particular attention to the needs of the populations that are most likely to benefit if we accept that cervical cancer is a burdensome a nd frequently preventable disease that disproportionately affects the least well-off. Furthermore, we have good reasons to prefer interventions that are likely to benefit the lea st well-off more than the most well-off.

The potential design of the eventual program is unclear.

The second strategy aims to address the systemic nature of the discrepancies in screening upta ke by identifying and eliminating obstacles that are known to obstruct access to screening[48]Th ere is a conflict between opportunity and outcome in this situation, thus alternative goals woul d be

- Togive everyone a meaningful opportunity to participate in screening regardless of ba ckground
- Reduce SES-based disparities in screening participation or cancer outcomes.

Experts stressed the significance of

indicating an opportunity to

focus, on women being able to access screening regardless of their circumstances.

It

assumes that it is appropriate to deny some women the chance to take part in a program that is apparently intended to help the population of women, as was previously demonstrated.

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This viewpoint is tacitly rejected by the method of reducing barriers, which aims to do so by g etting rid of things that limit opportunity (such as payment, being examined by a man, or not s peaking English).

It should be able to show a decrease in cervical cancer incidence and mortality in the targeted populations over the long term when barriers are removed if they are successful in improving i nvolvement and if this participation has an impact on cancer incidence.

The literature on barrier elimination, however, focuses on whether reducing obstacles boosts s creening uptake in specific populations rather than whether that evidence is present.

Sadly, the majority of research fails to demonstrate benefits through a higher uptake measure. There is a need for studies that examine the screening process.

It is yet unclear if greater availability will result in greater uptake, whether that uptake will cor respond with follow-up, or whether diagnoses resulting from follow-

up will be appropriately treated [49]If this interpretation of the evidence is adopted, it challenges the idea that the ability to screen should be the primary criterion for determining a just progra m.

One of two things would be required if an equitable opportunity to screen is to be considered a sign of the justice of a program.

First, there may be proof that the opportunity position is in fact giving women a genuine chan ce to decide whether screening is appropriate for them as a result of the elimination of barriers.

It is conceivable that women might be offered a worthwhile opportunity, decide that screening is not for them, and turn it down.

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It is conceivable that this explains why uptake remained unchanged after barrier removal meas ures.

However, there isn't yet any proof of this.

Second, since the program's main objective is uptake, the opportunity argument would need to be better reinforced in the absence of such data by greater justification for why opportunity sh ould matter.[49]

This leads us to the third strategy, which involves modifying screening programs to better app eal to particular underscreened groups.

This method acknowledged that despite efforts to make the service easy to use, some groups o f women might not use the service provided to the population for cultural reasons.

It should be highlighted that the majority of experts who shared this opinion focused on the un ique cultural requirements of indigenous women.

Cultural customization was not merely an instrumental good in this strategy for increasing ado ption or closing the screening rate gap.

It also contributed to self-determination and had intrinsic value.

2.3.3 SELF-DETERMINATION

Self-determination is intrinsic to conceptions of health and well-being in indigenous populations as well as being an identified component of autonomy more generally. It is not clear whether or how well cultural tailoring increases uptake of screening services, because of the way data are recorded or made available for analysis[49] as such, the same arguments made around tensions between assessing opportunity, outcome, and uptake for Position Two, above, hold here too. Where an analysis of the justifiability of Position Three could differ in considering the contribution its methods or basis in cultural respect might make. Arguably,

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consultation with marginalized minorities and any subsequent addition of (non-mainstream) culturally specific practices to a population service seems likely to produce goods other than increases in opportunity, screening uptake, or, disease prevention. It was based on at least some degree of appreciation for cultural variation and political will to value that variation. An additional, difficult-to-measure outcome may be that it accrues to a marginalized population as a result of this recognition[48,49]

It is not only indigenous peoples who experience cultural barriers to screening. Others, particularly immigrant groups, are also systematically disadvantaged. Tailoring screening for these groups, however, was not discussed in any depth in our interviews. In the literature, HPV self-testing is often suggested as a method of overcoming cultural barriers that are connected to modesty or discomfort more generally with vaginal examinations. This approach, prima facie, should have the potential in providing a culturally acceptable alternative. However, if it is introduced without consultation with traditionally under-screened groups, as sometimes appears to be the case, self-determination benefits seem likely to be less[40,41]

2.3.2 SITUATING CERVICAL SCREENING IN PUBLIC HEALTH

Experts' talk about reaching the under screened focused on the provision of effective opportunities to participate in screening programs for all women. There are a number of assumptions that underpinned their positions: 1. that preventive health measures could be made relevant and appealing to all women; 2. that effective opportunity to be screened would convert to uptake, and 3. that increase in the uptake of an initial test would convert to less disparity in cervical cancer incidence and mortality[41]

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CAN CERVICAL SCREENING BE MADE RELEVANT TO EVERYONE?

There was a broad inclination, as Positions Two and Three describe, towards attempts to make cervical screening effectively accessible or relevant by removing barriers to participation or providing alternative screening services. It is likely, however, that for some women it might not be identifiable practical or cultural misalignment that prevents them from being screened but chaotic lives or immediate health needs that make preventive care seem immaterial, irrespective of attempts to make it so[20] Sufficient Arian models of justice suggest that we should ensure that all members of a society meet a threshold level of wellbeing, justified largely by the idea that it is not the gap between poverty and affluence that is troubling, but the conditions of poverty themselves. Such arguments suggest that a baseline level of wellbeing may be necessary before it is possible for cervical screening, or health screening generally, to make sense as an offering. This approach reflects the position taken by the outlier expert; the fourth view is described in the results section. Arguably, a public health service, broadly conceived, might have some obligation to support women to reach that threshold level of well-being before it tries to offer them screening[25,26,27] If this is accepted, it may not be screening uptake or less screening disparity per se that should be measures of health equity. Rather, the achievement of a general level of well-being in the lives of all women, such that the opportunity to participate in screening seems relevant to them which may be a better indicator of health equity.

OPPORTUNITY AND UPTAKE: THE OBLIGATION TO SCREEN

The literature reports that members of the public may believe there is an obligation to access available cancer screening services. Because the success of screening programs is measured in part by uptake, such that financial incentives are offered to screeners to reach particular

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screening targets, screening is likely to be communicated to the public in a persuasive manner. When programs have an implicit goal of maximizing utility, all participants are imagined to be roughly identical, and offering standardized services is seen to be the most efficient and so the most utility maximizing. Women in traditionally under-screened groups seem more likely to perceive that service as irrelevant to them, perhaps because they are the most likely to be different than the imagined "standard" woman that these programs are targeting.[27] We can speculate that as particular groups of women are targeted via practical or cultural avenues, a shared perception of obligation to screen may increase. This could be for a number of reasons. 1) Screening programmers could have a stronger desire to make sure that money spent on tailored screening is not 'wasted' and might promote services accordingly in the belief that participation is important for both women and the public purse. 2) Services may seem more relevant and more appealing to the groups they target, creating a new shared perception of screening as a social norm. 3) Targeting may also stimulate a sense of reciprocity – if usually disenfranchised groups are offered a special service, they may feel a sense of owing something in exchange for the efforts made to include them, or in the hope, other types of offers might be made[30,31,32]

There are two conflicting ethical imperatives at play with expending special efforts to particular populations to provide meaningful opportunities to participate in screening. A heightened sense of obligation to undergo screening may be problematic when it comes to meeting conditions for consent because it may undermine the ideal of voluntary choice on the part of consumers that is intended to underpin informed consent. However, as we have discussed, a program that is not perceived as accessible or relevant to certain sections of the population is also morally difficult to justify, particularly when it is least relevant to the very

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people it is most likely to benefit. This tension is unlikely to be resolvable but it might be mitigated by closely attending to how opportunities are communicated. One way of supporting valid consent for screening is known as the 'consider an offer' approach[33] It suggests being explicit about the benefits and harms of a test and the appropriateness of that test for the individual in question. It also recommends being explicit about the organization behind the testing – who is making the offer? Do they have anything to gain from people's participation? – And communicating non-compulsion and the availability of further information if it is desired. While the 'consider an offer' approach seems likely to support consent for screening there is also the chance that, given the explicit option, women will decide not to participate, which remains a difficult tension for screening programs[34]

