KNOWLEGDE OF UNIVERSITY OF NAIROBI REGISTRARS WORKING IN KENYATTA NATIONAL HOSPITAL TOWARDS THE HUMAN PAPILLOMA VACCINE IN ADOLESCENTS.

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DECLARATION

This thesis is my original work and has not been presented for the award of a degree in any other university.

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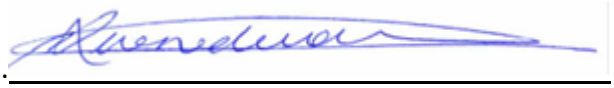
Signed: …  Date: …..04/08/2020.....

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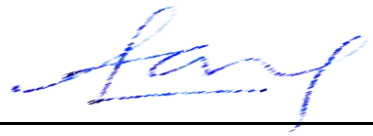
Signed:  Date: ……04/08/2020……

COLLABORATING INSTITUTIONS

The University of Nairobi

Kenyatta National Hospital

DEFINITIONS

Registrar /Resident – a medical doctor who is receiving advanced training in a specialist field of medicine in order to eventually become a consultant

Vaccine hesitancy– a delay in acceptance or refusal of vaccines despite availability of vaccination services.

ABBREVIATIONS

DVI – Division of Vaccines and Immunisations

HPV – Human papilloma virus

HPVv – Human papilloma virus vaccine

KNH – Kenyatta National Hospital

UoN – University of Nairobi

WHO – World Health Organization

MOH – Ministry of Health

MMed – Masters of medicine

OB & GYN - Obstetrics and Gynaecology

MST – Medical Specialist Trainee

Via/Vili - Visual inspection of the cervix, using acetic acid (**VIA**) or Lugol's iodine (**VILI**)

LIST OF TABLES

LIST OF FIGURES

TABLE OF CONTENTS

ABSTRACT

Background: The Human Papilloma Virus (HPV) is an asexually transmitted viral infection affecting men and women. HPV has been strongly associated with cervical, oral, pharyngeal and anal, cancers. Cervical cancer is the leading cause of cancer related deaths with over 70% of cases attributed to oncogenic HPV. With the advent of the Human Papilloma Virus Vaccine, there has been a significant decline in HPV related conditions. There is strong evidence that a healthcare worker's knowledge and attitude towards a vaccine is a key determinant to whether or not they recommend it for use to patients and subsequent uptake (1). Post-graduate medical doctors (Registrars) in KNH spend a significant amount of time interacting with patients and their parents and are well placed in providing information about and addressing any concerns that may arise concerning the HPV vaccine.

Objective: To determine the knowledge of the UON registrars working at KNH on the HPV vaccines as prospective key players in the implementation of the HPV vaccine.

Study design: A cross-sectional survey among registrars working in Kenyatta National Hospital.

Methods: Data was collected through a self-administered pretested digital questionnaire. The participants were registrars in all wards and outpatient clinical areas in the department of Internal Medicine (IM), Obstetrics and gynaecology (Obs & Gyn), Paediatrics and Child health (PCH) and Surgical disciplines.

Data analysis: Bivariate and multivariable analysis was carried out to relate HPV vaccine knowledge attitude and practice with socio-demographic characteristics.

Main outcome measures: to ascertain the knowledge and attitude of UON registrars towards the HPV vaccine.

Results: The overall proportion of all the participants that had good knowledge was 33(37.1%) The proportion of residents with good knowledge (overall score >75%) was OBS & GYN at 58.1% (18/31), IM 31.3% (5/16), PCH30.4% (7/23) and Surgery at 15.8% (3/19) [p=0.02].

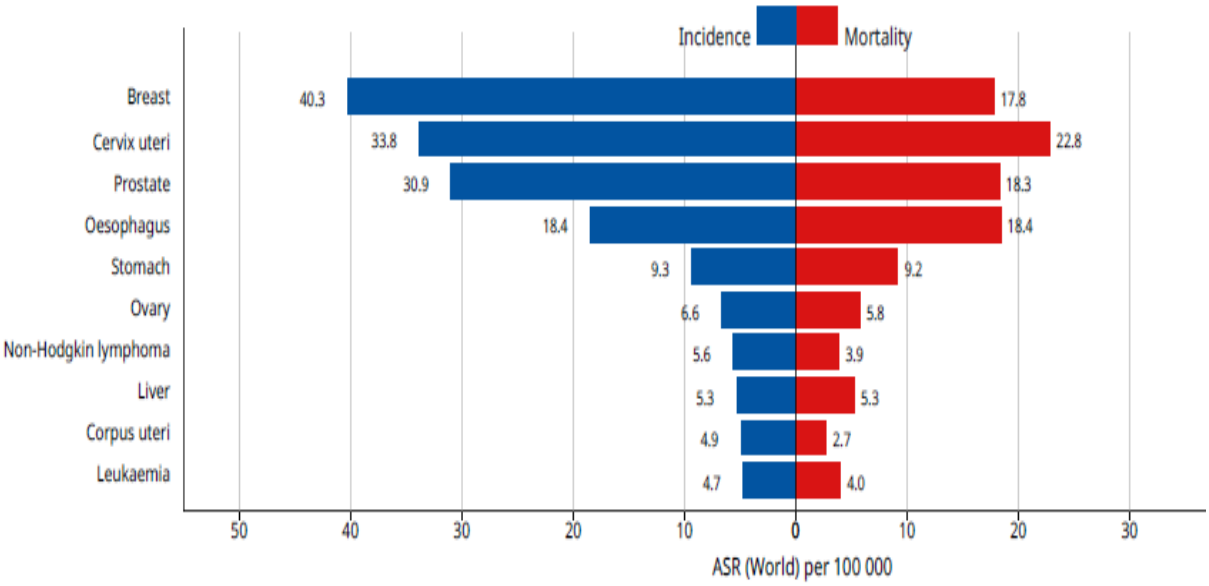
Conclusions: There was poor knowledge about the HPV vaccine.

CHAPTER 1: INTRODUCTION

1.1 Background

The Human Papilloma Virus is a viral infection that is sexually transmitted affecting men and women. With a strong association with neoplasms including all cases of cervical cancer with HPV 16 and 18, being responsible for approximately 70% of the cases, about 70% oropharyngeal cancers and 95% of anal cancers. In terms of primary prevention, a major development in the past few years has been the introduction of the HPV vaccines that prevent HPV infections and have the potential to reduce the incidence of cervical and other anogenital cancers. The vaccine is readily available in most private health facilities in Kenya and the Ministry of health intends to introduce the HPV vaccine as part of the national immunisation program targeting 10-year-old girls.

Figure 1 Global cancer incidence and mortality rates



1.2 The Role of Health Professionals

The Human Papilloma Virus vaccine (HPVv) in many countries is met with some certain level of hesitancy from parents and some healthcare professionals which then significantly affects the success of implementation. Health professionals' knowledge and attitudes about vaccines have previously been shown to be an important determinant of their own vaccine uptake, their intention to recommend the vaccine to their patients and the vaccine uptake of their patients (1). In countries where the HPV vaccine has been introduced, the level of its acceptance is often based on provider recommendations which has a direct correlation to good knowledge and attitude. (2). This study was carried out to determine knowledge and attitude of specialist doctors in training towards HPVv.

