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Knowledge and Attitude of Mothers towards Human Papilloma Virus Vaccine Uptake in Nigeria

Osejele I. Meshach [a*], Salami G. Braimah [b], Uhomoibhi O. David [c], Omokaro E. Junior [d], Ehizuelen G. Ehis [e], Abebe E. Stephen [f], Uangbaoje A. Cyril [f], Emmanuel E. Enobakhare [g], Odafen Martins [a] and Akhaine J. Precious [f]

[a] Department of Obstetrics and Gynecology, Central Hospital, Benin City, Nigeria.
[b] Department of Chemical Pathology, Medical Laboratory Science, Bichi Emirate Specialist Hospital, Nigeria.
[c] Department of Cancer Biology, George Town University, DC, USA.
[d] Department of Anatomic Pathology, Irrua Specialist Hospital, Irrua Edo State, Nigeria.
[e] Genetic Counseling, Sickle Cell Foundation Nigeria, Lagos, Nigeria.
[f] Department of Medicine and Surgery, Edo Specialist Hospital, Benin City, Nigeria.
[g] Department of Obstetrics and Gynecology, Edo Specialist Hospital, Benin City, Nigeria.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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**Corresponding author: E-mail: Meshachosejele123@gmail.com;*

ABSTRACT

Background: The human papilloma virus (HPV), a principal factor in the development of cervical cancer, is identified as one of the most widespread sexually transmitted infections, leading to a variety of conditions globally, from warts to cancer. It is estimated that 75% of people worldwide will contract an HPV infection at some point in their lives. Vaccination against HPV serves as an important preventive measure to reduce the rates of cervical cancer.
Objective: This study assessed knowledge, attitude of mothers toward HPV vaccine uptake in Local communities in Edo State Nigeria.
Methods: A cross-sectional study utilizing a descriptive approach was carried out with 350 participants, chosen through simple random sampling. Information was gathered via questionnaires conducted by researchers and was processed with the Statistical Package for the Social Sciences (SPSS), version 25. To examine the relationships between variables, the Fisher's exact test was employed, with statistical significance determined by a P-value < 0.05.
Results: The average age of those surveyed was 40.4 years, with a standard deviation of 10.1 years. A mere 28.3% (44 respondents) had adequate knowledge about HPV and its vaccine. A significant portion (80%) exhibited a negative attitude toward receiving the HPV vaccine. There was a noticeable statistical correlation between the respondents' age and their awareness of HPV (with a p-value of 0.019) as well as between their employment status and their knowledge about HPV (p-value = 0.002). The primary reason cited by participants for not getting the HPV vaccine was its lack of availability.
Conclusion: Knowledge and uptake of HPV vaccination among the respondents were poor. Majority also had negative attitude towards uptake of the vaccine.

Keywords: Attitude; mothers; human papilloma virus vaccine; knowledge; uptake.

ABBREVIATIONS

HPV : Human Papilloma Virus
WHO : World Health Organization

1. INTRODUCTION

1.1 Background

Cancer continues to be a significant threat to the health of women worldwide, resulting in the loss of numerous lives around the globe [1].

Some types of cancer are uniquely prevalent among women, with cervical and breast cancers being the most commonly reported. Worldwide, cervical cancer ranks as the fourth most common cancer among women, with approximately 14.1 million new cases and 8.2 million deaths related to cancer in 2012, an increase from 12.7 million cases and 7.6 million deaths in 2008. Annually, it is estimated that more than 270,000 women come down with cervical cancer and eventually die, with over 85% of these fatalities occurring in low- and middle-income countries. [2-3].

The human papillomavirus (HPV), identified as the primary cause of cervical cancer, is considered one of the most widespread sexually transmitted infections globally, leading to a range of conditions from warts to cancer. It is estimated that 75% of people globally will contract an HPV infection at some point in their lives. The two most prevalent high-risk HPV strains, types 16 and 18, have been identified worldwide, including in the Middle East and North African regions, playing a critical role in the development of cervical cancer. [4].

1.2 Statement of Problem

Cervical cancer ranks as the second major cause of cancer death among women in Nigeria, with approximately 9,659 women dying from the disease each year [5]. This situation has led to an increase in the mortality rate among women of reproductive age. According to the World Health Organization, if urgent measures are not taken, the worldwide death toll from cervical cancer is anticipated to rise by approximately 80% by 2030. The majority of these deaths are projected to occur in low- and middle-income nations, including Nigeria [6]. In sub-Saharan Africa, annually, 34.8 out of every 100,000 women are newly diagnosed with cervical cancer, and 22.5 out of every 100,000 women succumb to the disease [7].

A study conducted on women undergoing cervical cancer screening in the Federal Capital

Territory of Nigeria revealed a 37% prevalence rate of HPV [8] which is a far cry to the estimated global prevalence of 11.7% [9]. A comparable study conducted in Nigeria also found a high prevalence of HPV at 26.3% among women of all ages, with the highest rates observed in those aged 15 to 23 years. [10]. This indicates that Nigeria is also affected by this worldwide health risk to women. The country's national strategy for preventing cervical cancer encompasses both vaccination and screening measures [11]. Awareness of cervical cancer significantly influences the willingness to receive the HPV vaccine. In sub-Saharan Africa, there is still a low level of awareness among women regarding cervical cancer [12]. In Nigeria, Ezenwa *et al*. [14] as well as Ahmed *et al*. [15] reported adequate awareness but fair knowledge of cervical cancer among Nigerian mothers this was collaborated by Wright *et al*. [16]. Education and effective communication are crucial in achieving successful immunization programs [17]. Parents, particularly mothers, play a critical role in making vital decisions for their children. As the world increasingly moves from curative to preventive healthcare, there is a pressing need to enhance mothers' understanding of cervical cancer and HPV vaccination.

1.3 Justification of Study

Findings from the study will form the basis for the formulation and implementation of strategies for creating more awareness on the utilization of the HPV vaccine in the rural area. It will also sensitize the primary care physicians to identify high risk patients for timely intervention and referral when necessary. Information derived from this study will possibly serve as a resource for the development of policies towards prevention of cervical cancer.

1.4 Objectives

The aim of the study is to determine the knowledge, attitude of mothers towards HPV and HPV vaccine uptake in Local communities in Nigeria. The study will also access the barriers towards HPV vaccine uptake among study participants.

2. LITERATURE REVIEW

2.1 Knowledge of HPV and Vaccine Uptake

Presently, 87 countries, including the United Arab Emirates (UAE), have incorporated the HPV vaccine into their national vaccination and immunization programs [18-21]. Abu Dhabi was the pioneer city in the Middle East to adopt the HPV vaccine in 2008 [22]. Australia led the world in 2013 by starting to vaccinate its male population against HPV [23]. In Bahrain, the vaccine is accessible in select private hospitals, as it has not yet been added to the national immunization schedule. Research conducted in the region reveals a low public awareness about HPV and its related health issues.