UPTAKE AND CANCER: THE PAP TEST IN THE SCREENING PATHWAY

As cervical screening needs contextualizing in public health, so does the Pap test (or HPV DNA test, or another initial screening test) need to be seen in the context of the wider screening pathway. While special attention to traditional under-screened groups might increase uptake of an initial screening encounter, that test can only indicate normal or heightened risk. For that risk to be reduced there must be an investigation and, where indicated, treatment. Women who are unlikely to participate in mainstream screening are also less likely to take up recommended diagnostic services and treatment, indicating perceived or actual barriers to participation in some screening programs that go beyond the initial test[34] Therefore, increasing screening uptake and the identification of increased risk do not necessarily mean removal of that risk, or improved cervical cancer outcomes. Yet the focus of many organized screening programs, and all of the experts we interviewed, was participation in the initial screening encounter only, which means significant effort and resources put into a

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test that may produce distress rather than health[35] It is not clear why experts did not talk about the full screening pathway in interviews, but the same tendency is true of this literature. Barriers to initial screening tests receive full and frequent attention; socially-based discrepancies in the follow-up of women with abnormal result is much less so. Neglecting to talk about the full screening pathway may be just as responsible for the ongoing SES-based disparities in the distribution of cervical cancer as discrepancies in screening uptake[36]

WHAT THIS PAPER ADDS TO THE JUSTICE LITERATURE?

Our analysis shows that experts working on developing and implementing cervical screening programs tend to agree, prima facie, that there is an 'equity problem' with cervical screening and cervical cancer, but also tend to disagree on whether or how to address it[38] We began this paper with the claim that much of the public health literature regarding equity and justice is somewhat circular, and may be unhelpful for people involved in thinking practically about situations involving 'social' health differences. Cervical screening is a clear example of 'social' health difference: the same patterns of disadvantage in cervical cancer incidence appear to be replicated to a greater or lesser extent across many populations. We have shown that conceptions of what made a program justifiable varied across experts, with quite different consequences for the practical shape of the resulting program[39] this variation suggests a lack of connection between the literature on equity and justice and the everyday work of screening experts. We would speculate that this may be because the literature does not currently offer easily understood or applicable definitions of these concepts. It is also possible that other, perhaps less conceptually robust, resources offer a quicker and easier apparent solution to the 'equity problem'. In either of these cases, it is not clear that fine-tuning an ideal theory of justice would assist experts involved in program development. Their approaches to what made

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a justifiable program were deeply contextualized in the programs they had worked on and the patterns they had seen or deduced. It might be that, for the purposes of both public health ethics and public health practice, working out how notions of equity and justice work in a practical sense for a particular case is a more important task than ideal theorizing[40,41]

2.3.4 ENSEMBLE METHODS

Ensemble Methods - Ensemble methods are hybrid algorithms that combine different machine learning algorithms into one predictive model and decrease bias (boosting), and variance (bagging) or improve predictions (stacking). Most ensemble methods use a single base learning algorithm to produce homogeneous base learners.1) Boosting: Boosting is one of the ensemble methods which is used for improving the performances of a weak classifier Sequential learning of the predictors is used here. Initially, the whole data set is used for learning. Subsequently, learning occurs through the training sets based on previous performances. The weights of the misclassified instances are increased so that the possibility of appearing in the training set of the following predictor gets higher Bagging: Bagging is an ensemble method which used to improve unstable classification problems. If the position of a training point changes marginally, weak classifiers can become unstable. Bagging can be applied to different classification algorithms. It is a very useful technique for large data sets in which detecting a good model is difficult due to the complexity and scale of the problem[34]

2.3.5 CONCLUSIONS

There was strong support among the experts interviewed for targeting under-screened groups in order to provide better opportunities for screening; the same cooperation is found in the cervical screening literature. Broadly, it is assumed that providing a meaningful opportunity to

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participate in screening will translate to actual participation in screening and, presumably, improved outcomes in cervical screening incidence and mortality for traditionally under-screened groups. There is, however, no clear evidence of such outcomes[30] as a result, we are left with an intuitive sense that increased opportunity is good but no clarity about whether that alleged good makes any difference to women's lives. Different approaches to 'improving equity', as it was described by participating experts, are differently justified, and differently justifiable, but none focus adequately on the big picture. If cervical cancer is strongly associated with disadvantage, but screening is inevitably irrelevant to the most disadvantaged, then the public health program of which screening is part should arguably work to eliminate those conditions that mean screening cannot even be considered. Programs might also attend to the way screening is communicated to make sure that increased attention to some groups does not translate into an increased sense of obligation to be screened. Finally, unless there is attention to the full screening pathway it is difficult to see how providing even a genuine opportunity to take up an offer of an initial screening encounter will lead to improved cervical cancer outcomes [32,33,34]

Machine learning classification has received great attention in the past few days. Some of the popular classification algorithms were used in the study. The study was conducted among 858 patients having 36 different attributes. The algorithm with the best performance was selected and the ensemble methods were carried out on them to improve the overall accuracy. This accuracy can further be improved with nature-inspired optimization algorithms and therefore will remain as a possible future extension for our work. Also, we could try out other non-ensemble-based classification models to reach higher accuracy. Finally, this study turns out to

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be a very crucial one considering its health and social impact and research on this area should be kept going on in a continued way[37]

2.4 CONCEPTUAL FRAMEWORK (MODEL)

Health belief model as a framework for predicting behaviors. The health belief model was originally developed in the 1950s by a social psychologist in the U.S Public Health Service to explain the widespread failure of people to participate in programs to prevent and detect disease. Later, the model was extended to study peoples' responses to symptoms and their behaviors in response to diagnosed illness, especially adherence to medical regimens[33] This model aims to explain preventive health behaviors rather than behaviors in time of illness[4] Major health behaviors emphasized by the Health Belief Model focus on preventing exposure of diseases at their asymptomatic stage[38] The Health Belief Model contains several primary concepts that predict why people will take action to prevent, to screen for, or to control disease conditions. Thus, this model assumes that health behaviors are motivated by five elements of[51] perceived susceptibility, perceived seriousness, perceived benefits and perceived barriers to behavior, cues to action, and most recently factor of perceived self-efficacy[6]

2.4.1 APPLICATION OF THE HEALTH BELIEF MODEL TO CERVICAL CANCER SCREENING BEHAVIOR

The health belief model (HBM) is an influential and widely used psychosocial approach explaining health-related behaviors. It has a theoretical structure and was developed to explain why and under what conditions people take preventive health measures. The model has been

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used as a conceptual framework in a variety of health behavior studies including disease detection and prevention.[26]

The HBM consists of individual perception variables, modifying factors, and variables likely to affect initiating actions. Individual perception variables directly influence the tendency to act, while modifying variables affect behavior undertaking indirectly. The individual perception variables are beliefs about personal susceptibility to a certain disease and perceptions of the seriousness of that disease. The two variables together indicate the implied perceived threat of the illness for an individual. Modifying factors are those forces that affect an individual's perception and include a variety of demographics, socio-psychological factors such as personal and social class, and structural varieties such as knowledge about the disease and prior contact with it. Cues to action or stimulus to act might include mass media campaigns, advice from others, or a reminder postcard from a physician[41] In addition, variables likely to affect initiating actions include perceived benefit and perceived barriers to preventive behavior[46]

In the end, the study highlighted the concepts of the Health Belief Model that could be applied to cervical cancer screening tests. In summary, Health Belief Model constructs generally have been found to predict participation in cervical cancer screening. In addition, a large number of interventions studied addressing Health Belief Model constructs have resulted in increased cervical cancer screening behavior. The interventions tailored to address the recipient's specific Health Belief Model beliefs have been found to be particularly effective. It is entirely consistent with the Health Belief Model that intervention will be more effective if it addresses the person's specific perception of susceptibility, barrier, and self-efficacy. Women who already believe they are at risk for developing cervical cancer screening behavior do not need

