

**KNOWLEDGE OF CERVICAL CANCER AND UPTAKE OF
SCREENING AMONG FEMALE STUDENTS FROM
SELECTED UNIVERSITIES IN LUSAKA**

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FOR THE REQUIREMENT OF MASTER DEGREE IN
PUBLIC HEALTH-POPULATION STUDIES**

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DECLARATION

I, Kutha Banda hereby declare that this dissertation is my original work and has not been presented for any other awards at the University of Zambia or any other University.

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DEDICATION

Dissertation dedicated to my parents and my siblings who have been my inspiration throughout my school

ABSTRACT

Cervical cancer though preventable is a serious public health problem. Cervical cancer can be treated and detected while it is early invasive or pre-invasive significantly improves the probability of curing the disease. WHO reported that cervical cancer is the second most common cause of female cancer globally. There are approximately 500,000 new cases that are identified each year and 250,000 women die of cervical cancer each year. Students in tertiary institutions usually have a high risk of contracting STDs as compared to the general public because of the high sexual behavior in such institutions and they underestimate their risk of contracting various STDs, HPV being one of them. One study found that as many as 60% of college-age women had some form of HPV, which is causally linked to cervical cancer. The aim of this study therefore, was to determine the knowledge of cervical cancer in influencing uptake of cervical cancer screening among female students from selected Universities in Lusaka

The study was a quantitative cross-sectional study of full-time female students in these Universities conducted between July 2016 and January 2017. Data was analysed using Stata 13 (StataCorp, College Station, Texas, USA). The primary outcome was knowledge about cervical cancer, which adopted a validated cervical Cancer Awareness Measures (CAMs) tool and secondary outcome variable was uptake of Cervical cancer screening. Variables were first removed if the likelihood p-value was greater than 0.2, the final predictor variables in the model were those with $p < 0.05$. The uptake of cervical cancer screening was analysed in a similar way.

The study found that the majority of the students had never heard of HPV, and over 90% of them had heard of Cervical cancer. However, regarding the level of knowledge of Cervical cancer, the majority of the students had low knowledge levels with only 9% having high knowledge levels. This study found that only 13% of the students had screened for cervical cancer. Residing within School campus and having a health facility within School campus had a positive significant association to the level of knowledge. Age of sexual debut, knowing someone with cervical cancer and level of knowledge were significant positive predictors of uptake of cervical cancer

Students were aware of cervical cancer, however, their level of knowledge regarding risk factors and preventive measures is very low. This indicated that awareness messages on cervical cancer and its prevention to the Public are not adequate in these institutions, this is a gap that needs to be highlighted because a large number of University female students are sexually active and henceforth a key population to focus on regarding cervical cancer prevention. Therefore, there is need to intensify Information, Education and Communication (IEC) on cancer of the cervix and its prevention in an effort to curb this disease

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ACRONYMS

CAM	Cancer Awareness Measures
CCPPZ	Cervical Cancer Prevention Program in Zambia
CI	Confidence Interval
CIDRZ	Center for Infectious Diseases Research in Zambia
HIV/AIDS	Human Immune Virus/Acquired Immune Deficiency Virus Syndrome
HPV	Human Papillomavirus
IEC	Information, Education and Communication
LAMU	Lusaka Apex Medical University
MoH	Ministry of Health
NHRA	National Health Research Authority
STD	Sexually Transmitted Diseases
STI	Sexually Transmitted Infections
UNILUS	University of Lusaka
UNZA	University of Zambia
UNZABREC	University of Zambia Biological Research Ethics
WHO	World Health Organisation

CHAPTER ONE: INTRODUCTION

1.1 Background

Cervical cancer though preventable is a serious public health problem. Cervical cancer can be treated and detected while it is early invasive or pre-invasive significantly improves the probability of curing the disease (Chirenje et al, 2001). WHO reported that cervical cancer is the second most common cause of female cancer globally. There are approximately 500,000 new cases that are identified each year and 250,000 women die of cervical cancer each year. Approximately 85% of the world's incident cases and 87% of all cervical cancer deaths reported are from developing countries (Nwabichie et al, 2017). Access to primary preventive services and early access to secondary services would contribute highly in curbing this scourge. Human Papillomavirus (HPV) is a necessary cause of cervical cancer, but it is not a sufficient cause, other cofactors are necessary for progression from cervical HPV infection to cancer. HPV is sexually transmitted.

Some studies have shown that young women, especially those of university age (below 25), are at higher risk of contracting STIs such as Human Papillomavirus (HPV) as they may tend to be sexually active and have higher numbers of sexual partners and the prevalence rate for high risk HPV for women aged 18-24 are around 18-24% (Smith et al, 2008; Satterwhite et al, 2008; Abma et al, 2010; Trotter et al, 2007). Uptake of cervical cancer preventive measure has been associated with knowledge of its risk factors and prevention (Ahmed et al, 2017).

WHO (2006) recommends a comprehensive approach to cervical cancer prevention and control. A comprehensive program includes three interdependent components: primary, secondary and tertiary prevention. It should be multidisciplinary, including components from community education, social mobilization, vaccination, screening, treatment and palliative care (WHO, 2006). A study by Bosch et al (2007) also shows that having a weak immune system increases the risk of cervical cancer, especially if the woman has been exposed to HPV. Factors that affect the immune system and can increase the risk of cancer of the cervix are: smoking, diet, Human Immunodeficiency Virus (HIV) infection, history of sexually transmitted - infections (STIs), a family history of cervical cancer, older age, and poverty.

From the literature reviewed, there is need for more studies on this topic among this key population. Studies such as Hoque et al (2009) at Mangosuthu University in South Africa found

that awareness levels were still low and advocated for developing policies on health education and promotion. Some studies show that knowledge of cervical cancer risk factors and particularly knowledge of its strong relationship to human papillomavirus (HPV), independent of other factors have helped in the reduction of cervical cancer incidence in developed countries through preventive programs such as massive cervical cancer screening programs (Bosch et al, 2002). In Zambia, there are a number of studies conducted on knowledge of cervical cancer but this review was unable to find a published study that had targeted University students as they are a key population to consider. This study therefore, endeavors to query knowledge of cervical cancer and uptake of cervical cancer screening services particularly among selected female University students in Lusaka, this is in an effort to inform current programs and potential programs on whether there is need to give attention to this population in Zambia.

1.2 Statement of the problem

Cervical cancer remains a huge threat to all women worldwide, especially so those in developing countries such as Zambia with a high incidence rate. In Zambia, estimates indicate that every year 2330 women are diagnosed with cervical cancer and 1380 cervical cancer deaths are recorded (ICO Information Centre on HPV and Cancer Fact Sheet, 2015) and the crude incidence rate is 33.7 per 100,000 (ICO Information Centre on HPV and Cancer Fact Sheet, 2017). Cervical cancer ranks as the 1st most frequent cancer among women in Zambia and the 1st most frequent cancer among women between 15 and 44 years of age (Ibid), therefore, Zambia has a population of 4.4 million women aged 15 years and older who are at risk of developing this disease.

A lot of efforts have been put up to address this problem over the past decades, and the rate of cervical cancer has reduced significantly in more Developed worlds due to the routine screening programs implemented in these countries. On the contrary, in most Developing Countries, Cervical cancer rates have risen or remained unchanged (Güner, 2007; Forouzanfar, 2011). Zambia has developed the cervical cancer campaign and put up some interventions to reduce the burden of the disease. One such intervention is the Cervical Cancer Prevention Program in Zambia (CCPPZ) which was established in 2006 by CIDRZ (CIDRZ, 2014), and the HPV vaccination program launched in 2013 (Pink Ribbon-Red ribbon, 2016), however, there is still need to intensify these efforts and include more sensitization and awareness programs to compliment the screening and vaccination programs.

A study by Satterwhite et al (2008) found Sexually active women below the age of 25 such as college students have the highest rates of genital HPV infection. Another study conducted at the University of Transkei, South Africa, showed that the majority of respondents were young and sexually active (86.9 %), having initiated sexual activity at a mean age of 17.27 (Ferlay et al, 2004). College or University Students could be considered as a high-risk group for contracting STIs such as HPV because they are likely to have multiple sexual partners (MSP) and have unprotected sexual intercourse (Abma et al, 2010; Trotter et al, 2007).

The problem therefore was that the incidence of cervical cancer has been at a rise over the recent years, however, knowledge of the disease and uptake of screening services is still low. Studies reviewed from other Countries show that a lot of students are sexually active and most of them are around the peak age of contracting HPV which puts them at risk of developing Cervical cancer. This study was crucial in understanding the knowledge of cervical cancer and the uptake of screening services among student in Lusaka Zambia in a bid to inform Cervical cancer intervention programs.

