FUDMA Journal of Sciences (FJS)
ISSN online: 2616-1370
ISSN print: 2645 - 2944
Vol. 9 No. 1, January, 2025, pp 400 – 405
DOI: https://doi.org/10.33003/fjs-2025-0901-3258

DETERMINANTS OF HUMAN PAPILLOMA VIRUS VACCINE HESITANCY AMONG PRIMARY HEALTHCARE WORKERS IN KANO MUNICIPAL LOCAL GOVERNMENT AREA, KANO, KANO STATE

[1]Uba M. Rabi, *[2]Suberu Ahmed., [2]Umar L. Bello and [3]Abdullahi M. Nasiru

[1]Aminu Kano Teaching Hospital, Kano
[2]Department of Nursing Sciences, Bayero University, Kano
[3]Department of Psychiatric and Mental Health, and Community Health, College of Nursing, Qassim University, Buraydah, Saudi Arabia.

*Corresponding authors' email: asuberu.nur@buk.edu.ng Phone: +2348069178254

ABSTRACT

Cervical cancer remains a significant public health burden in low- and middle-income countries, where HPV vaccination programs are limited. Healthcare worker (HCW) hesitancy is a critical barrier to vaccine acceptance and uptake. In Nigeria, cervical cancer is the second most frequent cancer among women aged 15 to 44 with over 14,000 new diagnoses and more than 20 deaths daily. This study utilized mixed research design. The quantitative employed descriptive survey design. For the qualitative study, heads of various immunization units from the selected PHC's were purposively selected for key informant interview. The study was conducted among 143 primary healthcare workers in Kano Municipal LGA from 10 PHCs selected using a multi-stage sampling technique. The findings from the study revealed that majority of respondents (72.7%) reported that advice from family or friends influenced their decision to get vaccinated, whereas peer recommendations had minimal impact (4.9%). Three themes emerged from the qualitative study: Knowledge gaps and training needs, promoting vaccine acceptance and Willingness to recommend the HPV vaccine. The study concludes that there are significant barriers to vaccine hesitancy such as cost concerns, perceived vaccine efficacy, and limited access to vaccination services. It is recommended to implement targeted educational and accessibility interventions to overcome barriers and enhance HPV vaccine uptake.

Keywords: Human Papilloma Virus, Vaccine hesitancy, Primary healthcare workers, Determinants

INTRODUCTION

Cervical Cancer (CC) is the commonest female reproductive tract malignancy worldwide, and about 80% of the burden domicile in developing countries (Morhason-Bello et al; 2013). It is the second leading cause of cancer death in women globally and the first in many developing countries. In sub-Saharan Africa cervical cancer is the most common cancer and the most frequent cancer amongst women with mortality of 2111 lives every year according to the World Health Organization (WHO, 2017- Osamong, 2017). In Nigeria, cervical cancer is the second most frequent cancer among women aged 15 to 44 with over 14,000 new diagnoses and more than 20 deaths daily. Human papilloma virus (HPV) is a common sexually transmitted virus. HPV affects both men and women and condoms are only effective in preventing the infection partially as exposed skin can transmit the virus. HPV is responsible for other benign genital infections such as recurrent juvenile respiratory papillomatosis and genital warts; both mainly caused by HPV types 6 and 11 (Osamong, 2017).

However, many developing countries where majority of cervical cancer cases still occur have not yet commenced population-based mass immunisation programs against HPV infections. The identified as barriers for implementing such programs includes the high cost of the vaccines, weak health systems and absence of political intervention (Ezeanochie & Olasimbo, 2020). The implementation of HPV vaccination programs in most high-income countries was successful and they are already reaping the benefits. For example, a meta-analysis including fourteen high-income countries reported a reduction in the prevalence of HPV types 16 and 18 by 83%among girls aged 13-19 years and by 66% among women aged20-24 years with significant cross-protection from HPV 31, 33 and 45. Sadly, populations with the highest HPV incidence such as low and middle-income countries (LMICs) remain largely unprotected. In another instance, a global HPV vaccine coverage estimates, only 1% of the estimated 118 million women targeted through these programmes were from LMICs (Lubeya et al; 2022).

