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Original Article

Parental Uptake of Cervical Cancer Vaccine for their Female Adolescent in a City in Nigeria

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Abstract

Background: Cervical Cancer Vaccine is known to be one the effective ways of preventing cervical cancer. The present study aimed to assess parents' knowledge on uptake of human papilloma virus vaccine (HPVV) by adolescents, describe their perception on the uptake of HPVV by adolescents, and identify their cultural beliefs which could influence HPV uptake.
Methods: This work is a cross-sectional study. We conducted the current study in a local government area in Nigeria from December 2019 to February 2020. A total of 350 participants were recruited using a multi-stage sampling technique. A four-sectioned, 44-item-structured questionnaire was used for data collection. We strictly adhered ethical principles. The data was analysed via descriptive statistics.
Results: The obtained findings revealed that only 56.0% of the parents were aware of HPV, out of whom 73% had a good level of knowledge of cervical cancer vaccine. On the contrary, 1.7% of them had good perception of cervical cancer vaccine uptake while 67.1% had low perception. We also indicated that educational status of the parents influenced the uptake of HPVV by their adolescents (F=0.54, P=0.54). Additionally, 75% of the participants had negative cultural beliefs which prevent them from allowing their adolescents to take up the vaccine.
Conclusion: Awareness of HPV was found to be moderate while the majority of those who are aware of HPV had high knowledge of cervical cancer screening. Most of the parents had low perception of cervical cancer vaccine. Similarly, a big proportion of the parents had negative cultural beliefs about HPVV uptake. Thus, parents should be provided with further education in this regard so that they promote the uptake of HPVV for their female adolescents.

Keywords: Adolescents, Cancer, Vaccine, Uptake

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1. Introduction

Cancer of the cervix is the fourth foremost cause of death among women with a high incidence in developing countries. There are about 570,000 new cases of cervical cancer (CC) and 266,000 deaths annually worldwide (1). In Nigeria and other Sub-Saharan African countries, cervical cancer is the second most commonly diagnosed cancer among women, accounting for about 35 cases/100,000 women (2) and an annual death record of 22.5/100,000 women (3). Among women of all ages and those in the age range of 15 to 44 years old globally, CC is the second most prevalent type of cancer. In 2018, it was reported that every year, about 500,000 women were diagnosed with cervical cancer and over 250,000 died due to it. In 2018, the International Agency for Research on Cancer (IARC) reported its global estimates incidence as 18.1 million and mortality from it as 9.6 million (1). Catarino and colleagues reported that developing countries account for 88% of cervical cancer cases (3).

If not diagnosed and treated early, CC leads to fatality among women. This is particularly true in African countries where it often affects women mostly when they are young, productive, and needed most by their families (4). Cancer of the cervix ensues when there is uncontrollable growth of the cervix cells of the uterus. Cervical cancer develops once there is persistent human papilloma virus (HPV) infection, leading to precancerous development or cervical cells lesion that have been continuously infected with HPV followed by invasion of the cervix cells. HPV infections could be clear most of the times, but precancerous lesions rarely revert to normal cells (1). Human papilloma virus DNA had been implicated in between 90-100% cases of CC (5), making the link between HPV and CC stronger than that between smoking and lung cancer.

In Nigeria, CC is the second most prevalent cancer

among women, and the second most frequent among women of reproductive age (6). Recent estimates indicated that 14,550 women are diagnosed with CC and 9,659 die as a result of the disease annually in developing countries (7). Similarly, in general, 23.7% of women are estimated to harbour HPV infection, and over 90% of invasive CCs are credited to HPVs 16 or 18. Age-standardised incidence rate for CC in Nigeria has been projected to be 33.0 cases 100,000 women/year. It was estimated that in 2025, there will be 22,915 new CC cases and 15,251 deaths from CC in Nigeria (8).