A study among female adolescents in Ibadan, Southwest Nigeria, revealed poor awareness of the HPV vaccine, with only 11% of participants demonstrating adequate knowledge. Likewise, research involving medical and dental students at a tertiary institution in Benin, Nigeria, found that 31.2% possessed substantial knowledge about HPV infection and vaccination. The perceived better understanding observed among medical students could be due to their education, including specific lectures on HPV and its vaccine. [24]

In 2015, the national rates of HPV vaccination initiation were 63% for females and 50% for males, while the completion rates for the three-dose series were 42% for females and 28% for males [25], significantly below the Healthy People 2020 target of an 80% completion rate. Within the Greater Newark area, only 21% of Latino adolescents aged 10-20 years had begun the HPV vaccination process [25-27], and a mere 8% had completed the three-dose regimen. Despite these low figures, research indicates that Latina mothers, despite their limited knowledge about HPV infection and its vaccine, are generally supportive and hold positive views regarding HPV vaccination [28].

A study from Canada released in 2000 revealed that merely 13% of teenagers were aware of HPV. [29] Yet, a subsequent survey conducted from 2006 to 2007 found that 70% of participants who had daughters planned to vaccinate them against HPV. [30]

2.2 Attitude of Mothers towards HPV Vaccine

A study from Finland found that 86% of both parents and adolescents were in favor of HPV vaccination [31], and more than 90% of Vietnamese mothers supported vaccinating their daughters, despite only 1% being previously aware of the vaccine [32]. These results are echoed by a recent literature review on the

acceptance of the HPV vaccine, highlighting that while many women have limited knowledge about HPV, the majority of parents are keen on getting their children vaccinated [33].
A recent survey involving British women aged 16 to 97 asked an open-ended question about the causes of cervical cancer; a mere 2.5% identified HPV, and 7% referred to a nonspecific sexually transmitted virus or infection as the cause. [34]

In Turkey, a study by Seven et al. found that only 14.4% of surveyed mothers were in favor of vaccinating their daughters against HPV [35-36]. Conversely, Ezenwa et al. reported from Nigeria that 30.3% of mothers had no concerns about vaccinating their daughters against HPV [37]. In stark contrast, a study in Indonesia showed that 96% of parents were eager to vaccinate their daughters against HPV. Meanwhile, in Denmark, where the HPV vaccine is part of the National Immunization Program (NIP), Mortensen found that 84% of parents with daughters aged 12–15 had already vaccinated them, and 80% of the remaining parents intended to vaccinate their daughters eventually. [38-39]

The bulk of research conducted has revealed that the primary concerns deterring vaccination are fears regarding the vaccine's safety and a low perceived personal risk of developing cervical cancer. These concerns have fostered negative attitudes towards vaccine acceptance over time, attitudes that are likely to be influenced by targeted health education and awareness campaigns.

2.3 Acceptability and Practice of HPV Vaccination

Studies conducted in Nigeria have demonstrated a significant readiness to accept the HPV vaccine, with acceptance rates ranging from 70.0% to 88.9%. Similar findings have been observed in Tanzania (93.0%), South Africa (89.0%), Singapore (87.1%), and Honduras (91.0%), where the majority of participants expressed a high willingness to recommend the vaccine to others or to accept it themselves [40-44]. This suggests that despite limited knowledge about the vaccine, most women, when provided with adequate information and education, are very open to receiving the vaccine or advising their loved ones to do the same.

The decision to get vaccinated against HPV often does not hinge on the individual's educational background, family income, or socioeconomic status but may instead be influenced by factors such as age and a family history of cervical cancer. For instance, a survey among parents in Jinan showed that women between the ages of 18 and 29 and those with a family history of cervical cancer were more inclined to accept the vaccine. Additionally, other studies have indicated that younger individuals tend to have more favorable views towards the HPV vaccine compared to older people. [45-50].

2.4 Associated Factors for HPV Knowledge and Perception

In a longitudinal study conducted at an urban hospital's adolescent primary care office, which aimed to investigate the effects of HPV vaccination on the attitudes and behaviors of adolescent girls, it was found that the uptake of the HPV vaccine correlated with increased knowledge about HPV, a higher recognition of the vaccine's benefits, fewer perceived obstacles to getting vaccinated [51]. Although understanding the role of knowledge and perceptions in vaccine acceptance is crucial, there is limited information on what contributes to greater awareness or favorable views towards HPV vaccination, particularly among adolescent girls. Adolescents are more likely to hold positive attitudes towards HPV vaccination if their parents plan to vaccinate them and if they believe their parents consider vaccination to be important. [52-54].

Although mass media plays a significant role in disseminating information and aiding in the formation of knowledge about vaccines, the personal interactions within an individual's social network might be more influential in shaping and altering perceptions of health behaviors. Furthermore, family members and friends can impact vaccination decisions negatively, especially if they convey adverse experiences, such as getting ill from the flu vaccine. Therefore, the acceptance of the HPV vaccine could depend on parents and adolescents receiving precise and encouraging information from a variety of sources, including both mass media and their personal social networks. [55-58]

2.5 Assessment of Barriers towards HPV Vaccine Uptake

A study in the United States investigating the obstacles to HPV vaccination among adolescents identified several layers of challenges affecting vaccine uptake, including issues related to healthcare professionals,

parents, underserved and disadvantaged groups, males, and challenges specific to completing the 3-dose HPV vaccine series. [59].

Among healthcare professionals, barriers included parents' attitudes and concerns about HPV vaccination, financial issues, gaps in knowledge, insufficient insurance coverage and reimbursement issues, a preference for vaccinating older rather than younger adolescents, and a preference for vaccinating girls over boys [60-61].

For underserved and disadvantaged populations, as well as challenges in completing the 3-dose series, reported barriers encompassed limited awareness about HPV and the vaccine, absence of insurance coverage, not receiving a recommendation for the vaccine from a healthcare professional, mistrust in the healthcare system, cultural factors, and immigration status [64-68].

3. METHODOLOGY

3.1 Study Area

The study area was carried out in Ekpoma and Irrua, Esan west and Esan central local government area respectively, Edo state.

3.2 Study Population

The study participants were mothers in Ebhoakhuala and Idumebo with ages ranging from 20 to 60 years.

3.3 Study Design

A descriptive cross sectional study was employed.

3.4 Duration of Study

The study lasted for a period of eight months from November to June 2021.

3.5 Selection Criteria

3.5.1 Inclusion criteria

>Only mothers between the age range of 20 to 60 was included in the study

>Women who were willing to consent

3.5.2 Exclusion criteria

>Mothers outside the age range of 20 to 60 years.

>Those who were not present on the day of administration of questionnaire.

>participant who did not give consent and were not willing to participate

> Those who were ill and bedridden

3.6 Sample Size Estimation

Sample size was estimated using Cochran's formula for cross sectional surveys

Sample size $n = \frac{Z^2Pq}{d^2}$ =……. [69].

n= Sample size

Z = Standard normal deviation, set at 1.96 to correspond to 95% confidence interval.

P = Prevalence of condition under study taking from the highest value in the literature in previous studies.

q = 1-P

d = Error margin allowed from the study which is a measure of level of accuracy.