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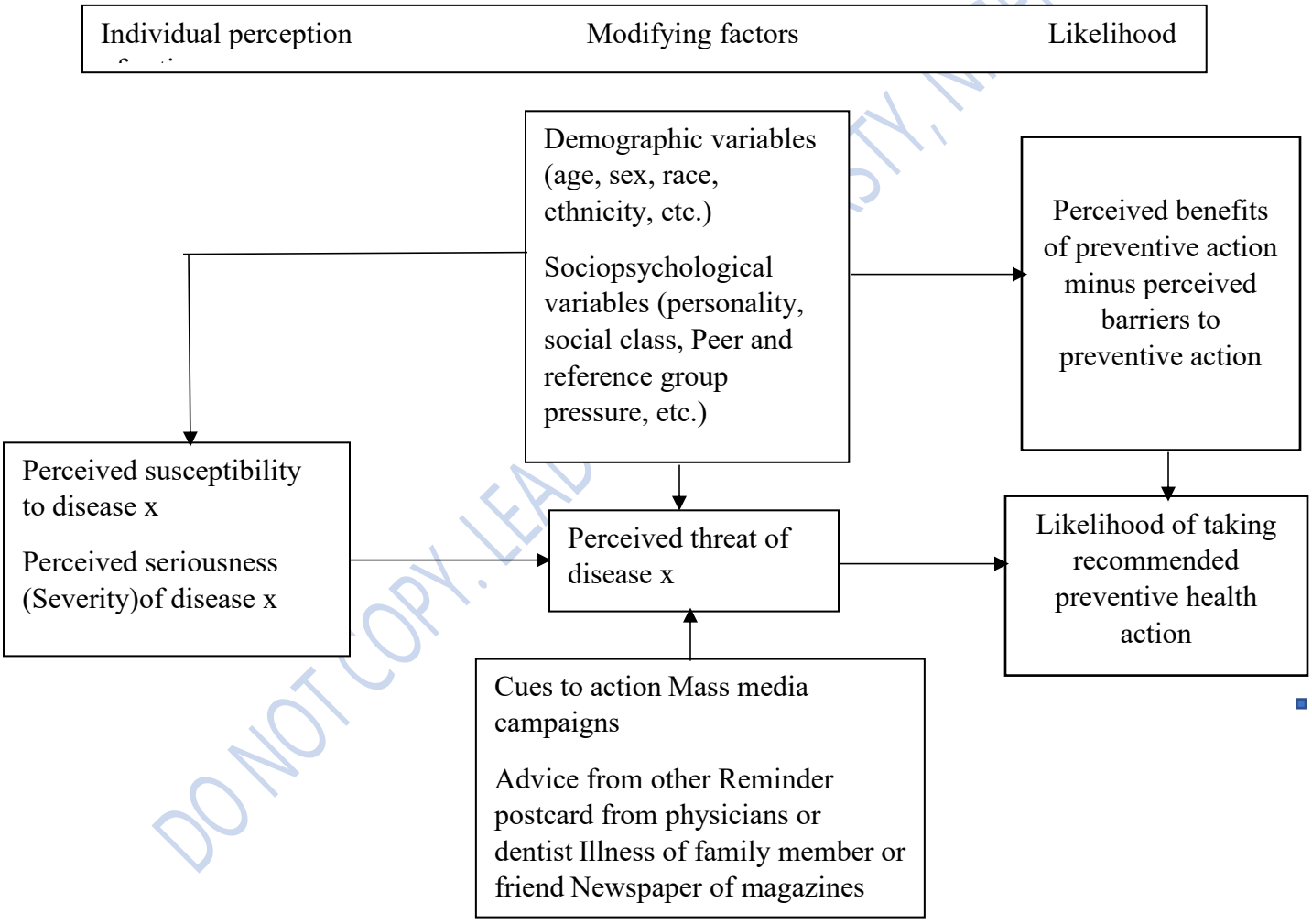
messages trying to conceive them to their susceptibility, those who know where to get screened but cannot find a way to get there need intervention addressing transportation not cost Just as it is important to be able to measure the Validity of Health Belief Model construct, tailoring technology has allowed interventions to address Health Belief Model constructs most relevant for a particular intervention

2.4.2 HEALTH BELIEF MODEL (Holland et al.,2020)



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2.5 SUMMARY OF GAPS IN LITERATURE

Knowledge, attitude, and experience of cervical cancer and screening. It has been observed that the high rate of cervical cancer and screening awareness in the United Kingdom cannot be compared to countries in the Sub-Saharan African region therefore, it is expected that the level of information available will influence students originating from these African countries. It has been noted from this study that students have poor knowledge of the disease because they are yet to understand how vulnerable they are which explains the urgent need to enlighten students on the severity of the disease and encourage them to take up screening programs irrespective of their experience and perception[29] This will help decrease the trend of the disease both at the national and global level. The use of health education programs and lectures that incorporate cervical cancer and screening messages could be inculcated as part of the school curriculum and offered to all students regardless of their health status or denomination. The use of mini-surveys to understand students' knowledge of the disease and screening services will help improve the school GP's screening services. Large-scale studies' exploring the uptake of screening services among all female students irrespective of their race or nationality are highly recommended[30]

Knowledge, attitude and practice of cervical cancer screening among women infected with HIV in Africa. The pooled estimates of knowledge, attitude, and practice of its finding were below half in different African countries. The enhancement of knowledge, attitude, and

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practice of women will augment the comprehensive approach to cervical cancer prevention and control strategy[29] the current work has shed light on how much the findings of the studies conducted in different countries on cervical cancer and its screening were very diverse and difficult for decision making. Thus, it is essential to have the pooled estimates of different findings for decision making. Other than this, the pooled estimates are very crucial for further strengthening the strategies for prevention measure and control of cervical cancer mainly on vulnerable population like women infected by HIV[31,32]

Knowledge, attitude, and practices on cervical cancer screening among undergraduate female students at the University of Gondar, Northwest Ethiopia. Despite the University female students apparently having good knowledge and a favorable attitude, their screening practice for cervical cancer was very low. Thus, the health sectors and the gender streaming office of the university need to mobilize students to strengthen the uptake of cervical cancer screening practice[23]

Knowledge and Attitude towards Cervical Cancer: A Case Study of Undergraduate Students in Imo State, Nigeria. The knowledge of cervical cancer among undergraduates in the study area was generally very low in spite of their high educational attainment. Also, they lacked knowledge of the causes of the infection. The attitude towards cervical cancer screening was also negative. This suggests that the students are yet to acquire sound knowledge about the disease which will encourage actions against its prevention and treatment. However, a significant relationship was found to exist between knowledge and attitude toward cervical cancer among the students. Increasing the knowledge of the students on the disease is expected to improve their attitude toward screening. Based on the findings of the study, radical sensitization campaigns should be mounted targeting mainly women in vulnerable age

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ranges. Also, awareness programs can be organized in universities to help raise the knowledge of the disease among students[29,30,31]

Knowledge, Attitudes, and Practices towards Cervical Cancer and Screening amongst Female Healthcare Professionals: A Cross-Sectional Study. The study results imply that if women, irrespective of their profession, do not receive education to increase their functional knowledge, understanding, and acceptance of routine cervical cancer screening, then they may not be able to promote behavior change in themselves, in their patients, or in the general population. First and foremost, the institution needs to develop a plan to intervene through education for self-care and also encourage them to educate other women they may encounter in their professional roles or in their personal life. Also, a follow-up study can be considered to evaluate the usefulness of the educational program after it is in place at the hospital level. Further studies should be carried out in other hospitals in Saudi Arabia to understand the gaps in the knowledge and practice of cervical cancer screening[2,3,4]

Cervical Cancer Screening: Assessment of Perception and Utilization of Services among Health Workers in Low Resource Setting. It was observed that despite the high level of awareness of cervical cancer screening, utilization remains low. There is, therefore, the need for cervical cancer education for the nurses to help improve utilization[33]

Knowledge, perceptions and practice of cervical cancer prevention among female public secondary school teachers in Mushin local government area of Lagos State, Nigeria. In the

study, unlike most previous studies in other regions of Nigeria and most part of sub-Saharan Africa, has demonstrated a relatively high level of awareness about cervical cancer, its cause,

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risk factors and prevention[22,23] However, conversely, the absence of a national health program me means that screening and vaccination centers are not available, accessible or affordable.

Knowledge, attitude, and practice of cervical cancer screening among female students in tertiary institutions in Calabar, Nigeria. It was recommended that female students should be encouraged on the need to practice cervical cancer screening and also that government and non-governmental organizations, and private investors should invest more into the health sectors by providing equipment and materials necessary for the provision of these services in all health facilities and at an affordable price[34].