CHAPTER 2: LITERATURE REVIEW

2.1 HUMAN PAPILLOMA VIRUS

HPV is a double-stranded DNA virus that belongs to the Papillomaviridae family and is only known to infect humans. More than 200 varying types of HPV have been identified and categorised into mucosal or cutaneous variants depending on their tissue tropism. There is a broad separation of HPV types based on their associated risk of cancer.

2.2 Knowledge, attitude and practice

The success of any health policy hugely depends on its advocacy by healthcare workers and the only way they can do this is if they are well versed with the said policy and have all their concerns and queries well addressed. There is emerging evidence that from studies done to assess the level of knowledge in healthcare workers and how it affects their attitude and practice on the HPV vaccine. Most studies have shown insufficient knowledge especially in some of the countries set to roll out national programs. (25) In some instances, only 47% of healthcare workers being willing to recommend the HPV vaccine. This reiterates the need for continued medical education of healthcare providers, particularly those from the government sector on the need for HPV vaccination as a measure of cervical cancer prevention. Public education is also pertinent for a successful HPV vaccination program in the country. (26)

In a study done in Kitui among school teachers 95% of the participants knew of the protective benefits HPV vaccine against cervical cancer, but had minimal information about the HPV infection association with cervical cancer. Eighty-four percent understood that cervical cancer is fatal. They had no knowledge on HPV, its modes of transmission, signs or symptoms. The participants that had gotten the vaccine had averagely more information about it than those who refused get the vaccine. Their knowledge and attitude can be enhanced by healthcare workers and their fears can be allayed only if the healthcare workers are knowledgeable and have a favourable attitude towards vaccination. (27)

2.3 DISEASE ASSOCIATIONS

2.3.1 NEOPLASIA

Of all cancers attributed to HPV, cervical cancer has had the most attention with majority of all cases being associated directly to HPV infection (3). HPV 16 and 18 are the most isolated subtypes found in cervical cancer, with type 16 found in approximately 50% of patients ,20 % in patients with type 18 and type 31, 33, 45, 52, and 58 being estimated to result in an approximate 19% (4). Other than cervical cancer, HPV types 16 and 18 can also be attributed to about 35 to 77% of precancerous and cancerous vulvar lesions, up to 60% of vaginal precancerous and cancerous lesions (5) about 35 to 40 % of cancers of the penis (6) and nearly 90% of anal precancerous and cancerous lesions. Female gender is associated with an increased incidence of anal cancer than their male counterparts, although incidence is of note high among men who have sex with men, especially those that are HIV positive (7). An estimated 90% of genital warts can be attributed to types 6 and 11(8). However, not all persons with infections will develop cancer (9). In Kenya the Prevalence of HPV 16 and/or HPV 18 among women with Cervical cancer is 63.1%% .

2.3.2 INTERACTIONS BETWEEN HIV AND HPV

HIV-infected individuals have been demonstrated to have a higher incidence of HPV infection than in uninfected individuals. It has been noted that HIV-infected individuals are more likely to present with multiple types of HPV. HIV positive patients have also been independently associated with a decreased ability to clear HPV infection over time. (10) There has also been noted to be a significantly higher rate of HPV related lesions in HIV infected individuals.

2.3.3 HPV AND ACQUISITION OF HIV

There is documented increased risk for co-infection with HIV with HPV infection. (11) There is however no clear evidence that HPV infection directly predisposes to subsequent HIV infection. There is nothing to dispute the notion that HPV infection could just be a sign of an individual's high-risk behaviour with subsequent increased risk of contracting HIV. It is not clear whether it is the presence of HPV infection or the immune response associated with clearing it, or both, that increases the likelihood of contracting HIV. Penile HPV infection has been suggested in some studies as a risk factor for HIV infection.(12)

2.4 HPV PREVENTION

2.4.1 PRIMARY PREVENTION

Condoms have been shown to have a significant protective benefit from HPV but their use is entirely dependent on human behaviour and ease of access hence reducing their efficacy.(13) In low income countries , high risk sexual behaviour and early sexual debut has been associated with low condom use and hence a significantly increased risk of infection with HPV.(14) Condoms are rarely utilized in oral and other forms of sex hence leaving people at risk of contracting HPV.

2.4.2 SECONDARY PREVENTION

Cervical cancer screening Pap smear and Visual inspection of the cervix, using acetic acid (**VIA**) or Lugol's iodine (**VILI**)has shown tremendous benefit in early detection and treatment. (15) However, these require effective, functional and affordable health services including laboratory services. Hence these services are not readily available in most low-income countries.

2.4.3 TERTIARY PREVENTION

The excision and ablation of the transformation zone of the cervix is the most effective documented mode of treatment of high-grade cervical intraepithelial neoplasia (CIN)(16). It however is dependent on early screening and is not effective in prevention of the other forms of HPV associated cancers.

2.4.4 HPV VACCINE

There are currently three vaccines available for use as a preventive measure against HPV acquisition and its associated diseases. These vaccines have been formulated to cover different HPV types and their availability in different locations is determined by economic conditions and local health policy:

Cervarix™ (Bivalent) vaccinates against types 16 and 18.

Gardasil™ (Quadrivalent) vaccinates against types 6, 11, 16, and 18.

Gardasil™ (9-valent) vaccinates against types 6, 11, 16, 18 31, 33, 45, 52, and 58.

2.5 HPV VACCINATION

In 2007 the World Health Organization recommended as part of comprehensive cervical cancer control the vaccination of 9-13-year-old girls against HPV. The vaccination is done at this age group to ensure capture before sexual debut. In Kenya sexual debut for more than 15% of women is documented to be as early as 15years. (17) In terms of global coverage, as of 31 March 2017 only 71 countries had introduced HPV vaccination as a requirement in their national immunization program for girls, and only 11 countries (6%) had integrated the same for boys. Australia was the first country to provide free quadrivalent HPV vaccines to 12 to 18-year-old girls. A study has shown a subsequent decline in the prevalence of cervical cancer from 28.7% before the initiation of the vaccination program to 2.3% after the national program. In the vaccinated cohort of women below 21 years there was drastic reduction in the incidence of genital warts compared to the older non-vaccinated cohort. (18). Various studies have shown benefits of HPV vaccination in preventing cervical disease and other HPV related cancers (19).

2.6 DOSING SCHEDULE

2.6.1 Routine vaccination:

Routine vaccination is recommended for all children aged between 9 to 18 years if previously not adequately vaccinated (20). The recommended schedule is as follows;

At initiation Age 9–14 years: 2-doses at 0 and 6–12 months.

Age 15 years or older at initiation: 3-doses at 0, 1–2, and 6 months.

2.6.2 Special situations:

History of sexual abuse or assault: Begin series at age 9 years.

Immunocompromised (including HIV) at 9–26 years: 3-doses at 0, 1–2, and 6 months.

