Assessment of Facebook Users' Awareness and Uptake on Human Papillomavirus Vaccine in Obio/Akpor Local Government Area, Rivers State, Nigeria

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Abstract

This study centred on assessing the recognition and approval of the HPV Vaccine among Facebook users in Obio/Akpor. The research aimed to measure users' acquaintance with the HPV vaccine, and analyze Facebook's influence on raising awareness about HPV vaccine utilization. From a projected population of 658,849, a sample size of 384 was selected using Philip Meyer's sample prescription. The snowball sampling technique was considered suitable, and data collection utilized an online questionnaire through Google Forms. The research results underscored a substantial deficiency in effective HPV and vaccine awareness campaigns through Facebook, leading to a significant lack of comprehension regarding the virus and its vaccines among the residents of the Obio/Akpor local government area. The researcher concluded and recommended that given Facebook's substantial user base in Nigeria, entities like the Rivers State Government, the Ministry of Health, and NGOs could effectively exploit the platform to enhance awareness regarding the Human Papilloma Virus, its associated risk factors, and available vaccines.

Keywords: **Public Health Communication, Health Communication, Sexual Health, Youths, Social media**

Introduction

Human Papilloma Virus (HPV) is one of the diseases healthy living can ameliorate. This virus causes almost all the Sexually Transmitted Infections (STIs) in the

world. HPV causes warts in various parts of the body, depending on the strain. It causes more than 90% of Sexually Transmitted Diseases (STDs) in the world (Uraeus 2020). There are over a hundred strains of HPV. The strain that causes genital warts is different from the strain that causes genital cancers such as cervical cancer. Different strains of HPV have different signs and symptoms and diseases they cause. About 80% of those infected are between the ages of 17 and 33 years with the peak age group being 20-24 (Global Health Science & Practice, 2008). While many HPV infections resolve without severe consequences, HPV is associated with 90% of anal and cervical cancers, as well as over 50% of vaginal, vulvar, and penile cancers (Centers for Disease Control and Prevention [CDC], 2018). In Southern, Central, and East Africa, HPV significantly contributes to conditions like cervical cancer and genital warts, ranking as the highest globally. Despite being preventable, it remains a leading cause of mortality among women in these regions (Global Health Science & Practice, 2008). Nigeria also displays a strikingly high prevalence of HPV (Franceschi group at International Agency for Research on Cancer [IARC], 2017). The World Health Organization (WHO, 2018) emphasizes the considerably elevated HPV mortality rates in Nigeria, where approximately four out of five cases lead to fatalities (Global Cancer Observatory, 2020). HPV-related diseases, particularly cancer, led to over 78,800 global deaths in 2020. The Institutes for Health Metrics & Evaluation indicate that Nigeria's HPV-related cancer death rate was 113.7 per 100,000 individuals in 2017, in contrast to Kenya's rate of 99.2 per 100,000. In 2007, a report disclosed that more than 36.59 million Nigerian women aged 15 years and older were at risk of developing HPV-related conditions.

A 2018 study on vaccines revealed that despite multiple public health efforts to encourage HPV vaccination, the uptake among Nigerian adolescents has remained low, partly due to the absence of government-sponsored free vaccination programs. In developing countries like Nigeria, the disease's prevalence is on the rise due to insufficient awareness about its nature. Additionally, there is a noticeable lack of understanding about this disease among social media users, which further adds to the challenge. Though scholars have written on the need for awareness of this disease and the need to be vaccinated it is not enough because some persons barely read write-ups on social media and the campaigns in underdeveloping countries like Nigeria and some African countries

on social media are a bit low making the knowledge spread of this disease and vaccine low. The PDPH in 2017 employed a novel approach on social media to raise awareness and boost HPV vaccination initiation and completion rates in teenagers. The right campaign on this disease has not been carried out duly but other related diseases caused by the same virus have been duly carried out by the media and other social media platforms either through campaigns or programs, e.g. cervical cancer. According to Atiqi, Chang and Deguchi (2022), the use of social media, especially Facebook has proven to be very effective in raising awareness on issues of public interest, specifically, public health concern.