For this study;

Z = 1.96

P = 31.2% i.e 0.312 (highest prevalence got from literature review)[24]

d = 0.05

From the formula above

Sample size $n = \frac{Z^2Pq}{d^2}$

or $n = \frac{Z^2P(1-P)}{d^2}$

$$n = \frac{(1.96)^2 * 0.312 * (1-0.312)}{(0.05)^2}$$

$$n = \frac{3.8419 * 0.312 * 0.688}{0.0025}$$

$$n = \frac{0.25008816}{0.0025}$$

n = 329.84899584, approximately 330

From the calculation above, the estimated sample size is 330.

Attrition or non-response rate = 10% of sample size

$$330 \frac{10}{100} = 33$$

10% of sample size then added to cover for possible non-response during the course of study. Therefore the estimated sample size is 330 + (10% of 330) =330+33= 363 and rounded to 350.Thus a total of 350 respondents was used.

3.7 Sampling Methods

The sampling for this study was done using the simple random sampling method. The names of the various communities in Ekpoma and Irrua were written on pieces of papers, folded and then placed in an enclosed container. Shaken together, the two communities were then selected by balloting.

3.8 Methods of Collection of Data

The data was collected using English language interviewer based questionnaire, focusing on the Knowledge of mothers on HPV, HPV vaccine and cervical cancer, Attitude of mothers towards HPV vaccination, risk factors of HPV infection and the impact of HPV infection on the general health .

The questionnaire was in three parts;

Section A: Questions were for socio-demographic data: age, sex, ethnicity, marital status, religion and occupation.

Section B: Questions were on the knowledge of HPV and HPV vaccine uptake.

Section C: Questions were on the attitude of mothers and barriers towards HPV vaccine uptake among eligible children

3.9 Pre-Testing

A pre-testing of the study instruments was carried out in Ebhoakhuala, a community in Ekpoma, Esan West Local Government Area.

3.10 Data Analysis

The data was analyzed using the statistical package for social sciences (SPSS) software version 25.0 (SPSS Inc, Chicago, USA) and the results was presented in form of numerical and diagrammatic presentations e.g. frequency tables and percentages. The chi-square test was also used to test for statistical associations.

4. RESULTS

During the study, 350 questionnaires were distributed and completely filled out, resulting in a 98.0% response rate. The average age of the participants was 40.4 years, with a standard deviation of 10.1, and ages ranged from 20 to 60 years. The largest age group among the respondents was those between 30 and 39 years, making up 33.4% of the total. Furthermore, the majority of participants were married (98%), had one or more daughters (82%), and possessed an education level of tertiary or higher (40.3%). (Table1).

4.1 Section A: Sociodemographic Characteristics of Respondents

The study involved 350 participants who gave consent and results were statistically interpreted with important findings noted.

Table 2 shows that more than two-third (76.46%) of the respondents did not know the symptoms of HPV infection, while 75.86% did not know the risk factors for HPV infection. More than half did not know the diseases caused by HPV (56%) and more than two-third (79.53%) did not know the mode of transmission of HPV. For the purposes of modeling, the knowledge score was reduced to a binary variable (poor knowledge: knowledge score = 0 vs. good knowledge: knowledge score >0), of which 71.7% had poor knowledge of HPV, while 28% had good knowledge of HPV.

A Likert scale ranging from strongly agree (score: 1) to strongly disagree (score: 5) was used. For the purposes of modeling, the attitude score was reduced to a binary variable (negative attitude: I am not sure, disagree and strongly disagree, vs. positive attitude: agree and strongly agree). From the above, 80% had a negative attitude, while 20% had a positive attitude towards HPV vaccine uptake.

4.2 Assessment of Barriers towards HPV Vaccine Uptake

The table below shows the frequencies and proportions of the socio-demographic characteristics.

Table 1. Sociodemographic characteristics of respondents

Variables	Frequency(n=350)	Percentage (100%)
Age of respondents		
20-29	71	20.3
30-39	117	33.4
40-49	111	31.7
50-60	51	14.6
Mean (± S.D.) age	40.4 ± 10.1	
Marital status of respondents		
Married	343	98.0
Single	7	2.0
Occupation of respondents		
Skilled	60	17.2
Semi skilled	32	9.1
Unskilled	258	73.7
Religion		
Christian	311	88.9
Islamic	39	11.1
Variables	**Frequency(n=350)**	**Percentage (100%)**
Level of Education		
No formal education	49	14.0
Primary school	39	11.1
Secondary	121	34.6
Tertiary	141	40.3
Ethnic group		
Yoruba	12	3.4
Hausa	3	0.9
Igbo	15	4.3
Esan	227	64.9
Etsako	57	16.3
Others	36	10.3
Employment status		
Self-employed	196	56.0
Unemployed	72	20.0
Salaried employment(government)	50	14.3
Salaried employment(private)	32	9.1
Number of children		
<5	268	76.6
5-10	82	23.4
Do you have any daughter		
Yes	287	82.0
No	63	18.0

