KNOWLEDGE AND ATTITUDE OF THE HUMAN PAPILLOMA VIRUS AND VACCINE IN SCHOOL GOING ADOLESCENT GIRLS IN NAIROBI COUNTY, KENYA

BY

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NOVEMBER 2021

DECLARATION

This is to certify that this research is my original work. It has not been presented in any other university for the award of a degree.

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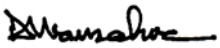
Signature…  Date…11/11/2021

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DEDICATION

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LIST OF ABBREVIATIONS

1. CA – Cancer
2. CDC- Centre for disease
3. DNA – Deoxyribonucleic acid
4. FGDs – Focus Group Discussions
5. FIGO – International Federation of Obstetricians and Gynecologists
6. HPV – Human Papilloma Virus
7. KIIs – Key Informant Interviews
8. LMICs – Low and middle income countries
9. STI – Sexually Transmitted Infection
10. VLPs- Virus Like Particles
11. WHO – World Health Organization

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DEFINITIONS

1. Adolescent – person between the ages of 10-19 years according to World Health Organization (WHO)
2. Knowledge –facts/ information about a subject
3. Attitude-a feeling / opinion about something/ someone
4. Misconceptions- a wrong/ inaccurate idea
5. Vaccine- preparation used as a preventive inoculation to confer immunity against a specific disease, usually employing an innocuous form of the disease agent, as killed or weakened bacteria or viruses, to stimulate antibody production.

ABSTRACT

Introduction

Cervical cancer is one of the most common cancers among females globally and is an outcome of persistent infection of the lower genital tract by Human Papilloma Virus (HPV). The HPV vaccine known to prevent cervical cancer is recommended by the Center of Diseases Control & Prevention (CDC) for both girls and boys. The Ministry of health rolled out the vaccine to 10 year old girls in 2019. Several studies have been done globally, regionally and locally on knowledge and attitude of HPV and vaccination amongst adolescents and their care givers with several misconceptions, beliefs and attitudes noted amongst them.

Study Justification

Adolescents being the primary target group for vaccination are a major group of stakeholders in the success of the immunization program that was recently rolled out in Kenya. Their opinion is important as HPV infection and cancer of cervix preventive measures uptake can be determined by their attitude. This study aimed to assess the level of knowledge and attitude of adolescent school girls on human papilloma virus infection and vaccine.

Methodology

This was a cross sectional mixed method study amongst 553 school going adolescent girls in selected public primary schools in Nairobi. Questionnaires were administered to the adolescent girls and focus group discussions held. The level of knowledge was reported in quantitative terms and attitudes described using qualitative methods.

Results

Majority of the girls 385 of 553 (69.6%) did not know what HPV was. Only 257 (46.6%) of 552 participants knew that HPV infection is prevented by HPV vaccination. About 60% of the participants had heard of HPV vaccine. School was the main source of information for 161(49.4%) of 326 participants while hospital and friends were the least with 31(9.5%) and 11(3.4%) respectively. More than half 296 (54.3%) of 545 girls associated HPV vaccine with

prevention of cervical cancer. Almost all the girls 528 (95.5%) had not received the vaccine citing lack of awareness in 324(63.2%) of 513 girls and lack of availability in 93(18.1%). Majority of the girls had a positive attitude towards the HPV vaccine as 342(61.8%) of 540 girls would encourage other girls to get vaccinated. The girls also believed that HPV causes cancer and if the vaccine would protect them they would get it. The main barrier for those who would not encourage others was lack of awareness in 109 (54.5%) of 198 girls and fear of harm in 78 (39.4%). Some of the barriers that came out in the discussions were misconceptions in the community and pain from the injection.

Conclusion

The level of knowledge about HPV and HPV vaccine was found to be generally low. They however had a positive attitude towards the vaccine. School was chosen to be the main source of information about HPV vaccine. The main barriers towards HPV vaccination were lack of awareness, availability, misconceptions, pain at the injection site and fear of adverse effects.

1.0 INTRODUCTION

Epidemiology of Cancer cervix

Cervical cancer is a very common cancer among females worldwide. The International Federation of Gynecologists (FIGO) ranked it fourth preceded by breast, colorectal, and lung cancer. About 527 600 new cases of cervical cancer were reported in 2012 with 265,700 deaths recorded yearly. In low and middle- income countries (LMICs), cancer of the cervix is the second most occurring cancer among women and the third leading cause of death. Most of the recently acquired cases (85%) and deaths (90%) occur in low- resource regions (1).

Ca cervix is amongst the most evident cancers in Eastern and Central Africa, mortality being highest in Eastern Africa at 27 per 10,000 compared to less than 2 per 100,000 in first world countries such as Europe, Australia and New Zealand (2). Kenya has a high cervical cancer burden which is the leading cause of cancer deaths in women of reproductive age. The estimated incidence is close to 2500 and annual deaths of just over 1500 with an average life lost at 25 years(2).

Anatomy

Anatomically, Ca cervix starts by involving the transformation zone which is the area between the previous and new squamocolumnar junction. The ectocervix which consists of a squamous epithelium protrudes into the birth canal. The endocervix span is from the inner os of cervix at the point where it meets the uterus to the outer os adjoining the birth canal. It has columnar epithelium. The cervix is easily visualized and sampled hence enhancing understanding of progression and history of its cancer and development of methods of screening and prevention(3).

Human Papilloma Virus

Cancer cervix is as a result of recurrent infection of the genital tract by HPV types. **HPV 16** and **18** cause majority of the cases while low risk HPV types could lead to some of the cases(4) (5) .Most of initial HPV infections do not continuously remain in the body past 2 years of getting infected. However similar HPV DNA can be found on some samples (about 10%) taken 6–12 months later indicating persistence which could advance to cervical precancerous lesions.

Administration of HPV vaccine can help control Ca cervix complemented by precancerous lesion screening(3) .

Acquisition of high risk HPV infection is estimated to be more than 80% of women followed up. This shows how easily it is transmitted. Worldwide HPV prevalence is around 11.7% among healthy women. Sub- Saharan Africa tops at 24%. Globally it ranges between 2% to 42% in various countries. Prevalence of HPV infection is noted to peak at 25% in females below 25 years, implying that it is acquired sexually and after sexual debut. Therefore prevention by HPV vaccination should be advocated for before sexual activity is commenced, with focus on 10-14 year old girls.(6).

HPV vaccine

The HPV vaccine was approved by the FDA in 2006 and recommended by CDC for both genders(7). The three vaccines in use globally are **Cervarix** which is bivalent and aimed at protecting against **HPV 16 and 18, Gardasil 4** quadrivalent that's focused on types 6,11,16 and 18 and **Gardasil 9** that is nonvalent and targets HPV types 31,33,34,45,52 and 58 besides those covered by the two mentioned above. Other than premalignant and malignant lesions, Gardasil 4 and 9 also protects against anogenital warts following HPV 6 and 11 infections. Viral DNA is not contained in these vaccines hence not infectious. They consist of virus- like particles (VLPs). It is recommended that 9-14-year-old **girls and boys** receive two doses (**0.5 mL at 0 and 5–13 months**). A third dose is advised in cases where dose two was received before 5 months' elapse post first dose.

Three doses (0.5 mL at 0, 1, 6 months) are to be administered in immunocompromised patients regardless of age and those above 15years (8).Issues around safety of the vaccines were ruled out after WHO reviewed the latest data (8). Since the introduction of the HPV vaccines occurrence of HPV types linked to causing CA cervix, anogenital warts and high grade cervical abnormalities have reduced in young women. Evidence of its effectiveness at population level has led to World Health Organization(WHO) advocating for HPV vaccination to 9–13-year-old girls and as part of the plan to fight cervical cancer, Kenya recently rolled out HPV vaccination in girls aged 10years with an aim of getting them before acquiring the HPV types of interest.

Similarly, countries such as Rwanda, Uganda, Cameroon, Tanzania, Lesotho and South Africa already introduced school based HPV vaccination programs (9).

2.0 LITERATURE REVIEW

Knowledge and Attitude

Several studies have been done globally on HPV infection and vaccine knowledge and adolescents' attitude towards HPV vaccination.

A review of studies conducted in Asia revealed most respondents had inadequate knowledge of HPV infection practices and preventive measures which had been examined in 48/63 studies. 40-90% of the participants in most studies were unaware of HPV transmission route and did not link HPV to CA cervix. Participants included girls aged 9-14 years. (10).

In developing countries knowledge has been reported to be low. A qualitative study conducted among 169 respondents in Northwest Tanzania (parents, health workers, teachers, religious leaders and female pupils) showed none of the parents (n=60), teachers (n=37) and female pupils (n=54) were aware of HPV infection or vaccine. The girls were aged 11-17 years. Despite the lack of knowledge all the girls showed interest to be vaccinated after being given more information. 35% (5/14) of the male teachers had their reservations on accepting their daughters to be vaccinated citing fear of side effects especially effects on their future reproduction. They also saw it as a license to be sexually active(11).

A similar study in Uganda reported little knowledge as only 17.6% of 670 adolescents were knowledgeable on HPV infection and its vaccine(12).

In Kenya a study revealed insufficient knowledge on HPV and HPV vaccination among women. In the same study the women would let their daughters get the vaccine if it would protect them against cervical cancer regardless of the level of knowledge(13). Among adolescents, low level of knowledge was reported in a study comparing those vaccinated and unvaccinated post HPV vaccination initiative in 2016 in Eldoret. Out of 120 unvaccinated

adolescents 108(90%) were unaware of the mode of transmission of HPV and only 6 (5%) had heard of HPV vaccine. 75\118 (63.3%) reported willingness to be vaccinated. Of the vaccinated group 25/60(41.7%) were aware of HPV mode of transmission 56/60 (93.3%) had heard of HPV vaccine(14)

Misconceptions

Several studies have reported misconceptions among women concerning HPV infection and Vaccination which could have a negative effect on the population's attitude towards preventive strategies put in place such as vaccination. Some of the misconceptions include poor safety profile hence risk of serious adverse events, low efficacy, lack of guarantee/otherwise on mutation of cancer causing HPV subtypes in future and that there is lack of evidence that the vaccine performs as advertised(15).

A study by Deborah et al revealed concerns about sterilizing properties in tetanus toxoid vaccine and the same being thought of the HPV vaccine(13).A study by Allison et al brought out concerns that it might affect future fertility and that even if it prevented cancer of the cervix ,it was not a disease of children hence vaccination not justified(16). A section of religious leaders in Kenya were opposed to the introduction of the HPV vaccine citing promotion of immorality and that since HPV is a sexually transmitted infection(STI) children who are chaste and faithful adults were not at risk (local media reports). They also noted that there was no need of the vaccine as over 90% of all HPV infections resolved spontaneously. Rumors spread that the HPV vaccine could be a form of contraception similar to when the tetanus toxoid vaccination program including 10-year-old girls was introduced (local media reports).

Locally in Korogocho, Nairobi and Mashuru,Kajiado some girls aged 11-13 years and boys 13-17 years participated in FGDs aimed at determining their understanding, thoughts and feelings towards HPV vaccination. Majority lacked knowledge on HPV and the vaccine. The girls expressed willingness to be vaccinated after being given proper information. Poor information, painful injections, religious beliefs and negative peer influences were some of the barriers to getting the vaccine that emerged(13).

