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Assessing Factors Influencing HPV Vaccine Uptake and Hesitancy in Northern Nigeria – A Case Study of Jigawa State

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Abstract

Human Papillomavirus (HPV) is a major health issue highly prevalent among participants with most of the victims being women since it is the primary cause of cervical cancer. Although HPV vaccination is recommended by the World Health Organization, there are still very low uptake rates of HPV vaccination in low or medium-income countries and northern Nigeria in particular. The paper evaluates the aspects highlighted in HPV vaccine uptake and hesitancy in this area which are sociocultural barriers, misconceptions and ignorance. A cross sectional survey, which used multistage sampling, was carried out in Jigawa. The results show that the respondents mostly were young mothers 18-24 years old and the higher percentage of them had no higher education only primary education which shows high fertility rate and inequality level in education. Even more, 47.6 and 37.8 percent of participants disagreed with the effectiveness of the vaccine in the prevention of cervical cancer and its safety, respectively. But in 34.8 percent of the cases, respondents said they are informed about the quality of the vaccine, and 41.4 percent of them supported its promotion in their communities. These rather contradictory perceptions point out to the substantial existence of barriers to tolerance and the necessity to implement complete educational measures to resolve misunderstandings and safety issues. Findings of the study show that awareness, availability, and cultural beliefs play a major role in leading to vaccine uptake, and efforts should be made to make HPV vaccination rates go up by making them sensitive to the context. This study can be used in the studies on the intricacies of the HPV vaccine hesitancy issue and the ideas that can be helpful in achieving the greater popularity of vaccines in Northern Nigeria in terms of public health programs.

Keywords: HPV vaccine, vaccine uptake, vaccine hesitancy, Northern Nigeria, public health, sociocultural factors, cervical cancer.

Introduction

Human Papilloma Virus (HPV) is a duplication DNA virus that queries papillomavirus family with more than 200 other virus related viruses, most of them are sexually transmitted (Luria & Cardoza-Favarato, 2023). HPV types of high to low risk are known to have resulted in an array of different cancers such as cervical cancer with the HPVs of 16 and 18 in high-risk types and warts, as well as respiratory papillomatosis, which patients develop due to the inability to breathe easily (National Cancer Institute, 2023). HPV can be mainly transmitted during a sexual intercourse but it may also be spread through skin contacts with an infected person and as such both men and women may be carriers and transmitters of this virus (Wolf *et al,* 2024).

HPV vaccine is an important preventive action against the HPV diseases especially cervical cancer (Pathak *et al,* 2022). Although it is available, it is striking that there is a certain population that is unwilling to take the vaccine, this has been a major health issue that has raised concerns (Galagali *et al,* 2022). Vaccine hesitancy has been declared by the World Health Organization WHO as one of the ten greatest threats to global health (WHO, 2019).

International coverage of the HPV vaccine by girls getting first doses stood at 27 percent as at 2023, still well short of the 90 percent world health goal by 2030 (Asgedom *et al,* 2024). The figure is an improvement on the previous number of 20 percent in 2022 but this is majorly owing to the improvement of hitherto vaccination programs across the globe. Nevertheless in Africa and especially sub-Saharan Africa the case is not easy. As an example, the introduction of a mobile clinic carrying out vaccinations in a rural village in Kenya was received with excitement and cautiousness. Whereas certain parents were anxious to take their daughters to get vaccinated, others were reluctant because of the myths about the safety and efficiency of the vaccine (Kolek *et al,* 2022).

HPV has been a significant public health problem in Nigeria; HPV is a leading risk factor in cervical cancer that affects most women in Nigeria; this cancer is the second most widespread cancer in the nation (Onwuamah *et al,* 2023). The present estimation denotes about 12,075 women each year are identified with cervical cancer and around 7,968 women die (Mafiana *et al,* 2022). Even when there was a preventive solution in the HPV vaccine, which is currently being used to prevent HPV-related diseases, the rate of acquiring the vaccine is very low, and thus the rate of the detectable HPV-related diseases is high (Asgedom *et al,* 2024). An outstanding case can be observed in northern Nigeria, where cultural beliefs and misinformation have played an

accentuated part in obstructing vaccination (Ohareri *et al,* 2020). In other parts, community leaders have been against the vaccine as they feel that it would encourage promiscuity by young girls, which are some of the reasons why there is great vaccine rejection (Ohareri *et al,* 2020).