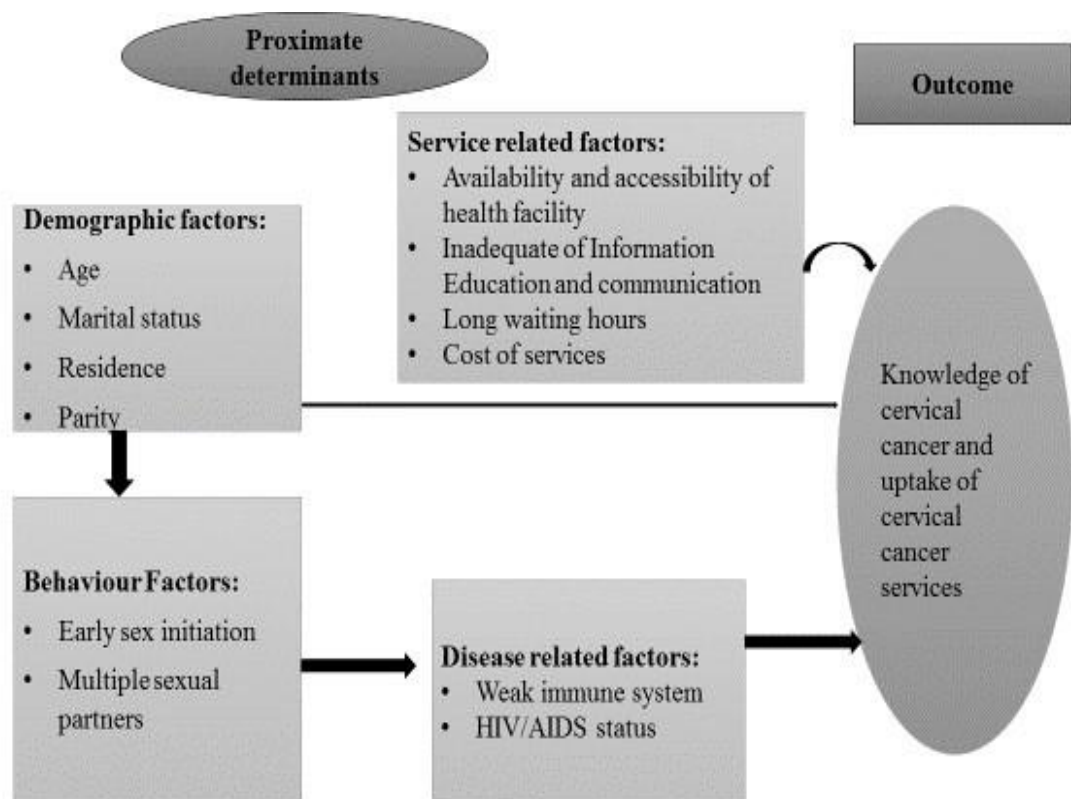


Figure 1: Factors associated with knowledge of cervical cancer and Uptake of cervical cancer services

1.3 Conceptual framework

The framework developed above details the relationship of proximate determinants and the outcome variables; knowledge on cervical cancer and uptake of cervical cancer services.

These factors were acquired from review of literature. The framework, shows demographic, behavioral, disease related and service related factors and how these interact in order to influence the knowledge of the disease and uptake of preventive services. For instance, demographic factors such as age, marital status, parity, residence may have an influence on behavioral factors which in turn may influence disease related factors and their effect on the outcome variables

1.4 Justification

The WHO comprehensive prevention program recommends the knowledge of cervical cancer and its risk factors as paramount to the fight against this problem. In Zambia, a number of studies have been conducted on knowledge of cervical cancer, however, there is limited research conducted on knowledge of cervical cancer particularly among University students in Lusaka in influencing uptake of cervical cancer screening. A study conducted by Ahmed et al (2017) found that uptake of HPV vaccine was associated to the level of knowledge of HPV and Cervical cancer. Therefore, it is hoped that findings of this study will:

- Help inform policy on level of knowledge cervical cancer as well as uptake of screening services by the University students in Lusaka.
- Fill in the gap on knowledge studies of cervical cancer and also uptake status of cervical cancer services provided among students in Lusaka
- Provide possible approaches of disseminating cervical cancer related information in influencing the uptake of the cervical cancer services

1.5 Research Question

What is the level of knowledge about cervical cancer among female students in selected Universities in Lusaka and what is their uptake of cervical cancer screening service?

1.6 General Objective

To determine the knowledge of cervical cancer in influencing uptake of cervical cancer screening among female students from selected Universities in Lusaka

1.6.1 Specific Objectives

1. To investigate the level of knowledge of cervical cancer among female University students in Lusaka
2. To investigate the uptake of cervical cancer screening among female students in selected Universities in Lusaka.
3. To determine the socio-demographic and sexual behavior characteristics such as age, marital status, residence associated with knowledge of cervical cancer and uptake of screening services among University students in Lusaka.

CHAPTER 2: LITERATURE REVIEW

The literature review focuses on cervical cancer knowledge and its preventive measures. The literature also includes studies on the risk factors of the disease. There is currently a number of studies carried out relating to cervical cancer, in this chapter literature is arranged according to the variables of interest starting with studies on knowledge of HPV related to cervical cancer then studies on uptake of cervical cancer preventive services.

2.1 Knowledge of Cervical cancer

A study conducted by Ahmed et al (2017) found that uptake of HPV vaccine was associated to the level of knowledge of HPV and Cervical cancer. The study found that the odds of receiving HPV vaccine was nearly 5 times more for students who achieved high knowledge scores about causes of cervical cancer as compared to the students with low knowledge scores (adjusted odds ratio (aOR):4.85, 95% confidence interval CI:2.15, 10.92). This study also found that the odds of receiving HPV vaccine was almost three times higher for students who knew that HPV causes cervical cancer as compared to those who did not know (aOR:2.9, 95% CI:1.1, 8.2)

This review also looked at a study by Hoque (2010) on ‘Cervical cancer awareness and preventive behaviour among female university students in South Africa’ whose objectives were to assess the awareness about cervical cancer and preventive behaviour of female first year Mangosuthu University of Technology students, found that 40% of the students were currently sexually active and among them 28% reported having two or more sexual partners. The study used a total of 205 students who were selected by stratified random sampling techniques. It concluded that the University management should concentrate on developing policies on health education and promotion particularly targeting preventable health conditions to prevent transmission of the HPV virus.

A study conducted by Durowade et al (2013) in North Central Nigeria on the ‘knowledge of cervical cancer and its socio-demographic determinants among women in an urban community’, showed that only 59 (29.5%) respondents had some knowledge of symptoms of cervical cancer with 9 (4.5%) of them having good knowledge. The study concluded that, there was poor knowledge of cervical cancer demonstrated by respondents in this study. This underscores the need for urgent community mobilization and use of educational resources to disseminate information on cervical cancer.

Another study reviewed is by Hoque et al (2009), on the ‘Knowledge of and attitude towards cervical cancer among female university students in South Africa’, whose objectives were to assess the knowledge of the risk factors associated with, and detection methods of cervical cancer among female undergraduate students at Mangosuthu University of Technology in South Africa. The study sample for this study was 389 students selected by stratified random sampling techniques. It concluded that there was low level of knowledge on cervical cancer and its risk factors and detection method among female university students. The study recommended that the university should thus concentrate on developing policies on health education and promotion, particularly targeting preventable health conditions, such as cervical cancer and strategies to prevent transmission of the human papillomavirus.

Another study reviewed is a cross-sectional study carried out by Adanu (2002) on four different groups of well educated women at the University of Ghana and medical campuses in Accra. These groups included a group of medical students, non-medical undergraduate’s studies, nurses and senior University workers. The study objective was to determining the level of knowledge about cancer of the cervix and Pap smear and level of Pap smear use and identify factors that promote cervical cancer awareness and Pap smear. This was conducted on 175 women ranging from 18 and 56 years old and the findings were that 164 (93%) had heard of cervical cancer, but only 65 (37%) had adequate knowledge about the disease.

Another study by Liu et al (2012) on ‘Cervical Cancer and HPV Vaccination: Knowledge and Attitudes of Adult Women in Lusaka, Zambia’ found that three hundred women (96.8%) had heard of cancer and of them, 224 women (74.7%) had heard of cervical cancer. This cross-sectional investigation was conducted in 2009 in Lusaka, Zambia. All women from the ages of 18 to 65 years of age presenting to two clinics providing general medical, antenatal, and gynecology services were eligible to participate. Every 10th woman who presented was approached by a trained research nurse to ask whether she was interested in completing a nurse administered questionnaire.

2.2 Cervical cancer screening

With regards to uptake of cervical cancer services, one of the studies reviewed is Everlyne et al (2014). The study was a cross-sectional study. In this study, knowledge, perceptions and cues for action associated with self-reported cervical screening uptake were explored. The targeted population (n = 424), purposively selected were women of child-bearing age (18–49 years) visiting JOOTRH. The study concluded that knowledge, perception of higher

susceptibility and attending child welfare clinic are key determinants of self-reported uptake of cervical screening and that increasing knowledge, enhancing health education and providing free services may increase uptake among women population in such settings. This would lead to an enhanced knowledge and reduced morbidity and mortality associated with cervical cancer.