Vaccines are effective interventions that can reduce the high burden of diseases globally. However, public vaccine hesitancy is a pressing problem for public health authorities. Health-care workers play a key role in promoting public health campaigns; however, vaccine hesitancy is an often, under-recognized challenge (Khamisy-Farah et al; 2019). The human papilloma virus vaccines have reduced the risk of cervical cancer effectively; as reported in a population-based follow-up study, women who had previously received the HPV vaccine were at a lower risk of developing invasive cervical cancer compared to those who had not been vaccinated (Turki, 2023).

HPV vaccination has been included in the national vaccination programs of 117 countries worldwide, according to data published by the WHO. However, the coverage of HPV vaccination is still lower in low- and middle-income countries compared to high-income countries (Turki, 2023). Despite the availability of efficient vaccines to control HPV infection, the high incidence rate of cervical cancer and HPV infections among women is alarming. Although there is average utilization rate of the HPV vaccine, the comparative uptake rate is lower than other vaccines (Turki, 2023).

Vaccine hesitancy is a barrier to achieve high vaccination coverage against infectious diseases. Compared to other adolescent vaccines, HPV vaccine recommendation remains lower. HPV vaccine discussion practices are influenced by the provider's own HPV vaccine knowledge and attitudes (Farnendes et al; 2023). In 2016, the World Health Organisation identified the HPV Vaccine as a public health priority which should be included into national immunisation programs (Ezeanochie & Olasimbo, 2020).

HCWs themselves as shown in many literatures can be vaccine hesitant and their hesitancy can impact hesitancy and aversion to receiving the vaccine among the general public (Chidinma et al, 2021). Vaccine hesitancy is a barrier to achieve high vaccination coverage against infectious diseases, therefore, understanding its determinants is necessary to aid acceptability and tackle vaccine hesitancy and consequently achieve high coverage for this vaccine. There is a paucity of data with regards to HCWs acceptance rate of HPV vaccines in Nigeria particularly Kano. The study therefore, contributed to knowledge by reporting the findings which showed that, the amount of the vaccine (26.6%), unavailability of vaccination sites (28%) and most importantly, new research findings with regards to the vaccine uptake (60.8%) were the major hesitancy towards the vaccine uptake. In addition, the study further revealed that, higher educational attainment has more tendency to reduce vaccine hesitancy when compared to other determinants.

MATERIALS AND METHODS

Design

A mixed method research design was used for the study.

Study setting

Kano State is one of the 36 States in Nigeria and was created on May 27th, 1967 from the part of the then northern region. According to the national census done in 2006, Kano State is the most populous in Nigeria. The recent official estimates taken in 2016 by the National Bureau of Statistics found that Kano State was still the largest state by population in Nigeria. Kano State borders Katsina State to the northwest, Kaduna State to the southwest, Bauchi State to the southeast and Jigawa State (which was initially part of Kano State until 1991) to the northeast. Primary Healthcare is the most efficient and cost-effective approach to achieve Universal Health Coverage. Primary health care is an integrated and people-centered approach to health and wellbeing that starts with individuals, families and communities. It is the foundation of health systems providing health care to people and ensuring that they receive quality health care whenever they need it.

There is a total of 1,260 PHC centres in Kano State which are located all over the 44 local government areas of the State. In Municipal local government, there are 20 PHC centres located all over the wards to cater for the health needs of the community (KSPHCMB, 2023).

Sampling

A sample size of 143 PHC workers was used for the study.

Multistage sampling was employed to select Primary Health Care (PHC) centres for data collection in Kano State.

Stage 1: Selection of the Local Government Area (LGA)

In the first stage, Simple random sampling technique was used to select the Local Government Area (LGA) for the study. A random number generator was used to select Kano Municipal.

Stage 2: Selection of PHCs within Kano Municipal

In the second stage, simple random sampling was used to select the PHCs within Kano Municipal. All 20 Primary Health Care (PHC) centres within Kano Municipal were listed. From this list, 10 PHCs were selected using a random number generator.