2.7 FEMALE AND MALE VACCINATION

Vaccination of females confers a significant protection to recipients from HPV related neoplasia which is best noted and studied with cervical cancer. All the vaccines currently in use are known to be effective against HPV types 16 and 18, which cause the majority of cervical carcinomas. Vaccinating the male population against HPV provides a benefit to the recipients of the vaccine by safely offering protection against neoplasms resulting from HPV infection. HPV types 16 and 18 cause majority of anal cancers with a significant contribution to penile and oropharyngeal carcinomas. The quadrivalent and 9-valent HPV vaccines protect against anogenital warts resulting from HPV types 6 and 11 which despites being benign lesions cause significant physical and psychological turmoil with low success in treatment. The vaccination of both males and females increases heard immunity and hence an exponential reduction of the HPV associated disease burden (21).

2.8 VACCINE SAFETY

2.8.1 Common Side Effects

- Fever
- Nausea
- Muscle or joint pain
- Pain, redness, or swelling on the injection site
- Headache or generalised malaise

Clinical trials of HPV vaccines have documented safety. The vaccines comprise virus-like particles (VLPs), which mimic the viral capsid and do not contain any viral genetic material. These features ensure the vaccines are safe and well tolerated with only some mild reactions at the site of injection.(22)

2.8.2 Behavioural impact

There has been concerns HPV vaccination being associated with high risk sexual behaviour raised by some surveys of parents of adolescent. There however has been no demonstrable correlation between vaccination and increased risky sexual behaviour. (23)

2.8.3 Infertility

There have been many concerns among parents of recipients of the vaccines and healthcare workers on infertility caused by the HPV vaccine. These concerns have significantly impacted the uptake of the vaccine. There are no studies that have currently demonstrated any direct link of HPV vaccination with infertility. (24). HPV vaccine does not confer protection against other sexually transmitted diseases which are also associated with infertility.

CHAPTER 3: JUSTIFICATION AND UTILITY

In line with global eradication initiative, the National Vaccination and Immunisation Program (NVIP) introduced the HPV vaccine as part of the Kenyan national vaccination protocol in September of 2019. The vaccination program specifically targets 10-year-old girls. Post-graduate trainees in the University of Nairobi (Registrars) in KNH are drawn from all the counties in the country, pursuing diverse specialties and are a good representation of the physician population. On completion of their training they will be at the forefront of implementation of health policy that will influence day to day practice in particular the national HPV vaccination program. Their knowledge, attitude and daily practice on the HPV vaccine shall have a direct correlation with the vaccine's uptake and hopefully eradication of cervical cancer and other related cancers in our generation.

3.1 RESEARCH QUESTION:

What is the knowledge and attitude of post-graduate medical students at the University of Nairobi working in KNH on the HPV vaccine?

3.2 OBJECTIVES:

3.2.1 Primary

To determine the knowledge of the UON registrars working at KNH on the HPV vaccines as prospective key players in the implementation of the HPV vaccine.

3.2.2 Secondary

Describe factors influencing their knowledge and the influence on current or intended practice The Potential factors include speciality, gender, duration of practice and religious views…..

CHAPTER 4: METHODOLOGY

4.1 STUDY DESIGN:

This was a cross sectional study.

4.2 STUDY POPULATION:

The study targeted University of Nairobi (UON) post-graduate medical students working in Kenyatta National Hospital (KNH) pursuing courses in Internal medicine (IM), Obstetrics and gynaecology (Obs & Gyn), Paediatrics and Child Health (PCH) and Surgery. The named specialities have a prolonged interaction with patients and their parents during admissions and follow up clinics. The increased contact time gives patients a chance to have any concerns pertaining to the vaccines addressed. Other than Paediatrics and Child Health, the other specialist trainees get to interact with patients who are affected with HPV related illnesses and hence should be vested in ensuring their prevention.

4.3 INCLUSION CRITERIA:

The participants were active post-graduate medical students at the University of Nairobi in KNH pursuing specialist medical training in; Internal medicine, Obstetrics and gynaecology, Paediatrics and child health and Surgery at the time of the study.

4.4 EXCLUSION CRITERIA:

1. Any registrar directly or indirectly involved in the HPV-vaccine pilot.

2. Any registrar that has not given consent.

4.5 STUDY SITE:

Kenyatta National Hospital is the largest public tertiary referral hospital in Kenya as well as the main teaching hospital for the UON school of medicine. The registrars in the Internal medicine

(IM), Obstetrics and gynaecology (Obs & Gyn), Paediatrics and Child Health (PCH) and Surgery disciplines run their training in the hospital's clinical areas.

4.6 SAMPLE SIZE

$$m = \frac{Z_{\alpha/2}^{\ 2} p(1-p)}{e^2}$$ (28).

Where;

p = proportion of registrars who **have accurate knowledge on HPV vaccines** (50%)

Z_α = Represents the desired **level of statistical significance** (typically 1.96 for 95% confidence).

e = **error margin** (5%)

m = **Sample size for finite population** (m=384 registrars)

post-graduate medical students at the University of Nairobi the sample size for a finite population, (28)

$$n = \frac{m}{1+\frac{m-1}{N}} n = \frac{m}{1+\frac{m-1}{N}}$$ Where

N = estimated population size (N=400).

n = sample size adjusting for finite population (n=96).

The study participants were stratified from a total of 407 residents that fit the inclusion criteria during the study period. Stratification was done according to their proportion of the total number of the registrars. We enrolled 96 participants by continuous sampling until the total number of participants was achieved as distributed in the table below. The total number of registrars according to the respective department records have been given. The sample desired sample size was achieved during this study.

Table 4.1 Stratification of study population

Cadre	Total registrars in specialty	%	N
Internal Medicine	74	18.2	17
Obs & GYN	130	31.9	31
Paediatrics and Child Health	103	25.3	24
Surgery	100	24.6	24
	407	100	96

4.7 ETHICAL CONSIDERATIONS

Ethical approval was sought and approved from the KNH/UoN research and ethics committee and data collection ensued. A written informed consent where the details, procedures and protocols of the study were explained was obtained from the study participants before submission of the digital questionnaire. Only the duly completed questionnaires with consent were subjected to data analysis while those without consent were considered incomplete. The participants were assured of no punitive nor preferential consequences should they decline to participate in the study. Consenting participants were also informed that they could opt out of the study at any point without being disadvantaged in any way. The study participants were assured that there shall be minimal discomfort and inconvenience during the study. They were also informed that they would not have any financial benefit for participating in the study. To ensure confidentiality study participants shall were given unique identification codes and no personal identification data shall was recorded. There was also an assurance that once the study is published, there would not be any direct and identifying link between the study participants and the results.

4.8 STUDY PROCEDURE

Potential study participants were identified during their daily duties in the Internal Medicine (IM), Paediatrics and Child Health (PCH), Obstetrics and Gynaecology (Obs & Gyn) and Surgical wards and outpatient clinics at KNH using the inclusion and exclusion criteria. The participants filled out a single use electronic questionnaire and data was collated in a secure database. The analysis was done using SPSS and the results represented in tables and graphs .

4.9 QUALITY ASSURANCE

The questionnaire was pretested by 2 participants from each of the population strata to determine the sensitivity of the questions in detecting important differences in the study population. The Principal Investigator assessed the collected data on a daily basis and oversee data entry and analysis.