Another study reviewed by Ndejjo et al (2016) on the uptake of cervical cancer screening and associated factors among women in rural Uganda concluded that the prevalence of cervical cancer screening is very low in rural Uganda and that interventions to increase uptake of cervical cancer screening should be implemented so as to improve access to the service in rural areas. This was a descriptive cross sectional study carried out in eastern Uganda and utilised quantitative data collection methods.

In Ghana, a study on Cervical Cancer Screening Among College Students in Ghana: Knowledge and Health Beliefs conducted by Abotchie et al, (2009) whose aim was to describe the knowledge and beliefs of women university college students in Ghana found that women were unaware of local screening initiatives and only 7.9% were aware of the link between HPV and cervical cancer. The most prevalent barriers cited were lack of awareness that the purpose of pap screening is to diagnose cancer, concerns about what others may think, and lack of information about how to obtain screening services. The study also found that although women perceived the benefits of screening, only about half perceived themselves to be at risk and these women received few screening cues. The study concluded that new screening programs in Ghana should address these barriers and increase screening cues to the public

2.3 Factors associated with Knowledge of Cervical cancer and Uptake of cervical cancer screening

Regarding factors associated with knowledge levels and uptake of cervical cancer screening, one of the studies reviewed is a study by Ncube et al (2015). This study was conducted in Jamaica and aimed to identify factors associated with Jamaican women's decisions to screen for cervical cancer. This was a cross-sectional descriptive study of 403 women aged 19 years and older from Portland, Jamaica. The study found that 66% had a Papanicolaou (Pap) smear and only 16% had a Pap test within the past year. Significant predictors of uptake of screening were being married, age, parity, discussing cancer with health provider, perception of consequences of not having a Pap smear, and knowing a person with cervical cancer. Women who did not know where to go for a Pap smear were 85% less likely to have been screened

(prevalence odds ratio (POR): 0.15, 95% confidence interval (CI): 0.04, 0.52). This study concluded that there was suboptimal uptake of cervical cancer screening among Jamaican women. Multipronged approaches are needed to address barriers to screening, as well as identify and support conditions that encourage women's use of reproductive health services, thereby reducing incidence and mortality rates from cervical cancer

Ajibola et al (2016) conducted a study on the determinants of Cervical cancer screening Uptake among women in Ilorin, North Central Nigeria: A community-based study. This study assessed the determinants of cervical cancer screening uptake among Nigerian women. This was a cross-sectional study conducted using multistage sampling technique among 338 participants in Ilorin, North Central Nigeria. This study found that only 8.0% of the respondents had ever been screened for cancer of the cervix. The proportion of women who had ever been screened was significantly higher among those who demonstrated positive attitude to screening (81.5%), respondents who were aware of the disease (100.0%), and those who were aware of cervical cancer screening (88.9%). Respondents who had negative attitude had 63% lesser odds of being screened compared to those who had positive attitudes towards screening (AOR; 0.37, 95% CI; 0.01–0.28). The study therefore concluded that there was urgent need to improve the knowledge base and attitude of Nigerian women to enhance cervical cancer screening uptake among them.

A study by Hoque et al (2014) entitled Cervical Cancer Screening among University Students in South Africa: A Theory Based Study, whose aim was to investigate the knowledge and beliefs of female university students in South Africa found that only 15% (22/147) of the students who had ever had sex and had heard about cervical cancer had taken a Pap test. Pearson correlation analysis showed that cervical cancer knowledge had a significantly negative relationship with barriers to cervical cancer screening. Susceptibility and seriousness score were significantly moderately correlated with benefit and motivation score as well as barrier score. The study also found that self-efficacy score also had a moderate correlation with benefit and motivation score. Students who had had a Pap test showed a significantly lower score in barriers to being screened compared to students who had not had a Pap test. The study concluded that educated women in South Africa lack complete information on cervical cancer and that students who had had a Pap test had significantly lower barriers to cervical cancer screening than those students who had not had a Pap test.

The studies reviewed all conclude that uptake of cervical cancer screening is low. Some of the studies show that there was knowledge of cervical cancer however, the knowledge levels may not be adequate. There is a lot of literature on knowledge of cervical cancer and uptake of screening services in the general population, however, there are a few studies conducted in particularly among students as a key population in cervical cancer prevention. The studies reviewed among students show that students were sexually active, with some having multiple sexual partners, however, adequate knowledge of cervical cancer was low among the students coupled with uptake of screening services. The literature above also shows that the majority of the students in most tertiary institutions are in the peak age group for contracting STIs such as HPV which is necessary for the development of cervical cancer, this therefore, prompted the need to conduct this study with the objective of identifying the level of knowledge students have regarding cervical cancer. The researcher hopes the results of the study will help inform cervical cancer programs on targeted health promotion measures that could be implemented with particular focus on the student populace as they are in the high risk age group.

CHAPTER 3: METHODOLOGY

3.1 Design

The study was a quantitative cross-sectional study of full-time female students in three Universities conducted between July 2016 and January 2017.

3.2 Study setting

The study was conducted in 3 Universities in Lusaka, Zambia. Lusaka was selected as the study district because it had the highest number of Universities in the Country. These were sampled from the sampling frame which consists of 11 Universities in Lusaka (Ministry of Higher Education, 2015). The selected Universities were; University of Zambia (Great East road campus) which is the biggest public University and offers programs from Natural sciences, Education and Humanities and social sciences, the University of Lusaka, a privately funded University which offers programs from Business, Humanities and social sciences and natural sciences and the Lusaka Apex Medical University, a privately owned medical University. The location of the three study sites are marked by X in figure 1 below

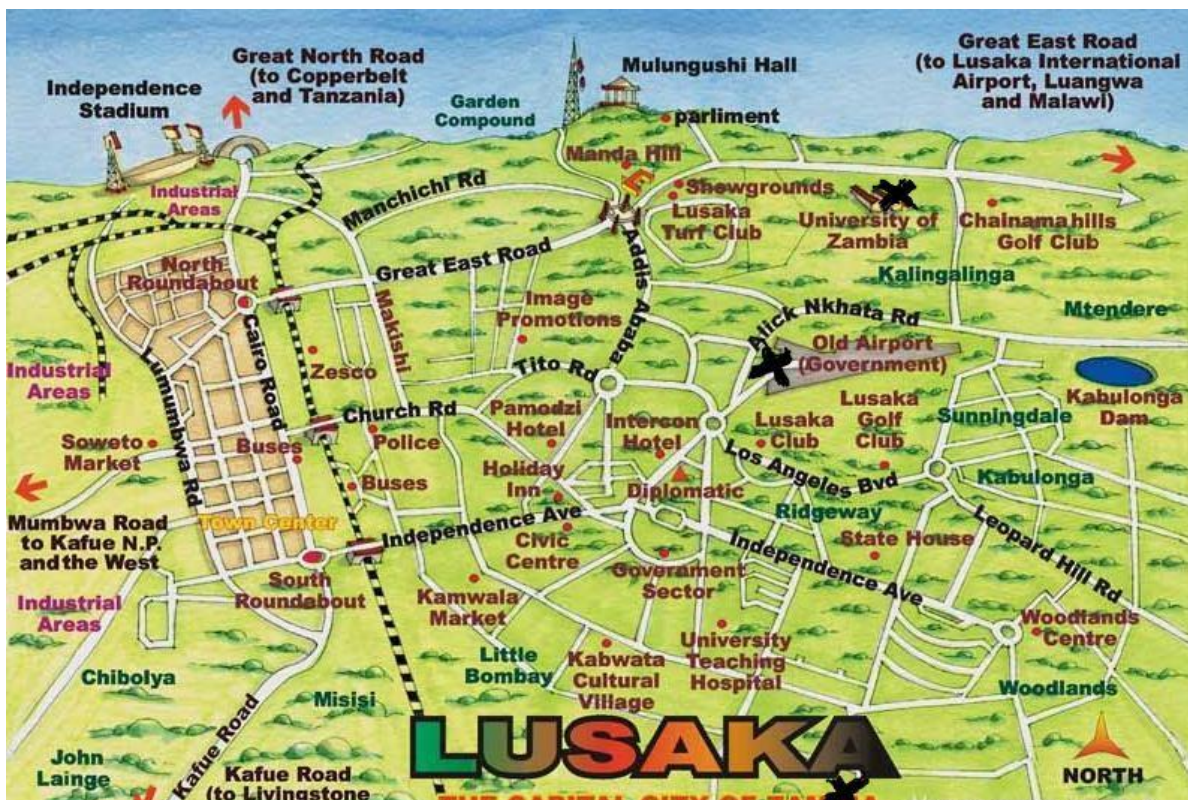


Figure 1: Location of study sites

Source: Google maps

3.3 Study Population

The study targeted full time students from the selected tertiary institutions in Lusaka. This was because full-time undergraduate students were easily accessible in school unlike post graduate students whose availability was not guaranteed at the time of conducting the study.

Some Universities did not have post graduate students and so the selection of undergraduate students made the sample comparable. Students were eligible for inclusion if they were 18 years old and above; and if they were full-time undergraduate female students at these Universities. All students who did not agree to participate in the study were excluded.