Stage 3: Selection of Health Care Workers (HCWs) from Each Selected PHC

In the third stage, simple random sampling was used to select Health Care Workers (HCWs) from each of the selected PHCs. Based on the sample size calculation, it was determined that 14 consenting HCWs would be recruited from each PHC centre. For each of the 10 selected PHCs, a list of all HCWs was compiled. From each list of HCWs, 14 were randomly selected using a random number generator. This process ensured that the selection of HCWs was unbiased and representative of the workforce in each PHC.

Instrument and Data collection

For the quantitative survey, an adapted questionnaire from Omondi et al; (2020) and Ajayi; (2017) based on the reviewed literatures was used for collection of data. A structured interview guide was used for qualitative data collection. The interview guide has seven open ended questions and explore the willingness to recommend HPV vaccine to patients among the PHCs in Kano Municipal, Kano State.

Data analysis

Data was analysed using SPSS version 25. Analysed data was presented using frequencies, summary measures, tables and figures. Logistic regression was used to identify the determinants of HPV vaccine hesitancy. Association between variables was calculated using chi-square. A p-value of 0.05 or less was used as the threshold for statistical significance.

For the qualitative data collected, thematic analysis was used. All recorded data was transcribed and read. Transcripts were re-read and then coded using MS word and themed.

Ethical Consideration

Ethical approval with reference number SHREC/2024/4797 was obtained from research ethics committee of Kano State Ministry of Health/State Primary Health Care Development agency. Before collecting the ethical clearance, an introductory letter from the Department of Nursing Science, Faculty of Allied Health Science Bayero University, Kano was collected and presented to Kano State Ministry of Health for appropriate data collection and also to seek permission to conduct the research in the PHC's. The letter contained an explanation regarding the nature and purpose of the study. After permission was granted by the Ministry of Health, the researcher went to the sampled PHC's and the clinic management was contacted, self-introduction was done and purpose of visit was explained. One PHC from a single ward in Municipal was visited for a period of one week.

Informed consent was obtained from each of the respondents, participation in the study was equally voluntary and that respondents have right to withdraw from the study at any point in time without any consequences. Information obtained from the respondents was treated with utmost confidentiality and used only for the purpose of the study. Confidentiality was guaranteed by storing data in a safe place and only the researcher has access to the data.

The objectives, methodology, purpose of the study, and the benefits and risks of the study were explained to all study participants. Before data collection, participants were also informed of their right to voluntarily participate in the study. Verbal and written consent were sought and documented before conducting any interview. To ensure the privacy of study participants, respondents were interviewed in a conducive environment and confidentiality of the data was guaranteed by preserving the anonymity of the study participants. Individual personal identifiers e.g. names were not collected to ensure the anonymity of data and the researcher kept the information obtained from the research participant in private. Identifying information (names and addresses) was not included in the data collection instrument.

RESULTS AND DISCUSSION

Results

The majority of respondents (72.7%) reported that advice from family or friends influenced their decision to get vaccinated. Significant barriers included the expense of the vaccine (26.6%) and unavailability of vaccination sites (28%). New research findings were the most influential factor affecting HPV vaccine uptake, with 60.8% of respondents indicating it could sway their decision. Changes in guidelines (13.3%) and personal experiences or observations (21%) were also noted as potential motivators, whereas peer recommendations had minimal impact (4.9%) (Table 1)

The regression analysis reveals several significant predictors of HPV vaccine hesitancy among primary health care (PHC) workers. Highest educational status exhibited a marginally significant effect (B = 0.175, p = 0.059), indicating that higher educational attainment may slightly reduce vaccine hesitancy. Intention to receive the vaccine showed a significant positive association with reduced hesitancy (B = 0.305, p = 0.005), underscoring the importance of fostering positive intentions towards vaccination. Additionally, advice from family or friends significantly reduced hesitancy (B = -2.609, p = 0.026), highlighting the critical role of social influence in vaccine decision-making (Table 2)

Despite the challenges, all participants expressed a strong willingness to recommend the HPV vaccine to patients and their communities. This enthusiasm underscores the pivotal role PHC workers can play in promoting public health.

