

Vaccination against Human Papilloma Virus in Adolescent Girls: Mother's Knowledge, Attitude, Desire and Practice in Nigeria

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Abstract

Background: Human papillomavirus is the main causative agent of cervical cancer. The HPV vaccination targets young adolescent girls that need parents' consent for medical interventions.

Objectives: To determine the practice of adolescent girls HPV vaccination, their mothers' knowledge and attitude to HPV and HPV vaccination.

Methods: This cross-sectional prospective study surveyed mothers of adolescent girls (9-17 years) in Nigeria. Relevant data were obtained using semi-structured questionnaires. Data was analyzed using statistics software SPSS version 17. P-value of 0.05 is considered significant.

Result: The mean age of 311 respondents was 40.4 ± 7 years. The vaccination of adolescent girls against HPV was low at 13.5% (42/311). The mothers' awareness of HPV and HPV vaccine was 58.5% and 55.3% respectively. Majority of the respondents (84.6%) expressed desire to vaccinate their daughters. There was predominantly positive attitude towards vaccination against HPV; however, fewer mothers (73.5%) with predominantly positive attitude versus 87.4% of mothers with predominantly negative attitude vaccinated their daughters. P-value =0.02. Attitude of mothers to cost of HPV vaccine and concern for early onset of sexual activity by daughters significantly influenced HPV vaccination of daughters. P =0.04 and 0.007 respectively.

Conclusion: There was moderate awareness of HPV and HPV vaccine among mothers of adolescent daughters in our environment. The high intention to vaccinate did not match the low uptake. Mother's attitude to cost of vaccine and concern for early sexual debut significantly influence practice. Healthcare givers should latch on this positive attitude by mothers to increase uptake.

Keywords Adolescent; Mothers; Human papillomavirus; Vaccine; Cervical cancer

Introduction

Cervical cancer is the fourth most common cancer in women and 85% of this burden occurs in developing countries. It has estimated incidence of 528,000 new cases annually. Cervical cancer related deaths of 266,000, accounts for 7.5% of female cancer death worldwide in 2012 [1]. In sub Saharan African 34.8 new cases per 100,000 women and 22.5 per 100,000 women death from cervical cancer occur annually [2]. In Nigeria cervical cancer is the second most common cancer among women with prevalence of 34.50 per 100,000 women [3]. Human papilloma virus (HPV) has almost been exclusively identified as the culprit in the etiopathogenesis of cervical cancer. It is the most common sexually transmitted infection and studies in developed countries suggests that 50-80% of sexually exposed are infected at least once in their life time [4,5]. HPV 16 and 18 are commonest oncogenic type and have been implicated in 60- 78% of squamous cancer of the cervix and 72-94% of cervical adenocarcinoma [6]. The prevention and control of cervical cancer had basically emphasized early identification and prompt diagnosis of precancerous lesion of the cervix until the

development and introduction of HPV vaccines (cervirax, Gardasil and Gardsil 9) that offers opportunity for primary prevention [7,8]. These vaccines had almost total protection against new and persistent infection and are recommended for girls 9-26 year [9-13].

HPV vaccination has been recommended for introduction into national immunization programs [14]. In USA, Australia, New Zealand and Sweden HPV vaccine has been incorporated into the school vaccination program for young adolescent girls often coupled with catch up program for older females. This practice however faces the challenges which are common to new vaccines or innovation. Parental consent is needed for the vaccination of minors, hence parental knowledge, attitude to and acceptance to vaccinate their daughters would to a good extent determine the success of the HPV vaccination program. Factors such as vaccine awareness, child age, perceived access to the vaccine, societal norms, religious inclination, stigmatization against sexually transmitted infection, vaccine safety & suspect of potential long-term adverse outcome, perception about disease susceptibility and severity, interaction with clinicians, the need to involve the adolescent in decision and mother's cervical dysplasia and cervical cancer experience are thought to influence the uptake of HPV vaccination [15-20]. Giffioen et al. in their study among mothers

who had vaccinated their daughters found that mothers health related beliefs and experience were the most frequently noted factors in decision to vaccinate their daughters. The same study also reported that the decision to vaccinate was essentially made by the mothers of the daughters that were vaccinated and about one third reported that their daughters were part of the decision. Essentially the utilization of HPV vaccine is directly influenced by patient, parents and care giver attitude to the vaccine. Other issues affecting vaccination uptake is the cost. Mairaing et al. [18] noted that free vaccination was the leading factors that influence vaccination uptake in their study.