3.4 Sampling

3.4.1 Sample size considerations

This study calculated its sample size using Stata v13, it assumed an estimated 42.9% level of knowledge about cervical cancer among female students in similar setting (Hoque et al. 2009). Given the multiplicity of interventions in this area the study anticipated a 55% increase in the level of knowledge and therefore estimated a total of 462 female University students at an 80% power at 5% level of significant using Pearson chi-squared test. Accounting for a non-response rate of 4.2 (CSO, 2015), the study required 481 female students for this study, however this study used a sample of 483 female students

The three Institutions were selected on the basis of having the highest numbers of enrollment from Eleven registered Universities in Lusaka, each Institution was considered a stratum, then after stratified random sampling was used to select the students in each Institution. Three programs were then randomly selected for each school and the school sample was equally distributed among the 3 selected programs. All female students who were attending classes in the aforementioned programs during the study period were eligible for this study, therefore, the researcher sampled female students from the selected programs from each class from the first year students to the fifth year students.

The University of Zambia had the highest female enrollment with 10636, followed by Lusaka Apex Medical University with 10636. Zambia Open University was the third highest with female enrollment, however, most of the students are on distance programs and were unavailable in Lusaka, therefore, University of Lusaka was selected as the third University with the female enrollment at 1395, and each selected institution was considered as a stratum. A proportionate number of students was sampled from each stratum based on student population. Students were identified through their faculties and randomly selected, this information was provided through the school registers and the students were checked for eligibility; being a full-

time undergraduate female student at the school and being 18 years of age or older. The distribution of enrolled participants is shown in Table 1 below.

Table 1: Distribution of Student enrolment by Institution in 2015

University student enrolment by institution and sex-Lusaka(2015)				
		Sex		Total
S/#.	Name	Male	Female	
1	University of Zambia	16067	10636	26703
2	University of Lusaka	1370	1395	2765
3	Lusaka Apex University	1305	1895	3200
4	St. Bonaventure	326	0	326
5	Justo Mwale	163	68	231
6	Cavendish	1167	1078	2245
7	City University	494	656	1150
8	FCE	50	50	100
9	DMI. St. Eugene	117	117	234
10	Zambia Open University	1281	1761	3042
11	Pamodzi University	52	36	88
Total		59876	46510	105420
Selected Universities				
1	University of Zambia	16067	10636	26703
2	University of Lusaka	1370	1395	2765
3	Lusaka Apex University	1305	1895	3200
Total		18742	13926	32668
Sample				
1	University of Zambia	(10636/13926)*483	369	
2	University of Lusaka	(1395/13926)*483	48	
3	Lusaka Apex University	(1895/13926)*483	66	
Total			483	

Source: Ministry of Education (2015)

3.5 Variables and definitions

Dependent variables:

The primary outcome was knowledge about cervical cancer, which adopted a validated cervical Cancer Awareness Measures (CAMs) tool (Simon A E et al, 2011). The cervical CAM is a reliable and valid measure of awareness of risk factors and early symptoms of cervical cancer. The tool used for this study contained 18 question-items related to warning signs, risk factors, age of peak incidence, and awareness of the cervical screening and vaccination programs, confidence in detecting a symptom, and anticipated time to help seeking, a correct response to the questions was given a score of 1 and zero otherwise (See Appendix A). A student was classified as having high knowledge levels if they had an average score of at least 60% (of the 18-item questions correctly) and less knowledgeable otherwise. The secondary outcome was uptake of cervical cancer screening defined as the fraction of female students who reported having ever screened for cervical cancer.

Independent variables include:

Age, residence, marital status, year of study, know anyone with cervical cancer, sexually activeness, number of sexual partners had, age at sexual debut, health facility in School. Table 2 below shows the variable definitions and scale of measurement

Table 2: Definition of Dependent and Independent variables

Variable Type	Operational Definition	Indicator	Scale of Measurement
Dependent Variables			
1. Level of knowledge of Cervical cancer	Cervical cancer is the cancer of the entrance to the womb (uterus)	1. Positive response to questions on Cervical cancer	0= Incorrect response
			1= Correct response
2. Uptake of Cervical cancer screening	Cervical cancer is the cancer of the entrance to the womb (uterus)	1. Number of Students screened for Cervical cancer	Proportion
		2. Number of students screened for Cervical cancer with high knowledge	Proportion
Independent Variables			
1. Socio-Demographic Characteristics			
Age	The length of time a person has lived	1. Age at last birthday	Numeric
Marital status	Civil status of each individual in relation to marriage laws and customs of a Country	1. Single ever married	Nominal
		2. Married	Nominal
		3. Separated/Divorced	Nominal
Residence	Living or dwelling within school campus or outside school campus	1. Number of students living within School campus	Proportion
Know Someone with Cervical cancer	Having contact with anyone who has Cervical cancer	1. Know Someone with Cervical cancer	Nominal
2. Sexual behaviour characteristics			
Sexual activeness	Having participated in sexual intercourse	1. Number of student sexually active	Proportion
Age at sexual debut	Age at which an individual started having sexual intercourse	1. Age of sexual debut	Proportion
Number of sexual partners	The number of people an individual has had sexual intercourse with	1. Number of sexual partners	Numeric
3. Academic Institution related characteristics			
Availability of health facility	Having a facility within campus that attends to the health of the Students	1. Availability of a health facility	Nominal
Years of study	Level of schooling a student has reached in years	1. Year of study	Ordinal

3.6 Data collection tool

Data collection was performed between July 2016 and January 2017. Data was collected using structured questionnaire interview by the researcher and 3 enumerators (See appendix A). Anonymity was maintained as the questionnaires only had a questionnaire ID and no other identifying details. The questionnaire was administered in the English language. Pilot testing of the questionnaire was performed using a sample of 15 female students. Respondents were asked if there were difficulties with questions within the questionnaire. The questions were divided into the following sections (1) Socio-demographic information; (2) Sexual behaviour; (3) Knowledge score questions on risk factors and preventive measures; (4) uptake of cervical cancer services

3.7 Data management and quality assurance

To ensure that data collectors are familiarized with the activities of the study, data collectors underwent thorough training in the use of the data collection tool. Data was collected using a hard copy questionnaire and responses were coded. The coded data was then entered in Ms Excel and all the entered data was counterchecked by the researcher to ensure accuracy of data entry. Data cleaning to check for outliers and inconsistencies were conducted was also done. Data was exported to STATA for data analysis. Electronic data without personal identifiable information (entered quantitative data) was stored in at least two locations at all times to ensure that there was always a back-up available. After the data was collected, the questionnaires and consent forms were given to the researcher and were stored under lock and key to ensure limited access to them.

3.8 Data analysis

Descriptive statistics were used to summarize socio-demographic characteristics using proportions (for nominal scale variables), mean and standard deviation. Chi-square test was used to investigate the association of level of knowledge of cervical cancer and sociodemographic factors such as age, marital status and residence. The significant factors with p -value < 0.05 at bivariate analysis were considered all together to multivariate logistic regression to estimate the independent effect of these factors on odds of knowledge of cervical cancer adjusting for all the other variables significant during bivariate analysis. Variables were first removed if the likelihood p -value was greater than 0.2, the final predictor variables in the model were those with $p < 0.05$. The uptake of cervical cancer screening was analysed in a similar way. All analyses were performed using Stata 13 (StataCorp, College Station, Texas, USA).

3.9 Ethical considerations

Participants were informed about the nature of the study and their role in the study before they were interviewed. Written informed consent was sought from the participants. Participation in the study was made voluntary and no coercion was used. The students were free to terminate the interview or to decline to answer any question as they deemed fit and were assured of no ill effects. The purpose and nature of the study was explained to the study participants and the participants were not remunerated in any way. To ensure privacy and assure confidentiality, the interviews were conducted in a secluded area where the student felt comfortable. Data collected was kept under lock and key accessible to the researcher only, the dataset was password protected using a password known only to the researcher. No information was divulged to any other person in any way that could lead to identification of the student.

Ethical clearance was obtained from University of Zambia Biological Research Ethics Committee (UNZABREC) and permission obtained from the National Health Research Authority (NHRA). Permission was also obtained from Ministry of higher education, and the Administration from the three Universities. As information pertaining to sexual behaviour was very sensitive, participants were feared to not give honest responses, however, this study minimized this by making the questionnaires anonymous and assuring the participants of maintaining confidentiality.

CHAPTER 4: FINDINGS

This section shows the results of the study findings. These results were arranged in the following sections; Socio-demographic and sexual behavioral characteristics of the study population, followed by bivariate and multi variate analysis of the factors associated with both the knowledge of cervical cancer. The last part shows the bivariate and multi variate analysis of the uptake of cervical cancer screening.