Table 1: Determinants of HPV Vaccine Hesitancy (n = 143)

Variable	Frequency (n)	Percentage (%)
Reason for Vaccine Uptake		
Advice from family or friends	104	72.7
Advice from colleague health worker	15	10.5
Perceived threat of Cervical Cancer	16	11.2
Media discussion on cervical cancer	8	5.6
Barriers to Vaccine Uptake		
The vaccine is expensive	38	26.6
Going for HPV vaccination is a waste of time	17	11.9
Unavailability of vaccination sites	40	28.0
There is limited information on HPV vaccine	48	33.6
New research findings	87	60.8
Changes in guidelines or recommendations	19	13.3
Personal experiences or observations	30	21.0
Peer or colleague recommendations	7	4.9

Table 2: Regression Analysis for Determinants of HPV Vaccine Hesitancy (n = 143)

Variable	B	SE	B	T	p
Intercept	0.892	0.466		1.916	0.058
Age	-0.039	0.043	-0.079	-0.923	0.358
Marital Status	0.063	0.106	0.065	0.592	0.555
Do You Have Children	0.126	0.104	0.127	1.213	0.227
Ethnicity	0.006	0.049	0.009	0.122	0.903
Religion	0.379	0.309	0.090	1.226	0.222
Profession	0.023	0.016	0.101	1.439	0.152
Highest Educational Status	0.175	0.092	0.141	1.906	0.059*
Years of Working Experience	-0.051	0.038	-0.112	-1.349	0.180
Intension to receive vaccine	0.305	0.106	0.248	2.861	0.005*
Perception of Effectiveness	-0.104	0.093	-0.096	-1.128	0.261
Advice from family or friends	-2.609	1.173	4.949	1	0.026*
Advice from colleague health worker	.834	1.563	.285	1	0.594
Perceived threat of Cervical Cancer	.832	1.542	.291	1	0.589
The vaccine is expensive	.838	.629	1.775	1	0.183
Going for HPV vaccination is a waste of time	.463	.797	.338	1	0.561
Unavailability of vaccination sites	-.145	.628	.054	1	0.817
New research findings	-.822	.998	.678	1	0.410
Changes in guidelines or recommendations	-1.999	1.211	2.723	1	0.099
Personal experiences or observations	-1.068	1.130	.892	1	0.345

Table 3: Socio-Demographic Characteristics of the Respondents (Qualitative)

Participant	Age	Marital Status	Educational Qualification	Profession	Level of Working Experience	Name of Facility
1	35	Married	Diploma in Nutrition and Dietetics	Nutrition Officer	8 years	Daneji PHC
2	41	Married	Diploma	X-ray Technician	20 years	Tukuntawa Model PHC
3	25	Single	Diploma	Basic Nursing	2 years	GandunAlbasa MPHC

THEME 1: Knowledge gaps and training needs

The findings of the qualitative study revealed a clear disparity in knowledge and training related to the HPV vaccine among PHC workers. Participant 2 (X-ray technician, Tukuntawa Model PHC) explicitly expresses a lack of training, while participant 1 (Nutrition Officer, Daneji PHC) mentions a campaign where some healthcare workers were not involved. For instance;

"Honestly, since I didn't attend any training sessions, my knowledge is limited. I've observed my colleagues administering the vaccine, but I can't recall specific details" (Participant 2).

THEME 2: Promoting Vaccine acceptance

The interviews also revealed strategies and challenges related to promoting HPV vaccine acceptance: Both Participant 1 and Participant 3 highlight education as a crucial tool. Participant 1 emphasizes how addressing community confusion through clear explanations increased acceptance:

"There was confusion and mixed reactions during the campaign, but with more explanation about how the HPV vaccine prevents cervical cancer, people have started accepting it" [Participant 1]. "Even though healthcare workers understand the importance of vaccination, it's crucial to continually educate and raise awareness..." [Participant 3].