**Others includes Edo, Akoko Edo, Ijaw, Itsekiri*

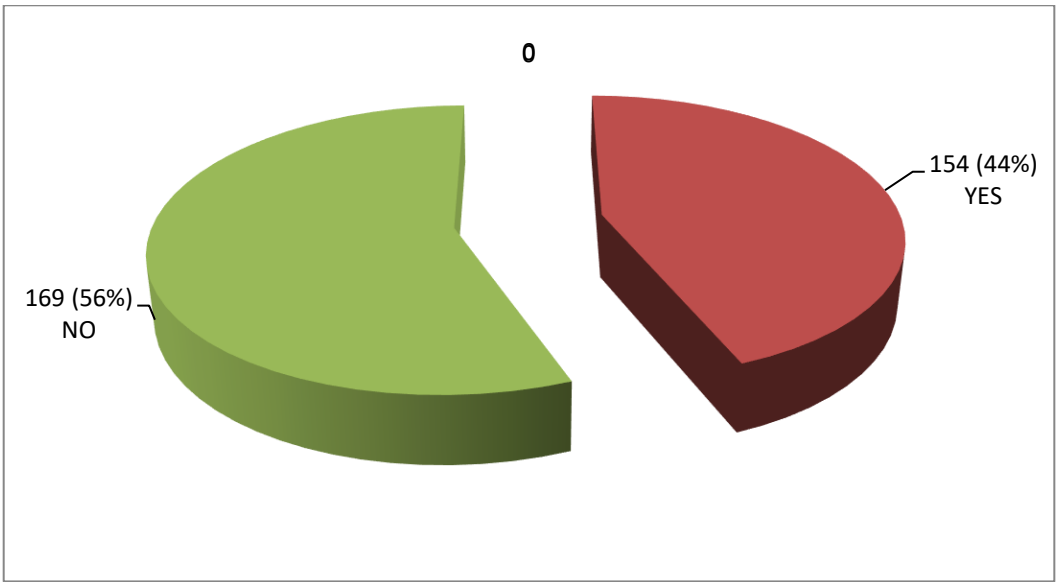

Fig. 1. Awareness of HPV amongst Participants

Table 2. Knowledge of HPV among respondents

		Correct n(%)	Incorrect n(%)
1)	HPV causes cervical cancer	146(41.7)	8(2.3)
2)	Someone with HPV infection can have the following;		
	a) Vaginal bleeding	85(24.3)	69(19.7)
	b) Severe headache	55(15.7)	99(28.3)
	c) Blood stained vaginal discharge	94(26.9)	60(17.1)
	d) Pain during sexual intercourse	95(27.1)	59(16.9)
	e) Genital warts	83(23.7)	71(20.3)
	f) Cancer of the mouth	36(10.3)	118(33.7)
3)	Mode of transmission		
	a) Faeco-oral	13(3.7)	141(40.0)
	b) Physical contact with infected objects	27(7.7)	127(36.2)
	c) Sexual intercourse	110(31.4)	44(12.6)
	d) Kissing	46(13.1)	108(30.8)
4)	Is HPV sexually transmitted	109(31.1)	45(12.9)
5)	Is HPV and HIV different	126(36.0)	28(8.0)
6)	Risk factors		
	a) Early sexual intercourse at young age	111(31.7)	42(12.0)
	b) Obesity	72(20.6)	82(23.5)
	c) Smoking	55(15.7)	98(28.0)
	d) Multiple sexual partner	109(31.1)	44(12.6)
	e) Having a high risk partner	107(30.6)	46(13.2)
	f) Sexually transmitted infections	108(30.9)	46(13.1)
		Correct n(%)	**Incorrect n(%)**
	g) Long standing disease	75(21.4)	79(22.6)
	h) Long term use of birth control drugs	71(20.3)	83(23.7)
	i) Poverty	46(13.1)	108(30.9)
	j) Having a history of cervical cancer	90(25.7)	64(18.3)
7)	Prevention		
	a) HPV vaccination	111(31.7)	42(12.0)
	b) Condom use	113(32.3)	41(11.7)
	c) Regular HPV screening	117(33.4)	37(10.6)
	d) Abstinence from sex	111(31.7)	43(12.3)

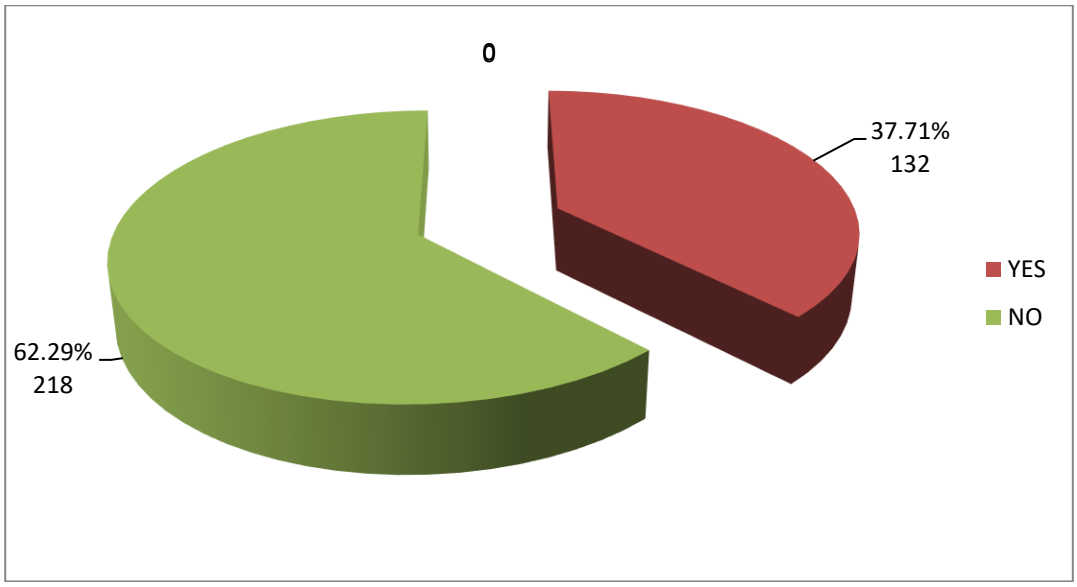

Fig. 2. Awareness of HPV vaccine One hundred and thirty-two (38.0%) respondents were aware of the HPV vaccines

Table 3. Knowledge of HPV vaccine among respondents

Variables	Correct n(%)	Incorrect n(%)
1) HPV vaccine prevents against:		
a) Cancer of the cervix	115(32)	20(5.7)
b) Cancer of the breast	13(3.7)	122(34.9)
c) Cancer of the anus, tongue and throat.	11(3.1)	124(35.4)
d) Cancer of the penis in man	13(3.7)	122(34.9)
2) Recommended number of doses of HPV vaccine	47(13.4)	88(25.2)
3) Recommended age of vaccination		
a) Before first sexual intercourse	95(27.1)	40(11.5)
b) After first sexual intercourse	31(8.9)	104(29.8)
c) If you have more than one sexual partner	81(23.1)	54(15.4)
4) Do you think the vaccine can prevent against HPV infection?	104(29.7)	31(8.9)
5) Do you think vaccine can offer protection against cervical cancer?	100(28.6)	35(10.0)

5. DISCUSSION

The purpose of this research was to assess the awareness about Human Papillomavirus (HPV) and the attitude of mothers towards the HPV vaccine in Esan Central and Esan West Local Government Areas of Edo State. The study revealed a significantly low level of knowledge about HPV among respondents, with approximately 71.7% demonstrating poor understanding. This outcome aligns with findings from a community-based research in Shomolu local government area in Lagos State, which reported a mere 27.9% awareness level [69-70]. Similar trends were observed in studies conducted both within Nigeria and internationally [71-74]. In contrast, studies among health workers in Lagos [75], Enugu [76], and South Africa [77] recorded considerably higher knowledge levels of 85.0%, 74.0%, and 96.0%, respectively. The variation in awareness levels

among these health workers compared to the general population may be attributed to their greater access to information about HPV infections within healthcare settings.