4.1 Socio-demographic characteristics

This section shows the distribution of the Socio-Demographic characteristics of the study population

Table 3: Socio-Demographic Characteristics of the Study Population

Variables	Frequency	Percent
Institution (N=483)		
Lusaka Apex Medical University	68	14
University of Zambia	365	76
University of Lusaka	50	10
Residence (N=483) off campus		
off campus	298	62
on campus	185	38
Year of study (N=483)		
1st	118	24
2nd	137	28
3rd	102	21
4th	96	20
5th	30	6
Age Group (N=483)		
18-24	408	84
25-29	61	13
30-34	11	2
35-39	3	1
Mean age 22 Years	Standard deviation	3.076
Marital Status (N=483) Single		
(Never married)	401	83
Married	73	15
Separated/Divorced	9	2

Table 3 above shows that the majority of the students (76%) of the respondents were from the University of Zambia (UNZA), while 14% were from Lusaka Apex Medical University

(LAMU) and 10% from University of Lusaka (UNILUS). The table shows that the majority of the students resided outside School campus (83%). The number of students by year of study was fairly distributed from first year to fourth year (24%, 28%, 21% and 20% respectively), whereas the fifth year students were only 6% of the sample.

Table 3 also shows the distribution of the study participants by age and marital status. The majority of the students were aged between 18-24 (84%). The mean age of the students was 22 Years and standard deviation of 3.076. The majority of the students were also single (83%) with only 15% married and 2% Separated or Divorced

4.2 Sexual Behavior

This section shows the distribution of students' sexual behavior. This section analysed the distribution of the students' sexual history and current sexual practice

Table 4: Sexual behavior characteristics of the students

Variable	Frequency	Percentage
Currently sexually Active (N=483)		
Yes	231	48
No	252	52
Students not currently sexually active but were sexually active prior to the study (N=254)		
Yes	74	30
No	180	70
Age at sexual debut (N=319)		
Below 18	115	36
18-24	188	59
Above 24	16	5
Number of Sexual Partners (N=314)		
1	125	40
2-5	153	49
More than 5	36	11

Table 4 above shows the distribution of student's sexual behavior. The table shows that almost half of the students were sexually active (48%) and slightly over half (52%) of the students said they were not sexually active at the time of the study. Out of the 52% not currently sexually active 15% were previously sexually active in the years prior to the study. Over a quarter (39%) of the Students said their sexual debut was between 18-24 years of age and 32% of them said that they have had between 2-5 sexual partners.

4.3 Knowledge of HPV, Cervical Cancer and Source of information

This section shows knowledge of Cervical cancer and the source of information.

Table 5: Knowledge of Cervical cancer and Source of information on cervical cancer

Characteristics	Frequency	Percentage
Ever heard of HPV (N=483)		71
No	341	
Yes	142	29
Ever heard of Cervical Cancer (N=483)		8
No	38	
Yes	445	92
Source of information		
Media (N=483)		
No	116	24
Yes	365	76
Health facility/Health personnel (N=483)		88
No	427	
Yes	56	12
Lectures (N=483)		
No	400	83
Yes	83	17
Relatives (N=483)		70
No	339	
Yes	144	30
Friends (N=483)		64
No	307	
Yes	176	36

Table 5 above shows that less than a quarter (29%) of the students has heard of HPV, however, the majority (92%) of them had heard of cervical cancer. The table also shows that the majority of the students (76%) heard of cervical cancer from the media, only 12% heard of it from the health facility/health personnel, 17% from the lectures, 30% from their relatives and 36% from their friends

4.4 Cervical cancer Screening

This section shows the distribution of cervical cancer screening practices of the Students

Table 6: Cervical cancer screening practices

Characteristic	Frequency	Percentage
Ever screened for Cervical Cancer (N=483) No	421	87
Yes	62	13
Willing to screen for Cervical Cancer (N=483)		
No	103	21
Yes	289	60
Don't Know	91	19
Willing to pay for screening (N=483) No	212	44
Yes	195	40
Don't Know	76	16

Table 6 above shows that the majority (87%) of the students have never screened for cervical cancer, however, 60% of them were willing to go for screening. When asked if they would be willing to pay for the screening services, only 40% said they were willing to pay while 44% of them were not.

4.5 Association between socio-Demographic characteristics and the Outcome Variables

This section shows the association between the socio-Demographic and behavioral characteristics and the two independent variables; Level of knowledge of cervical cancer and Uptake of cervical cancer screening

Table 7: Socio-Demographic and Sexual behavior characteristics associated with the level of knowledge of cervical cancer

Characteristics	Number of participants	Number (%) with high level knowledge	P-Value
Institution			
University of Zambia	365	4 (1)	<0.001
Lusaka Apex Medical University	68	41 (60)	
University of Lusaka	50	0	
Age Group			
18-24	408	25 (6)	<0.001
25-29	61	13 (21)	
30-34	11	5 (45)	
35-39	3	2 (67)	
Marital Status			
Single	401	24 (6)	<0.001
Married	73	18 (25)	
Separated/divorced	9	3 (33)	
Residences			
Outside campus	298	13 (4)	<0.001
Within campus	185	32 (17)	
Year of Study			
1st	118	4 (4)	<0.001
2nd	137	9 (7)	
3rd	102	8 (8)	
4th	96	13 (14)	
5th	30	11 (37)	
Currently Sexually active			
No	252	20 (8)	0.276
Yes	231	25 (11)	
Age at sexual debut			
Below 18	115	11 (10)	0.001
18-24	188	18 (10)	
Above 24	16	6 (38)	
Health facility in school			
No	72	3 (4)	0.236
Yes	388	39 (10)	
Don't Know	23	3 (13)	
Know anyone with Cervical cancer			
No	405	31 (8)	0.004
Yes	78	14 (18)	

Table 7 above shows that there was a strong association between the University a student belonged to and the level of knowledge of cervical cancer ($P < 0.001$), almost all of the students from UNZA had low knowledge levels with only 1% of them having high knowledge level and all the students from the UNILUS had low knowledge level. However, most of the students from LAMU had high knowledge level (60%) of cervical cancer.

The table also shows that there was a strong association between age group and the level of knowledge ($P < 0.001$). Students in the higher age groups had higher knowledge levels as compared to those in the younger age group. There was also a strong relationship between marital status and knowledge levels ($P < 0.001$). The students who were married and those that were separated/divorced seemed to have higher knowledge as compared to the ones that were single.

There was a strong association between residence and level of knowledge and also between year of study and level of knowledge ($P < 0.001$). The students who were residing in school were relatively more knowledgeable as compared to those from outside the school campus and students in the higher years of school also had high knowledge level as compared to those in the lower years

Regarding sexual activeness, the table shows that there was no association between the student being sexually active and level of knowledge ($P = 0.276$), however, there was a strong association between age of sexual debut and level of knowledge ($P = 0.001$). There was no association between having a health facility on school campus and level of knowledge ($P = 0.236$).

Table 7 further shows that there was an association between knowing someone with cervical cancer and having high knowledge of cervical cancer ($P = 0.004$).

Table 8: Socio-Demographic and Sexual behavior characteristics associated with Uptake of cervical cancer screening

Characteristics	Number of participants	Number (%) with high level knowledge	P-Value
Institution			
University of Zambia	365	35(10)	<0.001
Lusaka Apex Medical University	68	18(26)	
University of Lusaka	50	9(18)	
Age Group 18-			
24	408	38(9)	<0.001
25-29	61	17(28)	
30-34	11	5(45)	
35-39	3	2(62)	
Marital Status			
Single	401	37(9)	<0.001
Married	73	21(29)	
Separated/divorced	9	4(44)	
Residences			
Outside campus	298	28(9)	0.004
Within campus	185	34(18)	
Year of Study			
1st	118	5(4)	<0.001
2nd	137	16(12)	
3rd	102	16(16)	
4th	96	14(15)	
5th	30	11(37)	
Currently Sexually active			
No	252	14(6)	<0.001
Yes	231	48(13)	
Age at sexual debut			
Below 18	115	19(17)	<0.001
18-24	188	30(16)	
Above 24	16	7(44)	
Health facility in school			
No	72	9(13)	0.822
Yes	388	51(13)	
Don't Know	23	2(9)	
Know anyone with Cervical cancer			
No	405	36(9)	<0.001
Yes	78	26(33)	

Table 8 above shows that there was a strong association between the University a student belonged to and uptake of cervical cancer screening ($P < 0.001$). The table also shows that there was a strong association between age group and uptake of cervical cancer screening ($P < 0.001$). There were more students in the higher age groups who had screened for Cervical cancer. There was also a strong relationship between marital status and knowledge levels ($P < 0.001$).

There was an association between residence and uptake of cervical cancer screening ($P < 0.004$). The table also shows a strong relationship between year of study and screening for cervical cancer ($P < 0.001$), more students in higher years of study had screened for cervical cancer.

Regarding sexual activeness, the table shows that there was a strong association between the student being sexually active and uptake of cervical cancer screening ($P < 0.001$), and a strong association between age of sexual debut and cervical cancer screening ($P < 0.001$). The table however shows that there was no association between having a health facility on school campus and uptake of cervical cancer screening ($P = 0.822$).