Successful communication has proven its effectiveness in curbing HPV transmission in more developed areas like the United States and the United Kingdom. New media outlets like Facebook, a popular social networking platform, have proven highly effective in disseminating information and raising awareness about various issues. This medium enables users to engage with message senders, seek clarifications, and embrace promoted ideas. Evidence reveals that Facebook and other social media platforms have successfully created awareness and promoted vaccine uptake in cases involving HIV/AIDS, Ebola, Coronavirus, Polio, and more. Therefore, leveraging these platforms could similarly contribute to generating awareness and promoting the adoption of the HPV vaccine in Nigeria, particularly within Rivers State.

Human papillomavirus in the future, if not handled properly may become a major health issue for Rivers residents who are of reproductive age so getting the doses of the vaccine would be of great importance to the people, its government and the Nation's economy at large because, a healthy society creates an environment where self-sufficiency leads, people are happy with their healthy lifestyle and with this, they can work well in their different fields which have a positive effect on the gross domestic profit of the state. Therefore, the objective of this study is to assess the level of awareness and acceptance of the Human papillomavirus (HPV) vaccine in Rivers State.

In less developed countries, the understanding of Human papillomavirus (HPV) infection remains puzzling, even though diseases linked to the virus are widespread. While the virus itself might not be widely recognized, the diseases it

gives rise to stem from inadequate health education, lack of awareness, and limited information dissemination. Studies have shown that HPV causes about 100 types of infections and diseases including genital warts and cervical cancer among others. Even though the Nigerian government has introduced HPV vaccines, a comprehensive national vaccination strategy is still lacking. As per the World Health Organization (WHO, 2018), Nigeria is positioned among the nations exhibiting a significantly heightened global HPV mortality rate, where approximately four out of five cases result in deaths. Despite these alarming figures, it is remarkable to observe that awareness regarding HPV and its vaccines remains relatively restricted in the country. This again may be, because there is no national vaccination strategy for HPV, there obviously may not be any national communication plan to that effect and these issues listed motivated the researcher to undergo a journey of awareness on this virus and its vaccine.

Since the knowledge of this disease and its vaccines is relatively low, there is the assumption that many women and men in Rivers State have suffered from this fast-rising virus unknowingly and the vaccine which is available in federal hospitals has not got the required awareness and knowledge that it should. Thus, people barely know about this virus, what it causes and the vaccine which has been provided. Given this background, the researcher aims to evaluate the level of awareness and adoption of the human papillomavirus (HPV) vaccine within the Obio/Akpor local government area.

Literature Review

The Theory Of Planned Behaviour

This theory abbreviated as TPB was proposed by Icek Ajzen in 1991 to improve on the predictive power of the theory of reasoned action by including perceived behavioural control.

As a theory explaining human behaviour, it has been applied to studies of the relations among beliefs, attitudes, behavioural intentions and behaviour in various fields such as advertising, public relations and healthcare campaigns. The theory states that attitude towards behaviour, subjective norms and perceived behavioural control together shape an individual‟ 's behavioural intentions.

The theory was developed from the theory of reasoned action and according to the theory of reasoned action, if people evaluate the suggested behaviour as positive and if they think their significant others want them to perform the behaviour, this results in a higher intention and they are more likely to do so. A higher correlation of attitudes and subjective norms to behavioural intention and subsequently to behaviour has been confirmed in many studies. This theory is relevant to this study because it explains that attitude towards a behaviour shapes an individual's intention. So, it could be argued that an individual's attitude towards public health communication strategy is capable of shaping the efficacy of such communication strategy.

Public Health & Sexual Health Communication

The importance and need for communication cannot be overstated. Since the Old Ages, man has made infographics and created language in a bid to communicate and share ideas. Health Communication is without a doubt essential to help achieve Sustainable Development Goal 3: Good health and well-being. Public health communication believes that the use of communication strategies to inform individuals and community decisions can help influence and enhance their health. (Battle, 2009). Public health communication draws from disciplines including Communication and Media studies, Health Education and Advocacy, Marketing, Public relations, Informatics, Psychology and epidemiology (Bernhardt & Truglio-Londrigan, 2004).