Knowledge, Attitude, and Practice Toward Cervical Cancer Screening and Associated Factors among College and University Female Students in Dire Dawa City, Eastern Ethiopia. This study showed that students' knowledge of cervical cancer screening is low. Overall attitudes toward cervical cancer screening among female students were good, but only a small proportion of students had undergone cervical cancer screening. The most common reasons for the low screening practice were lack of information and undecided. There is a need to promote different campaigns for cervical cancer screening programs, in order to increase awareness[25,26,27]

Determinants of Cervical Cancer Screening Uptake among Women in Ilorin, North Central Nigeria: A Community-Based Study. It stated that most women in North Central Nigeria demonstrated poor knowledge about cervical cancer and low uptake of cervical cancer screening. Since early case detection through screening is the most cost-effective activity for reducing the morbidity and mortality from cancer of the cervix, reproductive health experts and policymakers need to demonstrate more commitment in creating awareness about cervical cancer[30,31] They also need to make screening tests available at affordable costs through the

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establishment of more screening centers in the North Central geopolitical zone in particular and in Nigeria as a whole. The existing screening programs which are majorly from nongovernmental organizations and largely in urban areas need to be decentralized and harmonized for greater efficiency. Also, there is a need to integrate cervical cancer screening exercises into the mainstream healthcare services in hospitals. Women who are at least 21 years of age, particularly those with a family history of cervical cancer must be encouraged to opt for cervical cancer screening at every available opportunity. Finally, there is a need to increase the number of healthcare workers with requisite skills to conduct cervical cancer screening in Nigeria[31,32]

Knowledge, attitude and practice of female university students regarding Human Papilloma Virus and self-sampling in KwaZulu-Natal, South Africa: a cross-sectional survey. Self-sampling is a more acceptable means of sample collection compared to a pelvic examination. Therefore, encouraging self-sampling and providing self-sampling kits will aid the increased screening participation and address certain barriers associated with HPV testing. Awareness and educational campaigns about HPV and its causative relationship with cervical cancer will occasion better attitude toward screening participation[34,35]

According to an event tagged “First ladies driving advocacy and interventions on elimination of cervical cancer in Nigeria” on 21st January 2022 at Birnin-Kebbi.

A health journalist “Adenike Tambe” residing in Abuja said she learnt about cervical cancer and people dying from the disease while carrying out her duty as a journalist that never took time to know her status until October 2021, when an expert reiterated that early detection is key to surviving any form of cancer”. Because the Medicaid cancer foundation (Non-Governmental Organization) gives Tambe a discount as part of their efforts to combat cancer,

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Tambe is able to undergo cancer tests. She made the decision to have a cervical cancer screening after learning about the discount. Tambe had a negative test result and had already got the first dose of the HPV vaccine. She advocated for women to administer the test.

Miss Tambe served as an illustration of how raising awareness can motivate people to take protective measures for themselves and to overcome the obstacles that millions of Nigerians face in obtaining preventive treatments for cancer, particularly cervical cancer.

The First Ladies of States have reacted to the World Health Organization's (WHO) appeal for action in the global plans to eliminate cervical cancer, respectively [14,41] with an estimated 12 075 cervical cancer cases and 7 968 fatalities documented in Nigeria annually.

By 2030, the World Health Organization wants to make cervical cancer a thing of the past. The wife of the governor of Kebbi State, Zainab Shinkafi-Bagudu, a doctor, has been using her position to advocate for strong action to guarantee that her state meets the goal of the 90-70-90 strategy as cervical cancer rates increase globally [41]

Through her nonprofit organization, the Medicaid Cancer Foundation, Dr. Shinkafi-Bagudu has led the fight for the National Health Insurance Scheme (NHIS) to include cancer screening and treatment as part of its benefits package. She has also promoted cancer awareness through annual cancer walks and the widespread immunization of girls with the HPV vaccine.

She advocates for early diagnosis, which increases the likelihood of effective treatment and raises awareness of the fatal condition.

"We understood the justification for the WHO's call to eradicate cervical cancer and agreed with it. Many traditional chiefs in Kebbi State have taken up various causes and initiatives to fight cervical cancer. The 21 local government areas in the state were reached through more

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than 150 outreach activities that were carried out with the assistance of community-based groups. According to her, these outreach efforts reached almost 26,000 women in a single year.

Dr. Shinkafi-Bagudu made a call for the inclusion of HPV vaccine in the national regular immunization schedule in order to achieve the transformative steps that will accelerate the elimination of cervical cancer[14,40].

Delivering the 2030 objectives, according to her, will require greater action than before. She urged high-income nations to give teenage girls in low- and middle-income nations priority access to HPV vaccines.

As far as we know, cervical cancer is a condition that can be prevented and treated. Cervical cancer is the second most prevalent malignancy among women in Nigeria, and the country still has one of the highest numbers of cases in the world [40]

Ondo, Kebbi, and Niger states in Nigeria get immediate assistance from the World Health Organization (WHO) for cervical cancer screening and treatment with the goal of screening at least 15000 women in the program's first phase.

The first ladies of Kebbi, Niger, and Ondo states are leading the implementation of cervical cancer screening and treatment among women in their respective states with assistance from WHO and the Clinton Health Access Initiative (CHAI) [40].

The WHO Country Representative (WR), Walter Kazadi Mulombo, emphasized the significance of adopting the strategy and said that the support from the states is a key component of WHO's efforts to ensure that Nigeria joins the rest of the world in pursuing the WHO Global Cervical Cancer Elimination Agenda. He thanked the government, particularly

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FLAC (First Ladies Against Cancer), for supporting several programs to eradicate cervical cancer in their respective states in his speech during the 2021 International Cancer Week [40].

He also promised Nigeria that the WHO will continue to support efforts to eradicate cervical cancer.

In order to undertake a national survey on the prevalence of tobacco use and the risk factors for NCDs (NCD STEPS Survey), WHO is assisting the Federal Ministry of Health. According to him, this survey will provide the most recent information on NCDs and associated risk factors for evidence-based strategies to reduce the malignancies' modifiable risk factors [14,40].

Nigeria Health Watch team, according to reports, recently went to a cervical cancer screening project run by the Society for Family Health in Nyanya, Abuja, to learn more about the work they are doing to raise awareness of and care for this silent killer among women. According to Cervical Cancer Screening in Nigeria through a Social Franchise Project, there are about 500,000 new cases and 250,000 fatalities of cervical cancer each year in poor nations. After breast cancer, it is the second most common cancer among women in Nigeria. Every two minutes, a woman dies from cervical cancer somewhere in the world. With over 80% of cases occurring in underdeveloped nations, women are disproportionately burdened by cervical cancer. Only cervical cancer has an efficient vaccine and screening program that can stop illness and mortality among all malignancies. Sadly, Nigerian women cannot access any of them outside of SFH efforts like this one. This cannot possible be acceptable in a nation as wealthy as Nigeria. Maybe it's time to put the lives of Nigerian women back in the forefront of our minds [5]. Aside from building new airports, stadiums, and high-speed trains, and paying lawmakers millions of Naira. In order to eliminate false beliefs and subsequently reduce the incidence and death of cervical cancer in Nigeria, this study finds that better educational

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intervention programs from health professionals are needed for women at risk of developing the disease [49].

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3.0 CHAPTER THREE METHODOLOGY

3.1 RESEARCH DESIGN

Adopted was a cross sectional study design.

3.2 POPULATION OF THE STUDY

All eligible female students of Lead City University.

3.3 SAMPLE AND SAMPLING TECHNIQUES

The population of this study consists of female students from the four faculties in Lead City University namely; Social and entrepreneurial studies, Law, Applied Sciences, Technology and communication information. Student enrollment ranges 3,000 -3999 according to Uni-rank

The four faculties were selected using purposive sampling technique because of the percentage of female 70% to 30% male. (Copyright 2021 - Lead City University, Ibadan). In order to encourage representativeness, this was done. Using a simple random sampling procedure, 135 female students from each faculty were chosen, giving a total of 540 females who reflect all of the university's students.