Table 8 further shows that there was a strong association between knowing someone with cervical cancer and screening for cervical cancer ($P < 0.001$).

4.6 Impact of Socio-Demographic and behavioral characteristics on the level of knowledge of Cervical cancer

This section quantifies the impact of the socio-demographic and behavioral characteristics associated with the level of knowledge.

At multivariate logistic regression, the independent effect of Socio-demographic factors on odds of knowledge of cervical cancer and uptake of cervical cancer screening was analysed adjusting for all the other variables. Using stepwise logistic regression, variables were first removed if the likelihood p-value was greater than 0.2, these variables are bolded.

Table 9: Characteristics associated with level of knowledge about cervical cancer among female university students

Characteristics	Unadjusted Odds Ratio (95% CI)	P-value
Age Group		
18-24	1	
25-29	4.150(1.990 - 8.647)	0.001
30-34	12.767(3.643 - 44.733)	0.001
35-39	30.64(2.685 - 349.540)	0.006
Marital Status		
Single	1	
Married	5.141(2.621 - 10.081)	0.001
Seperated/Divorced	7.854(1.849 - 33.350)	0.005
Residence		
Outside campus	1	
Within campus	4.585(2.34 - 8.10)	0.001
Year of Study		
1st	1	
2nd	2.004(0.601 - 6.683)	0.258
3rd	2.426(0.708 - 8.3058)	0.158
4th	4.464(1.405 - 14.180)	0.011
5th	16.50(4.760-57.199)	0.001
Currently Sexually active		
No	1	
Yes	1.408(0.756 - 2.610)	0.277
Age at sexual debut		
Below 18	1	
18-24	1.001(0.455 - 2.203)	0.998
Above 24	5.673(1.730 - 18.603)	0.004
Number of Sexual Partners		
1	1	
2-5	2.164(0.958 - 4.889)	0.063
>5	1.611(0.465 - 5.573)	0.451
Health facility in school		
No	1	
yes	2.570(0.772 - 8.554)	0.124
Know anyone with Cervical cancer		
No	1	
Yes	2.639(1.331 - 5.233)	0.005

Table 9 shows characteristics associated with level of knowledge. Unadjusted ratios show that students in the higher age groups were more likely to have high knowledge of cervical cancer as compared to those in the age group 18-24. Students in age group 24-25 were 4.15 times more likely to have high knowledge as compared to those aged 18-24 (95% CI: 1.99 - 8.64), while students aged 30-34 were 12.76 times more likely to have high knowledge as compared to those aged 18-24 (95% CI: 3.64- 44.73) and those aged 35-39 were 30.64 times more likely to have high knowledge as compared to those aged 18-24 (95% CI: 2.68- 349.54).

Table also shows that unadjusted for other factors, married students were 5.14 times more likely to have high knowledge of cervical cancer as compared to the single students (95% CI: 2.62 - 10.08) while separated and divorced students were 7.85 times more likely to have high knowledge of cervical cancer than those who were single (95% CI: 1.84 - 33.35). Students that resided on campus were 4.58 times more likely to have high knowledge of cervical cancer as compared to those who resided outside campus (95% CI: 2.34 - 8.10).

Table 9 shows that without adjusting for other factors, there was no association between students in 2nd and 3rd year of study and the level of knowledge of cervical cancer. Students in 4th year were 4.46 times more likely to have high knowledge of cervical cancer as compared to those who were in 1st year (95% CI: 1.40 - 14.18) and students in 5th year of study were 16.50 times more likely to have high knowledge of cervical cancer as compared to those in first year, however, that is at a high confidence interval (95% CI: 4.76-57.19). There was no statistically significant association between students being currently sexually active and level of knowledge. Students whose sexual debut was above 24 years were 5.67 times more likely to have high knowledge of cervical cancer as compared to those whose sexual debut was below 18 (95% CI: 1.73 - 18.60).

The table shows that there is no statistically significant association between number of sexual partners and level of knowledge and no association between having a health facility in school and level of knowledge. However, students who knew someone who had cervical cancer were 2.63 times more likely to have high knowledge of cervical cancer as compared to those who didn't (95%: 1.33 - 5.23).

Table 10: Predictors level of knowledge about cervical cancer among female university students

Predictors of level of knowledge	AOR (95% CI)	P-value
Residence		
Outside campus	1	
Within campus	4.34(1.97-9.54)	<0.001
Year of Study		
1st	1	
2nd	1.865(0.565-7.852)	0.331
3rd	2.106(0.564-7.852)	0.267
4th	3.588(0.966-13.322)	0.056
5th	7.338(1.521-35.410)	0.013
Currently Sexually active		
No	1	
Yes	0.32(0.12-0.88)	0.026
Health facility in school		
No	1	
Yes	7.12(1.63-31.12)	0.009

Table 10 above also shows the adjusted characteristics associated with the level of knowledge. Only a few variables had a significant association to the level of knowledge in the final model; Students who resided within School campus were 4.34 times more likely to have high knowledge of Cervical cancer as compared to those who resided outside School campus (95% CI: 1.979.54). Students who were in their 5th year of study were 7.33 times more likely to have high level of knowledge of cervical cancer as compared to those in the first year, however, that is at a high confidence interval (95% CI: 1.52-35.41). The table also showed that students who were sexually active at the time of the study were 0.32 times less likely to have high level of knowledge as compared to those who were not (95% CI: 0.11-0.87). Students who said they had a health facility within School campus were 7.11 times more likely to have high knowledge of Cervical cancer as compared to those who didn't (95% CI: 1.62-31.12).

4.7 Impact of Socio-Demographic and behavioral characteristics on uptake of Cervical cancer screening

This section quantifies the impact of the socio-demographic and behavioral characteristics associated with the level of knowledge.

Table 11: Characteristics associated with uptake of cervical cancer screening among female university students

Characteristics	Unadjusted Odds Ratio (95% CI)	P-value
Age Group		
18-24	1	
25-29	3.76(1.96-7.21)	<0.001
30-34	8.11(2.36-27.84)	0.001
35-39	19.47(1.72-219.78)	0.016
Marital status		
Single	1	
Married	3.97(2.16-7.30)	<0.001
Single/Divorced	7.87(2.02-30.59)	0.003
Residence		
Outside campus	1	
Within campus	2.17(1.26-3.71)	0.005
Year of Study		
1 st	1	
2 nd	2.98(1.06-8.42)	0.038
3 rd	4.20(1.48-11.92)	0.007
4 th	3.85(1.33-11.13)	0.013
5 th	13.08(4.08-41.88)	<0.001
Sexually active		
No	1	
Yes	4.45(2.38-8.33)	0.001
Age at sexual debut		
Below 18	1	
18-24	0.95(0.51-1.79)	0.897
Above 24	3.93(1.30-11.84)	0.015
Number of Sexual partners		
1	1	
2-5	1.61(0.84-3.07)	0.146
>5	1.53(0.58-4.04)	0.388
Health facility in school		
No	1	
Yes	1.05(0.49-2.26)	0.881
Know anyone with Cervical cancer		
No	1	
Yes	5.12(2.86-9.17)	0.001
Level of Knowledge of Cervical cancer		
Low	1	
High	5.97(3.04-11.69)	0.001

Table 11 above shows that unadjusted odds ratio of students in higher age groups have higher odds of screening for cervical cancer as compared to those in the age group 18-24. Students aged 25-29 were 3.76 times more likely to screen for cervical cancer as compared to those aged 18-24 (95% CI: 1.96 - 7.21). Students aged 30-24 were 8.11 times more likely to screen for cervical cancer as compared to those aged 18-24 (95% CI: 2.36 - 27.84). Students aged 35-39 were 19.47 more likely to screen for cervical cancer as compared to those aged 18-24, this however is at a very high confidence interval (95% CI: 1.72 - 219.78).

Unadjusted for other factors, students who were married were 3.97 times more likely to screen for cervical cancer as compared to those who were single (95% CI: 2.16 - 7.30). Students who were separated or divorced were 7.87 times more likely to screen for cervical cancer as compared to students who were single, this is however at a high confidence interval (95% CI: 2.02 -30.59). The table also shows that students who resided on campus were 2.17 more likely to screen for cervical cancer as compared to those who resided outside campus (95% CI: 1.26 - 3.71).

Table 11 shows that unadjusted for other factors, 2nd year students were 2.98 times more likely to screen for cervical cancer as compared to 1st year students (95%:1.06 - 8.42) whereas 3rd and 4th year students were 4.20 and 3.85 times more likely to screen for cervical cancer as compared to those in 1st year (95% CI: 1.48 - 11.92 and 1.33 - 11.13) respectively. The 5th year students were 13.084 times more likely to screen for cervical cancer than those in 1st year, this is however at a very high confidence interval (95% CI: 4.08 - 41.88).