In Nigeria, apart from breast cancer, CC is the most common health-associated issue of female genital tract (2). A high incidence was also reported in the southern part of Nigeria (9). According to Onyenwenyi and Gugu, the incidence is high in Nigeria due to the low HPV vaccine (HPVV) uptake, especially among the uneducated parents living in rural area where there is no access to information and health care facilities and there is therefore the lack of knowledge of the vaccine (4). Other factors that have been documented to affect HPVV uptake in Nigeria is the absence of a national policy on how to prevent CC among women and limitation in terms of CC access screening due to non-availability of medical equipment and personnel (10). We therefore conducted this study to assess parents' knowledge on HPVV uptake by their adolescents, describe their perception on the uptake of HPVV by adolescents, and identify their cultural beliefs which could influence HPV uptake.

2. Methods

The data collection was performed via a descriptive, cross-sectional method. We conducted this study in Akure, Akure South Local Government Area of Ondo State, Nigeria. The study population comprised all parents with their adolescents in the age range of 11-19 years at the time of the study.

Leslie Kesh[12] single proportion formula for estimating sample at 95% level of confidence was used to determine the study sample (11).

$$N = \frac{(Z\alpha/2)^2 pq}{d^2}$$

Where:

N=minimum sample size

$Z\alpha_{/2}$=standard normal deviate set at 1.96 which relates to a 95% confidence level

p=proportion of awareness of vaccine against cervical cancer in Nigeria 59.7% (12)

q=1-p=0.403

d=degree of precision which will be set at 5% (0.05 of the population)

N=370

Multi-stage sampling techniques were used to recruit the participants. There are 11 wards in Akure South Local Government; five were randomly selected with simple balloting; three Quarters were selected from the list of all the Quarters in each of the wards through simple random technique; lastly, two streets were randomly selected from each quarter. Households where adolescent parents in each of the quarter in the selected wards. We ultimately recruited a total of 350 parents.

The main instrument for data collection was a structured questionnaire. The questionnaire was administered to the parents/guardian of the adolescents to collect data for the study. A semi-structured questionnaire with established validity and reliability was utilized to obtain information from the participants. The questionnaire consists of a total of 44 items. Face and content validity of the tool were ascertained by giving the questionnaire to experts in the field of maternal and child health nursing, gynaecology, and oncology for expert opinion; it was confirmed to be valid by the experts. Ambiguous questions were removed and some were re-worded for further clarification. The questionnaire has a yielded Cronbach's Alpha of 0.73.

The questionnaire is divided into four sections; the first one includes 16 items, which question the socio-demographic characteristics of the participants. The second section elicits information on the knowledge about cervical cancer; it is an eight-item section with "Yes" and "No" type of questions. The third section asks for the information on perception towards HPV vaccination; it comprises 13 items on Likert scale with "strongly agree", 'agree", 'undecided", "disagree", and "strongly disagree". The last section assesses the cultural belief of the participants, which is a seven-item scale of "Yes" or "No" questions.

The Ethical Board approved the present work with the code of BUHREC282/19b. All the participants signed an informed consent. The study was conducted

from December 2019 to February 2020. Only 350 questionnaires were satisfactorily filled after retrieval, giving a response rate of 94.59%. The data were analysed with descriptive statistics (frequency, mean, percentage, and standard deviation). Inferential statistics (student t-test and analysis of variance (ANOVA)) were employed to analyse study hypothesis at 0.05 level of significance with a computer software called Statistical Package for Social Science (SPSS) version 23.

3. Results

Socio-demographic characteristics of the participants, as shown in Table 1, revealed that only 16 (4.6%) were below the age of 31 while 153 (43.7%) and 137 (39.1%) were within the age ranges of 41 to 50 and 31 to 40 years, respectively. The mean age of the subjects was found to be 42.57±7.11. The majority of the participants in this study were female: 257 (73.4), Christians: 323 (93.7), and Yoruba: 313 (89.4%). Likewise, 250 (71.4%) mothers had tertiary education and 319 (91.7%) were married while a few 25 (7.1%) were single. The obtained results further showed that a big proportion (273 (78.0%)) was employed with 152 (43.4%) public workers and 41 (11.75%) farmers. Only 83 (23.7%) of the participants earn more than 100,000 naira monthly whereas 87 (24.9%) earn less than 20,000 naira monthly. Two out of every five (41.7%) participants opined that their family income is not enough to vaccinate their adolescents against cervical cancer. Moreover, 215 (61.4%) of the participant said they do not have health facility close to their area of residence, where HPVV can be obtained. Furthermore, 245 (70.0%) of the participants were from a nuclear family and 21.7% from a polygamous family setting while 29 (8.3%) were single-parent families.