4.10 DATA COLLECTION AND STUDY TOOLS

This being a novel study we formulated and pretested a structured electronic-based questionnaire on the **Kobo Tool Box** online platform. A link to a digital questionnaire on the "KOBO TOOL BOX" was sent to the participants mobile devices through the messaging application "Whatsapp" and the participants at their own time and using their own internet connection filled out the single use questionnaire and submitted it after giving informed written consent. The study collected demographic characteristics of the participants that included age, gender, marital status and whether they are or have been parents of children, their field of specialist training, duration of medical practice, general questions to gauge knowledge previous and anticipated use of the vaccine.

4.11 MANAGEMENT AND ANALYSIS

Data collected was entered into a password protected Database that was only accessible to the principal investigator and lead statistician. Sociodemographic characteristics of the participants were described. The overall knowledge among the registrars across the four specialties was analysed using Obs&Gyn having recorded the highest mean knowledge scores as the reference group to compare the odds ratio and confidence interval. Descriptive statistics were carried out where discrete variables were summarized with frequencies and percentages while continuous variables were summarized using measures of central tendency and dispersion such as mean, median, mode, standard deviation and inter-quartile ranges.

Bivariate analysis was carried out to relate HPV vaccines knowledge with socio-demographic characteristics, attitudes, and other factors. During this process, comparison between means was done using t-tests/ANOVA while chi-squared tests was used to compare proportions. All analysis was carried out using IBM Statistics Software Version 24 and presented using tables, graphically and in prose.

4.12 STUDY DISSEMINATION PLAN

The study findings shall be presented to the UON department of Paediatrics and Child Health as part of the requirements of the Masters of Medicine Program in both hard and soft copies. Hard copies of the results shall be sent to the University of Nairobi repository for storage. The findings shall also be shared with the office of the head of department Paediatrics in KNH and the Division of vaccines and immunization with a view of dissemination of the study findings to improve patient care.

CHAPTER 5: RESULTS

5.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF HEALTHCARE WORKERS

A total of 96 residents were enrolled and responded to the survey as shown in table 5.1 below. Among them 59 (61.5%) females and 37 (38.5%) males. The residents were drawn from four disciplines; Internal medicine [IM] 17(17.7%), Obstetrics and Gynaecology [Obs & Gyn] 32(33.3%), Paediatrics and child health [PCH} 24(25%) and Surgery 23 (24.0%). There were 51(53.1%) who were married, 42(43.8%) single while 3(3.1%) were separated from their spouses. Overall, 38(40.0%) were parents while 57(60.0%) did not have any children. The mean age of the respondents was 32 years (SD 2) with an interquartile range of 31 to 34 and the median was the same at 32 years. It also shows the mean duration of service in years which was 7 years (SD 4) with an interquartile range of 4 to 9 and median duration of 7 years.

Table 5.1 Sociodemographic characteristics of study participants.

		N=96	%
Sex	Male	37	38.5
	Female	59	61.5
Age	Years (mean)	32	31-34 (IQR)
Field of study	Internal medicine	17	17.7
	Obstetrics and Gynaecology	32	33.3
	Paediatrics and Child health	24	25.0
	Surgery	23	24.0
Duration of service	Years of service(mean)	7	4-9(IQR)
Marital status	Married	51	53.1
	Single	42	43.8
	Separated	3	3.1
Participant with children	Yes	38	40.0

5.2 KNOWLEDGE, PERCEPTIONS AND PRACTICES ON HPV VACCINES

5.2.1 Knowledge across sociodemographic categories

Only 41% of the male and 34.5% of the female doctors had good knowledge regarding the HPV vaccine. A smaller proportion of married residents had good knowledge compared to those who were single 31.3% versus 42% but difference was not significant. Registrars who had children had a higher proportion having good knowledge compared to those without children, 46.2% compared to 35.5% (p =0.5).

Table 5.2 Level of knowledge across the sociodemographic categories.

		Knowledge category				
		At least 75% - Good knowledge		Below 75% - Needs additional support		
		N	%	n	%	p-value
Sex	Male	14	41.2	20	58.8	0.5
	Female	19	34.5	36	65.5	
Marital status	Married	15	31.3	33	68.8	0.3
	Single	16	42.1	22	57.9	
	Separated	2	66.7	1	33.3	
Parent to child	Yes	10	27.8	26	72.2	0.2
	No	22	42.3	30	57.7	

5.2.2 Knowledge across the different subspecialties

In this section knowledge of the residents for the different components of the assessments are presented in figure 2 and 3 . Table 5.3 shows the different levels of knowledge of the Registrars in the 4 areas of specialties across 6 question categories.

i. Mode of HPV transmission:

The first question was on the mode of transmission and the correct answer being that the HPV is sexually transmitted. All the residents in Internal medicine, Obstetrics and Gynaecology and Paediatrics and Child Health discipline had the correct answer. In contrast nearly one of five residents in surgery did not know HPV is a sexually transmitted infection. The distribution of participants answered the question correctly was as follows 17(100%) in Internal medicine, 32(100%) in Obstetrics and Gynaecology, 24 (100%) in Paediatrics and child health and 18(78%)

in Surgery. The surgery residents had significantly lower level of knowledge compared to registrars in other disciplines of training (p=0.01).

ii. Gender related susceptibility to HPV:

The second category being gender susceptible to HPV where the correct answer being both male and female are susceptible. All the registrars from Paediatrics 24 (100%) knew that male and females were equally susceptible to HPV infection while the participants in Obstetrics and Gynaecology31(96.9%) had good knowledge. Those in Internal medicine15(93.8%) answered the question correctly with the Surgical residents 12(54.5%) having the lowest proportion of participants with correct answers[p=0.001].

iii. Diseases attributed to HPV infection

The third category in measuring knowledge pertains to the different conditions resulting from HPV infection. The list included cervical, oesophageal, stomach, penile breast cancers and genital warts, and breast cancer being the only condition with no evidence showing relation to HPV infection. The different responses in percentage are expressed in figure 2.

a. Cervical cancer

All the residents in Internal medicine, Obstetrics and Gynaecology and Paediatrics and child health and 78% of those in surgery knew that cervical cancer was attributable to HPV infection. The difference in knowledge across the disciplines was not significant (p=0.4). Beyond this there was poor knowledge of the other types of cancers that were attributed to HPV infection.

b. Oesophageal cancer;

Less than half (35%) of the residents knew that HPV is an attributed cause of oesophageal cancer and included 47% Internal medicine residents, 43% in Obstetrics and Gynaecology and 33% in Paediatrics and child health and 17. 4% of those in surgery(p>0.05).

c. Stomach cancer:

Only 20%, of the participants were able to associate HPV with stomach cancer included 23.5% Internal medicine residents, 34.4% in Obstetrics and Gynaecology and 12.5% in Paediatrics and child health and 4.3%of those in surgery(p=0.03).

d. Penile cancer:

Of the participants 44.8% could make a direct causative association between Penile cancer and HPV. Most knowledgeable were Obs & Gyn residents 71.9%, followed by Internal medicine residents 47.1%, Paediatrics and child health 29.2% and least aware was surgical residents at 21.7% (p= 0.001) as shown in table 53.