Factors contributing to the reluctance to take and low coverage of vaccines are multiple and complicated. Social aspects are also very crucial, and stigma being associated with sexual health, as well as spread of misconceptions via social media, has a major effect on how the population thinks about this topic (Galagali *et al,* 2022). Several Nigerian parents fear that the vaccination of their daughters on the grounds against sexually transmitted virus may encourage the girls to be promiscuous (Ohareri *et al,* 2020). Such anxieties coupled with a tendency to not have exhaustive educational programs that would sensitize residents about HPV and its vaccine lead to low rates in the uptake of the vaccine. The proposed study seeks to evaluate the Factors Influencing HPV Vaccine Uptake and Hesitancy in Northern Nigeria, which is the case of Jigawa State.

Methodology

A cross-sectional survey design was used in this study in order to investigate determinants of HPV vaccine uptake and hesitancy among parents of girls between the ages of 9 and 14 years in Jigawa State, Northern Nigeria. Jigawa as the study site consists of mainly general activity consumers, farmers, and traders. The target population consisted of the parents living in the state who fulfilled the inclusion criteria. The multistage sampling methodology was used, where the selection of the states was based on convenience sample, and schools, and community organization in Jigawa were selected through cluster sampling. Lastly, to assess all households containing esteemed members, the simple random sampling technique was employed by selecting the 4 th households. The Jerome Cornfield formula of minimal size of 384 was calculated and adjusted to 500 participants with the expectation that there will be some participants who do not respond to the questionnaire, so they are not included in the estimation but rather the estimate is to a wider population.

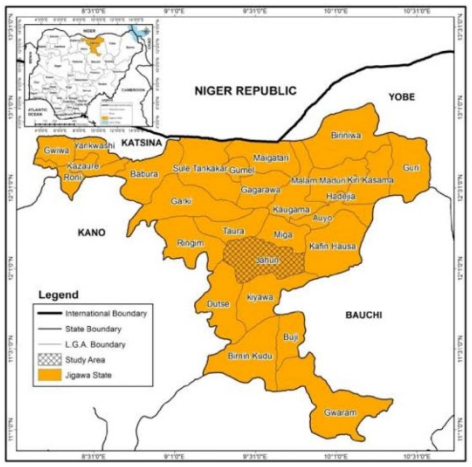


Figure 1: Map of Jigawa State (Study Area)

It used interviewer-administered structured questionnaire in collecting data, where trained interviewers would conduct an in-person interview and electronic recording of response variables. The questionnaire included closed asked questions with a modified five-point Likert scale to evaluate the attitude and perception to the HPV vaccine. The SPSS Version 21 was used to analyze the data obtained: descriptive statistics to summarize the

demographic characteristics and vaccine status, and inferential statistics to determine the relationship between demographic factors and vaccine uptake, including but not limited to odds ratio and p-values. It took a $p < 0.05$ level of significance. The ethical approval was addressed by the ministry of health and all participants signed the informed consent, confidentiality and voluntary participation rules were strictly followed.

Results

Table 1: Socio-demographic Characteristics

VARIABLES	Frequency (n)	Percentage (%)
Mother's Age (years)		
Under 18	56	11.2
18-24	319	63.8
25-34	74	18.8
35-44	51	10.2
45 and above		
Number of girls (aged 9-14 years)		
1-2	216	43.2
3-4	281	56.2
Above 4	3	0.6
State of Origin		
Urban	281	56.2
Rural	211	42.2
Mother's Educational Level		
No formal education	147	29.4
Primary education	212	42.4
Secondary education	119	23.8
Tertiary education	22	4.4
Mother's Occupation		
Student	83	16.6
Employed	187	37.4
Housewife	154	30.8
Unemployed	76	15.2

63.8 per cent of the mothers in the study were among the 18-24 years category. A majority of the mothers had three to four 9-14 years-old girls (56.2 percent). The percentage of the urban residents was 56.2 in sample size and by education; 42.4 percent of the mothers fell within the primary level of education and 4.4 within the higher levels (tertiary). In terms of occupation, 15.2 percent of the population was unemployed.