The table also shows that unadjusted for other factors, students who were sexually active were 4.45 times more likely to screen for cervical cancer as compared to those who weren't (95% CI: 2.38 - 8.36). Students whose sexual debut was above 24 were also 3.93 times more likely to screen for cervical cancer as compared to those whose sexual debut was below 18 (95% CI: 1.30 - 11.85). The table shows that there was no significant association between the number of sexual partners and uptake of screening, it also shows that there was no association between having a health facility in school campus and screening for cervical cancer. Students who knew someone with cervical cancer were 5.12 times more likely to screen for cervical cancer as compared to those who didn't (95% CI: 2.86 - 9.17) and students who had high knowledge of cervical cancer were 5.97 times more likely to screen for cervical cancer as compared to those with low knowledge (95% CI: 3.04 - 11.69)

Table 12: Predictors cervical cancer screening among female university students

Predictors of uptake of screening	AOR (95% CI)	P-value
Year of Study		
1st	1	
2nd	2.297(0.769-6.861)	0.136
3rd	3.263(1.077-9.879)	0.036
4th	1.786(0.555-5.743)	0.331
5th	4.502(1.199-16.902)	0.026
Sexually active		
No	1	
Yes	2.31(1.00-5.30)	0.049
Know anyone with Cervical cancer		
No	1	
Yes	4.22(2.21-8.09)	<0.001
Level of Knowledge of Cervical cancer		
Low	1	
High	3.83(1.70-8.62)	0.001

Table 12 above also shows adjusted variables associated with uptake of Cervical cancer. There were only a few variables that were in the final model. Students who were in 3rd year of their studies were 3.26 times more likely to screen for cervical cancer as compared to those who were in first year (95% CI: 1.07-9.87). Students in 5th year were also 4.50 times more likely to screen for cervical cancer as compared to those in first year (95% CI: 1.19-16.90).

Students who were sexually active were 2.30 more likely to screen for cervical cancer (95% CI:1.00-5.29). Students who knew someone with Cervical cancer were 4.22 times more likely to screen for cervical cancer as compared to those who didn't (95% CI: 2.20-8.08). The table also shows that Students with high knowledge of cervical cancer were 3.83 times more likely to screen for cervical cancer as compared to those with low knowledge (95% CI: 1.70-8.62)

CHAPTER 5: DISCUSSION, CONCLUSION, RECOMMENDATIONS AND LIMITATIONS

5.1 Discussion

This study sought to establish the knowledge of cervical cancer and uptake of cervical cancer screening services among female students from selected Universities in Lusaka.

Knowledge of Cervical cancer

The study found that the majority of the students had never heard of HPV, and over 90% of them had heard of cervical cancer. However, regarding the level of knowledge of cervical cancer, the majority of the students had low knowledge levels with only 9% having high knowledge levels. This is cause for concern as almost half of the students interviewed were sexually active and therefore at risk of contracting sexually transmitted infections such as HPV. There is need for the students to have adequate knowledge of cervical cancer in an attempt to influence the uptake of preventive measures.

This finding is also consistent with other studies such as Vail-Smith and White (1992) that surveyed 263 sexually active college women and concluded that these women lacked awareness of HPV, were at risk for contracting the infection, and were not practicing preventive behaviors to reduce their risk. Kalau (2012) also found that awareness of cervical cancer was high (95%) but knowledge of its risk factors and preventive measures was low. Durowade et al (2013) also reported that only 59 (29.5%) respondents had some knowledge of symptoms of cervical cancer with 9 (4.5%) of them having good knowledge. Also, 53 (26.5%) had appreciable knowledge of the risk factors with only 20 (10.0%) of them demonstrating good knowledge. This indicates that generally there is a low level of knowledge of cervical cancer and utilization of screening tests among the general population and particularly the student populace. Therefore, there is need to consider improving awareness of the programme targeted at these women to further their knowledge by educating students about risk factors for cervical cancer and practicing preventive behaviour.

The low knowledge of the Pap smear test could thus be due to a low level of knowledge of the benefits of the test and prevention of cervical cancer.

Cervical Cancer Screening

This study found that only 13% of the students had screened for cervical cancer. Over half of the students were willing to go for screening, however, only 40% of them were willing to pay for screening. However, the cervical cancer screening policy in Zambia is from the age of 25, given that most of the students were below the age of 25 and having the mean age of 22years, this could explain the number of students that had taken up the service. These results are similar to the findings from other studies, Hoque M et al (2014) reported that only 15% (22/147) of the students in South Africa who had ever had sex and had heard about cervical cancer had taken a Pap test. Al-Nagger (2010) reported that the prevalence of ever having had a Pap test among University Students in Malaysia was 6%. Abotchi P (2010) also reported that the prior pap screening rate was 12.0% in Ghanaian women, women were unaware of local screening initiatives and only 7.9% were aware of the link between HPV and cervical cancer.

Characteristics associated with Knowledge of Cervical cancer and Uptake of Screening

Residing within School campus and having a health facility within School campus had a positive significant association to the level of knowledge. Students who resided within School campus had higher odds of having high knowledge levels. This study found that there was an association between students who were sexually active and the level of knowledge on cervical cancer, this association was negative meaning that students who were sexually active at the time of the study were less likely have high knowledge, this poses as a big concern because this study found that the majority of the students were aged between 18-24 and over half of the students were sexually active with a considerable number of them have had more than 1 sexual partner (Table 5; Page 19). This is consistent with findings from different studies such as Hoque.E & Hoque.M (2009) who found that 51.2% respondents were sexually active and 19.2% had multiple sex partners. Another study conducted among undergraduate students in Nigeria found that 54% were sexually active and 43% had multiple sex partners (Omoteso BA 2006), whereas a study conducted in Uganda found that 70% of the students were sexually active (Sekirime WK et al 2001)

Having a health facility in school was also a predictor of the level of knowledge, this therefore shows that health professionals have a role to play in promoting health education regarding cervical cancer. Sandfort et al (2009) found that respondents preferred to get information on sexual health from a health professional and not the media, however, the media play a big role in raising awareness and therefore, media campaigns should be considered as these could work best in promoting cervical cancer knowledge, its risk factors and screening programs available.

Ncube et al (2015) found that discussing cancer with health provider was a significant predictor of uptake of cervical cancer screening among Jamaican women. In this study, most of the students heard of cervical cancer from the media (76%) while only 12% heard of cervical cancer from the health facility/health personnel. This shows that the Health facilities on school campuses may not have health education programs targeting at raising awareness and knowledge levels of the students on cervical cancer. The institutions health centers have a critical role to play in raising awareness about cervical cancer among the student populace. Healthcare workers at the clinic can educate healthcare users, targeting the risk population on risk factors for cervical cancer. This can improve the university community's knowledge of cervical cancer and their screening practices. This study found that most of the undergraduate students sampled were below the required age for cervical cancer screening, therefore awareness raising campaigns aimed at increasing the knowledge of cervical cancer are critical. The study, however found that students who were sexually active were more likely to screen for cervical cancer. This is a good indication as shown above that a large number of students were sexually active. Knowing someone with cervical cancer was a significant predictor of uptake of cervical cancer screening, this is consistent with a study conducted by Ncube et al (2015) in Jamaica.

This study also endeavored to investigate the knowledge of cervical cancer in influencing uptake of screening. The findings from this study show that students who had high knowledge of cervical cancer also were more likely to screen for cervical cancer as compared to those with low knowledge, this therefore shows that raising awareness of this disease is likely to improve the screening practices of the students and in turn reduce the incidences of the disease. This is consistent with some studies like Abotchi P et al (2010) who reported that lack of awareness that the purpose of pap screening is to diagnose cancer and lack of information about how to obtain screening services were some of the barriers associated with Cervical cancer screening among women in Ghana. Hoque et al (2014) also reported that cervical cancer knowledge had a significantly negative relationship with barriers to cervical cancer screening

5.2 Conclusion

Furthermore, cancer of the cervix was declared an AIDS-defining condition in 1993 because of its association with HIV and AIDS (Serraino, 1999)

This study concluded that Students are aware of cervical cancer, however, their level of knowledge regarding risk factors and preventive measures is very low. This showed that awareness messages on cervical cancer and its prevention to the Public are not adequate in these institutions, this is a gap that needs to be highlighted because a large number of women in Universities are sexually active and henceforth a key population to focus on regarding cervical cancer prevention. The majority of the students are too young to be included into the cervical cancer screening which begins at 25 years in Zambia. The university should thus concentrate on intensifying Information, Education and Communication (IEC) on cancer of the cervix and its prevention. This can improve the University community's knowledge of cervical cancer, informing students about the risk factors for cervical cancer and strategies to prevent transmission of the HPV virus, this could consequently improve uptake of screening as the findings show that students with higher knowledge were more likely to screen for cervical cancer

5.3 Recommendations

The Ministry of health should put up deliberate strategies to increase awareness targeted at young women. This study found that most of the students who had heard of Cervical cancer, got the information from the media, therefore, the Ministry can intensify use of the media for cervical cancer sensitization

University institutions should include cervical cancer programs in health promotion. Since most of the students are below 25, Universities should thus concentrate on informing students about the risk factors for cervical cancer and strategies to prevent transmission of the HPV virus. This study also found that students who resided on school campus were more likely to have high knowledge as compared to those who resided outside campus, therefore, the Institutions should come up with more ways of improving knowledge transmission to the students who reside outside the School campus as most of the Institutions do not have adequate accommodation within campus

University institutions should also ensure the health workers at the health facilities in their institutions play a role in educating the students on cervical cancer risk factors and prevention. This study showed that very few students received cervical cancer related information from the health facilities.