Other local studies on HPV have been done on various groups. A qualitative research seeking to understand concerns of male and female caregivers and their perceptions on HPV vaccine in Western Kenya revealed low awareness of HPV infection and its connection to cancer of the cervix. Most of the participants had questions concerning natural history, causes and how its transmitted. 56 caretakers and 12 influencers took part in the study. Other than professionals (n=3) no one else was aware of the HPV vaccine however they were willing and eager to accept it. Widespread community ignorance emerged as the major barrier to vaccination. Caregivers are decision makers in the household therefore their level of knowledge and perspectives would affect vaccination decisions of adolescents. They are also responsible for passing on what they know to their children(16).

Masika et al assessed knowledge of teachers in primary schools in Kitui and their positon on the HPV vaccine post launch of the Vaccination program to grade 4 girls. 339 teachers participated (60% female). The main findings were that there was moderate (48%)level of knowledge on HPV vaccine and cancer of the cervix. Women were more knowledgeable than men at 50%:46% respectively. 95% of the respondents linked the vaccine to prevention of cancer but did not know much about HPV infection. Adolescents spend most of their time in school and teachers' level of knowledge is important as they are at a position to influence their decisions and attitude towards the vaccination. Most of the teachers were positive as 98% were interested to know more and 93% supported school based vaccination program(15).

Table 1: Summary of similar studies in various parts of the world

Author/country/year	Title/ Objectives	Study Population	Study Design	Results
Subash et al in Puducherry-India June to November 2018	Knowledge and attitude on HPV among adolescent girls in school students at Puducherry	13 to 18 year old girls	Descriptive Study	56.7% - inadequate knowledge 36.7%-moderate knowledge 6.6%- adequate knowledge
Fairuz et al in Malaysia June to September 2015	Knowledge attitude and practice of HPV vaccination among secondary school students in rural areas of Negeri, Sembilan	13, 14 and 16 year olds. Both male and female 380 respondents	Cross sectional study	50.3% knew about HPV 66.3% knew about Ca Cervix 50.3% knew of vaccination to prevent HPV 86.6% had the intention to get vaccinated.
Spain (Valencia province) September 2010 to May 2011	Knowledge and attitude of Spanish adolescent girls towards HPV infection	15 year old girls	Cross sectional Descriptive Study	89.9% knew of HPV infection and associated it with Ca cervix 39.1% associated HPV with ovarian cancer
Brazil Between June and July 2015	Uncover knowledge and attitudes of girls, mothers, teachers and health professionals about HPV and vaccinations	9yrs 11-12yrs	Qualitative study	✓ The conclusion was that there was a controversial understanding of HPV ✓ There was adequate knowledge about the vaccine ✓ Need for education in health

3.0 STUDY JUSTIFICATION

Adolescents are a major group of stakeholders in the success of the HPV immunization program that was recently rolled out in Kenya after collaborative project was established to enhance country adolescent immunization programs and health systems in Africa involving 20 countries (9).

Their opinion is important as HPV infection and cancer of cervix are chronic conditions whose management/ prevention can be determined by their attitude. Information on their level of understanding and mindset towards the HPV infection and vaccine would be important in informing need of a school based awareness program.

The findings of the study will help in developing strategies against some of the barriers to uptake of the vaccine. It could also aid in identifying the age at which the first dose of the vaccine would have a higher uptake, this is important in programming.

Despite growing global interest in HPV vaccination, very few studies have been conducted on parents and other stakeholders such as adolescent girls to explore their perceptions following the launch of HPV vaccination in underdeveloped nations and particularly sub Saharan Africa (17).

There seems to be paucity of data in Kenya on knowledge and attitude of adolescent school girls regarding the human papilloma virus and vaccine. This study aims to assess the level of knowledge and attitude of adolescent school girls on human papilloma virus and vaccine.

4.0 RESEARCH QUESTION

What is the level of knowledge and attitude of adolescent school girls towards Human Papilloma Virus (HPV) and Vaccine in Nairobi County?

5.0 STUDY OBJECTIVES

5.1 BROAD OBJECTIVE

To assess the level of knowledge and attitude of adolescent school girls on Human Papilloma Virus and vaccine in select public primary schools in Nairobi County.

5.2 SPECIFIC OBJECTIVES

1. To assess the level of knowledge on HPV infection
2. To assess the level of knowledge on HPV vaccine
3. To determine attitude and barriers towards HPV vaccination

5.3 SECONDARY OBJECTIVE

To determine the factors associated with level of knowledge.

6.0 METHODOLOGY

6.1 STUDY DESIGN

Mixed methods

A cross-sectional study with both quantitative and qualitative aspects was carried out from January 2021 to March 2021.

Qualitative aspects included Focus group discussion and addressed attitudes and barriers towards vaccination.

6.2 STUDY AREA/ SITE

School based study in public primary schools in Nairobi County. Nairobi is one of the 47 counties in Kenya and is made up of 11 sub counties. The table below shows the distribution of number of primary schools in Nairobi County and their enrolment.

Table 2: Distribution of Primary Schools in Nairobi County and their enrolment

		PUBLIC				PRIVATE			
S/NO	**SUBCOUNTY**	**NO. OF SCHOOLS**	**BOYS**	**GIRLS**	**TOTAL**	**NO. OF SCHOOLS**	**BOYS**	**GIRLS**	**TOTAL**
1	DAGORETTI	15	9531	9955	**19486**	63	6572	6352	**12924**
2	EMBAKASI	20	17601	18351	**35952**	183	22496	22746	**45242**
3	KAMUKUNJI	17	9709	9273	**18982**	33	4318	3900	**8218**
4	KASARANI	26	15570	15864	**31434**	101	9506	9756	**19262**
5	KIBRA	9	6248	6407	**12655**	60	6536	7207	**13743**
6	LANGATA	12	3885	3916	**7801**	49	7109	6210	**13319**
7	MATHARE	18	4660	5694	**10354**	17	2255	2273	**4528**
8	MAKADARA	27	11690	12248	**23938**	26	6620	6552	**13172**
9	STAREHE	18	4357	4194	**8551**	44	3260	3244	**6504**
10	WESTLANDS	27	13426	13763	**27189**	162	7484	7966	**15450**
11	NJIRU	20	13883	14274	**28157**	60	15712	15394	**31106**
	TOTAL	**199**	**110560**	**113939**	**224499**	**798**	**91868**	**91600**	**183468**

6.3 STUDY POPULATON

The study population consisted of adolescent girls aged 10-14 years in selected public primary schools in Nairobi County who were in grade 4 to 8.

6.4 STUDY SUBJECTS

Inclusion Criteria

1. Primary School going girls
2. Age 10-14years
3. Grade 4 to 8

Exclusion Criteria

1. Those whose parents/guardians did not give written consent
2. Those who did not assent

6.5 STUDY VARIABLES

Predictor variables

1. Age
2. Grade
3. Religion
4. Parents level of education

Outcome variables

1. Knowledge of HPV among the adolescent girls.
2. Knowledge of HPV vaccine among the adolescent girls
3. Attitude towards HPV vaccine among the adolescent girls.

6.6 SAMPLE SIZE DETERMINATON

The sample size was determined using the Fischer's Formula

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

n=estimated sample size

Z= standard normal deviate for 95% confidence interval (1.96)

p=Proportion of adolescents with adequate knowledge {50.3% - 0.503} (18)

q= Proportion of adolescents without adequate knowledge (1-p)

d= Desired level of precision set to 0.042

n=550

P value was determined from prevalence of knowledge about HPV infection and vaccine at 50.3% by Fairuz et al in Malaysia where they assessed knowledge, attitude and practice of HPV among secondary school students Aged 13, 14 and 16.

6.7 SAMPLING TECHNIQUE

Sampling for quantitative aspect of the study

Multi stage stratified sampling was used.

Stage one: Three sub counties were selected randomly

Stage two: One public school from each sub county was randomly selected.

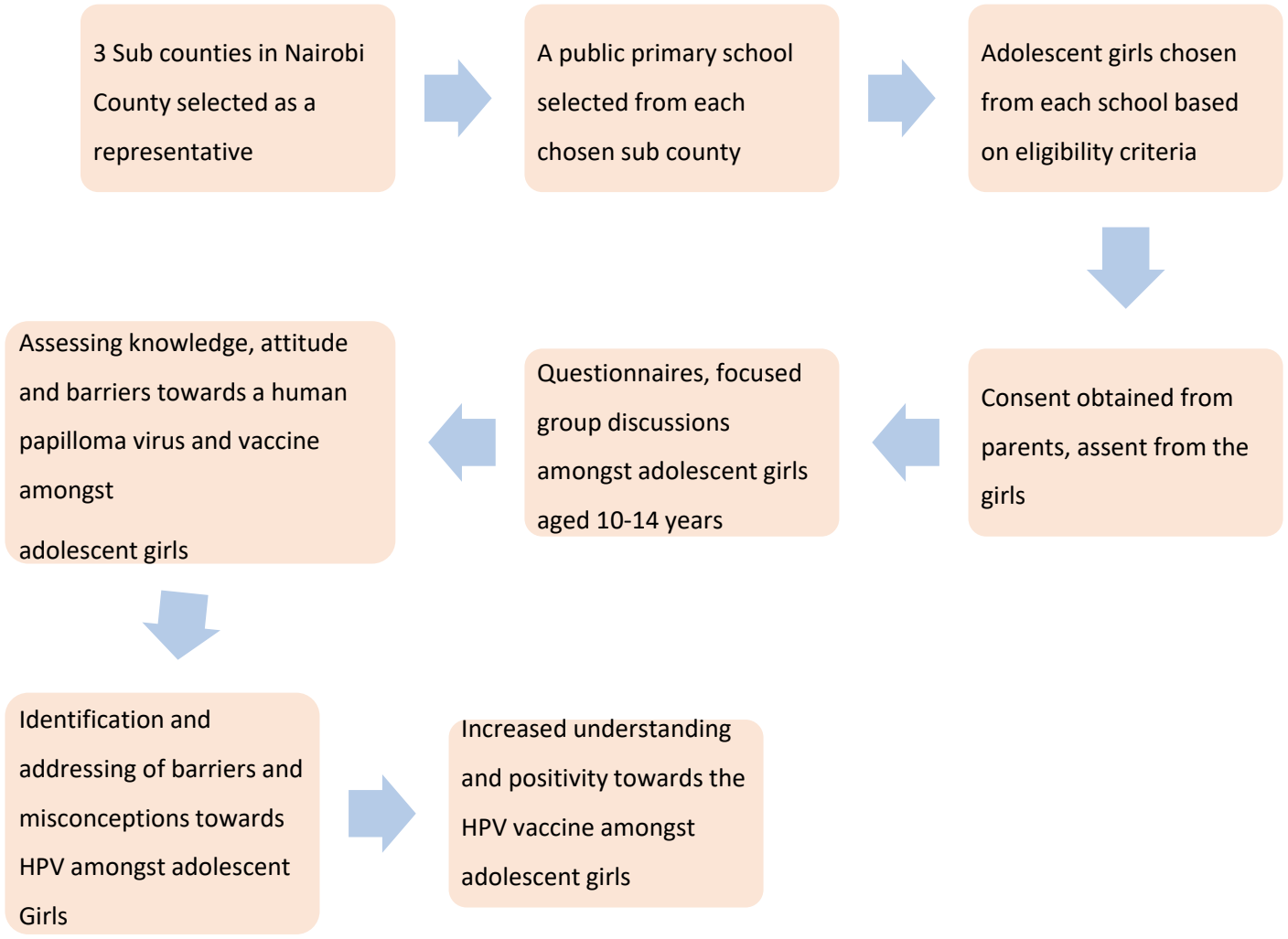
Stage three: The total number of participants required was divided equally among the three schools (If n girls desired in total, n/3 gave the number required from each school).