Table 2: Human Papilloma Virus (HPV) Vaccine Uptake

VARIABLES	Frequency (n)	Percentage (%)
My child received the HPV vaccine		
Yes	139	27.8
No	315	63.0
Not sure	46	9.2
If yes, at what age (years) (n=139)		
9-10	46	33.1

VARIABLES	Frequency (n)	Percentage (%)
11-12	59	42.4
13 14	25	18.0
Above 14	9	6.5
If No, why (multiple response) n=315		
Lack of information	283	89.8
Concerns about safety	127	40.3
Cost	138	43.8
Lack of access to healthcare	264	83.8
Cultural beliefs	150	47.6

HPV- Human Papilloma Virus

The most influential results indicate that, 63.0 percent had responded negatively to the HPV vaccine, 27.8 percent of them said that their child has gone through it and 9.2 percent said they are not sure. In the study, where the child was vaccinated, the majority (42.4%) did this at the age of 11-12. The key explanations of those who had not been immunized against their kid on the grounds of information (89.8%), no access to a health worker (83.8%) and cost (43.8%). There was also note of safety issues (40.3%) in addition to cultural beliefs (47.6%).

Table 3: Perception of HPV Vaccine

Perceptions	SA	A	N	D	SD
The HPV vaccine is an effective way to prevent cervical cancer	126 (25.2)	37 (7.4)	64 (12.8)`	238 (47.6)	35 (70.0)
I believe that the HPV vaccine is safe for individuals to receive.	37 (7.4)	173 (34.6)	189 (37.8)	68 (13.6)	33 (6.6)
I feel well-informed about the benefits of the HPV vaccine.	116 (23.2)	32 (6.4)	174 (34.8)	116 (23.2)	62 (12.4)
The HPV vaccine should be widely promoted in my community	207 (41.4)	85 (17.0)	161 (32.2)	27 (5.4)	20 (4.0)
I think that my health-care provider has adequately explained the HPV vaccine to me	26 (5.2)	143 (28.6)	57 (11.4)	217 (43.4)	57 (11.4)
I believe that receiving the HPV vaccine can help reduce the incidence of HPV-related diseases	19 (3.8)	284 (56.8)	157 (31.4)	27 (5.4)	13 (2.6)
I feel comfortable discussing the HPV vaccine with my friends or family	198 (39.6)	79 (15.8)	152 (30.4)	51 (10.2)	20 (4.0)
I think there is a stigma associated with receiving the HPV vaccine	79 (15.8)	216 (43.2)	175 (35.0)	19 (3.8)	11 (2.2)
I believe that misinformation about the HPV vaccine is a significant barrier to its uptake	149 (29.8)	174 (34.8)	67 (13.4)	89 (17.8)	21 (4.2)
I would encourage others to get the HPV vaccine based on my understanding of it.	85 (17.0)	92 (18.4)	218 (43.6)	96 (19.2)	9 (1.8)

HPV- Human Papilloma Virus

The most significant data in the table demonstrate that such a massive number of respondents (47.6%) is not ready to agree with the point of view that HPV vaccine is an effective way of cervical cancer prevention. In addition, about a third of the respondents (37.8 percent) does not care about the safety of the vaccine. Many of the participants believe that they have heard information about the benefits of using HPV vaccine (34.8%) and majority of them feel that the HPV vaccine should be highly promoted within their neighbourhood (41.4%). One of every two persons (28.6 percent) though does not believe that their medical officer has given a good explanation of the HPV vaccine. The majority of the study population (56.8%) believe that vaccination can become one thing which can help to overcome HPV-relating illnesses, and one more great number (39.6%) is ready to discuss the situation with friends or family members.

Table 3.1: Perception of Human Papilloma Virus (HPV) vaccine

Variables	Frequency (n=500)	Percentage (%)
How would you rate your knowledge about the HPV vaccine?		
Very knowledgeable	142	28.4
Somewhat knowledgeable	275	55.0
Not knowledgeable	83	16.6
What is your perception of the HPV vaccine?		
Very positive	116	23.2
Positive	132	26.4
Neutral	187	37.4
Negative	35	7.0
Very negative	30	6.0
What sources of information have influenced your perception of the HPV vaccine? (multiple response)		
Healthcare providers	217	43.4
Family and friends	342	68.4
Social media	374	74.8
News articles	416	83.2
Educational programs	314	62.8

HPV- Human Papilloma Virus

The critical findings suggest that the largest proportion of the respondents rate moderate when tested on their knowledge on HPV vaccine (55.0 per cent). In that regard, most individuals do not have a positive attitude about the HPV vaccine (37.4 percent), which is positive (26.4 percent) and rather positive (23.2 percent). The most common information sources and mentioned by the respondents on their way to the development of perception in relation to the HPV vaccine is news articles (83.2 percent) and social media (74.8 percent), whereas family and friends (68.4 percent), educational programs (62.8 percent), and healthcare providers (43.4 percent) are the least common.