Table 1: Socio-demographic characteristics of the respondents

Variable	Characteristics	Frequency n=350 f (%)
Age in years	21–30	16 (4.6)
	31–40	137 (39.1)
	41–50	153 (43.7)
Mean=42.57±7.11	51–60	41 (11.7)
	61–70	3 (0.9%)
Gender	Male	93 (26.6)
	Female	257 (73.4)
Religion	Christianity	328 (93.7)
	Islam	22 (6.3)
Education level	Primary	24 (6.9)
	Secondary	46 (13.1)
	Tertiary	250 (71.4)
	Others	30 (8.6)
Marital status	Single	25 (7.1)
	Married	319 (91.7)
	Separated	6 (1.7)
Ethnicity	Yoruba	313 (89.4)
	Hausa	9 (2.6)
	Igbo	21 (6.0)
	Others	7 (2.0)
Are you employed?	Yes	273 (78.0)
	No	77 (22.0)
Specify your employment status.	Public worker	152 (43.4)
	Farmer	41 (11.7)
	Artisan	63 (18.0)
	Professional	94 (26.9)
What is your average monthly income?	Less than 20, 000	87(24.9)
	20,000–59,000	108 (30.9)
	60,000–99,000	72 (20.6)
	100,000 & above	83 (23.7)
Is your income enough for the family to vaccinate your adolescents?	Yes	204 (58.3)
	No	146 (41.7)
Do you have health facility close to your residential area?	Yes	215 (61.4)
	No	135 (38.6)
Family settings	Nuclear	245 (70.0)
	Polygamous	76 (21.7)
	Single parent	29 (8.3)

Figure 1 illustrates the level of awareness of HPVV among the parents in this study. It shows that only 56.0% of the participants have heard about human Papillomavirus vaccine. The highest source of information was hospital (34.2%) followed by the media (25.0%) (Figure 2).

The parents' level of knowledge on the uptake of HPVV by adolescents, as presented in Table 2, indicated that the majority of the parents which was 187 (95.4%) said yes to whether HPV is used to prevent cervical cancer. Moreover, they mostly 192 (98.0%) agreed that CC, if detected early, is curable; meanwhile, most of them which was 157(80.1%) answered that CC is preventable. In addition, 188(95.9%) of them believed that female gender is at risk of developing cervical cancer; 183 (93.4%) said that female child (ren) can be vaccinated and 160 (81.6%) agreed that HPVV is taken once; thereafter, there is no need of taking it again. Figure 3 demonstrates that 73.0% of the participants had good knowledge, 25.5% had moderate knowledge, and 1.5% had low knowledge on the uptake of HPVV.

The questions concerning parents' perception on the uptake of HPVV by their adolescents revealed that about half (47.1%) strongly agreed that HPVV is taken once, 106 (30.3%) strongly agreed that HPV vaccination is not necessary, and 101 (28.9%) strongly agreed that they cannot vaccinate their adolescent against HPV; Table 3 depicts these findings. The results, as presented in the table, also showed that 76 (21.7%) strongly agreed that there are side effects of taking HPVV. Similarly, 88 (25.1%) strongly agreed that HPVV will make their children sexually active earlier than expected. Additionally, 89 (25.4%) agreed that HPV is a sexually transmitted infection while 136 (38.9%) disagreed that HPV vaccination prevents CC. Overall, their perception, as presented in Table 4, revealed that 67.1% had very low perception about the uptake of HPVV, 31.2% had moderate perception, and 1.7% had high perception about the vaccine. The mean perception score of the participants was found to be 23.88±4.79.