Stage four: In each school, simple random selection of the girls was done with the help of class teachers using the class registers of the individual classes. An equal number of girls from each class who met the eligibility criteria was selected until the required sample size attained. The girls between 10 and 14 years were expected to be in 5 classes (classes 4- 8) therefore the estimated number selected from each class was n/5). This was done in order to get similar representation from each class and thereby obtaining a better age spread.

Sampling for qualitative aspect of the study

Adolescent girls from the three schools in the quantitative arm were purposively selected for focus discussion groups. Each group had between 6-8 girls. 2-3 girls who had written consent from their parents/guardians were selected randomly from each class putting the various ages into consideration and aiming for inclusion of preteens (10-12 years) and teens (13-14years). The aim was to conduct two FGDs in each of the three schools for up to 6 FGDs and up to 48 participants.

FIGURE 1: STUDY FLOW CHART



6.8 STUDY PROCEDURE

6.8.1 Study tools

The study tools are provided in the appendix section

1. Questionnaire
2. Focus group discussion guide

6.8.2 Data collection procedure

Quantitative aspect

A questionnaire was developed and pretested in 100 adolescent girls in a selected public primary school which was not part of the study sample. It was then revised based on validity and question value. The questionnaire was self-administered. Sections of the questionnaire included socio-demographic characteristics, knowledge of HPV, knowledge on HPV vaccine and attitudes towards the HPV vaccine.

Introduction was done and purpose of the study explained to the heads of schools who then delegated the study processes to deputy heads of schools. Consent forms were then handed over to the selected participants through their class teachers to take to their parents/guardians. The adolescent girls who returned the signed informed consent forms from the parents/guardians were asked for assent and thereafter sat in a hall in their various schools.

After distribution of questionnaires instructions were given and any clarifications sought before answering the questions. This was done in the presence of one of their teachers and the principal investigator. Discussions amongst the girls were discouraged. The adolescent girls were encouraged to choose the “I don’t know” option rather than guessing. They were also informed that there was no wrong answer and asked to answer all the questions as honestly as possible. Filled questionnaires were thereafter taken for analysis.

Qualitative aspect

The focus group discussions were conducted after filling in of the questionnaires. The study participants were informed about the purpose of the study. At this point a verbal assent was taken since written informed consent/assent had been taken before the beginning of the study. The activity took place in the schools' halls. The aim was to conduct two FGDs in each of the three schools. However only three FGDs were conducted successfully with 7, 7 and 6 participants in each. The girls were aged 12 -14 years. The remaining participants in the other groups did not have knowledge on the study topic and some of the younger girls (10 and 11 years) who had been selected were shy hence no further discussion could take place. This led to reduced number of groups of one per school with up to 20 participants.

Circular sitting arrangement was adopted to facilitate easier discussion. The adolescent girls sat on chairs. Introduction was done off the record and ground rules laid. Thereafter the discussions commenced. Notes were taken verbatim by the investigator. The discussions were also recorded to ensure all details are captured. The teachers opted to stay away during the discussions to reduce tension and encourage the girls to open up more.

6.9 DATA MANAGEMENT AND ANALYSIS

6.9.1 Quantitative data

The data extraction forms and questionnaires were stored under lock and key before and after data entry into a password protected computer. These were double entered into an excel data base and cleaned. The questionnaires had codes as opposed to names hence protecting identity of the participants.

The questionnaire had twenty questions. The first seven questions were socio demographics. Three questions were on knowledge of HPV, two questions on HPV vaccine awareness and four questions on knowledge of HPV vaccine. The remaining four questions were on attitude and barriers towards the HPV vaccine. Each correctly answered question was awarded one point. A wrong answer, not answered, and those that ticked "I don't know" all scored zero points. For the HPV knowledge points were out of 3 and for the vaccine knowledge were out of 4. Percentages were then calculated. Poor level of knowledge were those that scored less than 50% whereas good level of knowledge were those that scored 50% and above.

All analysis was conducted using statistical package for the social sciences (SPSS) version 23. The primary outcomes were reported as proportions of participants with good knowledge and the main themes emerging from the qualitative analysis.

6.9.2 Qualitative data

The focus group sessions were recorded, transcribed verbatim and translated to English as needed. Recordings started after introduction to protect identity. Hand written notes were also made as the discussions were ongoing. Content analysis was conducted by 2 coders who reviewed the transcripts then by consensus arrived at codes which they both applied, and any disagreements resolved through further discussion. In addition, independent reading was also done by the principal investigator.

6.10 ETHICAL CONSIDERATION

1. Ethical approval was sought from the University of Nairobi/ Kenyatta National Hospital (UON/KNH) Ethics Committee to collect and analyze data as part of thesis dissertation. Copies of this protocol, informed consent/assent form were presented to the above named committee for written approval prior to commencement of the study.
2. Approval from the Ministry of Education.
3. Research authorization granted by NACOSTI, county and sub county directors of education.
4. The purpose of the study was clearly explained to the parents/guardians so as to obtain informed consent from the parents/guardians and assent from the adolescent girls.
5. Confidentiality was adhered to and study tools did not contain identifying information.

7.0 RESULTS

Quantitative results

Between January 2021 and March 2021, 553 adolescent girls participated in the study after returning consent forms duly signed by their parents. The girls also gave their assent. As shown in table 3, the median age was 12years (range of 10-14years).Three hundred and eighty six of 551(70%) girls live with both parents while 126 of 551(22.9%) are from single parent families. Two girls did not respond to that question.

Three of 550(0.5%) girls have illiterate mothers. Three girls did not answer the question. One of 547 (0.2%) girls have illiterate fathers and 6 girls did not answer that question. Majority of the girls' parents are working with 258 of 547(47.2%) and 252 of 547(46.1%) of their mothers and fathers respectively being in formal employment while 172(31.4%) and 118(21.6%) of 547 are self-employed. Table 3 below shows the socio demographic characteristics of the participants.

Table 3: Socio demographic characteristics of the girls, total=553girls

The median (IQR) age of the participants was 12.0 (12.0 – 13.0) years.

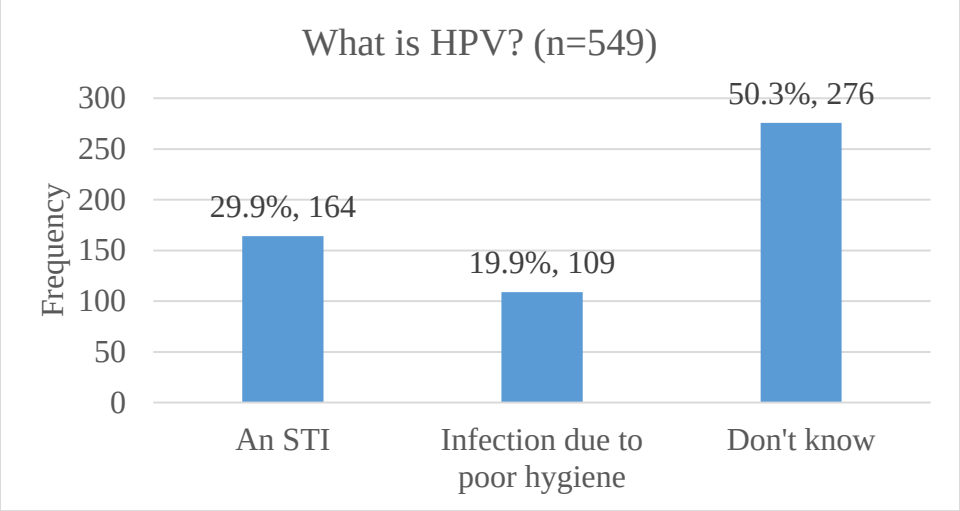
		Frequency	Percent
Age categories in years (n=553)	10	23	4.2
	11	92	16.6
	12	180	32.5
	13	169	30.6
	14	89	16.1
Religion(n=553)	No response	6	1.1
	Catholic	143	25.9
	Protestant	245	44.3
	Muslim	44	8.0
	Others	110	19.9
	Don't know	5	0.9
Class/grade(n=553)	No response	9	1.6
	5	145	26.2
	6	183	33.1
	7	147	26.6
	8	69	12.5
Live with(n=553)	Both parents	386	69.8
	Single parent	126	22.8
	Others	39	7.1
	No response	2	0.4
Mother's education(n=553)	No response	3	0.5
	Basic	187	33.8
	Post basic	238	43.0
	None	3	0.5
	Don't know	122	22.1
Father's education(n=553)	No response	6	1.1
	Basic	155	28.0
	Post basic	234	42.3
	None	1	0.2
	Don't know	157	28.4
Mother's occupation(n=553)	No response	6	1.1
	Housewife	38	6.9
	Self-employed	172	31.1
	Employed	258	46.7
	Don't know	55	9.9
	Others	24	4.3
Father's occupation(n=553)	No response	6	1.1
	Self-employed	118	21.3
	Employed	252	45.6
	Don't know	148	26.8
	Others	29	5.2

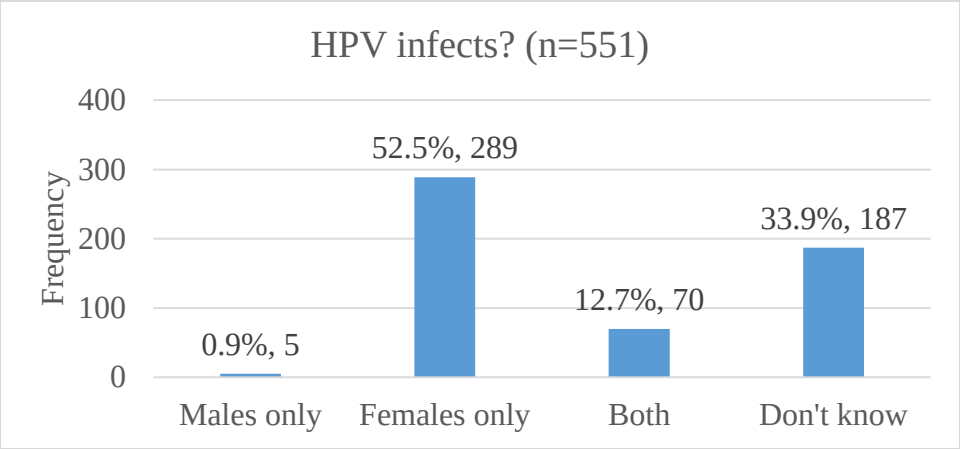
Knowledge of HPV infection

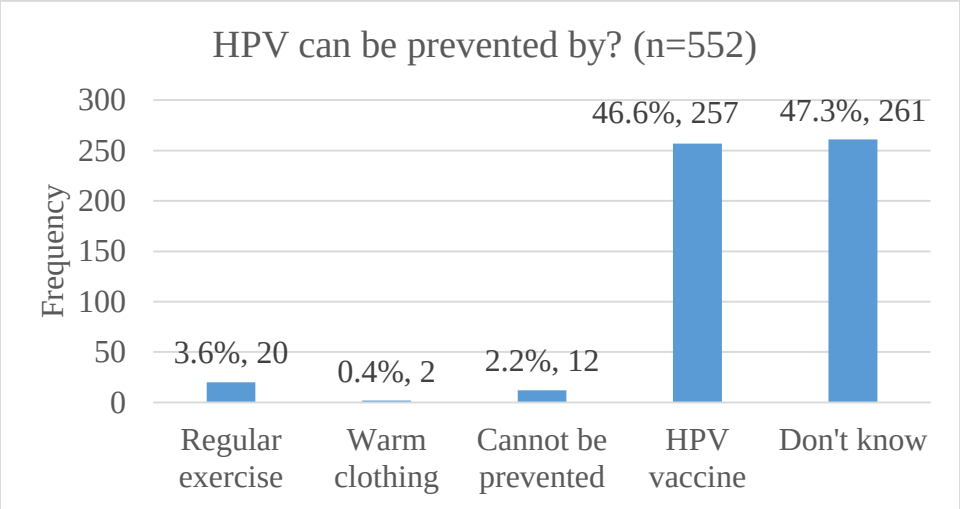
Majority of the girls 385 of 553 (69.6%) did not know what HPV was and out of these 109(19.9%) of 549 thought it was an infection due to poor hygiene. Four girls did not respond to this question. Only 70(12.7%) of 551 answered correctly on who HPV infects. Two hundred and eighty nine (52.5%) of 551 picked females only while 5(0.9%) of 551 girls thought it affected males only. The remaining participants did not know who it infected. Two hundred and fifty seven (46.6%) of 552 participants knew that HPV infection is prevented by HPV vaccination. Twelve (2.2%) of them thought it could not be prevented. The rest did not know the preventive measure with 20(3.6%) picking regular exercise and 2(0.4%) picking wearing warm clothing. One girl did not give a response.