The progress in programs and awareness creation about vaccination has remained slow in the continent of Africa. Few studies in our environment have explored the disposition, attitude, intention to vaccinate and practice of HPV vaccination of adolescent girls by their mothers. Hence this study aims at determining the knowledge, attitude to, desire and practice of HPV vaccination of their adolescent daughters and factor that determine intent and practice.

Material and Methods

This cross-sectional prospective study was conducted at the University of Nigeria Teaching Hospital (UNTH) Enugu and Enugu State University of Science and Technology Teaching Hospital Enugu, the two tertiary health institutions in Enugu state, Nigeria. UNTH Enugu Nigeria is 700 bed hospital which serves as the teaching hospital for the College of Medicine University of Nigeria. The ESUTH Teaching hospital also situated in Enugu is the teaching for Enugu State University of Science and Technology. Both hospitals serve as tertiary hospitals in Enugu and receive referrals from contiguous states. Enugu is a capital of Enugu state, southeastern Nigeria and is populated by mainly Ibo speaking people, Christians and civil servants.

Convenience sampling of consecutive consenting mothers who accompanied their daughters to gynaecological, paediatrics and adolescents, contraceptive and ophthalmology clinics, based on selection criteria was done between the months of April and September 2015 in both study centres.

Data was collected using semi-structured, pretested questionnaires after obtaining verbal consent. Interpretation was given to those who cannot understand English properly. Ethical clearance and approval was obtained from ethical board of both institutions. This questionnaire consisted of 4 sections seeking information about the socio-demographic characteristics of the respondents such as age, religion, tribe, occupation and educational attainment, their knowledge of Cervical cancer, HPV infection and HPV vaccination, and their attitude and practice of HPV vaccination of the daughters. The questionnaire was pre-tested for validity and recorded into SPSS data base and analyzed by trained statistician. Missing data were analyzed under the response caption "unsure". The average Cronbach alpha value for variables validity was 0.83. The depth of knowledge was determined by grading their responses on knowledge into poor, good and excellent. Five points Likert's scale was used to assess attitude; where various degrees of attitude were assessed using options of 1, strongly disagree, 2, disagree, 3, undecided, 4, agree, 5, strongly agree. Missing data or no response to particular questions was analyzed independently.

The sample size was calculated with the formula for infinite population, using a HPV prevalence of 26.3% at 95% confidence interval with 5% reliability, Z_{2pq/d^2} , the calculated minimum sample

size was 298, however a total sample size of 328 was used to make provisions for possible attritions and drop out [21,22].

Data was computed and analyzed using statistical software SPSS for windows version 17 (SPSS Inc, Chicago IL, USA) Variables were analyzed using descriptive and inferential statistics. Frequencies and percentages were determined where appropriate. Statistical significance was determined using chi-square and p value. P-value of 0.05 is considered significant.

Result

Three hundred and eleven out of 328 questionnaires were properly filled and returned giving a response rate of 94.8%. Table 1 shows the demographic characteristics of the respondents. The mean age of respondents was 40.4 ± 7 years. Tertiary education was attained by 212 (68.2%) of respondents while 93.0% were Christian.

Characteristics	Frequency (n=311)	Percent
1. Age		
25-29	13	4.2
30-34	42	13.5
35-39	91	29.3
40-44	76	24.4
45 and above	89	28.6
2. Marital Status		
Married	294	94.5
Widowed	8	2.6
Single	7	2.3
Divorced	2	0.6
3. Religion		
Christian	292	93.9
Muslim	2	0.6
Others	17	5.5
4. Occupation		
Civil servant	147	47.3
Health worker	76	24.4
Business/Trading	53	17
Artisan	21	6.8
Unemployed	14	4.5
5. Highest level of Education		
Non formal	17	5.5
Primary	25	8
Secondary	57	18.3
Tertiary	212	68.2

6. Tribe		
Igbo	294	94.5
Yoruba	5	1.6
Hausa	3	1
others	9	2.9

Table 1: Demographic characteristics of respondents.