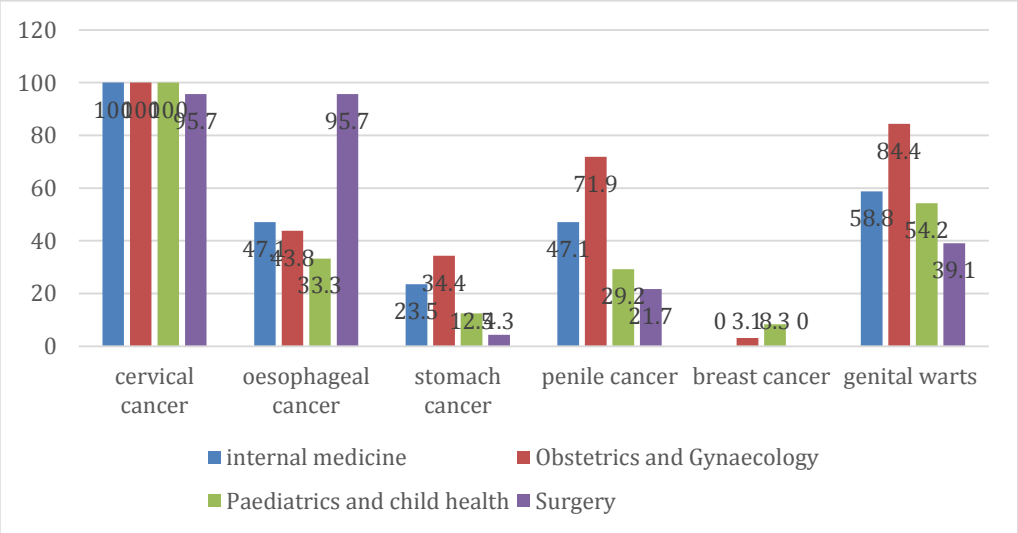
e. Breast cancer:

Breast cancer is one cancer where HPV has not been implicated in the etiology of the disease. The study participants were knowledgeable. Overall, only 3(%) associated breast cancer with HPV infection 0(0%) IM1(3.1%) in Obs&Gyn,2(8.3%) in PCH 0(0%) in Surgery. There was no variability in knowledge across the different groups p-value=0.3 as shown in table 53.

f. Genital warts:

Overall, 61 % of the participants knew that HPV is the cause of genital warts. Most knowledgeable were obstetrics and gynaecology residents 84.4%, followed by Internal medicine residents 58.8%, Paediatrics and child health 54.25 and 39.1% in surgery (p=0.006).

Figure 2 Knowledge on diseases associated with HPV.



iv. Eligibility for HPV vaccines

Participants were asked about gender eligibility for HPV vaccination with both boys and girls both being eligible for vaccination as expressed in Table 5.3. The participants that reported need for vaccination of both genders were distributed as follows 11(64.7%) Internal medicine,27(84.4%)

in Obstetrics and Gynaecology ,17(70.8%) in 8(36.4%)Paediatrics and child health and 18(78%) in Surgery(p=0.003).

v. Recommended age for vaccination:

The WHO recommends vaccination against HPV at the ages between 9 and 13 years old to ensure capturing the children before sexual debut. Of the participants that selected this age group as recommended for vaccination 12(70.6%) Internal medicine,28(87.5%) in Obstetrics and Gynaecology ,22(91.7%) Paediatrics and child health and 11(47.8%) in Surgery (p=0.025) as shown in table 5.3.

vi. HPV vaccine dosing

The final item in the knowledge score was the HPV vaccine dosing schedule in which the ideal schedule for the recommended age group is 2 doses 6 months apart. The distribution of the correct response per cadre was as follows 9(52.9%) Internal medicine,17(56.7%)in Obstetrics and Gynaecology ,17(70.8%) in Paediatrics and child health and 11(47.8%) in Surgery (p>0.5) as seen in table 5.3.

Figure 3 knowledge categories of the 4 subspecialties

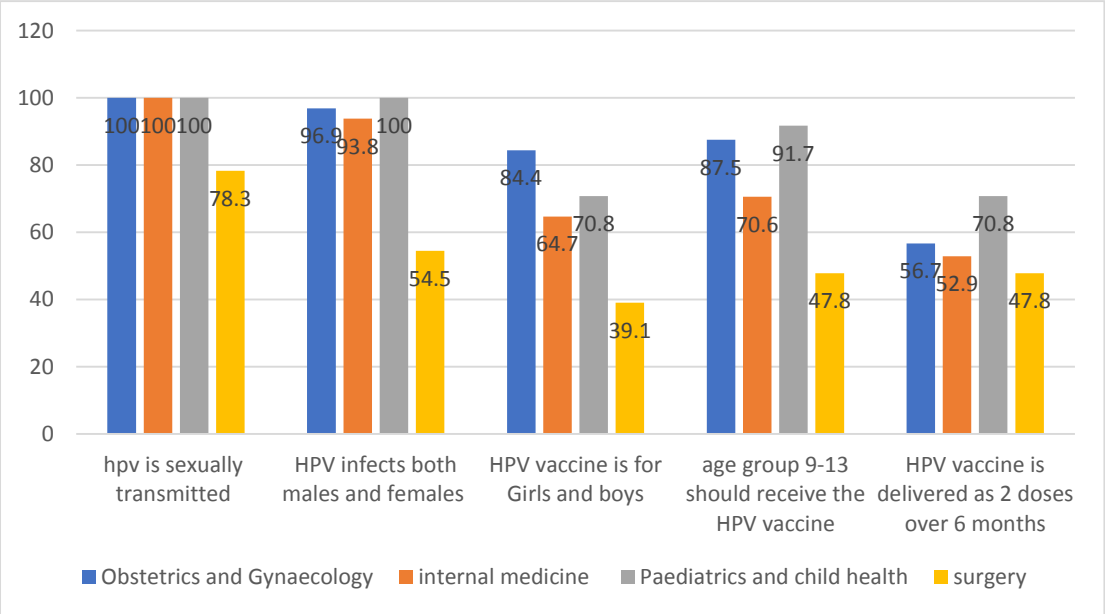


Table 5.3 The different levels of knowledge across 6 question categories.

		Field of study								
		Internal medicine		Obstetrics and Gynaecology		Paediatrics and child health		Surgery		
		N=17	%	N=32	%	N=24	%	N=23	%	p-value
HPV is	A sexually transmitted virus	17	100.0	32	100.0	24	100.0	18	78.3	0.01
HPV infects	Both	15	93.8	31	96.9	24	100.0	12	54.5	<0.0001
HPV Causes	cervical cancer	17	100.0	32	100.0	24	100.0	22	95.7	0.36
	oesophageal cancer	8	47.1	14	43.8	8	33.3	4	17.4	0.15
	stomach cancer	4	23.5	11	34.4	3	12.5	1	4.3	0.03
	penile cancer	8	47.1	23	71.9	7	29.2	5	21.7	0.001
	breast cancer	0	.0	1	3.1	2	8.3	0	.0	0.33
	genital warts	10	58.8	27	84.4	13	54.2	9	39.1	0.006
HPV vaccine is for Girls and boys	Yes	11	64.7	27	84.4	17	70.8	8	36.4	0.003
age group that should receive the HPV vaccine	9-13	12	70.6	28	87.5	22	91.7	11	47.8	
HPV vaccine is delivered as	2 doses over 6 months	9	52.9	17	56.7	17	70.8	11	47.8	0.14

5.2.3 Overall knowledge across the four specialties.

Table 5.4 represents the overall mean knowledge scores among the registrars across the four specialties. OBG&GYN were noted to be most knowledgeable with a mean score of 79.2%, IM 73.26, PCH 71.98 and surgery 62.57 ($p<0.0001$).