The results further showed a significant relationship between parent's knowledge of HPVV and their perception of uptake of the vaccine by their adolescents (correlation=-0.188; t=-65.58; P=0.008) (Table 5).

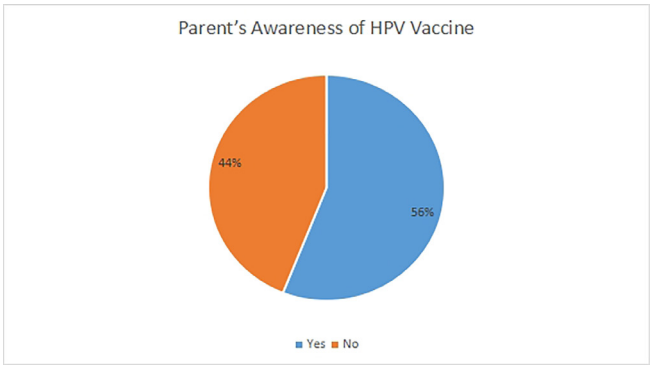

Figure 1: The figure shows the parents' awareness of human papilloma virus vaccine.

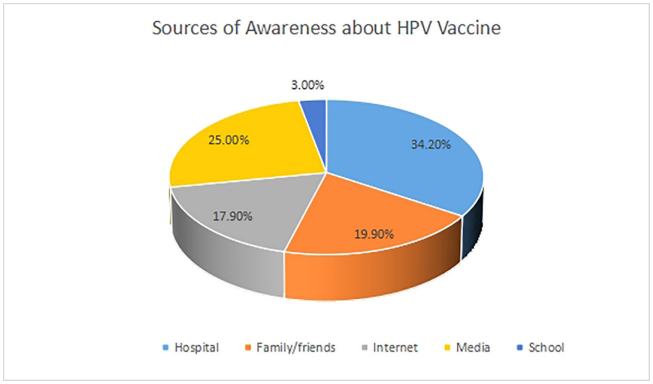

Figure 2: The figure shows the sources of awareness of human papilloma virus vaccine.

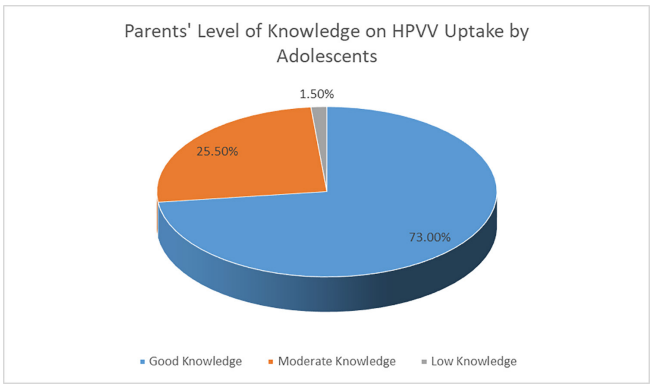

Figure 3: The figure shows the parents' level of knowledge on human papilloma virus vaccine uptake by adolescents.

Table 2: Parents' knowledge level on human papilloma virus vaccine (HPVV) uptake by adolescents

Variable (n=196)	Yes (%)	No (%)
HPV is used to prevent cervical cancer.	187 (95.4)	9 (4.6)
Cervical cancer is curable if detected early.	192 (98.0)	4 (2.0)
Cervical cancer is preventable.	157 (80.1)	39 (19.9)
Female gender is at risk of developing cervical cancer.	188 (95.9)	8 (4.1)
Female child (ren) can be vaccinated against HPV.	183 (93.4)	13 (6.6)
HPVV is taken once, thereafter, there is no need of taking it again.	160 (81.6)	36 (18.4)

* HPVV: Human Papilloma Virus Vaccine

Table 3: Parents' perception on the uptake of human papilloma virus vaccine (HPVV) by adolescents