Table 4. Attitude of Mothers towards HPV vaccine uptake

Attitude variable		Strongly agree n(%)	Agree n(%)	not sure n(%)	Disagree n(%)	Strongly disagree n(%)
1)	I feel the HPV vaccine is safe	24(6.9)	86(24.6)	23(6.6)	1(0.3)	0(0)
2)	My child is at risk of getting HPV	24(6.9)	66(18.9)	27(7.7)	13(3.7)	5(1.4)
3)	HPV is not a serious infection	9(2.6)	28(8.0)	29(8.3)	55(15.7)	14(4.0)
4)	The idea that HPV can cause diseases like cancer is not true:	8(2.3)	17(4.9)	28(8.0)	64(18.3)	18(5.1)
5)	HPV vaccine is effective in preventing cervical cancer:	16(4.6)	76(21.7)	32(9.1)	8(2.3)	3(0.9)
6)	I feel the vaccine will keep my child safe from cervical cancer:	19(5.4)	76(21.7)	31(8.9)	8(2.3)	1(0.3)
7)	I feel it is better a child is vaccinated before becoming sexually active:	23(6.6)	77(22.0)	30(8.6)	5(1.4)	0(0)
8)	The cost of the vaccine discourages me:	31(8.9)	62(17.7)	29(8.3)	10(2.9)	3(0.9)
	Attitude variable	Strongly agree n(%)	Agree n(%)	I am not sure n(%)	Disagree n(%)	Strongly disagree n(%)
9)	HPV vaccine may have negative side effects on my child:	29(8.3)	74(21.1)	19(5.4)	13(3.7)	0(0)
10)	HPV vaccination violates my cultural norms/religious beliefs:	6(1.7)	15(4.3)	37(10.6)	54(15.4)	23(6.6)
11)	I am generally against vaccination:	6(1.7)	10(2.9)	18(5.1)	58(16.6)	43(12.3)
12)	HPV vaccination should be included in the National Program on Immunization schedule:	47(13.4)	59(16.9)	23(6.6)	5(1.4)	1(0.3)
13)	I will wait for my friends to get their children vaccinated before I will allow:	9(2.6)	42(12.0)	40(11.4)	32(9.1)	12(3.4)
14)	I will vaccinate my child only on my partners instruction:	18(5.1)	42(12.0)	32(12.0)	22(6.3)	11(3.1)
15)	I feel that the process of getting the vaccine will not be easy:	14(4.0)	67(19.1)	32(9.1)	16(4.6)	6(1.7)

Table 5. Association of sociodemographic characteristic and knowledge of HPV

Variable	Knowledge of HPV		X^2	P VALUE
	Good n(%)	poor n(%)		
Age (years)				
20 – 29	11(3.2)	60(17.2)	9.978	0.019*
30 – 39	40(11.5)	77(22.1)		
40– 49	36(10.3)	74(21.2)		
50 – 60	11(3.2)	40(11.5)		
Marital status				
Married	97(27.8)	245(70.2)	1.616	0.656
Single	1 (0.3)	6(1.8)		
Occupation of respondents				
Skilled	3(2.1)	33(50.0)	12.454	0.491
Semi skilled	0(0.0)	9(6.2)		
Unskilled	3(5.0)	104(71.2)		
Religion				
Christian	84(24.1)	226(64.8)	1.329	0.249
Islam	14(4.0)	25(7.2)		
Level of education				
No formal education	15(4.3)	34(9.7)	0.525	0.913
Primary	11(3.2)	28(8.0)		
Secondary	31(8.9)	89(25.5)		
Tertiary	41(11.7)	100(28.7)		
Ethnic group				
Yoruba	4(1.1)	8(2.3)	12.454	0.491
Hausa	0(0.0)	2(0.6)		
Igbo	2(0.6)	14(4.0)		
Esan	61(17.5)	164(47.0)		
Etsako	16(4.6)	40(11.5)		
Others	12(3.5)	21(6.1)		
Employment status				
Self-employed	41(11.7)	154(44.1)	14.926	0.002*
Unemployed	21(6.0)	50(14.3)		
Salaried employment(government)	23(6.6)	27(7.7)		
Salaried employment(private)	13(3.7)	20(5.7)		
Number of children				
<5	78(22.4)	181(51.9)	10.800	0.148
5-10	20(5.7)	70(20.1)		
Do you have any daughter				
Yes	89(25.5)	197(56.4)	7.244	0.007
No	9(2.6)	54(15.5)		

*Key: *Significant at p-value <0.05, † Fisher's Exact Test applicable*

This study's evaluation of participants' familiarity with the HPV vaccine revealed a notably low awareness rate of 71.7%. This finding aligns with the outcomes of similar studies conducted in Nigeria, where the knowledge of the HPV vaccine was found to vary between 19.7% and 25.3% [78-79]. In stark contrast, research from Kenya [80] and South Africa [81] reported significantly higher levels of awareness and knowledge concerning HPV vaccination. This discrepancy can be attributed to the implementation of routine HPV vaccination initiatives within the Expanded Programme on Immunization (EPI) and school health systems in these countries, as opposed to Nigeria where

such government-backed programs are still predominantly absent. [82].

In a detailed analysis of the awareness regarding HPV vaccines among the 135 respondents who indicated familiarity with the vaccine, a significant portion exhibited a strong understanding of its protective benefits. Specifically, 115 respondents, representing 32%, were aware that the vaccine offers protection against cervical cancer. This insight stands in contrast to findings from a study among female university students in Lagos, Nigeria, where approximately 62% of the participants were unaware of the connection between HPV infection and the risk of developing cervical cancer. [73].

Regarding the perspective of mothers on the adoption of the HPV vaccine, a significant majority of the participants (80%) displayed a reluctance or negative view towards vaccinating. This outcome contrasts with a study among Nigerian mothers of adolescents, where 73.5% expressed a favorable attitude towards obtaining the HPV vaccine for their daughters. Additionally, this stands in opposition to research conducted with Ghanaian women, which found that 94% of participants were open to receiving the vaccine for themselves or their daughters [74,75].

The study revealed that the incidence of HPV vaccination among the respondents' children was notably low, at just 2 (1.48%), confirming similar observations from previous research. For instance, a study among female students in Benin, Nigeria, reported that only about 3.7% had been vaccinated against HPV. Similarly, research among female adolescents in Ibadan found a vaccination rate of approximately 4.1% [76,77].

In a study among female medical students at a higher education institution in India, it was found that only 6.8% of the participants had received the HPV vaccine [77]. In stark contrast, studies from developed nations like Germany and the United States reported significantly higher HPV vaccination rates of 53% and 62.4%, respectively [79,80]. This discrepancy in vaccination rates between developing and developed countries can often be attributed to financial support for vaccination in the latter, suggesting that the Nigerian government might need to consider implementing subsidies for the HPV vaccine to enhance its uptake. The primary obstacles to receiving the HPV vaccine, as identified by this study, were its unavailability (96 out of 135 respondents) and its high cost (85 out of 135 respondents), with concerns about side effects and the potential to encourage sexual promiscuity also noted as considerable barriers. These barriers are echoed in a study among HIV-positive women in Nigeria, where safety concerns (24.4%) and the vaccine's expense (19.5%) were cited as major reasons for not obtaining the HPV vaccine [81].