The objective of public health communication is to enhance the well-being and healthcare outcomes of a community or population by employing effective communication. It encompasses various forms of communication that specifically target health-related concerns and obstacles. Successful public health communication employs a wide range of strategic communication platforms to inspire and advocate for positive shifts in behaviours that promote health. Health communication, whether interpersonal or mass communication activities, is focused on improving the health of individuals and populations and has emerged as one of the most important public health points in this century.

The World Health Organisation (WHO), (2015) believes that sexual health is considered essential for the physical and emotional well-being of individuals, couples, families, communities, and nations. When discussing sexual health

communication, adolescents and young people are often linked to sexually transmitted diseases (STDs), and the approach to prevention in this context is frequently debated. One highly recommended option for this group is the consistent use of condoms to reduce the risk of contracting STDs, particularly for unmarried individuals.

Maintaining consistent condom use among sexually active adolescents and young adults is crucial for promoting sexual health. Condoms are recognized as the most effective method of preventing sexually transmitted infections (STIs) and HIV among sexually active youth. Additionally, condoms can help prevent unwanted pregnancies (Centers for Disease Control and Prevention [CDC], 2010; Holmes, Levine & Weaver, 2004). Behavioural theories related to health often extensively discuss theories concerning young people's perceived knowledge and attitudes towards sexual health communication.

From the World Health Organization's perspective, sexual health encompasses the state of physical, emotional, mental, and social well-being related to sexuality. It goes beyond the absence of disease, dysfunction, or infirmity, and is regarded as a fundamental aspect of overall health and well-being. Following this definition, van Lunsen and Laan further define sexual health as the capacity to experience a satisfying sexual life and adapt to and manage social, physical, and emotional obstacles encountered throughout different stages of life. Certain diseases, medical conditions, and their treatments, such as cancer, Parkinson's disease, and other chronic ailments, pose such challenges.

To ensure that patients receive the necessary care to address these challenges and contribute to their overall well-being, it is crucial to integrate discussions on sexual health as a routine part of healthcare. This approach acknowledges the importance of addressing sexual health concerns alongside other aspects of patient care.

Human Papillomavirus

HPV is estimated to contribute to around 5 per cent of human cancers, including anogenital cancers like cervical, vaginal, vulvar, penile, and anal cancers, as well as oropharyngeal cancer. In Nigeria, HPV prevalence is not uniform across the country, with varying rates reported in different regions. For example, prevalence

rates of 42.9 per cent among women in a northern state and 26.3 per cent of the general population in Southern Nigeria have been noted. Throughout different parts of the country, HPV prevalence ranges from 10.0 per cent in Irun, Ondo State, to 21.6 per cent in Ile-Ife, Osun State, and 26.3 per cent in Ibadan, Oyo State. Other studies have reported prevalence rates of 30.4 per cent and 36.5 per cent in different populations.

The risk of contracting HPV over one's lifetime is substantial, potentially reaching up to 80 per cent. However, there is a positive aspect: vaccination offers protection against HPV infection (Chimah et al., 2016).

HPV Risk Factors

Disparities in HPV prevalence across different global regions continue to exist, even with indications of higher rates among African women. To address the lack of comprehensive data on genital HPV prevalence, this study was conducted to ascertain the occurrence of HPV and its correlated risk factors among women in Nigeria's Rivers State.

a. **Early Onset of Sexual Activity**: In this current study, women who had their first sexual experience around the age of 21 showed an increased susceptibility to HPV exposure, suggesting that delaying the onset of sexual activity does not necessarily reduce the risk of HPV infection later in life. Contrary to the common assumption that most young women initiate sexual activity during adolescence, our investigation did not observe this pattern. Furthermore, the study's results revealed a higher likelihood of HPV infection among those who experienced their first pregnancy between the ages of 17 and 24. Similar to other research, our findings indicate that early sexual debut and childbirth may elevate the chances of contracting HPV (Nejo et al., 2019). Interestingly, our study found that early childbirth could potentially serve as a more reliable indicator of the initiation of sexual activity among women in our study context, considering the potential for inaccurate reporting of the age of sexual debut by some participants (Nejo et al., 2019; Adegbesan-Omilabu et al., 2014; Okunade et al., 2017).
b. **Engaging in multiple sexual relationships and a growing count of lifetime sexual partners**: In a study by Ashaka et al. (2022), it was noted