Figure two below shows graphs summarizing the girls' level of knowledge.

Figure 2: Summary of Knowledge of Human Papilloma Virus

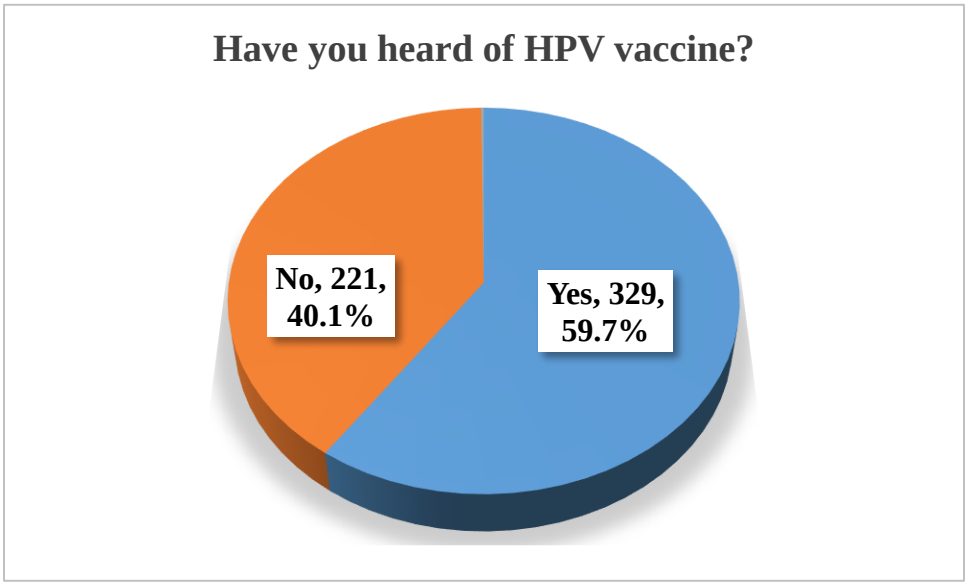


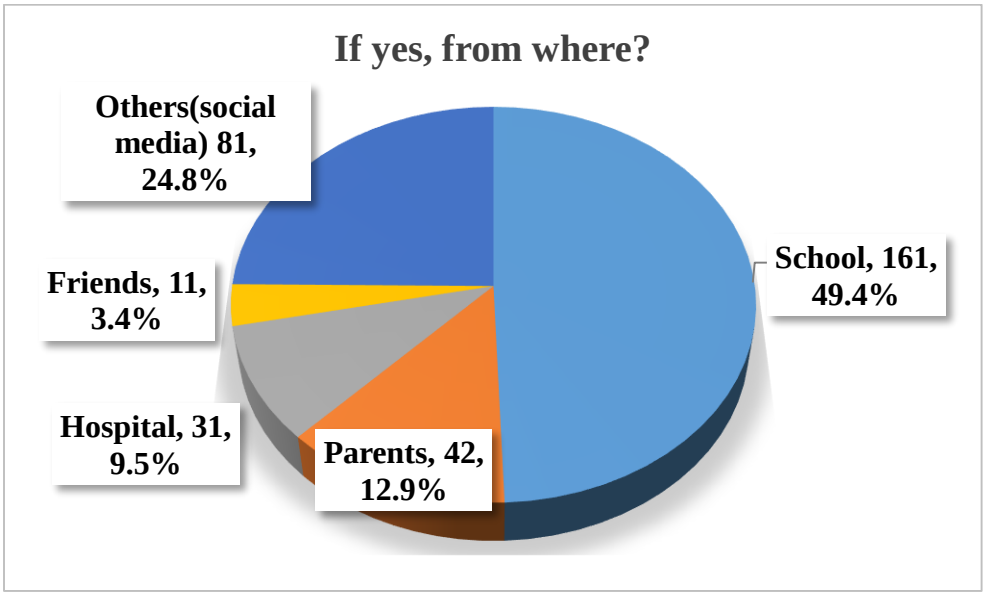




The figure below shows a summary of the awareness of HPV vaccine amongst the girls and their source of information.

Figure 3: Awareness on HPV Vaccine





As shown in figure 3 above 329(59.5%) of 553 participants had heard of HPV vaccine and of these, three did not know. School was the main source of information for 161(49.4%) of 326 participants. This was followed by social media with 81 (24.8%) of 326 participants. Parents came in third 42(12.9%) while hospital and friends were the least with 31(9.5%) and 11(3.4%) respectively.

Two hundred and ninety six (54.3%) of 545 girls associated HPV vaccine with prevention of cervical cancer. Two hundred and ninety one (53.2%) of 547 knew the mode of administration which is injection (Table 4). However, the majority, 456(82.5%) of 552 girls did not know the number of doses administered. Three hundred and ninety eight (72.1%) of 552 thought that only girls should get the vaccine. This was also evident in the focus group discussions as the girls said HPV vaccine is given to girls only. Five hundred and twenty eight (95.5%) girls had not received the vaccine. The reasons were lack of awareness in 324(63.2%) of 513 girls and lack of availability in 93(18.1%) of 513. Eighty one (15.3%) girls feared the vaccine would harm them while 9 (1.7%) cited religious reasons. The remainder thought the vaccine wouldn't benefit them. The differences in the total number of respondents is due to particular questions not being answered. In one of the focus groups, 1 out of 6 girls had received the vaccine. 2 did not know where to access it and the rest said they were above 10years (age being vaccinated currently) even though they knew girls up to 13 years could get the vaccine. Table four below shows a summary of the girls' knowledge of HPV vaccine.

Table 4: Summary of knowledge of HPV Vaccine

		Frequency	Percent
What does HPV vaccination protect from (n=545)	Cervical cancer	296	54.3
	Stomach cancer	5	0.9
	Breast cancer	28	5.1
	Don't know	216	39.6
Who should receive the vaccine (n=552)	Girls only	398	72.1
	Boys only	2	0.4
	Both boys and girls	34	6.2
	Don't know	118	21.4
How is the vaccine given (n=547)	By mouth	17	3.1
	Injection	291	53.2
	Don't know	239	43.7
How many times does one get the HPV vaccine (n=552)	Two	96	17.4
	One	50	9.0
	Don't know	406	73.6
Have you received the vaccine (n=552)	Yes	24	4.3
	No	528	95.7
If no, why? (n=513)	Not aware	324	63.2
	Don't know where to get it	93	18.1
	Fear of vaccine not being good for my body	81	15.8
	No benefits	6	1.2
	Religious reasons	9	1.8

Attitude and Barriers towards HPV Vaccine

Majority of the girls had a positive attitude towards the HPV vaccine as 342(61.8%) of 540 girls would encourage other girls to get vaccinated (Table 5).

Table 5: Attitude towards HPV vaccine

		Frequency	Percent
Would you encourage other girls to get the vaccine? (n=540)	Yes	342	63.3
	No	198	36.7
If no, why (n=198)	Not aware	109	55.1
	Fear of vaccine being harmful to body	78	39.4
	No benefits	5	2.5
	Religious reasons	6	3.0

The main barrier for those who would not encourage others was lack of awareness in 109 (54.5%) of 198 girls and fear of them being harmed in 78 (39.4%). The least chosen barrier was religious factors with 6(3%) of 198 girls (Table 5).

Qualitative results

Three focus group discussions were conducted among primary school going girls aged 12 to 14 years. Three themes were arrived at,

1) Girls had limited knowledge on both the Human Papilloma Virus (HPV) and the HPV vaccine.

The girls who were interviewed reported having got information on HPV from teachers, parents or social media. However, they did not have much information as they struggled to piece together bits and pieces of information to link the virus, the vaccine and cervical cancer.

"*And the vaccine is given I think once." FGD 1 participant*

"… the boys don't have that disease." FGD 2 participant

"The same way if a girl has HPV, she will transmit the disease to the boy." FGD 2 participant

The inadequate information was made worse by misconceptions that they had heard about HPV and the HPV vaccine.

"They are saying that it (the vaccine) doesn't really help that much, and it even makes it look bigger like it makes the virus spread more and more." FGD 1 participant

"They think people are going to test things out on them when they give them the vaccine" FGD 2 participant

"I heard that if one gets the vaccine they will not get children in future….." FGD 2 participant

"I heard from social media that someone can become sicker when they get the vaccine, and even die" FGD 3 participant

"My mom said if I get the vaccine I might get cervical cancer" FGD 3 participant

2) Girls were eager to get more information both on HPV and the vaccine

Only a few of the girls in the groups had some information on HPV vaccine, and all groups took the opportunity to ask the facilitator questions in a bid to increase their knowledge.

"Is it deadly? Cervical cancer?" FGD 2 participant

Is it normal to have pain? FGD 2 participant

"So, do you think that we should go for screening, or should we wait for the vaccine to come? FGD 1 participant

"In a span of how many years can you die from cervical cancer?" FGD 1 participant

It also gave them an opportunity to seek clarification on some of the things they had heard about cervical cancer.

": I don't know whether it's true, I was told that there was a woman who had like the HPV virus or something. Then after she contracted the disease there was a lot of discharge, like so much, it can be a bucket full. That is what I was told …" *FGD 2 participant*

3) Despite limited knowledge on the vaccine, girls were positive about the vaccine

Majority of the girls were optimistic that the vaccine would be useful. All 6 girls in one of the focus group discussions said they would encourage other girls to get the vaccine.

"I believe it also works because you wouldn't be giving us things that you know will harm us" FGD 1 participant

"I also encourage it because many people die from cancer daily and it's not really nice seeing fellow girls dying from something that can be treated." FGD 1 participant

"*I think they should all go for the vaccine" FGD 2 participant*

"If it is brought here I will get it" FGD 3 participant

Other than misconceptions, some of the barriers that came out were lack of availability and awareness on where to get the vaccine, and painful injection.

"*Where can we get this vaccine?" FGD 1 participant*

"Will you bring it to our school?" FGD 2 participant

"I got it……it is painful" FGD 3 participant

"If it's painful I don't think I'll get it" FGD 3 participant

"Can you make one for drinking?" FGD 2 participant

The secondary objective was to determine the factors associated with the level of knowledge. Table 6 below shows the association of demographic variables with level of knowledge on HPV.