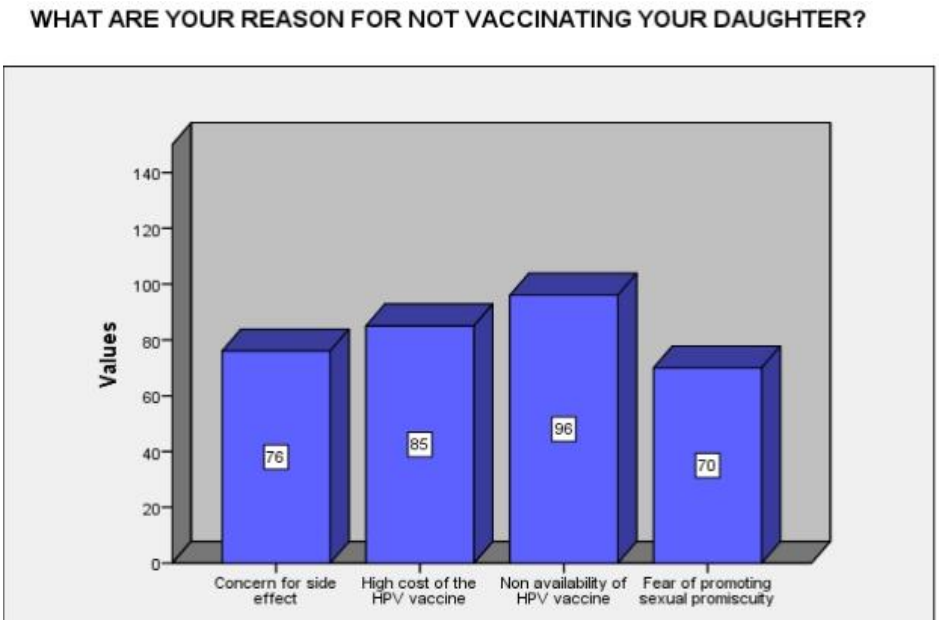

Fig. 3. Barriers towards HPV vaccine uptake

6. CONCLUSION

According to the findings from this study, the respondent's knowledge of HPV and its vaccine Was generally poor and the uptake of HPV vaccine was very low. However, there was a predominantly positive attitude towards uptake of HPV vaccine.In the socio-demographic data. Statistically significant association was found between age of respondents and knowledge of HPV (p-value=0.019) and between employment status of respondents and Knowledge of HPV (p-value =0.002). It was observed that awareness level was low as less than average (38%) were aware of HPV vaccine. However, no association was found between other social demographic characteristics and knowledge of HPV. The major factor affecting the uptake of HPV vaccine was non-availability of the vaccine. As regards attitude, 80% had a negative attitude, while 20% had a positive attitude towards HPV vaccine uptake. Also, government should endeavor to include HPV vaccine in the National Program on Immunization (NPI) schedule for easy accessibility.

7. LIMITATION OF THE STUDY

The findings from the study cannot be generalized as it is specific to the area that is concerned to the researcher.

Most participants find the questions asked offensive and hence not willing to participate in the study while others were perceived not to give the right answers to the questions asked.

CONSENT AND ETHICAL APPROVAL

Ethical clearance was gotten from the Irrua Specialist Teaching Hospital (ISTH) HREC, written consent was obtained from the selected participants and they were also made to understand that the information obtained from them was going to be treated with utmost confidentiality. Finally, the study was performed in compliance with the Helsinki Declaration; collected data was anonymous and used only for academic purpose.

COMPETING INTERESTS

Authors have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.

REFERENCES

1. International agency for research on cancer. World Cancer Day Global Press Release; 2013. Accessed on 2015 Jun 12. Available:http://www.worldcancerday.org/ world.cancer-day-2013globalpressrelease.
2. WHO: Comprehensive cervical cancer prevention and control: A healthier future for girls and women. Available:http://www.who.int/immunization/ hpv/learn/comprehensive cervical_cancer_who_2013.pdf.
3. National Cancer Institute. Human Papillomavirus (HPV) Vaccines. 2015. Available:http://www.cancer.gov/about-cancer/causes-prevention/risk/infectious-agents/hpv-vaccine. Accessed on 2015 Nov 11.
4. Al Moustafa AE, Al-Awadhi R, Missaoui N, Adam I, Durusoy R, Ghabreau L, et al. Human papillomaviruses-related cancers. Presence and prevention strategies in the Middle East and North African regions. Hum VaccinImmunother. 2014;10:1812–21.
5. Committee on Adolescent Health Care of the American College of Obstetricians and Gynecologists, Immunization Expert Work Group of the American College of Obstetricians and Gynecologists. Committee opinion no 588: Human papillomavirus vaccination. Obstet Gynecol. 2014;123:712–8. Accessed on 2015 Aug 15.
6. Centre for Disease Control. International Cancer Control: The Global Burden of Cancer; 2015. Available:http://www.cdc.gov/cancer/ international/burden.htm Accessed on 2015 Nov 05.
7. United Nation. Cervical cancer rate on the rise, Driving by Sharprise in Breast Cancer among Women-UN Report. United Nation News Center; 2013. Available:http://www.un.org/opp/Nes ID=14747# Accessed on 2016 Jan 17
8. Akarolo-Anthony SN, Famooto AO, DarengEO, Olaniyan OB, Offiong R, Wheeler CM, et al. Age-specific prevalence of human papilloma virus infection among Nigerian women. BMC Public Health. 2014;14:656.
9. O'Connel M. HPV Vaccine Introduction in Nigeria: The Way Forward for Women. Social and Behavioral foundation of

Primary Health care (JHPSPH) World Press; 2015.
Avaialablehttps://sbfphc.wordpress.com/2015/.
Accessed on 2016 Nov 10.

10. Okolo C, Franceschi S, Adewole I, Thomas JO, Follen M, Snijders PJ, et al. Human papillomavirus infection in women with and without cervical cancer in Ibadan, Nigeria. Infect Agent Cancer. 2010;5:24.
11. World Health Organization. Comprehensive cervical cancer control: A Guide to Essential Practice. 2nd ed. Geneva, Switzerland: WHO Press. 2014;27.
12. Perlman S, Wamai RG, Bain PA, Welty T, Welty E, Ogembo JG, et al. Knowledge and awareness of HPV vaccine and acceptability to vaccinate in sub-Saharan Africa: A systematic review. PLoS One. 2014;9:e90912.
13. Ozyer S, Uzunlar O, Ozler S, Kaymak O, Baser E, Gungor T, et al. Awareness of Turkish female adolescents and young women about HPV and their attitudes towards HPV vaccination. Asian Pac J Cancer Prev. 2013;14:4877–81.
14. Ezenwa BN, Balogun MR, Okafor IP. Mothers' human papilloma virus knowledge and willingness to vaccinate their adolescent daughters in Lagos, Nigeria. Int J Womens Health. 2013;5: 371–7.
15. Ahmed SA, Sabitu K, Idris SH, Ahmed R. Knowledge, attitude and practice of cervical cancer screening among market women in Zaria, Nigeria. Niger Med J. 2013;54:316–9.
16. Wright KO, Faseru B, Kuyinu YA, Faduyile FA. Awareness and uptake of the pap smear among market women in Lagos, Nigeria. J Public Health Afr. 2011;2:e14
17. Bello FA, EnaborOO, Adewole IF. Human papilloma virus vaccination for control of cervical cancer: A challenge for developing countries. Afr J Reprod Health. 2011; 15:25–30.
18. Global Alliance of Vaccine and Immunization. Human Papillomavirus Vaccine Support. 2014.
Available.from:http://www.gavi.org/support/nvs/ human-papillomavirusvaccinesupport/
Accessed on 2015 Oct 14.
19. Bosch FX, Burchell AN, Schiffman M, Giuliano AR, de Sanjose S, Bruni L, et al. Epidemiology and natural history of human papillomavirus infections and type-specific implications in cervical Neoplasia. Vaccine. 2008;26(Suppl 10):K1–16.
20. Odetola TD, Ekpo K. Nigerian Women's perceptions about human papilloma virus immunizations. J Community Med Health Educ. 2012;2:191.
21. Action CC. Global progress in HPV vaccination; 2017.
Available:http://www.cervical canceraction.org/comments/comments3.php
Accessed 12 April 2017.
22. Ortashi O, Raheel H, ShalalM, et al. Awareness and knowledge about human papillomavirus infection and vaccination among women in UAE. Asian Pac J Cancer Prev. 2013;14:6077–80.
23. Korostil IA, Ali H, Guy RJ, et al. Near elimination of genital warts in Australia predicted with extension of human papillomavirus vaccination to males. Sex Transm Dis. 2013;40:833–5.
24. Journal of Community Medicine and Primary Health Care. Human papilloma virus vaccination: Knowledge, attitude and uptake among female medical and dental students in a tertiary institution in Benin-City, Nigeria; 2017.
Available:https://www.ajol.info/index.php/jcmphc/article/view/154702
25. Reagan-Steiner S, Yankey D, Jeyarajah J, et al. National, regional, state, and selected local area vaccination coverage among adolescents aged 13–17 years—United States. MMWRMorb Mortal Wkly Rep. 2016;65:850–858.
26. Btoush RM, Brown DR, Fogarty S, et al. Initiation of human papillomavirus vaccination among predominantly minority female and male adolescents at inner-city community health centers. Am J Public Health. 2015;105:2388–2396.
27. Wilson RM, Brown DR, Carmody DP, et al. HPV vaccination completion and compliance with recommended dosing intervals among female and male adolescents in an inner-city community health center. J Community Health. 2015;40:395–403.
28. Chau J, Kibria F, Landi M, et al. HPV knowledge and vaccine acceptance in an uninsured Hispanic population in Providence, RI. R I Med J. 2014;97:35–39.
29. Dell DL, Chen H, Ahmad F, Stewart DF: Knowledge about Human Papillomavirus among adolescents. ObstetGynecol 2000;96:653-6.