Table 5.4 proportion with mean knowledge scores across the 4 specialities.

	N	Mean%	Std. Deviation	p-value
Obstetrics and Gynaecology	31	79.21	10.241	<0.0001
Internal medicine	16	73.26	12.704	
Paediatrics and child health	23	71.98	8.781	
Surgery	19	62.57	11.979	

Table 5.5 represents the proportion of residents with good knowledge set at an overall score >75%. OBS & GYN are seen to have residents with the highest proportion of good knowledge at 58.1% (18/31), IM 31.3% (5/16), PCH30.4% (7/23) and Surgical residents are noted to have lowest proportion with good knowledge of the subject at 15.8% (3/19) [p=0.02].

Table 5.5 knowledge score at least 75%

Field of study	Knowledge score		
	At least 75%		
	n	%	p-value
Obstetrics and Gynaecology	18	58.1	0.02
Internal medicine	5	31.3	
Paediatrics and child health	7	30.4	
Surgery	3	15.8	

The initial results clearly put OBS&GYN as the leading specialty in terms of knowledge scores; this formed the basis s to which they were used as the comparison reference group. Table 5.6 shows OBS&GYN knowledge being compared to the other 3 specialties likelihood of attaining knowledge scores of less than 75% which was the cut off for adequate knowledge. Compared to OBGYN, registrars in IM were 3 times more likely to have knowledge scores <75% OR 3.05[95% CI 0.85-10.91](p=0.09) while those in PCH were also 3 times more likely to have knowledge scores <75% OR 3.17 [95% CI 1.01-9.89](p=0.05) and Surgery were 7 times more likely to have knowledge scores <75% OR 7.39 [95% CI 1.78-30.69](p=0.05)

Table 5.6 knowledge comparison across the 4 specialties with OBS&GYN as the reference.

	Coefficient	S.E. of coefficient	p-value	OR	95% C.I. for OR	
					Lower	Upper
Obstetrics and Gynaecology			Ref			
Internal medicine	1.114	.651	0.09	3.05	0.85	10.91
Peadiatrics and child health	1.152	.581	0.05	3.17	1.01	9.89
Surgery	1.999	.727	0.01	7.39	1.78	30.69

The overall proportion of all the participants that had good knowledge was 33(37.1%) as shown in Table 5.7.

Table 5.7 overall knowledge score.

	n	%
Below 75% - Needs additional support	56	62.9
At least 75% - Good knowledge	33	37.1

5.3 PERCEPTIONS AND PRACTICES OF THE HPV VACCINE

5.3.1 Practice towards the HPV vaccine.

The registrars from the different cadres were assessed on their practice towards the HPV vaccine(table 5.8); with the first assessment being their history of receiving the vaccine themselves those with a positive response were 5(29.4%) Internal medicine,4(12.5%)in Obstetrics and Gynaecology ,2(8.3%) in Paediatrics and child health and 2(8.7%) in Surgery (p value =0.195).The reasons for not having received the vaccine were diverse across the 4 groups of participants with 5(41.7%) of the internal medicine and 10(35.7%) of the Obstetrics and Gynaecology participants attributing it to the high cost of the vaccine. The majority 10(45.5%) of the Paediatrics and Child health participants attributed the low vaccination rate to unavailability of the vaccine. The second assessment for practice was based on recommendation of the vaccine; where as table 5.8 shows 62(65.6%)of the participants reported to have recommended the vaccine with 87.5% of Obs & Gyn registrars having recommended the vaccine .The IM registrars were least likely to recommend the vaccine at 41.

Table 5.8 Perceptions and Practice of the HPV vaccine.

		Field of study								
		Internal medicine		Obstetrics and Gynaecology		Paediatrics and child health		Surgery		
		N=17	%	N=32	%	N=24	%	N=23	%	p-value
Received the HPV vaccine?	Yes	5	29.4	4	12.5	2	8.3	2	8.7	0.2
	No	12	70.6	28	87.5	22	91.7	21	91.3	
Why vaccine not received	Not aware of vaccine	0	.0	1	3.6	1	4.5	4	20.0	0.09
	No benefits of the vaccine	2	16.7	4	14.3	5	22.7	8	40.0	0.19
	Fear of side effects	1	8.3	1	3.6	1	4.5	1	5.0	0.94
	Cost of vaccine	5	41.7	10	35.7	2	9.1	0	.0	0.003
	Availability of vaccine	2	16.7	6	21.4	10	45.5	2	10.0	0.05
How likely are you to receive the vaccine?	Very likely	8	47.1	11	35.5	2	9.1	1	5.0	0.002
	Likely	2	11.8	4	12.9	4	18.2	0	.0	
	Neutral	1	5.9	8	25.8	7	31.8	2	10.0	
	Not likely	5	29.4	4	12.9	3	13.6	8	40.0	
	Very unlikely	1	5.9	4	12.9	6	27.3	9	45.0	
Ever recommended the vaccine?	Yes	7	41.2	28	87.5	16	66.7	11	47.8	0.003
	No	10	58.8	4	12.5	8	33.3	12	52.2	
Why not recommended	Not aware of vaccine	1	10.0	1	12.5	0	.0	5	41.7	0.08
	No benefits of the vaccine	1	10.0	1	12.5	0	.0	1	8.3	0.81
	Fear of side effects	1	10.0	0	.0	1	12.5	1	8.3	0.81
	Cost of vaccine	4	40.0	6	75.0	1	12.5	0	.0	0.002
	Availability of vaccine	3	30.0	1	12.5	3	37.5	3	25.0	0.71
Likelihood of recommending HPV vaccine to patients	Very likely	7	41.2	23	71.9	12	52.2	7	30.4	0.06
	Likely	4	23.5	2	6.3	5	21.7	5	21.7	
	Neutral	2	11.8	6	18.8	4	17.4	8	34.8	
	Not likely	3	17.6	1	3.1	0	.0	1	4.3	
	Very unlikely	1	5.9	0	.0	2	8.7	2	8.7	

A comparative analysis with OBS&GYN as the reference was done(table 5.9) and it was noted that compared to OBS&GYN the IM residents recommended the vaccine 10 times less OR 10.0 [95%CI 2.41-41.58](p=0.002). this was followed by the surgical residents who report to have recommended the vaccine almost 7times less than their OBS&GYN counterparts OR 7.64[95% CI 2.02-28.85](p=0.0.003) and finally the PCH registrars who recommended the vaccine almost 4 times less as much as the OBS&GYN residents OR 3.5[95%CI 0.91-13.48](p=0.51).