Table 6: Association of demographic variables with level of knowledge on HPV

	n	Poor, *n (%)*	Good, *n (%)*	OR (95% CI)	p-value
Age		**n=411**	**n=142**		
10	23	13 (3.2)	10 (7.0)	Reference	
11	92	68 (16.5)	24 (16.9)	2.2 (0.8-5.6)	0.107
12	180	134 (32.6)	46 (32.4)	2.2 (0.9-5.5)	0.076
13	169	126 (30.7)	43 (30.3)	2.3 (0.9-5.5)	0.075
14	89	70 (17.0)	19 (13.4)	2.8 (1.1-7.5)	**0.035**
Mother's education		**n=409**	**n=141**		
Basic	187	129 (31.5)	58 (41.1)	Reference	
Post basic	238	182 (44.5)	56 (39.7)	1.5 (1.0-2.2)	0.085
None	3	2 (0.5)	1 (0.7)	0.9 (0.1-10.1)	0.931
Don't know	122	96 (23.5)	26 (18.4)	1.7 (1.0-2.8)	0.062
Father's education		**n=407**	**n=140**		
Basic	155	112 (27.5)	43 (30.7)	Reference	
Post basic	234	174 (42.8)	60 (42.9)	1.1 (0.7-1.8)	0.646
None	1	1 (0.2)	0 (0.0)	-	-
Don't know	157	120 (29.5)	37 (26.4)	1.2 (0.7-2.1)	0.399
Live with		**n=410**	**n=141**		
Both parents	386	286 (69.8)	100 (70.9)	Reference	
Single parent	126	92 (22.4)	34 (24.1)	0.9 (0.6-1.5)	0.811
Others	39	32 (7.8)	7 (5.0)	1.6 (0.7-3.7)	0.279

The age of the girls tended to be associated with their level of knowledge on HPV. Girls who are 14 years are 2.8 times (95% CI: 1.1-7.5) more likely to have poor knowledge compared to those who are 10 years. This could be due to the number of participants from the two ages. Ten year olds were very few compared to 14 year olds.

Table 7 below shows the association of demographic variables with level of knowledge on HPV vaccine.

Table 7: Association of demographic variables with level of knowledge on HPV vaccine

	n	Poor, *n (%)*	Good, *n (%)*	OR (95% CI)	p-value
Age		**n=306**	**n=247**		
10	23	12 (3.9)	11 (4.5)	Reference	
11	92	51 (16.7)	41 (16.6)	1.1 (0.5-2.8)	0.779
12	180	104 (34)	76 (30.8)	1.3 (0.5-3.0)	0.610
13	169	86 (28.1)	83 (33.6)	1.0 (0.4-2.3)	0.908
14	89	53 (17.3)	36 (14.6)	1.4 (0.5-3.4)	0.524
Mother's education		**n=305**	**n=245**		
Basic	187	97 (31.8)	90 (36.7)	Reference	
Post basic	238	125 (41.0)	113 (46.1)	1.0 (0.7-1.5)	0.894
None	3	2 (0.7)	1 (0.4)	1.9 (0.2-20.8)	0.616
Don't know	122	81 (26.6)	41 (16.7)	1.8 (1.1-2.9)	**0.012**
Father's education		**n=303**	**n=244**		
Basic	155	81 (26.7)	74 (30.3)	Reference	
Post basic	234	123 (40.6)	111 (45.5)	1.0 (0.7-1.5)	0.953
None	1	1 (0.3)	0 (0.0)	-	-
Don't know	157	98 (32.3)	59 (24.2)	1.5 (1.0-2.4)	0.070
Live with		**n=305**	**n=246**		
Both parents	386	213 (69.8)	173 (70.3)	Reference	
Single parent	126	73 (23.9)	53 (21.5)	1.1 (0.7-1.7)	0.589
Others	39	19 (6.2)	20 (8.1)	0.8 (0.4-1.5)	0.441

As shown in table 7 above, 306(55.3%) of 553 girls had poor knowledge on HPV vaccine. The girls' mothers' level of education is associated with their level of knowledge on HPV. This is indicated by the P value of 0.012. Girls who did not know their mothers' education level are 1.8times (95% CI: 1.1-2.9) more likely to have poor knowledge compared to those whose mothers had basic education.

8.0 DISCUSSION

Some studies have been conducted in Kenya on HPV vaccination. However there is limited data exploring knowledge and attitude of adolescent girls on HPV and HPV vaccination. This is among the first studies whose purpose was to assess the level of knowledge and attitudes of the young adolescent girls towards HPV and HPV vaccination as well as explore barriers towards vaccination. Since Kenya has a high cervical cancer burden, the HPV vaccine was incorporated into the immunization program and rolled out in 2019 to ten year old girls as a preventive measure. Good attitude and knowledge are important in vaccine uptake.

The results in this study show a low level of knowledge of HPV and HPV vaccine. This is corroborated in studies done locally(14) (13) and regionally as well(12) (19) (11). All girls in a qualitative study done in Tanzania had not heard of HPV or its vaccine (11).Similar findings have also been reported in other Sub Saharan countries(20) (21) and in South America (22). A 2018 Indian study showed that more than half of the participants had inadequate knowledge(23). Poor knowledge was also reported in a cross sectional study done in Germany(24)

Mburu et al in a study done in Eldoret, Kenya found that only 17.2% of the participants identified HPV as sexually transmitted (14). This compares to our study where it was 19.7% of the participants. In a Nigerian study where 80% of the girls were between 9-13 years almost all of them were not aware of HPV transmission(21). In Brazil the number was less-14.7% than our study(25). Adolescents in a qualitative study done in the UK knew very little about HPV infection and its transmission (26). However in other developed countries such as Germany, Spain and Italy high percentages of adolescents up to 73%, 86% and 96% respectively were reported to know the mode of transmission of HPV (24) (27) (28). This could be due to better information delivery to the girls by the parents. In our country some cultural beliefs could still be a hindrance to talking about HPV at home especially because it is sexually transmitted. Health seeking behaviors could also be better in the developed countries hence more information available to the girls from their health care givers. The studies could also have included girls slightly older than the age group we used hence the difference.

Majority of the girls in this study lacked the knowledge that males could be infected by HPV. This is almost similar to a study in Spain where only a third of the girls knew males could be affected

(27).This is however not the case in cross sectional studies done in Mali and Italy where more than two thirds knew males could be infected(20) (29).In this study there was generally low knowledge on the HPV prevention as less than half of the girls chose HPV vaccine as a preventive measure. A few even thought it was not preventable same to the Spanish girls where 12.5% thought it could not be avoided(27). This is comparable to a study in the UK where lack of a clear understanding of how HPV could be prevented amongst young adolescents was demonstrated (26).In a Malaysian study half of the participants knew about HPV and its mode of prevention(30). This could be attributed to inclusion of 16 year olds who are believed to be more knowledgeable than the age group in this study.

In this study more than half of the girls had heard of the HPV vaccine and associated it with cervical cancer prevention. Several studies reported similar findings(19) (22) (27) (29) (30) (31). Despite only a third of participants having heard of HPV vaccine in a Mozambique study more than half were aware of cervical cancer being preventable by vaccination(32).
Most of the participants chose girls only should receive the HPV vaccine. Although the vaccine is recommended for both boys and girls, the girls were right based on the immunization program in the country where currently it's only girls being vaccinated.

Majority of the girls did not know the doses of the vaccine. This is not surprising as most of them had not received the vaccine. This could be attributed to how recently it was rolled out, the effects of the COVID-19 pandemic and health seeking behaviors since the vaccination was rolled out in health facilities. However in a Ugandan study where more than half of the participants had been vaccinated almost two thirds still did not know the recommended doses (22).

Almost half of the girls chose school as their source of information about HPV vaccine and a third chose social media. This mirrors a study done in Western Amazon where 51.6% of the participants had school as a source of information and 22.6% as health professionals (31). In our study hospital was poorly cited as a source of information-9.4% similar to a Brazil study where it was 12% and 27.5% for TV/radio source(25). On the contrary in developed countries such as Germany, Italy and USA, parents and health professionals are reported to be the most common source of information about HPV vaccine(24) (29) (33). Previous studies carried out in countries with higher

vaccination rates showed that parents/ guardians were the main source of information for their children. This is not the case in our study. It could be that family members do not know how to approach sexual topics to their young adolescents or parental lack of awareness and knowledge on HPV and its vaccine. This may be an impediment to high vaccine uptake.

In our study almost all the participants had not been vaccinated. Most of them cited lack of awareness. This finding is similar to several studies done in different groups locally (13) (14) (34). In a study done in Eldoret half of the unvaccinated participants reported they wouldn't accept it because of lack of knowledge about the vaccine(14). Watson et al also found that inadequate information about HPV vaccine would be a potential barrier to successful roll-out of a national program(13) as we have seen in our study. Availability also comes out as an issue from 17.6% of our participants.

It was evident that pain at the injection site, misconceptions, vaccine safety and side effects were some of the main barriers towards getting the vaccine. Several studies in USA reported similar findings (35) (36) (37). These are corroborated in studies from Germany, UK, Western Amazon and Hong Kong (24) (26) (31) (38).

In a systematic review conducted in USA on barriers of HPV vaccination in adolescents, parents were noted to play a crucial role to the success of the provision of HPV vaccine given the young age at which the vaccine is administered. A New York (USA) study reports parents and lack of knowledge as a barrier to vaccination(35) . Their level of knowledge therefore is important since they pass it on to their children and also help them make health related decisions. This is similar Hong Kong and Germany where dissuasion by parents was one of the primary barriers, as well as physicians advising against the vaccine (24) (38). Physicians' advice was not an issue in our study. During conduction of this study consent had to be sought from the adolescents' parents. Many called in saying they didn't know what it was about hence declined. This shows that there could be low level of parental knowledge and awareness on HPV and its vaccine hence affecting the girls as well.

One of the common misconceptions is infertility as one of the side effects. This seems to be a common misconception about HPV vaccine and also generally in Africa regarding new vaccines especially if given to girls only (13) (11) (34).

Potential adverse effects and death are misconceptions reported in another study in America(36).

This also comes out in our study where the girls reported to have been told that they could get infected with HPV, worsen the infection and even die when they received the vaccine.
The fear of vaccine being harmful to the girls' bodies and affecting their growth is a similar finding in a Hong Kong study where 36% of the participants had the same worry(38).
These barriers can be overcome by dissemination of the right information to the community, target increase of parental knowledge on HPV and vaccine and demystifying the misconceptions going round. In this study it was noted that social media was the second most common source of knowledge about the vaccine. This can explain the false information as that is not the right channel of obtaining knowledge.

In as much as most of the girls had not been vaccinated, they had a positive attitude towards the HPV vaccine. More than half of them would encourage their friends/relatives to get the vaccine. Oliveira et al reported more than 80% of respondents would recommend the vaccine for friends/relatives (31). They also believed that it protects from cancer which kills. This compares to a Tanzanian study where despite all the respondents not having heard about HPV vaccination they were willing to get it to avoid a dangerous disease like cancer(11). However it is likely that our girls' attitude towards the vaccine was more intuitive than reasoned, based on the mix of level of knowledge. They were also willing to get it should their fears be looked into and if it was brought to their school. In all the focus groups the girls believed that the government wouldn't give them a harmful vaccine.