30. Ogilvie GS, Remple VP, MarraF, et al Parental intention to have daughters receive the human papillomavirus vaccine. CMAJ. 2007;177(12):1506-12.
31. Woodhall SC, Lehtinen M, Verho T, Huhtala H, Hokkanen M, Kosunen E: Anticipated Acceptance of HPV vaccination at the baseline of implementation: A Survey of Parental and Adolescent Knowledge and Attitudes in Finland. Journal of Adolescent Health. 2007; 40(5): 466-469.
32. Dinh TA, Rosenthal SL, Doan ED, Trang T, Pham VH, Tran BD, Tran VD, Bao Phan GA, Chu HKH, Breitkopf CR: Attitudes of Mothers in Da Nang, Vietnam toward a Human Papillomavirus Vaccine. Journal of Adolescent Health 2007;10:1016.
33. Zimet GD, Liddon N, Rosenthal SL, Lazcano-Ponce E, Allen B: Psychosocial aspects of vaccine acceptability. Vaccine .2006;24(Suppl 3):S201-209.
34. Waller Marlow L, Wardle J: Public awareness that HPV is a risk factor for cervical cancer. Br J Cancer 2a007, 97:691-94.
35. Brabin L, Roberts SA, Farzaneh F, Kitchener HC: Future acceptance of adolescent human papillomavirus vaccination: a survey of parental attitudes. Vaccine 2006;24:3087-94.
36. Seven M, Güvenç G, Şahin E, Akyüz A. Attitudes to HPV vaccination among parents of children aged 10 to 13 years. J PediatrAdolesc Gynecol. 2015;28:382–386.
37. Ezenwa BN, Balogun MR, Okafor IP. Mothers' human papilloma virus knowledge and willingness to vaccinate their adolescent daughters in Lagos, Nigeria. Int J Womens Health. 2013;5:371–377.
38. Jaspers L, Budiningsih S, Wolterbeek R, Henderson FC, Peters AA. Parental acceptance of human papillomavirus (HPV) vaccination in Indonesia: A cross-sectional study. Vaccine. 2011;29:7785–7793.
39. Mortensen GL. Parental attitudes towards vaccinating sons with human papillomavirus vaccine. Dan Med Bull. 2010;57:A4230.
40. Ezeanochie MC, Olagbuji BN. Human papilloma virus vaccine: determinants of acceptability by mothers for adolescents in Nigeria, African Journal of Reproductive Health. 2014;18(3):154–158.
41. Cunningham MS, Skrastins E, Fitzpatrick R. et al. Cervical cancer screening and HPV vaccine acceptability among rural and urban women in Kilimanjaro Region, Tanzania, BMJ Open. 2015;5(3):Article ID e005828
42. Benin-City, Nigeria. J Community Med Primary Health Care. 2016;18:101–8. adolescents in selected secondary schools in Ibadan, Nigeria. Afr J Biomed Res. 2017;20:237–44. New 24 and 25. Onowhakpor AO, Omuemu VO, Osagie OL, Odili CG. Human papilloma virus.
43. Perkins RB, Langrish SM, Cotton DJ, Simon CJ. Maternal support for human papillomavirus vaccination in honduras, Journal of Women's Health. 2011;20 (1):85–90
44. Adolescents in selected secondary schools in Ibadan, Nigeria. Afr J Biomed Res. 2017;20:237–44.
45. Hoque ME, Ghuman S, Hal GV. Human papillomavirus vaccine acceptability among female university students in South Africa. Asian Pac J Cancer Prev. 2013;14:4865–9.
46. Remes P, Selestine V, Changalucha J, Ross DA, Wight D, de Sanjosé S. A qualitative study of HPV vaccine acceptability among health workers, teachers, parents, female pupils, and religious leaders in Northwest Tanzania. Vaccine. 2012;30:5363–7.
47. Juraskova I, Bari RA, O'Brien MT, KJ MC. HPV vaccine promotion: does referring to both cervical cancer and genital warts affect intended and actual vaccine behavior? Womens Health Issues. 2010; 21:71–9.
48. Iliyasu Z, Abubakar IS, Aliyu MH, Galadanci HS. Cervical cancer risk perception and predictors of human papilloma virus vaccine acceptability among female university students in northern Nigeria. J Obstet Gynaecol. 2010;30:857–62.
49. de Visser R, Waites L, Parikh C, Lawrie A. The importance of social norms for uptake of catch-up human papillomavirus vaccination in young women. Sex Health. 2011;8:330-337.
50. Fernández ME, Allen JD, Mistry R, Kahn JA. Integrating clinical, community, and policy perspectives on human papillomavirus vaccination. Annu Rev Public Health. 2010;31:235-252.