Table 4 Assessment of respondents' perception of Human Papilloma Virus (HPV) vaccine

Variable	Frequency (n)	Percentage (%)
Perception of susceptibility		
Good	296	59.2
Poor	204	40.8
Perception of severity		
Good	178	35.6
Poor	322	64.4
Perception of Benefits		
Good	217	43.4
Poor	283	56.6
Perception of barrier		
Good	315	63.0
Poor	185	37.0
Perception of cue to action		
Good	139	27.8
Poor	361	72.2
General Perception		
Good	229	45.8
Poor	271	54.2

The significant results are that most of the respondents (59.2) perceived well about their susceptibility to HPV. Nevertheless, the largest proportion of the respondents (64.4%) had a bad attitude to the seriousness of HPV. On the part of the positive aspects of the vaccine, 56.6 percent perceived it negatively. Conversely, 63.0 percent of the participants had a favorable understanding of the impediments linked with vaccine. The poor perception of the cues to action was significant at 72.2 percent. On the whole, the negative general attitude towards the HPV vaccine was found in 54.2 percent of respondents.

Table 5: Factors Influencing HPV Vaccine Uptake

Factors	SA	A	N	D	SD
Awareness of the HPV vaccine has a significant impact on my decision to receive it	178 (35.6)	28 (5.6)	140 (28.0)	117 (23.4)	37 (7.4)
Recommendations from healthcare providers strongly influence my willingness to get vaccinated against HPV	119 (23.8)	87 (17.4)	54 (10.8)	199 (39.8)	41 (8.2)
The availability of the HPV vaccine in my community affects my likelihood of receiving it.	219 (43.8)	25 (5.0)	142 (28.4)	86 (17.2)	28 (5.6)

Cultural beliefs in my community play a major role in the decision to receive the HPV vaccine.	183 (36.6)	16 (3.2)	101 (20.2)	138 (27.6)	62 (12.4)
Peer influence (friends and family) significantly affects my perception of the HPV vaccine.	34 (6.8)	188 (37.6)	79 (15.8)	158 (31.6)	41 (8.2)
Access to accurate information about the HPV vaccine makes me more likely to get vaccinated	152 (30.4)	91 (18.2)	87 (17.4)	121 (24.2)	49 (9.8)
Concerns about the side effects of the HPV vaccine deter me from considering it	97 (19.4)	130 (26.0)	73 (14.6)	96 (19.2)	104 (20.8)
The cost of receiving the HPV vaccine is a barrier to my decision to get vaccinated	83 (16.6)	47 (9.4)	139 (27.8)	135 (27.8)	96 (19.2)
Participation in community health programs influences my likelihood of receiving the HPV vaccine.	216 (43.2)	153 (30.6)	35 (19.0)	76 (15.2)	20 (4.0)
The presence of misinformation about the HPV vaccine significantly impacts my decision to get vaccinated	221 (44.2)	32 (6.4)	140 (28.0)	67 (13.4)	40 (8.0)

HPV- Human Papilloma Virus

The key findings depict that the level of awareness of the HPV vaccine is critical to the ruling to take the HPV vaccination, with 35.6 percent strongly agreeing. Also, the access of the vaccine to the community is extremely important since 43.8 percent strongly believe that it influences their chance of getting it. A large percentage also agree that cultural beliefs play a dominant role where 36.6% strongly agree. Peer influence also comes out as another ringing bell with 37.6% agreeing that they are influenced by friends and family. Side effects and the vaccine cost are barriers since 26.0 percent and 27.8 percent agree with them, respectively.