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Thus, sample size used was determined using the formula of Idowu and Ogunlana as seen below:

$$n = \frac{N}{1 + Ne^2}$$

Expressively: n = sample size N = Population size

e = 0.052^2 (Level of precision)

$$n = \frac{540}{1 + 540(0.05)^2}$$

n = 229.78723404255

n = 230 (To the nearest whole number)

3.4 DESCRIPTION OF THE RESEARCH INSTRUMENT

A self-administer and pre-designed questionnaire was used. Study variables questions were included in four sections. All questions are close ended, easy, short, and understandable in nature. Questions were answered after consent had been taken from respondents.

3.5 VALIDITY AND RELIABILITYOF THE RESEARCH INSTRUMENT

A pretest questionnaire was used.

3.6 DATA COLLECTION

The data was collected by using a self-administer questionnaire that contains different items like socio-demographics characteristics, knowledge, attitude and level of utilization questions towards cervical cancer screening. Questionnaires was adapted from different pieces of

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literature from previous studies. These questions explored the respondent's knowledge, attitude, and level of utilization towards cervical cancer screening.

3.8 DATA ANALYSIS

Following the coding of the filled-out surveys, data was input and analyzed using SPSS version 20 statistical software. Frequency, and proportion are examples of descriptive statistics that were used to describe the knowledge and attitude surrounding cervical cancer screening. To present the findings, tables, charts, and graphs were used.

3.9 ETHICAL APPROVAL

Approval for the study was obtained from the Health Research Ethical Committee of Lead City University Ibadan, Oyo State.

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CHAPTER FOUR RESULTS AND DISCUSSION OF FINDINGS

4.1 DEMOGRAPHICS DATA ANALYSIS

The result from the study shows ages 20-24 as the highest frequency (92) at a rate of 40% while ages 25-29 has the lowest frequency of 42 at only 18.3%.

Furthermore, it also reveals that Christians have the greatest number of respondents at 67.4% while those who practice Islam have only 32.6%.

143 out of 230 respondents (62.2%) are single while the non singles which include married, etc. make up 37.8% of the respondents.

The Yoruba tribe unsurprisingly makes up the highest respondents' number at 70.9%, with the non-Yoruba's e.g., Ibo, Hausa etc., having 29.1%.

161 out of the total respondents are undergraduates at 70% while the remaining 30% make up the postgraduate population.

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72.6% of the respondents have heard about cervical cancer screening and the other 27.4% have not.

The respondents mostly have their source of knowledge (78.3%) from social media, as seen from the table, and 72.6% of the respondents have had sexual intercourse before.

Finally, 84.8% of the participants have one partner, while a sum total of 16.2% have multiple partners.

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TABLE 4.1 SHOWS THE PERCENTAGE DISTRIBUTION OF SOCIODEMOGRAPHIC CHARACTERISTICS

VARIABLE	FREQUENCY	PERCENT
AGE		
LESS THAN 20	43	18.7
20-24	92	40.0
25-29	42	18.3
MORE THAN 30	53	23.0
MARITAL STATUS		
SINGLE	143	62.2
NON-SINGLE	87	37.8
RELIGION		
CHRISTIANITY	155	67.4

ISLAM	75	32.6
ETHNICITY		
YORUBA	163	70.9
NON-YORUBA	67	29.1
TERTIARY EDUCATION LEVEL		
UNDERGRADUATE	161	70.0
POSTGRADUATE	69	30.0
HAD SEXUAL INTERCOURSE		
YES	167	72.6
NO	63	27.4
IF YES, NO. OF PARTNERS		
1	142	84.8
MORE THAN 1	25	15.2
SOURCE OF INFORMATION		
SOCIAL MEDIA	180	78.3
OTHER SOURCES	50	21.7
HEARD OF CERVICAL SCREENING		
YES	167	72.6
NO	63	27.4

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4.2 PRESENTATION OF DATA

OBJECTIVE 1

KNOWLEDGE OF RESPONDENTS ABOUT CERVICAL CANCER SCREENING

From the result of the study, it was seen that, there is a relatively high number of good knowledges of "Causative agent of cervical cancer" is a virus at 72.7%.

However, there are several valid responses provided by responders to various questions, including Some Symptoms of Cervical Carcinoma, Some Cervical Cancer Risk Factors, A Person Can Prevent Cervical Cancer through, and Cervical cancer can be treated using any of these methods, which all have a 77.8% success rate.

Additionally, it is demonstrated that 78.3 and 69.1% of respondents correctly answered the questions "Is cervical cancer screening a good tool for early diagnosis of cervical cancer" and "The ideal time for doing screening test is a week following menses," respectively.

However, there is a low incorrect answer rate at 30.4% for the question "Is cervical cancer hereditary".

The relatively high rate of correct answers continues in the question "Carcinoma of the cervix is deadly" at 76. 5%

The final two questions "Vaccination from puberty is important to prevent cervical cancer' and "Are you aware of any of these screening tests etc." had the same rates of 77%

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Table 4.2 Shows The Knowledge Of Respondents About Cervical Cancer Screening

Variable	Frequency	Percent
Causative Agent of Cervical Cancer Is a Virus		
Yes	181	78.7

No	49	21.3
Some Symptoms of Carcinoma of The Cervix Are Vaginal Foul Smelling, etc.		
Yes	179	77.8
No	51	22.2
Some Risk Factors of Cancer of The Cervix Are Multiple Sexual Partners, HPV Etc.		
Yes	179	77.8
No	51	22.2
A Person Can Prevent Getting Cancer of The Cervix Through: Avoiding Multiple Sexual Partners, Avoiding Early Sexual Intercourse Vaccination, Quit Cigarette Smoking.		
Yes	179	77.8
No	51	22.2
A Person with Cervical Cancer Can Be Manage Through: Surgery, Drugs That Are Specific Given At The Hospital, Radiography		
Yes	179	77.8
No	51	22.2
Is Cervical Cancer Screening a Useful Tool for Early Detection of Cervical Cancer		
Yes	180	78.3
No	50	21.7
The Best Time for Doing Screening Test Is a Week After Menses		

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Yes	159	69.1
No	71	30.9
Is Cervical Cancer Hereditary		
Yes	70	30.4
No	160	69.6
Carcinoma of the Cervix Is Deadly		
Yes	176	76.5
No	54	23.5
Vaccination From Puberty Is Important to Prevent Cervical Cancer		
Yes	177	77.0
No	53	23.0
Are You Aware of Any of These Screening Tests:		
Yes	177	77.0
No	53	23.0

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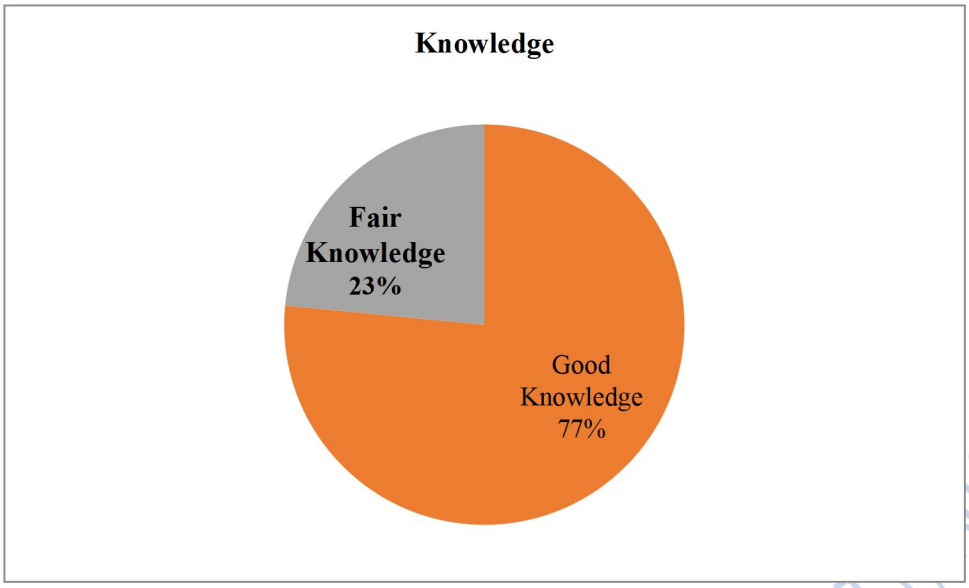
Figure 4.1 Shows the Knowledge of Cervical Cancer Screening

This highlights that 77% of respondents have a good knowledge regarding cervical cancer screening while 23% of respondents have a fair knowledge regarding their knowledge on cervical cancer screening.