51. Rosen BL, Shew ML, Zimet GD, Ding L, Mullins TLK, Kahn JA. Human Papillomavirus Vaccine Sources of Information and Adolescents' Knowledge and Perceptions. Glob Pediatr Health. 2017 Nov 24;4:2333794X17743405. DOI: 10.1177/2333794X17743405 PMID: 29204462; PMCID: PMC5703096.
52. Dempsey AF, Abraham LM, Dalton V, Ruffin M. Understanding the reasons why mothers do or do not have their adolescent daughters vaccinated against human papillomavirus. Ann Epidemiol. 2009;19: 531-538.
53. Bero LA, Grilli R, Grimshaw JM, Harvey E, Oxman AD, Thomson MA. Closing the gap between research and practice: an overview of systematic reviews of interventions to promote the implementation of research findings. The Cochrane Effective Practice and Organization of Care Review Gro.
54. Herbert NL, Gargano LM, Painter JE, et al. Understanding reasons for participating in a school-based influenza vaccination program and decisionmaking dynamics among adolescents and parents. Health Educ Res. 2013;28:663672.
55. Perkins RB, Clark JA. Providers' attitudes toward human papillomavirus vaccination in young men: challenges for implementation of 2011 recommendations. Am J Mens Health. 2012;6(4):320–323.
56. Quinn GP, Murphy D, Malo TL, Christie J, Vadaparampil ST. A national survey about human papillomavirus vaccination: what we didn't ask, but physicians wanted us to know. J PediatrAdolesc Gynecol. 2012;25(4):254–258.
57. Dorell CG, Yankey D, Santibanez TA, Markowitz LE. Human papillomavirus vaccination series initiation and completion, 2008–2009 [published correction appears in Pediatrics. Pediatrics. 2011; 128(5):830–839.
58. Sanders Thompson VL, Arnold LD, Notaro SR. African American parents' HPV vaccination intent and concerns. J Health Care Poor Underserved. 2012;23(1):290–301.
59. Luque JS, Raychowdhury S, Weaver M. Health care provider challenges for reaching Hispanic immigrants with HPV vaccination in rural Georgia. Rural Remote Health. 2012;12(2):1975.
60. Wilson R, Brown DR, Boothe MA, Harris CE. Knowledge and acceptability of the HPV vaccine among ethnically diverse black women. J Immigr Minor Health. 2013;15(4):747–757.
61. Oldach BR, Katz ML. Ohio Appalachia public health department personnel: human papillomavirus (HPV) vaccine availability, and acceptance and concerns among parents of male and female adolescents. J Community Health. 2012;37(6):1157–1163.
62. Schluterman NH, Terplan M, Lydecker AD, Tracy JK. Human papillomavirus (HPV) vaccine uptake and completion at an urban hospital. Vaccine. 2011;29(21):3767–3772
63. Gutierrez B, Jr, Leung A, Jones KT, et al. Acceptability of the human papillomavirus vaccine among urban adolescent males. Am J Mens Health. 2013;7(1):27–36
64. Ezenwa BN, Balogun R, Okafor IP., Mothers' human papilloma virus knowledgeand willingness to vaccinate their adolescent daughters in Lagos, Nigeria, International JournalofWomen's Health. 2013;5(1):371–377.
65. Agida T. Akaba G, Isah A, Ekele B. Knowledge and perceptionof human papilloma virus vaccine among the antenatal women in a Nigerian tertiary hospital," Nigerian Medical Journal. 2015;56(1):23–27
66. Akanbi OA, Iyanda A, Osundare F, Opaley O. O. e, Perceptionsof Nigerian Women about Human Papilloma Virus, Cervical Cancer, and HPV Vaccine, Scientifica, Article ID 285702, 2015;4.
67. Montgomery MP, Dune T, Shetty PKAK. Knowledge and acceptability of human papillomavirus vaccination and cervical cancer screening among women in Karnataka, India, Journal of Cancer Education. 2015;30(1):130–137.
68. Makwe CC, Anorlu RI. Knowledge of and attitude toward human Papilloma virus infection and vaccines among female nurses at a tertiary hospital inNigeria, InternationalJournal of Women's Health. 2011;3(1):313–317.
69. Ojiyi CE, Dike EI, Okeudo C, Nzewuihe C, Uzoma MJK. Human papillomavirus vaccine: Awareness and acceptability amongst female medical students and health workers in a University Teaching Hospital in Eastern Nigeria, Nigerian Journal of Surgical Sciences. 2013;23:14-17.
70. Hoque ME, Acceptability of human papillomavirus vaccination among

academics at the University of KwaZulu-Natal, South Africa, South African Family Practice. 2015;57(5):318–321

71. Odetola TD, Ekpo K, Nigerian women's perceptions about human papilloma virus immunisations, Journal of Community Medicine & Health Education. 2012;2 (191).
72. C. C. Makwe and R. I. Anorlu, Knowledge of and attitude toward human papillomavirus infection and vaccines among female nurses at a tertiary hospital in Nigeria," International Journal of Women's Health. 2011l3(1):313–317.
73. Hoque ME, Acceptability of human papillomavirus vaccination among academics at theUniversity of KwaZulu-Natal, South Africa, South African Family Practice. 2015;57(5): 318–321, 2015.
74. Makewe CC, Anorlu RI, Odeyemi KA. Human papillomavirus (HPV) infection and vaccines:Knowledge, attitude and perception among female students at the University of Lagos,LagosNigeria. J Epidemiol GlobHealth. 2012;2:199–206
75. Onowhakpor AO, Omuemu VO, Osagie OL, Odili CG. Human papilloma virus vaccination: Knowledge, attitude and uptake among female medical and dental students in a tertiary institution in Benin-City, Nigeria. J Community Med Primary Health Care.2016;18:101
76. 52. Ndikom C, Oboh P. Perception, acceptance and uptake of human papillomavirusvaccine among female adolescents in selectedsecondary schools in Ibadan, Nigeria. Afr J Biomed Res. 2017;20:237–44.
77. Swarnapriya K, Kavitha D, Mohan R. Knowledge, attitude and practices regarding HPV vaccination among medical and para medical in students, India a cross sectional study. Asian Pac J Cancer Prev.2015;16:8473–7.
78. Remschmidt C, Walter D, Schmich P, Wetzstein M, Deleré Y, Wichmann O. Knowledge, attitude, and uptake related to human papilloma virus vaccination among young women in Germany recruited via a social media site. Hum VaccinImmunother. 2014;10:2527–35.
79. Guodong L, Lan K, Ping D. HPV vaccine completion and dose adherence among commercially insured females, aged 9 through 26 years inthe US. Papilloma Research. 2016;2:1–8.
80. Ogochukwu TN, Akabueze J, Ezeome IV, AniebueUU, OranuEO. Vaccination against Human Papilloma Virus in Adolescent Girls: Mother's Knowledge, Attitude, Desire and Practice in Nigeria. JInfect Dis Preve Med. 2017;5:1
81. Mojahed S, KariMi M, BoKaie M, SaliMi T. Attitude and knowledge of Iranian female nurses about human papilloma virus infection and cervical cancer: A cross sectional survey. J Prev Med Hyg. 2013; 54:187–90.
82. International HPV Vaccination Introduction and Equity. https://www.jsi.com/global-human-papillomavirus-vaccine-introduction/

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