Table 5.9 comparison of vaccine recommendation.

	p-value	OR	95% C.I. for OR	
			Lower	Upper
Obstetrics and Gynaecology	ref			
Internal medicine	0.002	10.00	2.41	41.58
Paediatrics and child health	0.07	3.50	0.91	13.48
Surgery	0.003	7.64	2.02	28.85

5.3.2 Perceptions towards the HPV vaccine.

The negative perception of the vaccine was assessed based on the 34(35.42%) of participants who did not recommend the vaccine as shown in table 5.8. Of the surgical residents 8(40%) did not find their vaccination to be beneficial. A five point Likert scale ranging from '' Very likely to Very unlikely'' was utilized to assess willingness of the participants to receive the vaccine.it was noted that Internal medicine with 8(47.1 %) participants were the most willing to receive the vaccination while 9(45%) of the surgical participants were least likely to accept vaccination (p value =0.002). Of the participants that did not recommend the vaccine, 7 were not aware of the vaccine, 3 did not consider the vaccine to be beneficial, 3 were concerned about the side effects, 11 found the cost to be prohibitive and 10 believed the vaccine was unavailable. Two of the participants also cited religious views as a reason for not recommending the vaccine while myriad of other reasons were also mentioned and are delineated in table 5.10.

Table 5.10 other reasons cited for not recommending the vaccine.

Reason	Frequency
Adverse drug reactions	1
Controversy around the vaccine	1
Did not consider it to be important	1
I see older patients past the age of vaccination	1
Most patients are sexually active adults encounter of younger patients is minimal	1
My patients are already sexually active	1
My patients mostly don't fit the demographic	1
PENTA vaccine	1
Religious views	2

CHAPTER 6: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

6.1 Discussion

Immunization is a very effective measure available to prevent disease and the advent of the HPV vaccine has demonstrated significant strides in the prevention of cervical cancer and other HPV related illnesses (29). Through the KAP framework, it is well known that knowledge often plays an important role in HCW for improving their attitudes and even potential uptake of HPV vaccination(30). In Kenya cervical cancer remains the leading cause of cancer related deaths and this has occasioned the government to launch a nationwide HPV vaccine for school going girls at the age of 10 years(31).This study revealed that overall there is relatively poor knowledge of the HPV vaccine, with the overall proportion of all the participants that had good knowledge being 33(37.1%) . During the literature search there were no studies that cover a similar demographic of HCWs. However the results of this study closely mirror a study carried out in medical students in India where out of 957 participants, only 430 (44.9%) displayed good knowledge pertaining HPV vaccine(32).It was quite evident that the Obs & Gyn registrars had the highest level of knowledge with 58% of them having knowledge scores of above 75%. This could be attributed to their focus on reproductive health. However, among the surgical registrars only 15.8% demonstrated good knowledge despite dealing with patients presenting with malignancies that are associated with HPV. There was good general knowledge on the mode of transmission of the HPV where 78% of the surgical registrars had the right information while 100% of the other respondents identified it as sexually transmitted. This shows there is a basic understanding of the disease transmission process and further demonstrates the need for vaccination of both sexes. This was also demonstrated by the extensive knowledge that the disease affects both males and females where more than 85% of respondents knew this.

Majority of the respondents (99%) identified the HPV as having a direct causal relationship with cervical cancer. Further supporting the narrative that elimination of the HPV would have a significant corresponding reduction in the burden of cervical cancer. However the knowledge that the HPV vaccine is associated with other malignancies (oesophageal, stomach and penile cancers) was quite low with less than 50 % of the respondents making the association. Despite these carcinomas (oesophageal, stomach and penile cancers) having been shown to have higher prevalence in males than in females(34). In a study in the US assessing knowledge of HPV's

association with head and neck cancers (HNC) among medical students and residents across 4 specialties (Paediatrics, obstetrics and gynaecology, family medicine, and otolaryngology) found that only 40.3% of surveyed medical students and 56.1% of surveyed obstetrics/gynaecology, paediatrics, and family medicine residents identified associations between persistent HPV infection and HNC. This gap in knowledge seems to correlate with the low knowledge in need for vaccination of boys that was evidenced in this study where only 65% of the respondents saw the need to vaccinate boys. In a study among family medicine residents in the US approximately 83% of respondents reported supporting the use of the HPV vaccine in males, but less than 8% reported having actually offered the vaccine to males(35). This further highlights the need to vaccinate boys equally as girls and dispels the notion that males are merely carriers of the disease. According to our study, 75% of the respondents were aware of the recommended age of administration of the vaccine. The HPV vaccine is considered to be most effective when administered before sexual debut and as per the latest surveys in Kenya about 12 percent of girls and 22 percent of boys reported to have had sex by the age of 15 (35). This significantly impacted the decision to have the age for vaccine administration at between 9-13 years. The national guideline currently covers only 10-year-old girls and this creates significant missed opportunities in those children above this age. There was also significance variance on the dosing schedule for the vaccine with the PCH registrars scoring the highest at 70.8% and the surgical counterparts scoring 47.8%. There was a demonstrable correlation with the willingness to receive the vaccine and the level of knowledge. Where the participants with the highest knowledge (Obs & Gyn 58.1%) were more likely to receive the vaccine (35.5%) while those with lower knowledge scores (surgery 15.8%) were least likely to receive the vaccine (5%).

The same pattern was associated with knowledge and likelihood of recommending the vaccine where the cohort with highest knowledge scores (Obs & Gyn 58.1%) were more likely to recommend the vaccine (71.9%) while those with the lowest knowledge scores (Surgery 15.8%) were least likely to recommend the vaccine with only 30.4% most likely to recommend the vaccine to their patients. There was a variation with a survey done in the US with the aim to establish Resident Physicians Contribution to HPV Vaccine Uptake. The survey was completed by 1,549 resident physicians, including 413 paediatric residents, 167 obstetrics and gynaecology residents, 579 family medicine residents, and 355 internal medicine residents. For all specialties 58.9% reported that they always counsel patients to receive the vaccine. Paediatrics residents

were the group with the highest number of respondents always recommending the vaccine at 82.2% (36).The cost of the vaccine and its unavailability were reported as the greatest impediments to recommending the vaccine by our study participants despite the fact that at the time of the study the vaccine was available free of charge for 10-year-old girls. This demonstrated that the dissemination of information pertaining the vaccine was not enough. The study demonstrated low rates of recommending of the vaccine the surgical registrars had recommended the vaccine more that the Internal medicine and PCH registrars that had recorded higher knowledge scores of 31.3 % and 30.4% respectively.

The low level of knowledge and subsequent reduced willingness to recommend the vaccine is likely to reduce the acceptability and uptake of the vaccine by the general population. This has been demonstrated in other studies where the providers' knowledge on HPV was generally low with a correspondingly low vaccine recommendation rate()(30). The study findings shall be presented to the UON department of Paediatrics and Child Health as part of the requirements of the Masters of Medicine Program in both hard and soft copies. Hard copies of the results shall be sent to the University of Nairobi repository for storage. The findings shall also be shared with the office of the head of department Paediatrics in KNH and the Division of vaccines and immunization with a view of dissemination of the study findings to improve patient care.

6.2 STUDY LIMITATIONS

The anticipated limitations of the study included:

Being a cross sectional study, the temporal association of knowledge and attitude of healthcare workers towards the HPVv and its successful implementation cannot be implemented. The study was conducted in an institution where higher learning takes place and hence might not be representative of general population in terms of knowledge gaps.

The study relied in the most part on self-reported data with no demand of proof for truth from the participants. This had the potential of affecting the outcomes of the study.

The study was started before implementation of the HPV vaccine and hence majorly reflected intended practice.

