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HPV Vaccine Adoption: A Cross-Sectional Exploration of the Relationship between Maternal Knowledge of HPV, Religion, and their Girl-Child Vaccination Decision in Jalingo

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Abstract **Original Research Article**

HPV is the most common sexually transmitted infection globally, with over 200 strains. Among these, high-risk HPV strains (such as types 16 and 18) are associated with cervical cancer in women. All cervical cancers are caused by HPV infection, particularly strains 16 and 18, which account for at least 70% of cases. HPV vaccination is a powerful preventive measure, preventing 90% of cervical cancer cases. We conducted this research to determine the association between maternal HPV knowledge, religion, and the adoption of HPV vaccines for their Girl-Child in Nigeria. We conducted a cross-sectional survey in February 2024 among women with one or more girl-child between 9-14 in Jalingo, Taraba, Nigeria.

Methods: This community-based cross-sectional study was conducted among participants from Jalingo, the capital city of Taraba State. A convenient sampling method was utilized to recruit participants from major gathering points (the Open markets and other places where people gather and play). Data was collected from 413 participants using Google Forms, administered face-to-face by trained data collectors. Data analysis was conducted using SPSS version 28. Associations were determined using univariate and multivariate analysis.

Result: A statistical significance and positive association between HPV knowledge by the mother and acceptance of HPV vaccination for their child-girl, with 691% increase in the likelihood of adoption with a unit increase in HPV knowledge by the mother. No significant association was found between HPV vaccine adoption and the religion of the mother.

Conclusion: The introduction of the HPV vaccine in Nigeria represents a significant milestone in the fight against cervical cancer. Government and public health policymakers must improve awareness across the board. Policymakers must engage community leaders, schools, and healthcare providers to disseminate accurate information about HPV, Cervical cancer, and the role of vaccines as a preventive measure. A robust message will go a long way to create the desired end to cervical cancer in Nigeria

Keywords: Simulation-Based Learning, Nursing Education, Clinical Competence, Patient Safety, Global Health, Medical Simulation.

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INTRODUCTION

The human papillomavirus (HPV) vaccine, which provides protection against high-risk HPV (16&18) associated with cervical cancer and other cancers, has been approved free of charge for Nigerian girls from ages 9 to 14. Nigeria has taken a monumental step by introducing the HPV vaccine into its routine immunization system. The goal is to reach 7.7 million girls, making it the largest single round of HPV vaccination in Africa (UNICEF, 2022). Girls aged 9–14 years receive a single dose of the vaccine, protecting against HPV types 16 and 18. The campaign is currently ongoing all over the country. The Federal government rolled out the vaccination program in phases. Taraba State, like other Northern states, is presently vaccinating girls between 9 and 14.

Cervical cancer is the third most common cancer and the second most frequent cause of cancer deaths among Nigerian women aged 15–44 years. Cervical cancer is considered second only to breast cancer affecting women and leading to mortality. Evidence suggests that persistent infection of high-risk human papillomavirus (*HPV*, 16&18) is the agent identified involved (WHO). This clear etiological identification helps with the establishment, globally, of a comprehensive prevention and control system. As early as 2018, the World Health Organization (WHO) made a call for the elimination of cervical cancer. In 2020, the organization released a strategy to accelerate the elimination of cervical cancer. Nigeria was one of the 194 countries that accepted the challenge.

Human Papillomavirus (HPV) is one of the most common sexually transmitted infections globally, with significant implications for public health due to its association with cervical cancer (Talabi, O. & Gilbert A, 2023). In Nigeria, where cervical cancer remains a leading cause of cancer-related mortality among women, the adoption of HPV vaccination for daughters presents a crucial strategy for disease prevention. Understanding parents' knowledge, beliefs, and attitudes toward HPV vaccination is essential for the successful implementation and uptake of vaccination programs.

Research suggests that parents in Nigeria often lack adequate knowledge about HPV and its associated risks. A study by Ezenwa et al. (2015) found that only a small percentage of parents surveyed were aware of HPV and its link to cervical cancer. Similarly, findings from a qualitative study by Okunowo and Daramola (2018) highlighted misconceptions and limited understanding of HPV among parents, with many expressing uncertainties about the necessity and safety of vaccination for their daughters.