Table 6: Factors Influencing Human Papilloma Virus (HPV) Vaccine Uptake

VARIABLES	N	My child Received HPV Vaccine		OR	P-Value
		Yes (%) N=139	No (%) N=361		
Mother's Age (years)					
Under 18	56	19 (33.9)	37 (66.1)	3.872	0.018
18-24	319	63 (19.7)	256 (80.3)		
25-34	74	34 (45.9)	40 (54.1)		
35-44	51	23 (40.1)	28 (54.9)		
45 and above					
Number of girls (aged 9-14 years)					
1-2	216	46 (21.3)	170 (78.7)	2.431	0.002
3-4	281	90 (32.0)	191 (68.0)		

VARIABLES	N	My child Received HPV Vaccine		OR	P-Value
		Yes (%) N=139	No (%) N=361		
Above 4	3	3 (100.0)	0 (0.0)		
Location					
Urban	281	94 (33.5)	187 (66.5)	3.593	0.021
Rural	219	45 (20.5)	174 (79.5)		
Mother's Educational Level					
No formal education	147	11 (7.5)	136 (92.5)	2.241	0.004
Primary education	212	49 (23.1)	163 (76.9)		
Secondary education	119	57 (47.9)	62 (52.1)		
Tertiary education	22	22 (100.0)	0 (0.0)		
Mother's Occupation					
Student	83	64 (77.1)	19 (22.9)	1.273	0.001
Employed	187	51 (27.3)	136 (72.7)		
Unemployed	154	21 (13.6)	133 (86.4)		
Retired	76	3 (3.9)	73 (96.1)		
States of residence					

HPV- Human Papilloma Virus *p-value = <0.001

The key findings reveal that there are influential factors as regards to HPV vaccine uptake. The chances of vaccinating the children are high among mothers aged between 25-34 years (45.9 percent) and 35-44 years (40.1 percent) than the younger and the older mothers with a p-value of 0.018. The probability of being vaccinated is higher among urban dwellers (33.5%) than it is among the rural dwellers (20.5%), and the p-value is 0.021. Another important factor is the level of education, with our mothers with higher educational levels most likely to have their children vaccinated, that is, those with tertiary (100.0%) and secondary education (47.9%) levels having a p-value of 0.004.

Table 7: Predictors of HPV Vaccine Hesitancy

Statement	Yes	%	No	%
Have you ever felt uncertain about the safety of the HPV vaccine?	316	63.2	184	36.8
Do you believe that the HPV vaccine may have serious side effects?	189	37.8	311	62.2
Have you discussed the HPV vaccine with a healthcare provider?	153	30.6	347	69.4
Do you feel that there is enough information available about the HPV vaccine?	174	34.8	326	65.2
Have you encountered negative information about the HPV vaccine in social media or other platforms?	187	37.4	313	62.6

Statement	Yes	%	No	%
Do you believe that your family or friends have concerns about the HPV vaccine?	327	65.4	173	34.6
Have cultural beliefs influenced your perception of the HPV vaccine?	219	43.8	281	56.2
Do you think that educational programs about the HPV vaccine are lacking in your community?	311	62.2	189	37.2
Are you aware of any misconceptions about the HPV vaccine that may affect its uptake?	249	49.8	251	50.2
Would you say that peer pressure has contributed to your hesitancy towards the HPV vaccine?	205	41.0	295	59.0
Do you have any concerns about the HPV vaccine?	287	57.4	213	42.6
Would you recommend the HPV vaccine to others?	289	57.8	211	42.2

HPV- Human Papilloma Virus

Sixty three point two percent of respondents have expressed uncertainty regarding the safety of HPV vaccine and thirty seven point eight percent are of the notion that it could have serious effects. Besides, most of them (69.4%) have not talked to a healthcare provider about the vaccine, and 65.2% said that they lacked sufficient information concerning the vaccine. Among the respondents, 37.4% have been exposed to negative information regarding the vaccine either in social media or elsewhere but 65.4% of them think that their family or friends would think less of the vaccine. Beliefs of culture have also affected the perception of 43.8 of the respondents. In addition, 62.2% believe that there are shortages regarding the educational programs on the HPV vaccine within their community and 49.8% have heard about misinformation that could influence its application.

Table 8: Level of Hesitancy towards Human Papilloma Virus (HPV) vaccine

Hesitancy	Frequency (n)	Percentage (%)
Yes	**258**	**51.6**
No	**242**	**48.4**

The major findings show that a slight majority of respondents (51.6%) exhibit hesitancy towards the HPV vaccine, while 48.4% do not demonstrate hesitancy.