Variables	Strongly Agree f (n)	Agree f (n)	Undecided f (n)	Disagree f (n)	Strongly Disagree
HPVV is taken once; thereafter, there is no need of taking it.	165 (47.1)	119 (34.0)	62 (17.7)	1 (0.3)	3 (0.9)
HPV vaccination is not necessary.	106 (30.3)	109 (31.1)	31 (8.9)	60 (17.1)	44 (12.6)
I cannot vaccinate my adolescent.	101 (28.9)	133 (38.0)	62 (17.7)	33 (9.4)	21 (6.0)
There are side effects of taking HPVV.	76 (21.7)	94 (26.9)	87 (24.9)	74 (21.1)	19 (5.4)
My children are too young to take HPVV.	62 (17.7)	115 (32.9)	86 (24.6)	57 (16.3)	30 (8.6)
HPVV will make children sexually active earlier than expected.	88 (25.1)	119 (34.0)	75 (21.4)	48 (13.7)	20 (5.7)
Awareness on HPVV is not enough to stimulate vaccine uptake.	25 (7.1)	53 (15.1)	53 (15.1)	131 (37.4)	88 (25.1)
Fear of injection can hinder the adolescents from taking HPVV.	41 (11.7)	44 (12.6)	52 (14.9)	145 (41.4)	68 (19.4)
Cervical cancer is major disease of women.	33 (9.4)	63 (18.0)	52 (14.9)	115 (32.9)	87 (24.9)
HPV is a sexually transmitted infection.	45 (12.9)	52 (14.9)	89 (25.4)	103 (29.4)	61 (17.4)
HPV vaccination prevents cervical cancer.	25 (7.1)	39 (11.1)	69 (19.7)	136 (38.9)	81 (23.1)
Male cannot obtain HPVV.	33 (9.4)	91 (26.0)	114 (32.6)	68 (19.4)	44 (12.6)
Cervical cancer does not lead to death for most people.	52 (14.9)	60 (17.1)	59 (16.9)	114 (32.6)	65 (18.6)
HPVV is only for adolescents.	75 (21.4)	72 (20.6)	67 (19.1)	84 (24.0)	52 (14.9)

* HPVV: Human Papilloma Virus Vaccine

Table 4: Summary of parents' perception on uptake of human papilloma virus vaccine (HPVV) by adolescents

Level of Perception	Score Range	Frequency	Percentage
High	36–52	6	1.7
Moderate	26–35	109	31.2
Low	0–25	235	67.1
Total	0–52	350	100.0
Mean score	23.88		
Std. Deviation	4.79		

Table 5: Relationship between parents' knowledge of HPVV and their perception of HPVV uptake by adolescents

Variable	Mean	Correlations	T	P
Knowledge	6.15±1.02	-0.188	-65.58	0.008
Perception	23.88±4.79			

*HPVV: Human Papilloma Virus Vaccine

Table 6: Relationship between parents' socio-demographic characteristics and their perception of HPVV uptake by adolescents

	Perception of HPVV Uptake by Adolescents	
	f	P
Level of Education	0.54	0.54
Marital Status	0.92	0.40
Age	2.02	0.09

* HPVV: Human Papilloma Virus Vaccine

However, no significant relationship was observed between the level of education (F=0.54, P=0.54), marital status (F=0.92, P=0.40), age (F=2.02, P=0.09), and parents' perception of the uptake of HPVV by adolescents (Table 6).