Cultural beliefs and societal norms play a significant role in shaping parents' attitudes towards HPV vaccination. In Nigeria, discussions about sexual health and reproductive issues are often considered taboo, contributing to the stigma surrounding HPV vaccination. Adejuyigbe et al. (2017) noted that some parents expressed concerns about the vaccine promoting promiscuity among young girls, reflecting deep-rooted cultural beliefs about sexuality and morality. Additionally, misconceptions about vaccine safety and efficacy, influenced by misinformation circulated through social networks and media channels, further contribute to vaccine hesitancy among parents (Ogbonna & Okafor, 2016). Even though most Nigerians identify with either Islam or Christianity, to my knowledge, no research currently defines the relationship between parental religion and the adoption of the HPV vaccine for their daughter.

Despite the challenges posed by limited knowledge and cultural beliefs, studies indicate a growing acceptance of HPV vaccination among parents in Nigeria. Adequate information provision and education are key factors in improving parents' attitudes toward vaccination uptake (Ezenwa et al., 2015). Furthermore, the endorsement of vaccination by healthcare providers and community leaders has positively influenced parental decision-making regarding vaccination for their daughters (Ogbonna & Okafor, 2016).

We conducted this quantitative cross-sectional study to evaluate the relationship between maternal religion and knowledge and the adoption of the HPV vaccine for the prevention of cervical cancer in Jalingo, the capital of Taraba State, Nigeria.

MATERIALS AND METHOD

1.2 Study Design and Study Site

This is a cross-sectional quantitative study conducted between February 10 and March 10, 2024, in the City of Jalingo and its environment. Jalingo is located in the north eastern part of Nigeria in Taraba State. A convenient design was employed. Data was collected using QR codes and Google Docs by trained data collectors. Data collection occurred in markets, roadsides, and other open places where people gather for social or commercial purposes. Efforts were made to avoid religious or cultural gatherings representing a particular population group to reduce bias.

1.2 Study Participants and Sample Size Determination

Women of childbearing age with at least one or more female children between the ages of 9 and 13 were conveniently selected for the study in large gathering centers such as schools, markets, religious centers, and social gatherings. Using G*Power, the sample size was estimated at 383, but a total of 413 participants were obtained

1.3 Data collection

Individuals who volunteered to participate were informed about the research and its purpose, after which they were required to sign an online standard informed consent before administering an online survey instrument from Google Docs. Smart device participants were given QR codes to scan and access the questionnaire. Those without smartphones were allowed to use the smartphone provided by our data collected who were previously trained. Data collection followed ethical clearance from the Bingham University Ethical Committee.

1.4 Data analysis

Data was analyzed using IBM version 28. Demographic data are presented in tables, and logistic regression was utilized to demonstrate the relationship between variables.

3. RESULTS

Variables	Frequency	Percentage
Age		
18-24	50	12.2
25-34	12	2.9
35-44	205	49.2
45-54	108	26.2
55+	38	9.2
Marital Status		
Single	30	7.2
Married	258	62.5
Divorced	82	19.9
Widowed	843	10.4
Religion		
Christianity	203	49.2
Islam	166	40.5
Others	44	10.7
Educational Level		
Not educated	44	10.7
Completed Primary	29	7
Completed JSS 3	46	11.1
Completed SS3	133	32.2
Completed Tertiary education	161	39
Occupation		
Farmer	69	16.7
Housewife	69	16.7
Not employed	73	17.7
Trader/business	97	23.5
Employed by Government/Private	77	18.6
Others	28	6.8

Table 2. *Knowledge about HPV Vaccine*

Variables	*N*	*%*
Have you ever heard about the HPV Vaccine?		
No	64	15.5
Yes	349	84.5
How do you hear about it?		
Friends	71	17.2
Radio	38	19.2
Newspaper	47	11.4
Health professional	195	47.2
Religion organization	62	15

Are you going to allow any of your girl-child get the HPV vaccine?

		Frequency	Percent	Valid Percent
Valid	No	36	8.7	8.7
	Yes	377	91.3	91.3
	Total	413	100	100.0

Bivariate Analysis

Variables in the Equation									
								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Religion (1)	-.079	.495	.025	1	.874	.924	.350	2.441
	Knowledge	4.246	.588	5.214	1	<.001	6.911	2.058	9.118
	Constant	-6.933	1.346	26.514	1	<.001	.001		
a. Variable(s) entered on step 1: Religion, Knowledge.									

The p-value for knowledge (Sig.) is < 0.001, indicating high statistical significance.