Table 2 shows the awareness and level of knowledge of cervical cancer, Human Papilloma Virus and HPV vaccine. Most of the respondents 83.9% (261/311) were aware of cervical cancer, while 58.5% (182/311) and 55.3% (172/311) were aware of human papilloma virus and human papilloma vaccine respectively. Majority of the respondents that were aware of cervical cancer (69.1%181/261) had good knowledge, while 30.6% (80/261) had poor knowledge of cervical cancer. About 58.0% (182/311) and 55.0% of respondents were aware of HPV and HPV vaccine respectively. While 47.3% (86/182) of those aware of HPV had good knowledge, more than 50.0% had poor knowledge. The major sources of information on HPV vaccine were from health personnel (75.5%) and multimedia (30.0%).

Items	Frequency	Percent
1. Awareness of cervical cancer		
Yes	261	83.9
No	50	16.1
2. Awareness of HPV		
Yes	182	58.5
No	129	41.5
3. Awareness of HPV Vaccine		
Yes	172	55.3

No	139	44.7
4. Sources of information		
Mass/ Social Media	52	30.2
Health workers	66	38.3
Workshop/conferences	64	37.2
Others	24	14
5. Risk Factors for cervical cancer		
Early Sexual intercourse	126	48.3
HPV infection	127	48.7
Multiple sexual partners	157	60.7
Cigarette smoking	48	15.4
Kissing	2	0.8
I don't knowledge	7	2.7
6. Knowledge of HPV prevention Measures		
Immunization by HPV Vaccine	153	49.2
Sexual abstinence	105	33.8
Use of condoms	83	26.7
None of the above	8	2.6

Table 2: Knowledge of cervical cancer and HPV and HPV vaccine.

Table 3 shows the attitude of mothers toward vaccination of their daughters. Positive attitude predominate in 4 of the 6 attitudinal parameters studied while negative attitude predominate in only two. Two hundred and sixty three (84.6%) respondents desired to vaccinate their daughters against HPV however only 42 (13.5%) had been able to initiate and/or had completed vaccination for their daughters.

Items	Attitude n (%)					Predominant attitude
	Strongly disagree	Disagree	Undecided	Agree	Strongly Agree	
1. HPV Vaccine is effective in preventing cervical cancer	39 (12.5)	15 (4.8)	103 (33.1)	102 (32.8)	52 (17.7)	Positive
2. HPV vaccine can cause severe HPV infection	101(32.5)	49 (15.8)	109 (35.0)	33 (10.6)	19 (6.1)	Positive
3. Vaccination of my young daughters will prompt earlier sexual activity	97 (31.2)	71 (22.8)	101 (32.5)	16 (5.1)	26 (8.4)	Positive
4. HPV may have long negative effect on my daughter	61(19.6)	60 (19.3)	120 (38.6)	40 (12.9)	30 (9.6)	Positive
5. The cost of HPV is a major barrier to HPV vaccination	27 (8.7)	43 (13.8)	103 (33.1)	85 (27.3)	53 (17.0)	Negative

6. HPV vaccination violates my cultural norms/ religious beliefs	41 (13.2)	59 (19.0)	86 (27.7)	91 (29.3)	34 (10.9)	Negative
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Table 3: Mothers attitude towards vaccination of their daughters.