As represented in Table 7 and based on the questions focusing on cultural beliefs about HPVV uptake, 103 (29.4%) agreed that cultural beliefs hinder them from taking their adolescents for HPV vaccination. The majority (71.1%) of the participants were of the opinion that their culture encourages adolescents in the uptake of HPVV. However, 150 (42.95) agreed that it is believed in their culture that taking HPVV will make adolescents promiscuous. Only 121 (34.6%) agreed that it is believed in their culture that taking local herb can do as much as HPVV. Meanwhile, only a few (38.0%) opined that their culture supports that HPVV can

Table 7: Cultural belief of parents on HPVV uptake by adolescents

Variable	Yes (%)	No (%)
Do your cultural beliefs hinder you from taking your adolescent for HPV vaccination?	103 (29.4)	247 (70.6)
Does your culture believe that the uptake of HPVV can prevent cervical cancer?	243 (69.4)	107 (30.6)
Does your culture believe that taking HPVV makes adolescents promiscuous?	150 (42.9)	200 (57.1)
Does your culture allow parents to decide for their adolescents concerning HPVV uptake?	250 (71.4)	100 (28.6)
Does your culture believe that taking local herb can do as much as HPVV?	121 (34.6)	229 (65.4)
Does your culture believe that HPVV can predispose adolescents to cancer in future?	133 (38.0)	217 (62.0)
Does your culture believe that HPVV can lead to infertility?	114 (32.6)	236 (67.4)

* HPVV: Human Papilloma Virus Vaccine

predispose to cancer in the future. Similarly, only 114 (32.6%) agreed that their culture believes that HPVV can lead to infertility.

4. Discussion

This study showed moderate level of awareness of HPV among the participants in the study despite high level of awareness of HPV. Similarly, a number of the participants still have negative cultural beliefs about HPVV uptake and this might probably influence their readiness to take HPVV for their female child (ren). The mean age of the participants in this study was 42.57±7.11 years. Most likely, parents within this age range are likely to have adolescent. The higher number of female parents in this study is due to the fact that mothers are usually more available at home and willing to participate in studies compared with fathers. However, the male to female ratio of the participants in this study might not necessarily mean the male to female ratio in the general population.

The obtained findings herein implied that awareness of HPVV among the sampled parents was high. In an earlier study carried out on parents in Sharjah in United Arab Emirate (UAE), Ahmad and colleagues (13) reported that only few of the participants had heard of HPVV before. Perlman and colleagues also documented that awareness of HPVV in Sub-Sahara Africa is low (14). However, our results showed an improvement in awareness compared to the aforementioned studies. The reason behind this might be the increase in some campaigns on the media about CC and CC vaccination. This is also corroborated by hospitals and the media, respectively accounting for the biggest sources of information among the sampled population. In another study in this field, in Nigeria in 2017, it was reported that the media (television and radio) is the most important source of awareness about CC, CC screening, and vaccination (15).

The mean score of knowledge in this study was found to be high. Three out of every five parents that participated in this study had good knowledge about CC and vaccination against CC. The study findings further revealed that many of the parents had a high level of knowledge of HPVV uptake by their female adolescents. This is better than level of knowledge about vaccination against cervical cancer reported by Rashid and co-workers in India (16). Nonetheless, in an earlier paper in Nigeria, Toye and colleagues reported good knowledge about prevention of CC among their sampled population (17). This consistently showed that the knowledge of people about prevention of CC through vaccination is on the increase.

Perlman and colleagues documented a high level of readiness and acceptability of HPVV with a low level of awareness and knowledge of CC, HPV, and HPVV in Sub-Sahara Africa (14). However, in this study, awareness about CC, CC screening, and CC vaccination among our participants was high. This further demonstrated the increasing level of public information about CC, CC screening, and CC vaccination. This implies increasing the frequency of CC vaccination uptake will be easier since the level of awareness is high. Nevertheless, according to our findings, the high level of awareness was not translated into knowledge. It is however believed that with an increase in education and public enlightenment, this can be easily achieved.

Studies across different countries have demonstrated a significant relationship between HPVV uptake and the level of education of parents (18, 19). This study; however, indicated that parents' level of education is not a determinant of uptake of HPVV among adolescents. This also negates previous submissions of Feiring and colleagues in their study among parents in Canada, United States, and Norway, where they submitted that parents with a higher level of education were less probable to vaccinate their adolescents against HPV (20). Moreover, in some other research in Hong Kong and some African countries, scholars submitted that female adolescents whose mothers have a tertiary

education are more than twice probable to be vaccinated against HPV compared to those whose mother is less educated (21).