From our study the factors associated with knowledge were age of the girls and their mothers' level of education. It is believed that mothers should talk to their daughters more about their health as they grow up. The more educated they are the more likely to pass on the information to their daughters.

9.0 CONCLUSION

The level of knowledge about HPV was poor with only 25% of the participants having adequate knowledge. Only 44% of the girls had adequate knowledge on HPV vaccine. They however had a positive attitude towards the vaccine as 63% would recommend it to other girls. School was chosen to be the main source of information about HPV vaccine. The main barriers towards HPV vaccination were lack of awareness, availability, misconceptions, pain at the injection site and fear of adverse effects.

10.0 RECOMMENDATIONS

1. Strengthening of the school based program that could increase awareness and knowledge of HPV and HPV vaccination.
2. Reduce barriers towards vaccination by:

- Dissemination of correct information to the parents/guardians and the community at large.
- Campaigns to create awareness and information on where the vaccine is available.

11.0 STUDY LIMITATIONS

The participants in this study relied on the parental consent based on their age therefore some parents may have tried to discuss about the study topic beforehand. This also led to skewed number of the younger participants as they thought their daughters were too young and feared potential exposure to sex education if they participated in the study. The questionnaire was not validated however some questions were similar to those in other studies that had validated tools. The shy girls may have denied us getting some useful information from them. Seventy percent of the girls did not know what HPV is and forty percent had not heard of the HPV vaccine. This could have led to guesswork in the subsequent questions.

12.0 STUDY BUDJET

Table 10: Estimated budget for the study

Components	Unit of measure	Number of pages	Cost(Kshs)	Total (Kshs)
Personnel				
Statistician				**30,000**
Printing				
Consent form	**1**	**2**	**10**	**20**
Assent form	**1**	**2**	**10**	**20**
Questionnaires	**1**	**5**	**10**	**50**
FGD guide	**1**	**1**	**10**	**10**
Final Report	**1**	**100**	**10**	**1,000**
Photocopying				
Consent form	**400**	**4**	**5**	**8,000**
Assent form	**400**	**4**	**5**	**8,000**
Questionnaire	**400**	**7**	**5**	**14,000**
FGD guide	**5**	**1**	**5**	**25**
Final Report	**5**	**100**	**5**	**2,500**
Final Report Binding	**6**	**1**	**100**	**600**
Jjhh				
Other Costs				
ERC Fees				**2,000**
Governor's office Fees				**3,000**
NACOSTI fees				**1,000**
Transport				**1,000**
Airtime				**1,000**
GRAND TOTAL				**72,225**

13.0 STUDY TIMELINES

Table 11: Table showing the timelines and stages of the study

	Concept presentation	Proposal Writing	Internal Marking	ERC Approval	Data Collection	Results analysis & Presentation	Dissemination of results
November 2019							
December 2019							
January 2020							
February 2020							
March 2020							
April 2020							
May 2020							
June 2020							
July 2020							
August 2020							
September2020							
October 2020							
November 2020							
December 2020							
January 2021							
February 2021							
March 2021							
April 2021							
May 2021							

14.0 REFERENCES

1. Ferlay J, Soerjomataram I, Dikshit R, Eser S, Mathers C, Rebelo M, et al. Cancer incidence and mortality worldwide: Sources, methods and major patterns in GLOBOCAN 2012. Int J Cancer. 2015;29.

2. Mabeya H, Menon S, Weyers S, Naanyu V, Mwaliko E, Kirop E, et al. Uptake of three doses of HPV vaccine by primary school girls in Eldoret, Kenya; a prospective cohort study in a malaria endemic setting. BMC Cancer. 2018 Dec;18(1):557.

3. Bhatla N, Aoki D, Sharma DN, Sankaranarayanan R. Cancer of the cervix uteri. Int J Gynecol Obstet. 2018 Oct;143:22–36.

4. Bosch FX, Lorincz A, Munoz N, Meijer CJLM, Shah KV. The causal relation between human papillomavirus and cervical cancer. J Clin Pathol. 2002 Apr 1;55(4):244–65.

5. International Agency for Research on Cancer, editor. IARC monographs on the evaluation of carcinogenic risks to humans, volume 90, Human papillomaviruses: this publication represents the views and expert opinions of an IARC Working Group on the Evaluation of Carcinogenic Risks to Humans, which met in Lyon, 15 - 22 February 2005. Lyon: IARC; 2007. 670 p.

6. Bruni L, Diaz M, Castellsagué X, Ferrer E, Bosch FX, de Sanjosé S. Cervical Human Papillomavirus Prevalence in 5 Continents: Meta-Analysis of 1 Million Women with Normal Cytological Findings. J Infect Dis. 2010 Dec 15;202(12):1789–99.

7. Almazrou S, Saddik B, Jradi H. Knowledge, attitudes, and practices of Saudi physicians regarding cervical cancer and the human papilloma virus vaccine. J Infect Public Health. 2019 Sep;S1876034119303028.

8. World Health Organization. Human papillomavirus vaccines WHO position paper, May 2017. Wkly Epidemiol Rec. 2017;92241–268..pdf.

9. Dochez C, Burnett RJ, Mbassi SM, Were F, Musyoki A, Trovoada D, et al. Improving skills and institutional capacity to strengthen adolescent immunisation programmes and health systems in African countries through HPV vaccine introduction. Papillomavirus Res. 2017 Dec;4:66–71.

10. Santhanes D, Wong CP, Yap YY, San SP, Chaiyakunapruk N, Khan TM. Factors involved in human papillomavirus (HPV) vaccine hesitancy among women in the South-East Asian Region (SEAR) and Western Pacific Region (WPR): A scoping review. Hum Vaccines Immunother. 2018 Jan 2;14(1):124–33.

11. Remes P. A qualitative study of HPV vaccine acceptability among health workers, teachers, parents, female pupils, and religious leaders in northwest Tanzania. 2012;5.

12. Turiho AK, Muhwezi WW, Okello ES, Tumwesigye NM, Banura C, Katahoire AR. Human Papillomavirus (HPV) Vaccination and Adolescent Girls' Knowledge and Sexuality in Western Uganda: A Comparative Cross-Sectional Study. Consolaro MEL, editor. PLOS ONE. 2015 Sep 1;10(9):e0137094.

13. Watson-Jones D, Mugo N, Lees S, Mathai M, Vusha S, Ndirangu G, et al. Access and Attitudes to HPV Vaccination amongst Hard-To-Reach Populations in Kenya. Consolaro MEL, editor. PLOS ONE. 2015 Jun 26;10(6):e0123701.

14. Mburu A, Itsura P, Mabeya H, Kaaria A, Brown DR. Knowledge of Cervical Cancer and Acceptability of Prevention Strategies Among Human Papillomavirus-Vaccinated and Human Papillomavirus-Unvaccinated Adolescent Women in Eldoret, Kenya. BioResearch Open Access. 2019 Aug;8(1):139–45.

15. Masika MM, Ogembo JG, Chabeda SV, Wamai RG, Mugo N. Knowledge on HPV Vaccine and Cervical Cancer Facilitates Vaccine Acceptability among School Teachers in Kitui County, Kenya. Hozbor DF, editor. PLOS ONE. 2015 Aug 12;10(8):e0135563.

16. Friedman AL, Oruko KO, Habel MA, Ford J, Kinsey J, Odhiambo F, et al. Preparing for human papillomavirus vaccine introduction in Kenya: implications from focus-group and interview discussions with caregivers and opinion leaders in Western Kenya. BMC Public Health. 2014 Dec;14(1):855.

17. Turiho AK, Okello ES, Muhwezi WW, Katahoire AR. Perceptions of human papillomavirus vaccination of adolescent schoolgirls in western Uganda and their implications for acceptability of HPV vaccination: a qualitative study. BMC Res Notes. 2017 Dec;10(1):431.

18. Jalani FFM, Rani MDM, Isahak I, Aris SM, Roslan N. Knowledge, Attitude and Practice of Human Papillomavirus (HPV) Vaccination among Secondary School Students in Rural Areas of Negeri Sembilan, Malaysia. Public Health. 2016;8(6):15.

19. Kisaakye E, Namakula J, Kihembo C, Kisakye A, Nsubuga P, Babirye JN. Level and factors associated with uptake of Human papillomavirus infection vaccine among female adolescents in Lira District, Uganda. Pan Afr Med J [Internet]. 2018 [cited 2021 May 1];31. Available from: http://www.panafrican-med-journal.com/content/article/31/184/full/

20. Poole DN, Tracy JK, Levitz L, Rochas M, Sangare K, Yekta S, et al. A Cross-Sectional Study to Assess HPV Knowledge and HPV Vaccine Acceptability in Mali. Cameron DW, editor. PLoS ONE. 2013 Feb 19;8(2):e56402.

21. Ezeanochie M, Olasimbo P. Awareness and uptake of human papilloma virus vaccines among female secondary school students in Benin City, Nigeria. Afr Health Sci. 2020 Apr 20;20(1):45–50.

22. Gomes JM, Silva BM, Santos EF de S, Kelly PJ, Costa A de S, Takiuti AD, et al. Human Papillomavirus (HPV) and the quadrivalent HPV Vaccine among Brazilian adolescents and parents: Factors associated with and divergences in knowledge and acceptance. Grce M, editor. PLOS ONE. 2020 Nov 12;15(11):e0241674.

23. Arunachalam D, Subash Chandrabose G. Knowledge and attitude on human papilloma virus among adolescent girls in school students at Puducherry. Int J Community Med Public Health. 2019 Jan 24;6(2):573.

24. Stöcker P, Dehnert M, Schuster M, Wichmann O, Deleré Y. Human papillomavirus vaccine uptake, knowledge and attitude among 10th grade students in Berlin, Germany, 2010. Hum Vaccines Immunother. 2013 Jan;9(1):74–82.

25. Santos AC da S, Silva NNT, Carneiro CM, Coura-Vital W, Lima AA. Knowledge about cervical cancer and HPV immunization dropout rate among Brazilian adolescent girls and their guardians. BMC Public Health. 2020 Dec;20(1):301.

26. Hilton S, Smith E. "I thought cancer was one of those random things. I didn't know cancer could be caught…": Adolescent girls' understandings and experiences of the HPV programme in the UK. Vaccine. 2011 Jun;29(26):4409–15.

27. Navarro-Illana P, Diez-Domingo J, Navarro-Illana E, Tuells J, Alemán S, Puig-Barberá J. "Knowledge and attitudes of Spanish adolescent girls towards human papillomavirus infection: where to intervene to improve vaccination coverage." BMC Public Health. 2014 Dec;14(1):490.

28. Firenze A, Marsala MGL, Bonanno V, Maranto M, Ferrara C, Giovannelli L, et al. Facilitators and barriers HPV unvaccinated girls after 5 years of program implementation. Hum Vaccines Immunother. 2015 Jan;11(1):240–4.

29. Gualano MR, Stillo M, Mussa MV, Zotti CM. Cross sectional study investigating the differences in knowledge and behaviors about HPV between vaccinated and non-vaccinated girls. :7.

30. Jalani FFM, Rani MDM, Isahak I, Aris SM, Roslan N. Knowledge, Attitude and Practice of Human Papillomavirus (HPV) Vaccination among Secondary School Students in Rural Areas of Negeri Sembilan, Malaysia. Public Health. 2016;8(6):15.

31. Oliveira MSF de, Sorpreso ICE, Zuchelo LTS, Silva ATM da, Gomes J de M, Silva BKR, et al. Knowledge and acceptability of HPV vaccine among HPV-vaccinated and unvaccinated adolescents at Western Amazon. Rev Assoc Médica Bras. 2020 Aug;66(8):1062–9.