6.3 CONCLUSION

There is low level of knowledge about the HPV vaccine. This deficiency in knowledge seems to impact negatively on the respondents' attitude towards receiving and recommending its use.

6.4 RECOMMENDATIONS

There is need to have a targeted training package pertaining the HPV and its vaccination targeting all healthcare workers.

A follow up study targeting other cadres of healthcare workers and parents to assess if low provider knowledge would create hesitancy to the HPV vaccine.

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APPENDICES

APPENDIX 1: STUDY FUNDING

This research project is fully self-funded there were no conflicts.

Table 8.1 Study funding

Category	Remarks	Units	Unit Cost (KShs)	Total (KShs)
Proposal Development	Printing drafts	500 pages	5	2,500
	Proposal Copies	10 copies	350	3,500
Data Collection	Stationery Packs (Pens, Paper and Study Definitions)	20	100	2000
	Research assistants	2	8000	14000
Data Analysis	Statistician	1		40,000
Thesis Write Up	Computer Services			5,000
	Printing drafts	1000 pages	5	5,000
	Printing Thesis	10 copies	500	5,000
Contingency funds				20,000
Total				**97,000**

APPENDIX 2: CONSENT FORM FOR PARTICIPATION IN THE STUDY

Study title: KNOWLEGDE AND ATTITUDE OF UNIVERSITY OF NAIROBI REGISTRARS WORKING IN KENYATTA NATIONAL HOSPITAL TOWARDS THE HUMAN PAPILLOMA VACCINE IN ADOLESCENTS.

Name of researcher: **Dr. BRIAN MWANGI NDERU**

I am a postgraduate student at the **University of Nairobi** pursuing a **Master of Medicine degree in Paediatrics and Child Health**.

I am conducting a study aimed at establishing the KNOWLEGDE AND ATTITUDE OF UNIVERSITY OF NAIROBI REGISTRARS WORKING IN KENYATTA NATIONAL HOSPITAL TOWARDS THE HUMAN PAPILLOMA VACCINE IN ADOLESCENTS.

The HPV vaccine is set to be rolled out this year by the DVI as part of the comprehensive vaccine schedule. The efficacy of this roll out shall depend extensively on the health workers knowledge and willingness to implement the policy guidelines.

Should you accept to participate in the study you shall be given a questionnaire in hard or electronic copy to fill out? This information shall be analysed and compiled into a final report.

Kindly understand the following: -

Participation is voluntary.

Confidentiality shall be maintained at all times. Your name or any other unique identifiers shall not be used in the study. We shall use a randomly assigned code number to identify participants and the information shall be stored in a password-protected computer database and will keep all of our paper records in a locked file cabinet.

Refusal of any participation in the study will not attract any penalties.

Risks: there are minimal risks in participating in this study. You are only expected to fill out a questionnaire or participate in a focus group discussion. You are not required to make any payments to participate in the research.

Benefits: The results of this study shall be made public and will influence policy in the efficacy of utilisation of the HPV vaccine.

If you have further questions or concerns participating in this study, please contact the following:

1. Dr Brian Nderu (Lead researcher) telephone or text; 0707987759 **email;** briannderu@gmail.com

2. Prof Ruth Nduati (lead supervisor) ruth_nduati200@yahoo.com

For more information about your rights as a research participant, you may contact the Secretary/Chairperson, Kenyatta National Hospital-University of Nairobi Ethics and Research Committee Telephone No. **2726300 Ext. 44102 email uonknh_erc@uonbi.ac.ke.**

Participant statement

I have read this consent form or had the information read to me. I have had the chance to discuss this research study with the researcher. I have had my questions answered satisfactorily by him or her in a language that I understand. The risks and benefits have been explained to me. I understand that I shall be given a copy of this consent form after signing it. I understand that my participation is voluntary and that I may choose to withdraw it any time. I understand that all efforts shall be made to keep information regarding me and my personal identity confidential. By signing this consent form, I have not given up my legal rights as a participant in this research study.

I voluntarily agree to participate in this research study: Yes No

I agree to provide contact information for follow-up: Yes No

Participant's signature _____ Date _____

Researcher's statement

I, the undersigned, have fully explained the relevant details of this research study to the participant named above and believe that the participant has understood and has knowingly given his/her consent.

Printed Name: _____ Date: _____

Signature: _____

Role in the study: _____

Witness Printed Name _____ Signature:

_____ Date; _____

APPENDIX 3: QUESTIONNAIRE

KNOWLEGDE AND ATTITUDE OF UNIVERSITY OF NAIROBI REGISTRARS WORKING IN KENYATTA NATIONAL HOSPITAL TOWARDS THE HUMAN PAPILLOMA VACCINE IN ADOLESCENTS.

Kindly ensure you have read and understood your rights and responsibilities as the participant and given consent before filling out this questionnaire. Please fill out all the fields provided to the best of your ability.

Study number……

A: Socio-demographic information

date of birth yyyy/mm/dd

SEX

Female ( )

Male ( )

Field of study

Internal medicine ( )

Obstetrics and gynaecology ( )

Paediatrics and child health ( )

Surgery (specify) ( )

Marital Status

Married

Single

Separated

Parent to a child –

Yes

No

Age of children

1st.....

2nd.....

3rd.....

Date of service commencement yyyy/mm ……/…….

Human papilloma virus (HPV) is

a sexually transmitted virus

infection due to poor hygiene (3)

I don't know (4)

Other specify……

HPV infects

females

males

both

Have you heard about HPV vaccine

Yes

No

If yes where did you hear about HPV vaccines?

college/university training

workshop/CME

journal/magazine

Other specify……..

HPV vaccination is currently offered freely as part of the KEPI schedule.

Yes

No

HPV vaccination can protect from which of the following

cervical cancer

oesophageal cancer

stomach cancer

penile cancer

breast cancer

genital warts

Who should receive HPV vaccine?

girls

boys

girls and boys

women

men

I don’t know

What age group should receive the HPV vaccine?

0-4 years

5- 8 years

9- 13 years

14-20 years

21-30 years

30 – 40 years

over 40 years

How is the HPV vaccine delivered?

Oral

Intramuscular injection

HPV vaccine is delivered as

2 doses over 2 months

2 doses over 6 months

3 doses over 3 months

3 doses over 6 months

Have you received the HPV vaccine?

Yes

No

If NO why

Not aware of vaccine

No benefits of the vaccine

Fear of side effects

cost of vaccine

Availability of vaccine

Other specify

How likely are you to receive the vaccine?

Very Likely

Likely

Neutral

Not Likely

Very Unlikely

If yes where did you get the vaccine?

Have you ever recommended the vaccine to any of your patients?

Yes

No

If NO why?

Not aware of vaccine

No benefits of the vaccine

Fear of side effects

cost of vaccine

Availability of vaccine

Other specify How likely would you recommend the HPV vaccine to your patients?

Very Likely

Likely

Neutral

Not Likely

Very Unlikely

APPENDIX 3: TIME FRAME

Number	Activity	Estimated Time
1	Proposal Development and Presentation	Jan to June 2019
2	Submission of proposal for ethical approval	June 2019
3	Ethical corrections, pretesting and seeking permission	July to October 2019
4	Data Collection	October to December 2019
5	Data Analysis	January 2020
6	Thesis writing	February 2020
7	Thesis submission	March 2020