Testing For Association Between the Knowledge of Cervical Cancer Screening and the Sociodemographic Characteristics

According to the study, there are significant associations between the knowledge of cervical cancer screening and age, marital status, ethnicity, tertiary education level and if they have had sexual intercourse before, with all at p-values of 0.

At a p-value of 0.002, there is also a significant correlation between the number of partners and knowledge about cervical cancer screening.

However, there is no significant association between the knowledge of cervical cancer screening and religion, which has its p-value at 0.063.

Table 4.3

Association Between the Knowledge of Cervical Cancer Screening and The Sociodemographic Characteristics

Variable	Correct Answer	Incorrect Answer	Chi Square	P Value

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Age			84.768[a]	.000
Less Than 20	25.6%	74.4%		
20-24	79.3%	20.7%		
25-29	100.0%	0.0%		
More Than 30	94.3%	5.7%		
Marital Status			31.248[a]	.000
Single	64.3%	35.7%		
Non-Single	96.6%	3.4%		
Religion			3.464[a]	.063
Christianity	72.9%	27.1%		
Islam	84.0%	16.0%		
Ethnicity			18.998[a]	.000
Yoruba	68.7%	31.3%		
Non-Yoruba	95.5%	4.5%		
Tertiary Education Level			20.079[a]	.000
Undergraduate	68.3%	31.7%		
Postgraduate	95.7%	4.3%		
Number Of Partners			12.666[a]	0.002
1	72.3%	27.7%		
More Than 1	100.0%	0.0%		

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Had Sexual Intercourse			117.390[a]	.000
Yes	72.3%	17.7%		
No	28.8%	71.2%		

Objective 2

Respondents' Attitude Towards Cervical Cancer Screening

From the observed result, 77.8% of the respondents have good attitudes to "I think it is helpful to detect cervical cancer early".

However, the respondents had a low rate of 3.5% and 3.9% to "I think I have the chance of getting cervical cancer" and "I believe that getting cervical cancer is serious for you", showing a result of poor attitudes to the question.

The other questions "I think that there are effective methods to reduce the risk of seriousness of cervical cancer", "I think carcinoma of the cervix is the cause of death", "I think any women can acquire cervical cancer", "I think screening helps in prevention of cervical cancer", "I think I have the Willingness for screening" and "I think screening causes no harm to the client", have good attitudes towards the questions regarding cervical cancer screening at 74.3%, 73.9%, 73.5%, 73.5%, 75.2% and 73.9%.

Table 4.4 Shows Respondents' Attitude Towards Cervical Cancer Screening

Variables	Frequency	Percent
I Think It Is Helpful to Detect Cervical Cancer Early		
Poor Attitude	51	22.2
Good Attitude	179	77.8
I Think I Have the Chance of Contracting Cervical Cancer		

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Poor Attitude	222	96.5
Good Attitude	8	3.5
I Believe That Contracting Cervical Cancer Is Serious for You		
Poor Attitude	221	96.1
Good Attitude	9	3.9
I Think There Are Best Methods to Minimize the Risk of Serious Cervical Cancer		
Poor Attitude	59	25.7
Good Attitude	171	74.3
I Think Carcinoma of The Cervix Is the Cause of Death		
Poor Attitude	60	26.1
Good Attitude	170	73.9
I Think Any Women Can Get Cervical Cancer		
Poor Attitude	61	26.5
Good Attitude	169	73.5
I Think Screening Can Help in The Prevention of Cervical Cancer?		
Poor Attitude	61	26.5
Good Attitude	169	73.5
I Think I Have the Willingness for Screening		
Poor Attitude	57	24.8
Good Attitude	173	75.2

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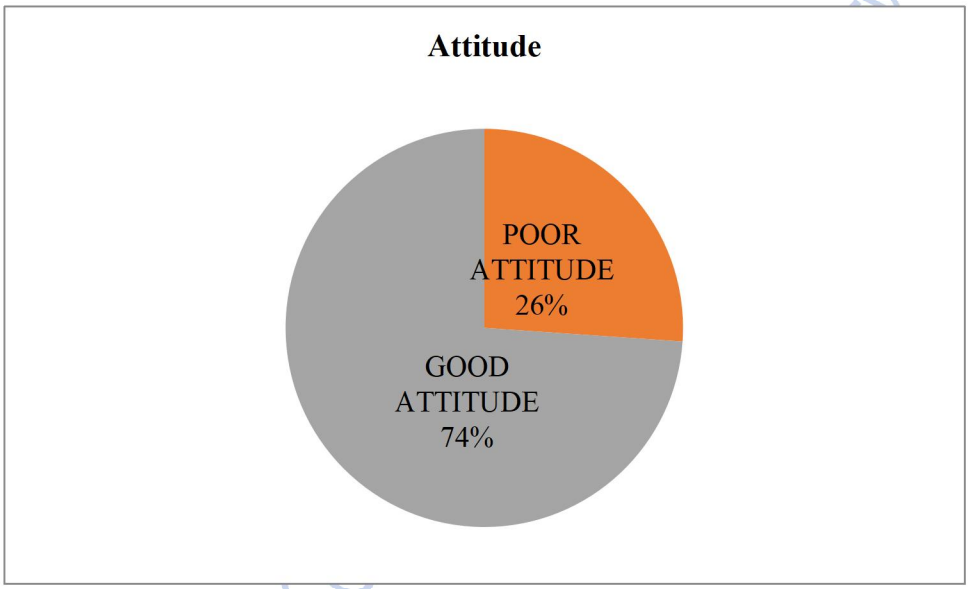
I think screening causes no harm to the client		
Poor Attitude	60	26.1
Good Attitude	170	73.9

Figure 4.2 Shows the Attitude Towards Cervical Cancer Screening

The chart illustrates that 74% of respondents have a good attitude towards cervical cancer screening while only 26% of respondents have a poor attitude towards cervical cancer screening.



Testing The Association Between Attitude Towards Cervical Cancer Screening and Sociodemographic Characteristics

The table depicts that there are significant associations between the attitude of respondents and their age, marital status, tertiary education level and ever had sexual intercourse, with all having a p-value of 0.

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There are no significant associations between the attitude of respondents regarding cervical cancer screening and their religion, source of information and number of partners, having p-values of 0.015, 0.987 and 0.010 respectively.

Table 4.5 Shows the Association Between Attitude Towards Cervical Cancer Screening and Sociodemographic Characteristics

Age	Poor	Good	75.574[a]	.000
Less Than 20	76.7%	23.3%		
20-24	21.7%	78.3%		
25-29	9.5%	90.5%		
More Than 30	5.7%	94.3%		
Marital Status			37.194[a]	.000
Single	39.9%	60.1%		
Non-Single	3.4%	96.6%		
Religion			5.873[a]	.015
Christianity	31.0%	69.0%		
Islam	16.0%	84.0%		
Ethnicity			9.812[a]	.002
Yoruba	31.9%	68.1%		
Non-Yoruba	11.9%	88.1%		
Tertiary Education Level			12.993[a]	.000
Undergraduate	32.9%	67.1%		
Postgraduate	10.1%	89.9%		

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Number Of Partners			6.568[a]	.010
1	29.2%	70.8%		
More Than 1	8.6%	91.4%		
Had Sexual Intercourse			105.921[a]	.000
Yes	7.8%	92.2%		
No	74.6%	25.4%		
Source Of Information			.000	.987
Social Media	26.1%	73.9%		
Other Sources	26.0%	74.0%		

Objective 3

Level Of Utilization of Cervical Cancer Screening

This study shows that 31.7% of respondents did not have a cervical cancer screening, 64.3% of respondents had one.

Also 54.3% have been screened at least once during the past 3 years, while the remaining 45.7% have not.

Finally, 105 out of the230 respondents (45.7%) have been vaccinated for HPV virus.