Table 5.2: Level of Hesitancy and Vaccine Uptake

Hesitancy	N	Vaccine Uptake		OR	P-Value
		Yes (%) N=139	No (%) N=361		
Yes	258	41 (15.9)	217 (84.1)	3.76	0.001
No	242	98 (40.5)	144 (59.5)		

Of the respondents who were hesitant (258 respondents) 15.9 percent had taken the HPV vaccine. On the other hand, of those who had not been hesitant (242 respondents), 40.5 percent had been vaccinated. The fact that the odds ratio (OR) is 3.76 with p-value = 0.001 indicates that hesitancy has a strong effect on vaccine uptake.

Table 9: Factors Influencing Human Papilloma Virus (HPV) Vaccine Hesitancy

VARIABLES	N	HPV vaccine hesitancy		OR	P-Value
		Yes (%) N=258	No (%) N=242		
Mother's Age (years)					
Under 18	56	37 (66.1)	19 (33.9)	5.312	0.271
18-24	319	184 (57.7)	135 (42.3)		
25-34	74	21 (28.4)	53 (71.6)		
35-44	51	16 (31.4)	35 (68.6)		
45 and above					
Number of girls (aged 9-14 years)					
1-2	216	95 (44.0)	121 (56.0)	1.733	0.048
3-4	281	163 (58.0)	118 (42.0)		
Above 4	3	0 (0.0)	3 (100.0)		
Location					
Urban	281	113 (40.2)	168 (59.8)	4.117	0.068
Rural	219	145 (66.2)	74 (33.8)		
Mother's Educational Level					
No formal education	147	102 (69.4)	45 (30.6)	2.241	0.004
Primary education	212	85 (40.1)	127 (59.9)		
Secondary education	119	64 (53.8)	55 (46.2)		
Tertiary education	22	7 (31.8)	15 (68.2)		
Mother's Occupation					
Student	83	31 (37.3)	52 (62.7)	1.211	0.001
Employed	187	99 (52.9)	88 (47.1)		
Unemployed	154	117 (78.0)	37 (24.0)*		
Retired	76	11 (14.5)	65 (85.5)		
States of residence					

HPV- Human Papilloma Virus *p-value = <0.001

The age of daughters between 9-14 years is also a factor with 3-4 daughters having a dramatic hesitancy (58.0%) compared to those of 1-2 daughters (44.0%) with p- value of 0.048; which was found to be statistically significant. Mothers educational level critically contributes where the mothers with no education indicate the highest hesitancy (69.4%) on the relation to this educational level with no education, it has been found to be statistically significant (p=0.004).

Table 10: Strategies to Address HPV Vaccine Hesitancy

Variables	Freq (n)	Per (%)
What strategies do you think would be effective in addressing HPV vaccine hesitancy? (multiple response)		
Community education programs	**349**	**69.8**
Improved access to healthcare services	**291**	**58.2**
Engagement with local leaders and influencers	**327**	**65.4**
Social media campaigns	**427**	**85.4**
Would you be interested in participating in educational workshops about the HPV vaccine?		
Yes	**388**	**77.6**
No	**17**	**3.4**
Maybe	**95**	**19.0**

HPV- Human Papilloma Virus

The favorite plan is a social media campaign where 85.4 percent of the respondents agree with the approach. Participants are also very supportive of the use of community education programs with 69.8 percent of respondents agreeing with it. Another important strategy is involvement of the local leaders and forces, which resonates with 65.4 percent of the respondents. Further, a high proportion (77.6%) were interested in attending educational workshops on the topic of the HPV vaccine demonstrating a high interest in receiving further education to avoid vaccine hesitancy.

Discussion

The report has also established very crucial sociodemographic parameters in the uptake and hesitancy of the HPV vaccine in Northern Nigeria and more specifically, among parents in Jigawa State. Most of the mothers were of prime age (18-24 years old), and the families had as many as 3-4 girls in the age group of the target vaccine group. Most of the respondents lived in towns though even a large number had primary education. The prevalence of employed mothers was drastic and this was mostly due to the strain that was required by the economic situation of the area. These features, young maternal age, household size, and the lack of education present problems with vaccine awareness and acceptance (Mavundza et al., 2024; Kolek et al., 2022). Many of the respondents denied that HPV vaccine prevents cervical cancer and nearly one out of every three did not know whether it is safe. Although some parents were reported as sufficiently informed and facilitated vaccine promotion, others had no authoritative source of information, were less likely to interact with health professionals and more affected by misinformation on social media and cultural views as noted by Onwuamah et al., 2023 on their work titled ‘Prevalence and risk factors for high-risk human papillomavirus infection among women from three southern geopolitical zones of Nigeria’. These results support the importance of increasing awareness and becoming aware of sociodemographic and increase the HPV vaccination rates (Galagali et al., 2022; Wolf et al., 2024).