32. Bardají A, Mindu C, Augusto OJ, Casellas A, Cambaco O, Simbine E, et al. Awareness of cervical cancer and willingness to be vaccinated against human papillomavirus in Mozambican adolescent girls. Papillomavirus Res. 2018 Jun;5:156–62.

33. Ramanadhan S, Fontanet C, Teixeira M, Mahtani S, Katz I. Exploring attitudes of adolescents and caregivers towards community-based delivery of the HPV vaccine: a qualitative study. BMC Public Health. 2020 Dec;20(1):1531.

34. Vermandere H, Naanyu V, Mabeya H, Broeck DV, Michielsen K, Degomme O. Determinants of Acceptance and Subsequent Uptake of the HPV Vaccine in a Cohort in Eldoret, Kenya. PLOS ONE. 2014;9(10):13.

35. Galbraith-Gyan KV, Lechuga J, Jenerette CM, Palmer MH, Moore AD, Hamilton JB. African-American parents' and daughters' beliefs about HPV infection and the HPV vaccine. Public Health Nurs. 2018 Dec 11;phn.12565.

36. Herman R, McNutt L-A, Mehta M, Salmon DA, Bednarczyk RA, Shaw J. Vaccination perspectives among adolescents and their desired role in the decision-making process. Hum Vaccines Immunother. 2019 Aug 3;15(7–8):1752–9.

37. Holman DM, Benard V, Roland KB, Watson M, Liddon N, Stokley S. Barriers to Human Papillomavirus Vaccination Among US Adolescents: A Systematic Review of the Literature. JAMA Pediatr. 2014 Jan 1;168(1):76.

38. Yuen WWY, Lee A, Chan PKS, Tran L, Sayko E. Uptake of human papillomavirus (HPV) vaccination in Hong Kong: Facilitators and barriers among adolescent girls and their parents. Grce M, editor. PLOS ONE. 2018 Mar 15;13(3):e0194159.

APPENDX 1: QUESTIONNAIRE FOR ADOLESCENT GIRLS

Questionnaire No._____ Initials_____ Age____ Date_____

Residence _____ Class/grade_____

Instructions

Please tick your answer to the questions below.

1. Do you know your religion?
    - Yes
    - No
2. If yes, which one is it?
    - Catholic
    - Protestant
    - Muslim
    - Others _____
3. Who do you live with at home?
    - Both parents
    - Mother only
    - Father only
    - Relatives
4. What is the level of education of your mother?
    - Illiterate
    - Read and write
    - Primary
    - Secondary and above
    - I don't know
5. What is the level of education of your father?
    - Illiterate
    - Read and write
    - Primary
    - Secondary and above
    - I don't know

6. What is the occupation of your mother?
    - Housewife
    - Self employed
    - Employed
    - I don't know
    - Others _____
7. What is the occupation of your father?
    - Self employed
    - Employed
    - I don't know
    - Others _____

8. What is Human Papilloma Virus (HPV)?
    - A sexually transmitted virus
    - Infection due to poor hygiene
    - I don't know

9. HPV infects
    - Males only
    - Females only
    - Both
10. HPV can be prevented by?
    - Regular Exercise
    - Wearing warm clothing
    - Cannot be prevented
    - HPV vaccine
11. Have you heard about HPV vaccine?
    - Yes
    - No
12. If yes, where did you hear about it from?

- School
- Parents
- Hospital
- Friends
- Others (social media)

13. What does HPV vaccination protect from?
    - Cervical cancer
    - Stomach cancer
    - Breast cancer
    - Esophageal cancer

14. Who should receive the HPV vaccine?
    - Girls only
    - Boys only
    - Both boys and girls
    - I don't know
15. How is the HPV vaccine given?
    - By mouth
    - Injection
    - I don't know
16. How many times does one get the HPV vaccine?
    - 2
    - 1
    - I don't know
17. Have you received the vaccine?
    - Yes
    - No

18. If NO, why
    - Not aware
    - Don't know where to get it

- Fear of vaccine not being good for my body
- No benefits
- Religious reasons

19. Would you encourage other girls to get the vaccine?
    - Yes
    - No
20. If NO, why
    - Not aware
    - Fear of vaccine being harmful to my body.
    - No benefits
    - Religious reasons

KISWAHILI

Maagizo

Chagua jibu moja kwa maswali yafuatayo

1.Unaishi na nani nyumbani?

- Wazazi wote
- Mama pekee
- Baba pekee
- Jamaa wengine (ambao sio wazazi wako)

2.Mama yako amesoma mpaka kiwango kipi?

- Hakuenda shule
- Anaweza kusoma na kuandika
- Alimaliza shule ya msingi pekee
- Alimaliza shule ya upili kuendelea
- Sijui

3.Baba yako amesoma mpaka kiwango kipi?

- Hakuenda shule
- Anaweza kusoma na kuandika

- Alimaliza shule ya msingi pekee
- Alimaliza shule ya upili kuendelea
- Sijui

4.Mama yako anafanya kazi gani?

- Hana kazi ya kuajiriwa
- Ana biashara yake
- Ameajriwa
- Sijui

5.Baba yako anafanya kazi gani?

- Hana kazi ya kuajiriwa
- Anafanya biashara yake
- Ameajiriwa
- Sijui

6.Unajua dini yako?

- Ndiyo
- La

7.Kama ndiyo, ni ipi?

- Katoliki
- Kiislamu
- Nyingine

8.Human Papilloma Virus (HPV) ni nini?

- Ugonjwa kutokana na uchafu
- Ugonjwa wa zinaa
- Sijui

9.Human Papilloma Virus(HPV) huathiri kina nani?

- Wanaume pekee
- Wanawake pekee
- Wanaume na wanawake

10.Virusi vya HPV vinaweza kuzuiliwa kwa njia gani?

- Kufanya mazoezi
- Kuvaa nguo zenye joto

- Haviwezi kuzuiliwa
- Chanjo ya HPV

11.Umesikia kuhusu chanjo ya HPV?

- Ndio
- La

12.Kama ndio,ulisikia kutoka wapi?

- Shule
- Wazazi
- Hospitali
- Marafiki
- Mtandao

13.Chanjo ya HPV hukinga kutokana na?

- Saratani ya kizazi
- Saratani ya tumbo
- Saratani ya matiti
- Saratani ya umio
- Sijui

14.Nani anapaswa kupewa chanjo ya HPV?

- Wasichana pekee
- Wavulana pekee
- Wasichana na wavulana
- Sijui

15.Chanjo ya HPV hupewa kwa njia gani?

- Mdomo
- Sindano
- Sijui

16.Chanjo ya HPV hupewa mara ngapi?

- 2
- 3
- Sijui

17.Umepata chanjo ya HPV?

- Ndio
- La

18.Kama la, kwa nini?

- Sijasikia kuhusu chanjo hiyo
- Sijui pa kuipata
- Naogopa itaniumiza
- Haina faida yoyote
- Sababu za kidini

19.Unaweza kuhimiza wasichana wengine wapate chanjo hiyo?

- Ndio
- La

20.Kama la, kwa nini?

- Sijasikia kuihusu
- Naogopa itawaumiza
- Haina faida yoyote
- Sababu za kidini

APPENDIX 2: DUMMY TABLE

Sociodemographic characteristics of the girls

Variables		Frequency	Percentage
Age (years)	10 11 12 13 14		
Residence			
Religion	Catholic Protestant Muslim Others		
Class/ Grade	4 5 6 7 8		
Live with	Both parents Mother only Father only Relatives		
Mother's education	Illiterate Read and write Primary Secondary and above		
Father's education	Illiterate Read and write Primary Secondary and above		
Mother's occupation	Housewife Self employed Employed Don't know		
Father's occupation	Self employed Employed Don't Know		

APPENDIX 3: FOCUSED GROUP DISCUSSION TOPIC GUIDE

Welcome and thank you for volunteering to take part in this focused group. You have been asked to participate in this group as your knowledge and perceptions are important to our topic of today.

Introduction

The main objective of our meeting today is to discuss about the Human Papilloma Virus, its vaccine and to understand your knowledge on this subject matter as well as to unearth any misconceptions and barriers to vaccination. The information from this meeting will be used to provide guidance to Ministry of Health and Stakeholders in administration of vaccines. The focused group discussion will take about 45 minutes.

Anonymity

This discussion will be strictly anonymous and no one's identity shall be revealed to the public. Recordings of our discussions shall be put under lock and key after which they will be transcribed and later destroyed. You shall be required not to discuss any information obtained from your classmates outside of this focused group discussion.

Rules

Should there be any questions that make you uncomfortable feel free not to answer but you are encouraged to participate as much as possible.

One person should speak at a time.

There are no incorrect or correct answers, just your opinion on a question.

Do not shy from giving your honest opinion despite other group members opinions.

Questions

1. Can anyone tell us what Human Papilloma Virus(HPV) is?
2. Have you ever heard of a Human Papilloma Virus Vaccine? From where? Tell us more about it.
3. Who do you think can be affected by HPV?
4. What do you think could make anyone not go for the vaccine?

5. Have you heard of any bad things about the vaccine? If yes, from where/whom? What are some of the bad things you have heard?
6. Do you think the HPV vaccine is good for you? If not, why?

APPENDIX 4: CONSENT FOR THE ADOLESCENTS' PARENTS

Consent number……..

Study Title: Knowledge and attitude of the Human Papilloma Virus and Vaccine in school going adolescent girls in Nairobi County, Kenya.

Institution: Department of Paediatrics and Child Health University of Nairobi.

Principle investigator: Dr Mercy Nafula Ogeng'o(MBChB)- 0770358797

Supervisors: Prof Fredrick N Were, MBCHB, MMED, FNIC, MD, DCEH

Prof Dalton Wamalwa MBCHB, MMED, MPH

Before consenting to this study, please read through the information provided below and understand the purpose of this study.

Introduction: Cervical cancer is one of the most common cancers among females globally. It is an outcome of persistent infection of the lower genital tract by Human Papilloma Virus (HPV). The HPV vaccine known to prevent cervical cancer was approved by Food and Drug Administration (FDA) in 2006.Evidence of its effectiveness and safety at population level has led to World Health Organization advocating for HPV vaccination to 9–13-year-old girls and as part of the plan to fight cervical cancer it has been recently rolled out in Kenya to be given to girls aged 10 years.

Objectives of the study: To assess the level of knowledge and attitude of adolescent girls towards Human Papilloma Virus infection and Vaccination.

Benefits of the study: We expect the outcome of this study to help in identifying gaps in terms of knowledge and therefore plan on how to create awareness. It would also shed light on some of the factors that could prevent the success of the immunization program hence assist in re strategizing for the future.

Risks: No harm is anticipated

Study Procedure: Your child will be requested to fill in a questionnaire that will take approximately 15 minutes and thereafter if selected participate in a group discussion on the same topic.

Confidentiality of Research Records: The responses to the questionnaire will be completely anonymous. Information obtained in hard copy shall be kept under lock and key by the principle investigator. Audio recordings of the discussions shall be done after introduction to maintain anonymity.

Review for the protection of participants: This study has been reviewed and approved by the Kenyatta National Hospital/ University of Nairobi Ethical and Research Committee (KNH-UON ERC).

Research Participants Rights: By consenting to this research, you are confirming that you have read through the above information and are accepting your daughter to be a participant in the study. Participation is voluntary and no one shall be victimized for not accepting. No favors shall be offered to those who will accept.