Certain provisions such as reading materials on Cervical cancer should be made available for female students when attending health clinics at the University for any condition. This could also be incorporated in other programs such as Sexual reproductive health education or HIV/AIDS education which are incorporated in most health programs

The University institutions in collaboration with the Ministry of Health should put up screening programs at certain times during the school calendar to ensure that students can assess the screening services within school campus.

5.4 Limitations

This study finding were based on a cross-sectional design therefore should be interpreted with some limitations. The data collected was also from self-reported response. The study was conducted in three Universities in Lusaka and only included undergraduate students. Post graduate students were not included, therefore, this presented a missed opportunity to get the perspective of these students. The study employed both probability and non-probability sampling techniques therefore, the findings may not be fully representative of the entire student population. The results should be treated as association not as causational. The study findings should also be interpreted with caution because the variables related to sexual activity were self-reported

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APPENDICES

Appendix 1:

Information Sheet

Title of Study: KNOWLEDGE OF CERVICAL CANCER AND UPTAKE OF CERVICAL CANCER SERVICES AMONG FEMALE STUDENTS FROM SELECTED UNIVERSITIES IN LUSAKA

Introduction

Dear Participant,

I am a researcher with the University of Zambia. Thank you for agreeing to participate in this study whose aim is to determine the knowledge of cervical cancer in influencing uptake of cervical cancer screening among female students from selected Universities in Lusaka.

The purpose of the study

Cervical cancer though preventable is a serious public health problem. Cervical cancer ranks as the 1st most frequent cancer among women in Zambia and the 1st most frequent cancer among women between 15 and 44 years of age, and 4.4 million women aged 15 years and older are at risk of developing this disease, therefore I am conducting this study in order to assess the knowledge and screening of cervical cancer in order to inform policy on how best to improve cervical cancer programs

Procedures and processes involved in participating

In terms of procedure, I am asking to speak to female undergraduate students in your institution who are aged above 18. I would like to ask your questions on cervical cancer, sexual practices and screening for cervical cancer. These questions will last no more than 25 minutes

Confidentiality

All the information you provide will be treated as strictly confidential. The research information will be disseminated to the relevant authorities with no direct link to you; anonymity shall be maintained at all times.

Discomfort that you might experience as a participant

I understand some questions may make you feel uncomfortable, should this happen, we want you to know that you do not have to answer any question or take part in the interview if you feel the questions make you uncomfortable. If you feel uncomfortable at any point during the interview, you can decide to pause or stop the interview at that time – it is completely up to you to decide this and to indicate to me, as the interviewer, that you wish to pause or stop the interview process.

Potential benefits for you and the community in relation to your participation

It is hoped that through your participating in this study, I will be able to produce rich and valuable information that will help in addressing issues surrounding cervical cancer knowledge and screening. You will not be paid for participating in this study. Please seek clarification where you do not understand.

Appendix 2:

INFORMED CONSENT FOR PARTICIPANTS

The purpose of the study has been adequately explained to me and I understand the aim, benefits, risks and confidentiality of the study. I further understand that if I agree to take part in this study, I can withdraw at any time without having to give an explanation and that taking part in this study is purely voluntary.

I _____ (Names)

Consent to participate in this study

Signed; _____ date; _____ (Participant)

Signed; _____ date; _____ (Witness)

Name of the interviewer; _____

Signed; _____ date; _____

A. CONTACT PERSONS

1. Kutha Banda , University of Zambia, School of Medicine. Mobile Phone: +260 979142603
2. The Chairperson, University of Zambia Biomedical Research Ethics Committee, University of Zambia, P O Box 32379, LUSAKA

Appendix 3:

Questionnaire

THE UNIVERSITY OF ZAMBIA

SCHOOL OF MEDICINE

DEPARTMENT OF PUBLIC HEALTH

**TOPIC: KNOWLEDGE OF CERVICAL CANCER AND UPTAKE OF CERVICAL
CANCER SERVICES AMONG FEMALE UNIVERSITY STUDENTS IN LUSAKA**

QID:

DATE OF INTERVIEW:

PLACE OF INTERVIEW:

NAME OF INTERVIEWER:

INSTRUCTIONS FOR THE INTERVIEWER

- 1. Introduce yourself to the respondent.**
- 2. Explain the reason for the interview.**
- 3. Do not write the name of the respondent on the interview schedule**
- 4. Circle the response to the question or fill in the answer on the space provided.**
- 5. Assure the respondent of confidentiality and anonymity.**

SECTION A: DEMOGRAPHIC DATA

1. Age at last birthday

2. Marital status

0. Single

1. Married

2. Seperated/Divorced

3. Where do you reside during academic sessions?

1. On campus

2. Off campus

4. Year of study

1. First

2. Second

3. Third

4. Fourth

5. Above Fourth

SECTION B: BEHAVIOUR/LIFESTYLE

5. Are you currently sexually active?

1. Yes

2. No

If no skip to Q10

6. If no to Q5, were you sexually active in the years before this study

1. Yes

2. No

If no skip to Q10

7. If yes to Q5&6, at what age did you first have sex?

1. below 18

2. 18-24

3. above 24

8. How many sexual partners have you have had?

1. 1

2. 2-5 3. >6

9. Have you ever had sex with someone more than 10 years older than you?

1. Yes

2. No

SECTION C: KNOWLEDGE OF CERVICAL CANCER

10. Is there a health facility at your school?

1. Yes

2. No

88. Don't know

11. Have you heard of Human Papillomavirus?

1. Yes

2. No

12. Have you heard of cancer of the cervix?

1. Yes

2. No

13. Do you know anyone with cervical cancer?

1. Yes

2. No

14. If yes, what is the source of information. (Circle all applicable). 1- yes, 0- No

--	--

1. Media

2. Health personnel/Health facility

3. Lecturers/Class

--	--

4. Relatives

--	--

5. Friends

--	--

6. Others, Specify _____ *Knowledge*

--	--

score Questions:

--	--

15. What are the possible signs and symptoms of cancer of the cervix?

1. Bleeding in between periods

2. Pain in the cervix regularly

3. Constant Water discharge

--	--

16. What would you do in case of vaginal bleeding between periods?

--	--

1. Consult a doctor

--	--

2. Wait for it to stop

3. Others, Specify _____

--	--

17. Is cervical cancer treatable?

1. Yes

2. No

88. Don't know

--	--

18. At what stage can cancer of the cervix be treatable?

1. At early stage

2. In late stage

88. Don't know

19. Who is at risk of developing cancer of the cervix?

1. All women

2. Married women

3. Young women

4. Women sexually active

88. Don't know

20. Are some of these below risk factors of cervical cancer? Circle all applicable (1-Yes, 0-No)

1. Multiple Sexual partners

2. Low immunity due to HIV/AIDS

3. Smoking

4. Starting sex early

5. Having sexually transmitted diseases

21. Around what age range is someone most likely to develop cervical cancer?

1. 15-29

2. 30-49

3. 50+

22. Can cancer of the cervix be prevented?

1. Yes

2. No

3. Don't know

23. If YES to question 16, how can cancer of the cervix be prevented?

- 1. Seek Pap smear services
- 2. Have Sexually transmitted infections treated early
- 3. Sticking to one Sexual partner

--	--

- 1. Vaccination
- 2. Others, specify _____

--	--

Cervical cancer in Zambia

--	--

24. At what stage can someone get vaccination for cervical cancer in Zambia?

--	--

- 1. 1-8 years
- 2. 9-13 years
- 3. 15- 20 yeas
- 4. above 20 years

--	--

25. At what stage can someone start screening for cervical cancer in Zambia?

- 1. 15-24 years
- 2. above 24 years

SECTION C: UPTAKE OF CERVICAL CANCER SCREENING

--	--

26. When was your last gynecological exam?

- 1. Less than a 2 years ago
- 2. More than 2 years ago
- 3. Never

--	--

27. Do you use chemicals or plants for your intimate care?

- 1. Yes
- 2. No

28. Have you ever screened for cervical cancer?

--	--

- 1. Yes
- 2. No

29. Are you willing to screen for cervical cancer?

1. Yes

2. No

88. Don't know

--	--

--	--

30. Are you willing to pay for a cervical cancer?

1. Yes

2. No

88. Don't know

--	--

31. Do you have daughters?

1. Yes

2. No

32. If you yes to Q24, would you allow your daughter get vaccinated with the HPV vaccine?

1. Yes

2. No

88. Don't know

--	--

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**I HAVE COME TO THE END OF THE INTERVIEW. THANK YOU FOR
YOUR PARTICIPATION**