that the likelihood of HPV infection increased when an individual had engaged in sexual activity with more than four partners over their lifetime. Conversely, women who used condoms in this research experienced a notable decrease in the risk of HPV infection. This underscores the significance of condom usage as a protective measure during sexual intercourse to prevent the transmission of sexually transmitted infections like HPV. These findings align with the results of Veldhuijzen et al. (2018), who indicated that exposure to HPV could be associated with diverse sexual behaviours, including early initiation of sexual activity, a high number of recent or current sexual partners, the behaviour of sexual partners, and a substantial lifetime number of sexual partners.

c. **Previous occurrence of sexually transmitted infections (STIs) or genital warts**: Upon reviewing historical clinical records, it became evident that individuals with a previous record of sexually transmitted infections (STIs) or genital warts, as well as those who had employed hormonal contraceptives, displayed an increased susceptibility to HPV infection. This result agrees with the findings of Clarke *et al.,* (2017) who reported a significant association between HPV infection and the use of birth control pills. It stands to reason that if an individual has a history of sexually transmitted infection or genital warts it indicates the possibility that she would have been exposed to HPV at some point in time.

d. **Alcohol and tobacco consumption**: Alcohol and tobacco consumption elevate the risk of high-risk HPV infection in individuals with head and neck cancer. Research has indicated a notable rise in high-risk HPV (hr-HPV) infection among individuals who consume alcohol and use tobacco, particularly those who engage in tobacco chewing. This suggests that tobacco chewing could be considered a risk factor for hr-HPV infection. The presence of nicotine and its extended exposure to cells may potentially modify signalling pathways related to antigen response (ørensen et al., 2014). Such modifications in immune cell-mediated signalling processes could potentially explain how nicotine or other components of cigarettes inhibit cellular responses to bacterial or viral infections (Won et al., 2014). We propose that tobacco-related carcinogens might induce genetic alterations that subsequently lead to molecular changes, rendering individuals more susceptible to HR-HPV infection.

The ongoing investigation has revealed a notable link between high-risk HPV (HR-HPV) infection and alcohol consumption in cases of head and neck cancer (HNC). This finding aligns with previous research by Oh et al. (2014), suggesting a potential synergistic effect between HR-HPV load and alcohol consumption regarding HR-HPV infection and its persistence in cervical cancer (Oh et al., 2014). Another study involving men also demonstrated an increased risk of HPV infection associated with alcohol consumption, which supports our findings (Schabath et al., 2015).

Ethanol, a major component of alcoholic beverages, undergoes oxidation to generate acetaldehyde through alcohol dehydrogenases (ADH). Subsequently, aldehyde dehydrogenases (ALDH) metabolize acetaldehyde into acetate. Poor oral hygiene and smoking can influence the oral bacterial environment, leading to elevated acetaldehyde production (Kumar et al., 2015). Genetic factors such as ADH/ALDH2 polymorphism, deficient ALDH2 activity, and alcohol consumption patterns have been linked to an increased risk of head and neck cancer (Argiris et al., 2014; Chau et al., 2014).

Methodology

The survey research design was adopted for this study. This approach is apt for gathering viewpoints, perspectives, or emotions from participants within populous contexts, enabling the acquisition of both quantitative and qualitative data. The target population for this study includes both male and female inhabitants of Obio/Akpor Local Government Area in Rivers State. 462,350 individuals. By projecting a 2.5% annual growth rate over 17 years, the estimated population of both women and men in Obio/Akpor amounts to 658,849 individuals. The sample size for this study was determined using Philip Meyer's sample prescription method. With a confidence level of 95%, a sample size of 384 participants was deemed sufficient for conducting the research. The snowball sampling method, also known as the chain referral technique, was employed in this research. This approach involves selecting initial participants, who then refer and introduce additional participants. This sampling technique was chosen to specifically target and reach out to female residents of Rivers State, ensuring a focused and relevant participant group. More so, because the researcher may not be able to know all the required respondents, the groups and individuals to which

the questionnaire was sent helped the researcher to also get to other groups and individuals who are resident in Rivers State and are females.