Table 4.6 Shows the Level of Utilization of Cervical Cancer Screening

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Variables	Frequency	Percentage
Have You Ever Been Screened for Cervical Cancer		
Yes	157	68.3
No	73	31.7
Have You Been Screened At Least Once During the Last Three Years		
Yes	125	54.3
No	105	45.7
Have You Been Vaccinated Against Human Papilloma Virus		
Yes	105	45.7
No	125	54.3

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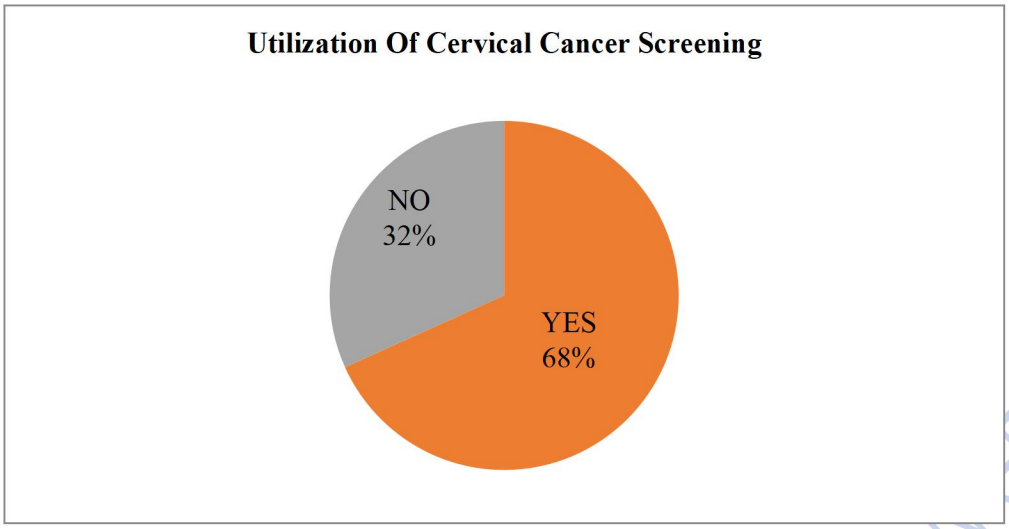
Figure 4.3 Shows the Level of Cervical Cancer Screening Utilization

This shows that 68% of the respondents have undergone cervical cancer screening while just 32% have not.



Association Between Level of Utilization and the Sociodemographic Characteristics

From the study, we can see no significant association between the level of utilization and the number of partners, having a p-value of 0.105.

There is also no significance between the level of utilization of cervical screening and the variables religion and the source of information, which has a p-value of 0.250 and 0.156 respectively.

However, there are significant associations between the level of utilization and the other sociodemographic characteristics which includes Age, marital status, ethnicity, tertiary education level and ever had sexual intercourse, with all having a p-value of 0.

Table 4.7 Shows the Association Between Level of Utilization and The Sociodemographic Characteristics

Age			69.233[a]	.000
Less Than 20	18.6%	81.4%		
20-24	69.6%	30.4%		

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25-29	85.7%	14.3%		
More Than 30	92.5%	7.5%		
Marital Status			36.257[a]	.000
Single	53.8%	46.2%		
Non-Single	92.0%	8.0%		
Religion			1.322[a]	.250
Christianity	65.8%	34.2%		
Islam	73.3%	26.7%		
Ethnicity			17.105[a]	.000
Yoruba	60.1%	39.9%		
Non-Yoruba	88.1%	11.9%		
Tertiary Education Level			27.294[a]	.000
Undergraduate	57.8%	42.2%		
Postgraduate	92.8%	7.2%		
Number Of Partners			2.626[a]	.105
1	66.2%	33.8%		
More Than 1	80.0%	20.0%		
Had Sexual Intercourse			73.582[a]	.000
Yes	84.4%	15.6%		
No	25.4%	74.6%		

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Source Of Information			2.012[a]	.156
Social Media	70.6%	29.4%		
Other Sources	60.0%	40.0%		

4.2.1 The Research Questions

1. What is the knowledge of cervical cancer screening with female students at Lead City University.

2. What is the attitudes of cervical cancer screening with female University Students at Lead City University?

3. What is the level of cervical cancer screening utilization among female students at Lead City University?

4.What is the association towards cervical cancer screening between knowledge, attitude and level of utilization and sociodemographic characteristics

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4.3 Discussion of Findings

The majority of the respondents to the study were single, young, exposed to sexual intercourse and of childbearing age, indicating their vulnerability to cervical cancer disease. According to the study's findings, there is a high risk of infection for women between the ages of late adolescence and early 30s.[2,49] it can be seen that their age and exposure to internet source has

assisted them to have good knowledge of the disease. Also, their tribe, religion, level of study and ethnicity was in comparison to their high tolerance of the good knowledge of the disease and has hence influenced them positively of their knowledge and attitude on the disease respectively.

More so, the study found that respondents' knowledge of cervical cancer disease was good. This might be as a result of their good exposure to information of the infection through the internet (socio media). A fair knowledge of the infection, can lead to vulnerability and succeeding sudden occurrence while a good knowledge can speed up behavior that will automatically minimize the outbreak of a disease. Change in behavior can be propelled without experiencing the disease[46]It was also noted in a study that dissemination of information about a disease will minimize incidence and outbreak[48]It was also recorded in sub-Saharan African that age, exposure to sex, ethnicity, tribe and religion has very high tolerance for knowledge and attitude of cervical cancer screening[1]

The study recorded a good attitude for cervical cancer screening. It will therefore protect respondents from the disease and preventing the spread because when screening or preventive measure is not taken on a disease, detection of the disease at its early stage will not be possible. The poor attitude might be connected to the fair knowledge of the infection because screening is paramount to curb the spread of the disease.

Fair attitude was reported among the female university students that provision of more females' staffs, adequate structures in place, cheaper services in place will enhance participation for screening[4] Also, it was stated that misconception, and ignorance affected people's attitude for cervical cancer screening[48]

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Furthermore, a fair utilization for cervical cancer screening was found in the study likewise a poor utilization as well. Having a good knowledge of a disease, will lead to embracing good attitude concerning it. When there is good knowledge of a disease, it will be associated with good attitude that will pave way for reduction in disease burden, socio-cultural acceptance and good treatment outcomes.

The association tested in the study reveals that there is significance in knowledge, attitude and utilization of cervical cancer screening with age, marital status, ethnicity, tertiary education level and ever heard sexual intercourse. The age, marital status, ethnicity, tertiary education and exposure to sex are predisposing factors to cervical cancer screening and need not to be underrated.

A study also confirmed that there is a significant association with age, tertiary education. Marital status, ethnicity and ever heard sex with knowledge, attitude and utilization of cervical cancer screening[29]

Furthermore, there was good attitude toward cervical cancer screening. Significant correlations exist between respondents' attitudes and age, marital status, level of tertiary education, and history of sexual activity. Significant correlations have also been found between respondents' attitudes on cervical cancer screening and their respective ethnicity, religion, and marital status[3]

Chapter Five Conclusion

5.1 Summary of Findings

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The study reveals that quite a number of the female students were aware of cervical cancer but some numbers were not conversant with it. The study established a good knowledge towards cervical cancer screening while some shows a fair knowledge of it.

The study also reveals that the majority of the female students have a good attitude towards cervical cancer screening while a minority have a poor attitude towards cervical cancer screening.

Furthermore, the study shows that the part of the female students has undergone cervical cancer screening with a fair utilization been recorded while some minorities are yet to have it done with a poor utilization been documented.

Moreso, there was a significant association with age, marital status, ethnicity, tertiary level of education and exposure to sex for cervical cancer screening.

5.2 Conclusion

In the study area, there was a good knowledge among the respondents regarding cervical cancer screening. According to the study, there are strong correlations between knowledge of cervical cancer screening and factors like age, marital status, ethnicity, level of tertiary education, and history of sexual activity.

The students still need to continue acquiring solid knowledge about the disease in order to further promote efforts aimed at preventing and treating it.

Furthermore, there was good attitude toward cervical cancer screening. Significant correlations exist between respondents' attitudes and age, marital status, level of tertiary education, and history of sexual activity. Significant correlations have also been found

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between respondents' attitudes on cervical cancer screening and their respective ethnicity, religion, and marital status.

Additionally, the college should implement awareness campaigns to consistently increase the knowledge of the disease among the female students.