Knowledge of parents about HPV vaccination and cervical cancer influences their perception about HPVV uptake by the adolescents. Nickel and colleagues reported that parental knowledge about cervical cancer vaccination plays essential role in HPV vaccination uptake among adolescents (22). Earlier in 2015, Hansen and colleagues as well as Kepka and colleagues suggested that level of parents' knowledge has a significant role to play in CC vaccine uptake (19, 23). Based on the results of Agida and colleagues, one of the causes for the reduced vaccination initiation and completion rates in Nigeria is the lack of knowledge about infections and vaccination against it among mothers of children in the eligible age range (24).

Only about half of the parents in this study have good perception of uptake of HPVV by adolescent. This is at variance with submissions of Ahmed and colleagues in an attempt to assess the attitude of CC screening among market women in Zaria, Nigeria (25). They documented that the majority of their participants had an appropriate attitude towards CC vaccination.

A number of the participants still believed that HPVV is not necessary for their female adolescent whereas almost half believed that the vaccine might have side effects. This is closely related to concern that was documented among parents in the United States, the United Kingdom, Germany, and Canada (26). In addition, a considerable number of participants in this study believed that vaccinating their adolescent girl against cervical cancer is like encouraging them to engage in premarital sex. This is important that HPVV will not protect adolescents against other STIs. Herein, we also found that some participants opined that their children are too young for the vaccine. These support submission of Berenson that many parents felt as if their adolescent children were not sexually active because they are too young and therefore believed that vaccination against HPV is unnecessary (27).

Only few believed that the awareness of HPVV is not enough, which showed that earlier opinion of Loke and colleagues about that HPVV is relatively new in African countries is changing. However, a number of participants in this study still opined that the risk of their children contracting HPV is low, which is similar to what has been documented in the literature (26).

The high cost of HPVVs is a major hindrance to vaccination uptake, which has been reported by Chiang and colleagues (28). A survey in the United States documented that female adolescents covered under health insurance take HPVV more than uninsured female adolescents in USA (29). Presently in Nigeria, only people working in formal organizations are adequately covered by the health insurance policies. Even among those in formal settings, only the federal government implements health insurance for all the staff; many states are yet to enrol their workers under the health insurance scheme. Vaccination against cervical cancer is not presently under the list of items covered by the health insurance in Nigeria. This will further limit the access of adolescents to vaccination against cervical cancer.

Rees and colleagues reported cultural belief as one of the most dominant factors influencing HPVV uptake among rural dwellers (30). However, in this study, cultural belief of the parents was not significantly related to uptake of HPVV among adolescents. The obtained results herein also showed that only a little more than half of the participants have a positive cultural belief about uptake of cervical cancer by adolescents. A considerable number of participants believed that their cultural background hinders their adolescent from HPV vaccination. About half of the parents in this study opined that in their culture, encouraging adolescents to take HPVV will promote promiscuity. Furthermore, some of the parents held that HPVV can lead to infertility in the future.

4.1. Limitations

Only few male parents of adolescents volunteered to participate in the study. Most of the male parents declined participation. This limited the generalization of the results to both male and female parents.

5. Conclusions

The findings of the current work revealed that regardless of the high level of knowledge among parents, the majority of them still have very low perception of the uptake of the vaccine. We also indicated that the educational status of parents influenced their uptake of HPVV by their adolescents. The findings of this study showed that not all parents are willing to permit their female adolescents to uptake of HPVV. Hence, there is a need for nurses, health institutions, government, and non-governmental agencies to continue to encourage people in this regard through campaigns, which will

be conducive to stopping the misconceptions that negatively affect HPVV uptake among public.

Acknowledgement

The authors acknowledge the support from all participants that participated in the study.

Ethical Approval

The Ethical Board approved the present work with the code of BUHREC282/19b. All the participants signed an informed consent.

Conflict of Interest: None declared.

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