I……. have read the above provided information and hereby give voluntary consent for my daughter to be a participant of this study.

SIGN……DATE……
……

For any queries or clarification regarding the study, feel free to contact me or or my supervisors or the Chairman of the KNH/UON Ethics and Research committee

Prof. Fredrick Were. Tel No. 0722718770

Prof Dalton Wamalwa. Tel No. 0721239493

KNH/ERC (Kenyatta National Hospital/Ethics and Review Committee)

Tel No.020-2726300/0722829500/0733606400/EXT 44102. PO BOX 20723, Nairobi

Kiswahili

Kiambatisho 4: Idhini ya wazazi wa vijana wa umri wakubalehe.

Nambari ya idhini:…….

Kichwa cha utafiti: Maarifa na mtazamo wa virusi vya papilloma kwa wanadamu na chanjo kwa wanafunzi wa kike waliobalehe katika kaunti ya Nairobi, Kenya.

Taasisi: Shirika la madaktari wa watoto na afya ya watoto chuo kikuu cha Nairobi.

Mtafiti mkuu : Daktari Mercy Nafula Ogeng'o [MBchB]- 0770358797

Wasimamizi: Profesa Fredrick N Were, MBCHB, MMED, FNIC, MD, DCEH

Profesa Dalton Wamalwa MBCHB, MMED, MPH

Kabla ya kuidhinisha utafiti huu, tafadhali soma kwanza maelezo uliyopewa ili uelewe sababu ya uchunguzi unaofanywa.

Utangulizi : Saratani ya uzazi ni mojawapo ya saratani inayokumba jinsia ya kike duniani kote . Hii ni kwa sababu ya kuendelezwa kwa maambukizi ya virusi vya papilloma kwa wanadamu [human papilloma virus-HPV] kupitia kwa njia ya chini ya uzazi. Chanjo ya HPV inayojulikana kuzuia maambukizi ya saratani ya uzazi iliidhinishwa na shirika la chakula na dawa.[Food and Drug Administration]FDA] mwaka wa 2006. Ushahidi na usalama kwa idadi iliyoitumia chanjo hiii imelifanya shirika la afya ulimwenguni [WHO] kuruhusu matumizi ya chanjo ya HPV kwa

wasichana wenye umri wa miaka 9-13 kama mojawapo ya mipango ya kupigana na saratani ya uzazi. Chanjo hii imezinduliwa hivi juzi nchini Kenya ili wapewe wasichana wenye umri wa miaka 10

Malengo ya uchunguzi : kujua kiwango cha maarifa na mtazamo wa wasichana kuhusu virusi vya papilloma kwa wanadamu na chanjo yake.

Hatari: hakuna hatari inayotarajiwa.

Manufaa ya uchunguzi: Tunatarajia kuwa uchunguzi huu utasaidia kubaini upungufu/hitilafu katika maarifa hivyo basi, kupanga jinsi ya kufanya uhamasisho. Pia italeta mwangaza kujua sababu zinazoweza kuzuia mpango wa kupeana chanjo, hivyo basi kusaidia katika mikakati ya baadaye.

Utaratibu wa uchunguzi: Mtoto wako ataombwa kujaza orodha ya maswali ya utafiti yatakayo chukua takriban dakika 15-30 kisha huenda atachaguliwa kushiriki katika kujadili katika kikundi kuhusu swala hili.

Usiri wa rekodi ya utafiti: Maoni katika orodha hii ya maswali hayatajulikana kabisa. Habari zilizoko kwenye karatasi hii zitatumika tu na mtafiti mkuu. Sauti za majadiliano zitanaswa baada ya utangulizi kuwezesha kutojulikana.

Hakiki kwa ulinzi wa washiriki : Uchunguzi huu umepitiwa na kupitishwa na Hospitali ya kitaifa ya Kenyatta/ chuo kikuu cha Nairobi na kamati ya utafiti na maadili .[KNH –UON ERC]

Utafiti haki za mshiriki : Kwa kukubali kushiriki katika utafiti huu, unadhibitisha kuwa umesoma na kuelewa yaliyomo na unakubali mwanao wa kike kushiriki katika utafiti huu. Ushiriki ni wa hiari na hakuna yeyote atakaye dhulumiwa kwa kukosa kushiriki. Hakuna zawadi yoyote itakayotolewa kwa watakao kubali kushiriki.

Mimi……nimesoma maelezo niliyopewa na hapa ninatoa idhini ya hiari kwa mtoto wangu wa kike kushiriki katika utafiti huu.

Sahihi……..

tarehe…….

Kwa maswali au ufafanuzi zaidi tumia nambari za simu zilizoandikwa hapo chini.

Daktari Mercy Nafula Ogeng'o – 0770358797

Hospitali Kuu Ya Kenyatta – Nambari 020-2726300/0722829500/0733606400/EXT 44102. PO BOX 20723, Nairobi

APPENDIX 5: ASSENT FOR THE ADOLESCENT GIRLS AGED 10-14 YEARS

Study Title: Knowledge and attitude of the Human Papilloma Virus and vaccine in school going adolescent girls in Nairobi County, Kenya.

Institution: Department of Paediatrics and Child Health university of Nairobi.

Principal Investigator: Dr Mercy Nafula Ogeng'o (MBChB)

Supervisors: Prof Fredrick N Were, MBCHB, MMED, FNIC, MD, DCEH

Prof Dalton Wamalwa MBCHB, MMED, MPH

Ethical Approval: This study has been approved by the Kenyatta National Hospital/ University of Nairobi Ethical and Research Committee (KNH-UON ERC)

Introduction: The information below is about a research study that we would like to conduct. A research study helps us learn more about a topic and gives us new ideas. Once you have understood what this study is about, we shall ask if you would like to take part in it.

Why are we doing this study?

We are doing this study to gauge how much you know about Human Papilloma Virus(HPV) infection and HPV vaccine. This information will help us to increase efforts on making more girls like you know more about it and hence help prevent cervical cancer. The results of this study will also help those who create vaccination schedules to know what age would have better compliance.

What will happen if I take part in the study?

Should you agree to take part, you shall be given some multiple choice questions to answer. This should take about 15 to 30 minutes. The questions will have some personal information such as age and where you live. Your name will not appear anywhere. Nobody will know what you answered.

After that, if you are further picked after the questionnaire, we shall have a discussion with about 5 other girls on the same topic.

Will this study be of help to me?

There will be no direct benefit to you. However, the results of this study will help to prepare better on how to teach you and other girls like you about the Human Papilloma Virus infection and vaccine.

Can something bad happen to me if I take part in the study?

Nothing bad will happen to you. We will not conduct any procedures or give you any medication.

Are there any costs I should pay?

You will not be required to pay anything for this study. We shall conduct the study when on a school day.

You will also not be paid for taking part in the study.

Important things to note:

1.You will not be forced to take part in the study.

2.You can say "YES" or "NO"

3. All the information you give us will be private.

4.If you say NO, there will be no punishment.

5. It is okay to say YES, should you wish to change your mind, it is also okay.

6.You can ask questions where you do not understand.

7.Your teachers are aware of the study.

8. Your parents/guardians will also be asked if it is okay for you to take part in the study.

Would you like to participate in this study?

If you would like to participate in this study, please write your name below. I shall write my name under yours meaning we explained to you about this research and you are willing to be part of it.

Name of participant……Date……

(To be written by child)

Name of Researcher……Signature……

……...

Date……..

Kiswahili

Kiambatisho 5: **RUHUSA YA WASICHANA WALIOBALEHE WENYE UMRI WA MIAKA 10-14**

Mada ya utafiti: Maarifa na mtazamo kuhusu virusi ya papilloma kwa wanadamu na chanjo kwa wanafunzi wa kike katika kaunti ya Nairobi ,Kenya.

Mtafiti mkuu: Daktari Mercy Nafula Ogeng'o [MBchB]

Wasimamizi : Profesa Fredrick N Were, MBCHB, MMED, FNIC, MD, DCEH

Profesa Dalton Wamalwa MBCHB, MMED, MPH

Idhini ya kimaadili: Utafiti huu umeidhinishwa na hospitali kuu ya Kenyatta/ckamati ya maadili na utafiti chuo kikuu cha Nairobi [KNH –UON ERC]

Utangulizi : Maelezo yafuatayo ni kuhusu utafiti tunaotaka kuufanya . Utafiti husaidia kujua zaidi kuhusu mada na hupeana mawazo mapya. Mara unapoelewa lengo la utafiti huu ,tutakuomba ikiwa utakubali kushiriki katika utafiti.

Ni kwa nini tunafanya utafiti huu ?

Tunafanya utafiti kujua ni yapi ambayo unafahamu kuhusu maambukizi ya virusi vya papilloma kwa wanadamu [human papilloma virus- HPV] na chanjo ya HPV. Utafiti huu utatusaidia kuongeza juhudi za kuwafanya wasichana wengine wengi kama wewe kujua kuhusu chanjo hii, na hivyo basi kusaidia kuzuia saratani ya uzazi. Pia matokeo ya utafiti huu yatawasaidia wanaotengeneza ratiba ya chanjo kujua umri upi bora kuzingatia.

Ni nini kitafanyika nikishiriki katika utafiti?

Endapo utakubali kushiriki utahitajika kujibu maswali kwa kuchagua jibu sahihi. Itachukuwa muda wa dakika 15-30 kujibu maswali yenyewe. Maswali yatahitaji habari za kukuhusu kama vile umri wako na mahali unapoishi. Jina lako halitahitajika . Hakuna atakayejua ulijibu nini.

Baadaye waweza kuchaguliwa kushiriki katika majadiliano juu ya mada haya na wasichana wenzako watano katika kikundi.

Utafiti huu utakuwa wa faida kwangu?

Hakuna manufaa ya moja kwa moja kwako,hata hivyo matokeo ya utafiti yatasaidia kuboresha jinsi ya kukufunza wewe na wasichana wengine kama wewe kuhusu virusi vya papilloma kwa wanadamu na chanjo yake.

Kuna jambo baya linaweza kunitendekea nikishiriki katika utafiti huu?

Hakuna jambo baya litakutendekea. Hatutafanya tendo lolote kwako au kukupa dawa zozote.

Kuna malipo yoyote ninahitaji kulipa?

Hauhitaji kulipa chochote katika utafiti huu. Tutafanya utafiti ukiwa shuleni.

Pia hautalipwa kwa kushiriki.

Mambo muhimu ya kuzingatia

1.Hutalazimishwa kushiriki.

2.Waweza kusema' ndio' au la'.

3.Maelezo yote utakayotupa yatawekwa siri.

4.Hutaadhibiwa kwa kusema la.

5. Ni vyema kusema ndiyo na iwapo utabadilisha mtazamo ni vyema pia.

6. Waweza kuuliza maswali endapo huelewi.

7. Walimu wako wana habari kuhusu utafiti huu.

8. Wazazi wataombwa kuidhinisha iwapo ni sawa ushiriki katika utafiti huu.

Ungependa kushiriki katika utafiti huu?

Ikiwa ungependa kushiriki katika utafiti, tafadhali andika jina lako hapo chini. Nitaliandika jina langu chini ya lako kuonyesha kuwa nilikuelezea kuhusu utafiti huu nawe umekubali kushiriki

Jina la mshiriki…….tarehe……
……..

[mwanafunzi aandike]

Jina la mtafiti…………………………………………………………………………..
sahihi………………………………………………

Tarehe…………………………………………