Similarly to what was shown in other African and international research (Asgedom et al., 2024; Kolek et al., 2022), the HPV vaccine acceptance is heavily influenced by awareness, vaccine availability, and confidence in the healthcare system. Nigerian, United States, and Cameroon research by Pathak and colleagues on a review on the use of the HPV vaccine in the prevention of cervical cancer, always finds younger maternal age, low levels of education, and poor healthcare access tied to the lower uptake, although regional disparities may arise (Pathak et al., 2022). In the current survey, social media campaigns (85.4%), community education initiatives (69.8%), and deployment of local leaders (65.4%) were considered the possible ways to respond to hesitancy by the majority of respondents. More than that, 77.6percent of parents were interested in the idea of educational seminars, which indicates they are willing to educate themselves and get rid of the misinformation. These findings indicate that a complex approach that incorporates the use of online reach, grassroots mobilization, and community influencers will be critical in enhancing HPV coverage and minimizing cervical cancer development among these communities as suggested by Luria & Cardoza-Favarato, (2023) and Mafiana et al., (2022).

Conclusion, Contributions to knowledge, Limitations and Recommendations

Conclusion

To sum the research up, HPV vaccine hesitancy in Northern Nigeria is characterized by the multifactorial nature coupled with the prominence of sociodemographic factors including the presence of young age mothers, households of larger size, and low educational level. Further, the negative feelings and doubts regarding the vaccine safety and effectiveness are caused by the cultural beliefs and misperceptions. Anecdotal evidence Raising these issues by utilizing specific interventions, such as the higher awareness regarding the vaccine, better communication with the healthcare providers, and contact with the leaders within the community, are the most critical parts of ensuring higher rates of HPV vaccine acquisition. Addressing these obstacles will greatly facilitate the effects of the public health programs in decreasing the load of the HPV-caused conditions and enhance the health status of the residents in the area.

Contributions to knowledge

The present research will be beneficial to the current body of knowledge as it will illuminate potentially valuable information regarding HPV vaccination and hesitancy causing factors in Northern Nigeria. It evidences the high contribution of sociodemographic factors, including young maternal age, more extended household size, low educational attainment in determining vaccine perceptions and behaviors. Besides, the research underlines the influence of cultural faith and propaganda on vaccine reluctance. In revealing these determinants, the research provides an elaborate insight into obstacles to HPV vaccination as far as this setting is concerned. It further proposes some interventions that may be used to enhance vaccine acceptance, hence guiding the usefulness of public health interventions to limit HPV-related illnesses and promote health outcomes throughout the area.

Limitations of the Study

One major limitation is the possibility of response bias when taking self-reported information. Parents might give socially acceptable responses to any queries on HPV vaccine intake and hesitation and this might give a biased outcome. In order to curb this, the research will focus on the idea of anonymity and confidentiality when collecting the data and citizens will be motivated to give the truthful answers.

The cross-sectional design of a study can restrict the capability to find the causal relationship between independent and dependant variables. In order to adapt this shortcoming, the research will define the objectives and hypothesis of the study explicitly thus enabling them to interpret the findings well. To explore further on the causal factors associated with HPV vaccine uptake, the future prospective longitudinal studies may be proposed.

Recommendations

1. Conduct community based education programs which should aim at giving the correct information about the safety, benefits and effectiveness of the HPV vaccine. Programs involving the locals, their leaders and influencers should be encouraged to create trust and clearing cultural misunderstandings.
2. Empower healthcare provider-patient communication by educating healthcare workers on effectively addressing the topic of the HPV vaccine and recommending them to make mutually beneficial recommendations on the topic. Support the providers to discuss the vaccine when they visit communities on a regular basis.
3. Increase availability of healthcare infrastructure and distribution through vaccines, including HPV vaccine in the city and villages. Introduction of outreach programs that will serve underserved populations and where the vaccination will be offered at little or no cost will eliminate financial barriers.

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