Results

Table 4.1: Mean (x) analysis of the extent of Facebook users' awareness of HPV among residents of Rivers State.

Items	Strongly Agree (4)	Agree (3)	Disagree (2)	Strongly Disagree (1)	Total	Mean	Remark
I am a Facebook user	131	174	64	9	378		
						3.1	Agreed
	524	522	128	9	1,183		
I am very active on several groups on Facebook	82	155	70	71	378		
						2.6	Agreed
	328	465	140	71	1,004		
I know about HPV	79	188	43	68	378		
						2.7	Agree
	304	564	86	68	1,022		
I am aware that sex at a young age is a risk factor for HPV	72	176	68	62	378		
						2.7	Agree
	288	528	136	62	1,014		
I understand that engaging in sexual promiscuity and having multiple sexual partners can elevate the likelihood of acquiring HPV infections.	101	176	43	58	378		
						2.8	Agree
	404	528	86	58	1,076		
I know that a history of STIs or genital warts can also cause HPV	70	187	70	51	378		
						2.7	Agree
	280	561	140	51	1,032		
I am aware that alcohol consumption may lead to HPV	59	112	135	72	378		
						2.4	Disagree
	236	336	270	72	914		
I have seen Facebook posts on HPV and its vaccines	55	137	107	79	378		
						2.4	Disagree
	220	405	214	79	918		

I know different types of vaccines that I have seen on Facebook	43 172	109 327	122 244	104 104	378 847	2.2	Disagree

The data presented in Table 4.1 suggests that the participants are active members of diverse Facebook groups and have some familiarity with HPV. However, their understanding of the risk factors and causes of HPV seems to be restricted. Furthermore, the findings indicate that the respondents have not come across any Facebook posts concerning HPV awareness and its vaccines, leading to a lack of information about the existing vaccines.

Table 4.2: Mean (x) analysis of the extent to which Facebook users are motivated to engage in screening practices for HPV.

Items	**Strongly Agree (SA)**	**Agree (A)**	**Disagree (D)**	**Strongly Disagree (SD)**	**Total**	**Mean**	**Remark**
I know of the HPV liquid-based cytology screening exercise.	57 228	109 327	111 222	101 101	378 678	1.8	Disagree
I am aware of the HPV pap Smear test screening exercise.	57 228	151 453	85 170	85 85	378 936	2.5	Agree
I know of the visual inspection screening exercise.	44 176	115 345	125 250	95 95	378 866	2.3	Disagree
Facebook posts have made me interested in getting an HPV screening	53 212	86 258	103 206	136 136	378 812	2.1	Disagree
I have gone for an HPV screening exercise because of the posts I see on Facebook.	46 184	50 150	119 238	163 163	378 735	1.9	Disagree

The data presented in Table 4.2 illustrates that participants were acquainted with only one of the HPV screening practices, and it seems that Facebook posts have not exerted any influence on the respondents to engage in any of the HPV screening practices.

Discussion

Research Question 1: To what extent is Facebook users' awareness of HPV among residents of Rivers State.

The study findings unveiled that the participants were not only active members of various social media groups but also demonstrated a strong comprehension of the Human papillomavirus (HPV) and its associated risk factors. Respondents exhibited awareness of factors such as early onset of sexual activity, sexual promiscuity, involvement with multiple sexual partners, and a previous history of sexually transmitted infections (STIs) as contributors to HPV. However, it was noted that the respondents lacked awareness regarding the potential link between excessive alcohol consumption and an increased risk of HPV. The implication of this is that respondents know about HPV but not holistically. They probably have heard about STIs, but do not have comprehensive information as to the different causes of the infection. The findings align with the observations of Awodele et al. (2017), who similarly identified a lack of awareness and knowledge concerning HPV among young individuals. This insufficient distribution of information regarding the infection contributes to limited comprehension. The situation becomes worrisome when a substantial health risk such as HPV remains unfamiliar to individuals. Indeed, the depth of one's understanding of a disease significantly influences the amount of attention and concern it garners.