The Exp(B) value is 6.911, which means that as HPV knowledge increases, the odds of parents being willing to vaccinate their child rise exponentially by 6.91 at CI 95%, 92.7-2669.2

The multivariate analyses accounting for religion, age, and level of education suggest no significant confounding effects from those variables

DISCUSSION

This cross-sectional study was conducted to assess the relationship between maternal knowledge of HPV, their religion, and the adoption of the HPV vaccine for their female children. The result indicates that the Exp(B) value is 6.911, which means that as HPV knowledge increases, the odds of parents being willing to vaccinate their child rise exponentially by 6.911 at CI 95%, 2.058-9.118. Parents with higher HPV knowledge are strongly associated with a greater willingness to vaccinate their children. The positive coefficient for Knowledge Means indicates that as parents' knowledge about HPV increases, the likelihood of vaccination also increases significantly. The wide confidence interval suggests some uncertainty, but the overall trend is clear. However, the constant term's negative coefficient indicates that even without HPV knowledge, some parents may still be willing to vaccinate their children. Keep in mind that this analysis assumes that other factors are held constant. These findings suggest that further research and context are needed to fully understand these findings' practical implications**.** In their work conducted among adolescents in rural Nigerian communities, Egbon et al (2022) recommended the exploration of sociocultural perspectives and conceptual realities to better understand the relationship between knowledge and the adoption of vaccines. This may be the case here too, because their findings showed a strong association between knowledge and the adoption of the vaccines among adolescent girls. In another research conducted by Yusuf et al (2024) to examine the hesitancy toward the HPV vaccine, their finding suggests a strong association between a lack of previous knowledge of HPV and vaccine hesitancy, which is in consonant with our finding. However, in sharp contrast to our finding, Yusuf et found that 6.7% of the respondents would not vaccinate their girl-child because of their religion. A similar research conducted by Mihretie et al (2022) to evaluate the relationship between knowledge of HPV and the willingness to adopt the vaccines in Tabor Town, Ethiopia, found a strong association between the two variables with the odds of 3.30 with every unit increase in knowledge. Overall, most research conducted among African subjects agreed with our findings.

Effective awareness campaigns are crucial to encourage vaccination. This is following similar findings from other researchers. It is instructive to find that parental education, religion, and age play no significant role in the vaccine uptake decision. Parental education will be the most effective way to create the desired awareness and encourage vaccine uptake. Luckily, the vaccine is free so Federal, State, and local governments should have no issues with funding. Some effective strategies for parental education include the involvement of community leaders such as kings, emirs, and religious leaders across the country. The lack of significant associtions between mothers religion and the willingness to vaccinate their daughthers could be a boost to the effectiveness of the messaging sysytem by eliminating the need to create multiple messages.

Strengths and Limitation

The major strenght of this research is the fact that the study was conducted within the community with large enough study population. However, there are several limitations to the study but the most important ones are sampling bias and response bias. In a multicultural and multireligion society like Taraba State, capturing a true representative of the population is problmatic. Underrepresentation of certain group is very possible. Similarly, other may be over representted. Also, there is likelyhood of participants to provide socially acceptable responses rather than providing honest and truthful responses. These two errors may impact the validity of the data. Efforts were made to inlcude people of different culture and religion in data collection to mitigate the identified limitations.

Implications for HPV Prevention and Public Health Practice in Nigeria

Implement targeted awareness campaigns to educate parents, caregivers, and adolescents about the importance of

HPV vaccination. Engage community leaders, schools, and healthcare providers to disseminate accurate information. Leverage media channels (TV, radio, social media) to raise awareness. Expand school-based vaccination programs to reach more girls while at the same time introducing the campaign to marketplaces, social gathering events, and community centers to capture out-of-school girls, and also consider integrating HPV vaccination into existing school health programs. Finally, **Monitoring and Evaluation**: Establish robust monitoring and evaluation systems to track vaccine coverage, identify gaps, and measure impact. Regularly assess awareness levels, vaccine acceptance, and barriers to inform program adjustments.

Conclusion and recommnedation

The findings that maternal knowledge about HPV and cancer have significant influence on the mothers' decsion to vaccinate their daughters underscore the urgency of scaling up HPV and cervical cancer public education through all the available media in Nigeria. This will encourage vaccination uptake efforts in Nigeria to prevent cervical cancer and save lives. By addressing awareness, affordability, and accessibility, Nigeria can significantly reduce the burden of this preventable disease.

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