Sensitization programs should be allowed for female students who are in vulnerable age groups.

5.3 Recommendations

i. Conduction of Awareness campaigns in the school on cervical cancer screening that will cut across to the female students.

ii. Mandatory Cervical cancer screening as part of the routine medical examination for the female students who have gained admission to the university every year. This exposure will not only lead to having healthy female students but will also denote that screening for cancer is as necessary as screening for TB, HIV, and HBV etc. and also imbibe the attitude of medical examination and checkups in them.

iii. Public service announcements on local radio and television as well as printed informational materials displaying the health care facilities promoting cervical cancer screening services should be created.

iv. Encouraging female students who are sexually active to undergo regular cervical cancer screenings

v. It is necessary to undertake qualitative research with female students to examine the obstacles to using services for cervical cancer screening.

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vi. There is a need for our governments to boost the health care budget and launch a national cervical cancer awareness campaign, expanding screening services across the nation with the help of affordable screening techniques that have shown to have a respectable sensitivity and specificity, respectively.

vii. It is important to stress that women who have a negative cervical cancer test still plan to undergo routine screenings.

5.4 Contribution to Knowledge

The most prevalent cancer and a significant source of morbidity and mortality in females who are childbearing age is cervical cancer, but it is preventive, early detectable, and generally treatable. Nigerians are especially concerned about it because of its prevalence, morbidity, and mortality. If we want to battle the disease and win, we must make a concentrated effort to continuously inform the female students in our institution about the risks the disease poses and provide them encouragement to go past any obstacles to taking the screening test.

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5.5 Suggested Areas for Further Research

i. Evaluating the difficulties in detecting cervical cancer in female students at Lead City University in Ibadan.

ii. Determining the main cause of Lead City University, Ibadan's low cervical cancer screening uptake.

iii. Obstacles to female students at Lead City University in Ibadan receiving the Human Papilloma Virus vaccine at a low rate.

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Appendices

Biodata CV Format

Name	Position/Title
Ayobami-Fadele Elizabeth Abiodun	Mrs
Address/Email 1/3 Fokutu Street Ajao Estate, Lagos State	

Education/Training Masters in Public Health			
Institution And Location	Degree *(If Applicable)*	Mm/Yy	Field Of Study
Lead City University, Tollgate, Ibadan	Mph	09/2020	Public Health

Attestation – This is to attest to the fact that I went through the study with the title:

Assessment of the Knowledge and the Attitude towards Cervical Cancer Screening Among Female Students at Lead City University, Ibadan, Nigeria.

I hereby append my signature as an investigator on the study.

Name: Ayobami-Fadele Elizabeth Abiodun

Signature: E. A

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University Compliance

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Consent For Participation in A Study

Description: I am Ayobami-Fadele Elizabeth Abiodun, a final year post graduate student on MPH program at Lead City University. I want to carry out a study on assessment of knowledge and attitude towards cervical cancer screening among female students in Lead City University, Ibadan. You will be asked to participate in a structured interview. The outcome of this study will help to document the following:

1. The knowledge of cervical cancer screening with female students at Lead City University, Ibadan.

2. The attitudes of cervical cancer screening with female University Students at Lead City University, Ibadan.

3. The level of cervical cancer screening utilization among female students at Lead City University, Ibadan.

4.The association towards cervical cancer screening between knowledge, attitude and level of utilization and sociodemographic characteristics among female students at Lead City University, Ibadan.

Time Involvement: Your participation will take less than 20minutes.

Risks There is no risk that can be associated with your participation in this study because no information you provided is directly linked to you.

Payments: You will not receive any payment for your participation.

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Participant's Rights: Please be aware that your involvement in this project is voluntary and that you are free to end it at any moment without incurring any consequences if you have read this form and opted to take part. You are free to decline to answer specific questions. The results of this study will be used to determine the degree of knowledge about cervical cancer screening and to advise the university health authority on the potential need to raise awareness about this procedure.

Contact Information:

Whom to Contact

Questions: In case you have any question about the study you can ask it. You can also raise your questions, concerns or complaints about this research, its procedures, risks and benefits, on that ground, you are free to contact the principal investigator with any information needed.

Ayobami-Fadele Elizabeth Abiodun

Department of Public Health

Lead City University Ibadan, Oyo State

bettyakad@gmail.com

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I give my consent to participate in this study.

Yes No

Signature _____ Date _____

Questionnaire

Assessment Of Knowledge and Attitude of Female Students Towards Cervical Cancer Screening in Lead City University, Ibadan, Nigeria.

Dear Respondent,

I am conducting a study on assessment of knowledge and attitude of female students towards cervical cancer screening. Please read the questions below and kindly give appropriate responses by either ticking in the bracket {/} or by giving further information in the spaces provided. This study is purely for academic purposes and all information shall be treated confidentially.

Section A

Demographic Characteristics Information

1. Age at last birthday ……
2. Marital Status: Single { }

Married { }

Separated { }

Divorced { }

Widow { }

3. Religion: Christianity { }

Islamic { }

Other { }

4. Ethnicity: Yoruba { }

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Hausa { }

Igbo { }

Others { }

5. Level(s) ……

6. Have you heard about cervical cancer? Yes { } No { }

7. If Yes, what is your main source of information on cervical cancer?

   Radio { } T.V { } social media (Facebook, WhatsApp, Twitter etc.) { }

   Health clinics { } Family & Friends { }

8. Have you experienced sexual intercourse? Yes { } No { }?

9. If yes, with how many partner(s)?.....

Section B

Knowledge towards cervical Cancer

Instructions: This section has statements that you are to decide carefully whether YES or NO against each statement depending on your feelings. If you make a mistake, cross by putting (X) through the tick [/] and then tick in the appropriate box.

S/N	Items	Yes	No
1.	Virus is the causative agent of cervical cancer		
2.	Some of the symptoms of carcinoma of the cervix are vaginal irregular bleeding, vaginal foul smelling, and post coital bleeding.		
3.	Some risk factors of cancer of the cervix are multiple sexual partners, human papilloma virus, early sexual intercourse, cigarette smoking.		
4.	A person can prevent getting cancer of the cervix through: Avoiding multiple sexual partners, avoiding early sexual intercourse vaccination, Quit cigarette smoking.		

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5.	A person with cancer of the cervix can be treated through: surgery, specific drugs given at the hospital, radiography		
6.	Is cervical cancer screening a useful tool for early detection of cervical cancer		
7.	The best time for doing screening test is a week after menses		
8.	Is cervical cancer hereditary		
9.	Carcinoma of the cervix is deadly		
10.	Vaccination from puberty is important to prevent cervical cancer		
11.	Are you aware of any of these screening tests ● Pap smear ● Liquid based cytology ● HPV DNA ● Blood testing ● VIA (Visual inspection with acetic acid) ● VILI (Visual inspection with Lugol's iodine)		

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Section C

Attitude Towards Cervical Cancer

Instructions: This section has statements that you are to decide carefully whether STRONGLY DISAGREED, DISAGREED, UNSURED, AGREED, STRONGLY AGREED against each statement depending on your feelings. If you make a mistake, cross by putting (X) through the tick [/] and then tick in the appropriate bo**x.**

S/N	Items	SD	D	U	A	SA
1.	I think it is helpful to detect cervical cancer early?					
2.	I think I have the tendency of contracting cervical cancer?					
3.	I believe getting cervical cancer will be a serious thing for you?					
4.	I think effective methods are available to minimize the risk of serious cervical cancer?					
5.	I think that carcinoma of the cervix can cause death?					
6.	I think any woman can acquire cervical cancer?					
7.	I think screening can helps in the prevention of cervical cancer?					
8.	I think I have the Willingness for screening.					
9.	I think screening causes no harm to the client					

Section D

Level Of Utilization Towards Cervical Cancer Screening

Instructions: This section has statements that focus on how you have done some certain things. You need to decide if Yes or No. Put a tick [/] against each statement depending on your actions. If you make a mistake, cross by putting (X) through the tick [/] and then tick in the appropriate box.

S/N	Items	Yes	No
1.	Have you ever been screened for cervical cancer		

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2.	Have you been Screened at least once during the last three years		
3.	Have you been vaccinated against Human Papilloma Virus		

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