The results align with those of Akinola et al. (2018), who also noted that both parents and caregivers in Nigeria lack sufficient knowledge about HPV and screening for their children. This deficiency is attributed to a lack of available information on the subject. Moreover, Goldie et al. (2018) found that both government agencies and non-profit health organizations have not effectively utilized the interactive capabilities of Facebook to spread awareness about HPV vaccines, contributing to the inadequate level of public awareness. The dissemination of HPV-related information should ideally create intense awareness of the virus and vaccines, but the potency of Facebook has not been harnessed fully.

Research Question 2: To what extent are Facebook users motivated to engage in screening practices for HPV?

The study's results indicated a glaring lack of awareness among respondents regarding various types of HPV screening methods. The collected data underscored that participants were unfamiliar with HPV liquid-based cytology screening and visual inspection screening methods. Their awareness was limited to only the Pap Smear Test screening approach. This deficiency in knowledge concerning HPV screening methods can be attributed to inadequate information dissemination about these techniques. Again, the poor information dissemination on the virus which has left people unaware of HPV and its vaccines, has also impacted the knowledge of the various screening exercises available. Of course, if the virus is not known, the possibility of knowing the various screening exercises to ascertain the presence of the virus becomes very thin. Akinola et al. (2018) argue that as of 2018, only a few highbrow hospitals in Lagos State offer screening services, this may also impede the level of awareness of the HPV screening exercises. If only a few hospitals offer screening services, it then goes to show that only a few of them should create awareness of the exercises, more so, only the few who have a social media presence could have used Facebook to create awareness of the exercises, which again impedes the reach of the campaign.

Despite the advocacy for HPV screening by the Society of Obstetrics and Gynecology of Nigeria (SOGON), as highlighted by Akinola et al. (2018), the noticeable lack of awareness among the participants about HPV screening techniques suggests that even SOGON's initiatives have not effectively promoted women's awareness, particularly when it comes to HPV screening procedures. This oversight indicates that SOGON has not fully harnessed the potential of platforms like Facebook to reach a substantial audience and educate them about HPV screening exercises.

Findings from the study also revealed that have not been motivated to engage in screening exercises. This is because they have barely come across any such posts on Facebook encouraging them to engage in HPV screening practices. Contrarily, the study conducted by Ortiz et al. (2018) contradicts this perspective. Ortiz and colleagues found that leveraging Facebook to deliver HPV-related health messages specifically aimed at adolescents in Philadelphia effectively motivated

them to undergo screening and receive vaccination. This demonstrates that, when utilized effectively, Facebook can indeed play a pivotal role in promoting awareness and encouraging preventive measures such as screening and vaccination for HPV. This therefore shows that Facebook have not been fully used to sensitize people to HPV and to encourage them to go for screening exercises. Thus, the failure to utilize the full potential of Facebook has shown in the poor awareness level of respondents on the various screening practices.

Conclusion

The findings of the study underscore a significant lack of awareness regarding the Human papillomavirus (HPV) and its associated vaccines within the population of Obio/Akpor. This scarcity of awareness may stem from inadequate sensitization efforts on Facebook. Furthermore, the residents of Obio/Akpor seem to lack information about HPV screening practices and have not been prompted to engage in such screening activities. Consequently, the residents of Obio/Akpor Local Government Area exhibit limited knowledge about HPV vaccines and have displayed minimal inclination towards seeking vaccination. A mere 0.14% of the total respondents in the LGA have received the vaccine within the past three years. The utilization of Facebook for HPV sensitization has proven ineffective in encouraging users in Obio/Akpor to avail themselves of the vaccines.

Facebook possesses considerable potential for disseminating public health information and promoting behavioural changes. However, in this particular case, the complete capacity of Facebook has not been effectively utilized to raise awareness and encourage individuals to undergo essential measures such as screening and vaccination. The socio-economic status of the population could also act as a hindrance, potentially excluding them from the groups targeted by these Facebook campaigns.

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