Of the 266/311 mothers who had positive attitude to HPV vaccination seen in this study only 31/311 of them had actually had their daughters vaccinated. Vaccination practice of women with positive attitudinal response to HPV vaccination was significantly lower than those without $p=0.02$, 95% CI, OR=0.48 (0.90-0.89) Table 4 shows further comparison between attitude of mothers to HPV vaccination of their daughters and desire and practice of daughters' HPV vaccination. Positive attitude significantly led to desire or intention to vaccinate daughters. P values ranges from 0.00 –0.04. The attitude of mothers to the statement "HPV Vaccination may lead to my daughter/daughters early onset of sexual activity and HPV vaccination

violates my cultural and religious beliefs" was not statistically significant in influencing mothers desire to vaccinate their daughters against HPV. P value=0.14 and 0.60 respectively. Only two attitudinal parameters; "vaccination of my daughters will prompt early sexual activity and cost of HPV vaccination being a barrier to vaccination" had statistically significant influence on the practice of HPV vaccination of daughters. Positive attitude to cost of HPV vaccine significantly increased up take of HPV vaccination of daughters while negative attitude to daughters' early onset of sexual activity significantly reduced up take. P value =0.04 and 0.007 respectively.

Attitude To HPV Vaccination	Desire to Vaccinate (n=263)			Practice of Vaccination (n=42)		
	Yes	No	P-value	Yes	No	p-value
HPV Vaccine is effective in preventing cervical cancer	139	15	0	23	131	1.26
	47	7		13	41	
	77	26		6	97	
HPV vaccine can cause severe HPV infection	134	16	0.0001	26	122	0.07
	46	6		10	42	
	83	26		6	103	
Vaccination of my daughters will prompt earlier sexual activity	126	22	0.14	22	146	
	40	12		13	29	0.007
	97	14		7	94	
HPV vaccine may have long negative effect on my daughter	113	8	0.01	21	100	
	57	13		11	59	0.77
	93	27		10	110	
The cost of HPV is a major barrier to HPV vaccination	57	13	0.04	17	53	
	126	12		18	120	0.04
	80	23		7	96	
HPV vaccination violates my cultural norms and religious beliefs	82	18	0.6	18	82	
	111	14		15	110	0.21

	70	16		9	77	
P Value denotes statistical significant comparison between positive and negative attitude to HPV vaccination						

Table 4: Attitude of mothers to HPV Vaccine versus desire and practice of HPV vaccination of their daughter.

Table 5 shows reasons for uptake and non-uptake of HPV vaccination. One hundred and sixty three (62.0%) of those that had desire to vaccinate, but had not, gave high cost and non-availability of vaccine as their main hindrance. About 95.0% (34/42) of those respondents that vaccinated their daughters gave fear and life experiences of cervical cancer as the dominant reasons for doing so. Health workers influenced daughters' vaccination in 57.1% of cases, while the others (35.7%) were influenced to vaccinate their daughter by their relatives. The average age of daughters at vaccination was 10 ± 0.75 years. Ten (23.8%) of those that initiated vaccination defaulted.

Factors influencing practice	Frequency	Percent
1. Reasons for Vaccinating my daughter		
Fear of Cervical cancer	29	69
As routine immunization	13	31
Life experience of cervical cancer	11	26.2
To prevent STD	10	23.8
Others	5	11.9
2. Who influenced the vaccination		
Health worker	26	57.1
Relatives	16	38.1
Friends	2	2.4
3. Reasons for not Vaccinating my daughter		
Concerned for side effects	79	25.4
High cost of HPV vaccine	68	14.9
Non availability of HPV vaccine	63	20.3
Fear of promoting sexual promiscuity	14	4.5

Table 5: Factors influencing practice of HPV vaccination of daughters.

Discussion

The introduction of HPV vaccination as a measure to combat the scourge of cervical cancer in women is highly applauded but has attracted a lot of concern and research. This vaccination essentially targets young girls classed as minors that need parental consent for vaccine administration. The parental awareness, attitude, intent and acceptance of HPV vaccination for their daughters have become pertinent for the success of the preventive program. This study found a high level (83.9%) of cervical cancer awareness but much lower awareness of HPV (58.5%) and HPV vaccine (55.3%). These findings were comparable but slightly lower than 91% awareness level for cervical smear and 62.7% for HPV vaccination reported among women health workers in Nigeria and this collaborated with others within and outside Nigeria [15,23,24]. Being a health worker probably

exposed them to the milieu of health information, which explains the higher awareness. While an average of 74.0% of responders in a systematic review [25] knew the link between cervical cancer and HPV, only 48.7% of our studied population identified HPV as a risk factor for cervical cancer. Although the awareness of HPV reported in this study was quite lower than that reported in a study among women in Lagos Nigeria and the range of 64.7–93.0% reported in a systematic review by Trim et al. [26], the awareness of HPV vaccine in our study was higher than that of the study in Lagos but was within the range of 47–64.5% reported in the systematic review [24,25].

The mean age of the respondents of 40.4 ± 7 years found in this study was comparable to 41.3 ± 9.4 years and a range of 30–49 years reported in other studies [15,26]. Most (68.2%) of our respondents had tertiary education, this was quite higher than 55.7% and 58.3% reported in other studies to have graduate degrees [15,26]. A study reported that the basic knowledge of HPV was found to be higher in those that had higher education [18], and another reported that limited knowledge of HPV connection to cervical cancer led to reduced acceptability [19]. This study found no significant effects of level of education to acceptability of and practice of HPV vaccination (p=0.969). Despite moderate level of awareness of HPV and HPV vaccine, and poor depth of HPV knowledge, most parents (84.6%) still indicated intentions to vaccinate their daughters in this study. This was higher than 76% reported in another study and the range of 47–79.5% noted in the systematic review by Trim et al. [25,27]. Overall this study found a predominantly positive attitude towards HPV vaccine among studied mothers. This led significantly to high intent to vaccinate their daughters. Only in two parameters did negative attitude dominate. This finding thus collaborated the report by Hertweck et al. [16] that intention to vaccinate was significantly predicated on attitude and perceived behavioral control. Positive attitudes however do not always lead to dominant practice. This study found out that a lower number of mothers with positive attitude vaccinated their daughters. P=0.02, 95% CI, odd ratio 0.48 (0.19–0.89). This probably reflected the influence of other factors on uptake of HPV vaccination by mothers for their daughters. Positive attitude to cost significantly influenced uptake of HPV vaccination. This is quite pertinent in low resource countries such as ours where many may not afford the vaccine. Only 42 (13.5%) of the respondents had initiated vaccination for their daughters in this study. Though this is lower but it is comparable to the 19.0–21.0 % uptake rate reported in other studies [15,24,28–30]. Thirteen (23.8%) of those that initiated vaccination defaulted. This emphasized the need for continued follow up for those that have initiated the vaccination.

Fear for, and life experiences of cervical cancer are the predominant reasons for uptake of HPV vaccination in our population while lack of awareness of HPV vaccine, concern about efficacy and adverse side effects, high cost of HPV vaccine and young age of their daughters were reasons given by mothers that did not vaccinate their daughters. This agreed with other studies that reported fear of side effects, perceiving the vaccine as risky and belief that vaccine is experimental, low knowledge of HPV vaccine and cervical cancer and not participating in routine cervical smear as reasons for reduced intention

to vaccinate and uptake of HPV vaccination for their daughters [15,17-21].

The introduction of HPV vaccination and its acceptance as well as highlighting its values has only been undertaken sparingly in resource poor countries where its use is most desirable. This pilot study conducted in two tertiary hospitals had limited number of mothers accompanying their minors to the clinics. This prevented the conduct of randomization and may limit the generalisation of the outcome of this study. A population based study is planned to further examine the challenges of use of HPV vaccine in our environment. A similar study among the youths may also be of importance in further identifying issues that affect uptake of vaccination against HPV and would be of pertinence in program planning.

We conclude that the awareness of HPV and HPV vaccine for prevention of cervical cancer is still suboptimal among mothers of adolescent daughters in our environment. There was predominantly positive attitude towards the use of HPV vaccination for prevention of cervical cancer among respondents; hence the high rate of desire by mothers to vaccinate their daughters. The practice of the HPV vaccination by mothers of adolescent girls was still low. There was need for increased awareness creation by government agencies and caring physicians. The government departments responsible for routine immunization should latch on this positive attitude by mothers to increase uptake by making HPV vaccination part of routine immunization for the adolescent.

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