THEME 3: Willingness to recommend the HPV Vaccine

Despite the challenges, all participants expressed a strong willingness to recommend the HPV vaccine to patients and their communities. This enthusiasm underscores the pivotal role PHC workers can play in promoting public health.

"Absolutely, my daughter received the vaccine during the campaign, and I am sure of it" (Participant 1).

"As healthcare providers, we have a responsibility to inform and protect our patients. Recommending the HPV vaccine is a crucial part of that" (Participant 2).

Discussion

Determinants of HPV vaccine Hesitancy among PHC workers

The study revealed that advice from family or friends was the primary reason for vaccine uptake among PHC workers, followed by the perceived threat of cervical cancer. In contrast, advice from colleague health workers and media discussions on cervical cancer had minimal influence. This contrasts with findings from France, where a significant percentage of HCWs expressed hesitancy about the HPV vaccine due to concerns about its risks, efficacy, and potential side effects (Collange et al., 2016). In Nigeria, insufficient knowledge about HPV vaccines and their safety was cited as a major reason for vaccine hesitancy among HCWs (Makwe & Anorlu, 2011).

Regarding barriers to vaccine uptake, cost emerged as a significant concern among PHC workers in Kano, along with the perceived notion that HPV vaccination is a waste of time. Unavailability of vaccination sites and limited information on the HPV vaccine were also reported as barriers. These findings align with previous research indicating that insufficient knowledge about HPV vaccines and concerns about safety contribute to vaccine hesitancy among healthcare workers (Makwe & Anorlu, 2011).

In terms of factors influencing future vaccine uptake, new research findings emerged as the strongest motivator among PHC workers, followed by changes in guidelines or recommendations. Personal experiences or observations of HPV-related illnesses were also cited as potential motivators. This aligns with the notion that healthcare professionals are more likely to accept vaccines when new scientific evidence supports their efficacy and safety (Collange et al., 2016).

The similarities observed in reasons for vaccine hesitancy across different regions, such as concerns about safety and efficacy, suggest common underlying factors influencing healthcare workers' attitudes towards the HPV vaccine. Insufficient knowledge and information gaps about HPV vaccines appear to be universal barriers contributing to hesitancy among healthcare workers.

Disparities in vaccine uptake and hesitancy could be attributed to various factors, including differences in healthcare infrastructure, access to vaccination services, and cultural attitudes towards vaccines. Additionally, the level of trust in healthcare systems and authorities may influence vaccine acceptance. In regions where healthcare workers have greater confidence in vaccine safety and effectiveness, hesitancy rates may be lower.

These findings highlight the complexity of vaccine hesitancy among PHC workers and underscore the need for multifaceted interventions to address underlying concerns. The discrepancy between the primary reasons for vaccine uptake and barriers to uptake underscores the importance of tailored approaches to address specific challenges faced by healthcare workers. Increasing vaccine accessibility, providing accurate information, and fostering a supportive environment for vaccine acceptance are crucial steps towards achieving higher HPV vaccine uptake rates among PHC workers in Kano Municipal LGA.

Convenience involves the accessibility and affordability of vaccines, as well as the ease of obtaining them. The study identified several barriers to vaccine uptake among PHC workers, including the cost of the vaccine, unavailability of vaccination sites, and limited information about the HPV vaccine. These barriers significantly impact the convenience of getting vaccinated. To enhance convenience, it is crucial to address these logistical challenges. This can include making the vaccine more affordable, increasing the number of vaccination sites, and providing comprehensive information about the vaccine's availability and benefits. Improving the convenience of vaccination processes can facilitate higher vaccine uptake among healthcare workers.

Furthermore, this study emphasizes the significance of context-specific research to understand the unique challenges and drivers of vaccine hesitancy in different regions. By focusing on PHC workers in Kano, we can develop targeted strategies to overcome barriers and promote vaccine acceptance within this critical population. Moving forward,

collaboration between healthcare providers, policymakers, and public health stakeholders will be essential to ensure successful implementation of HPV vaccination programs and ultimately reduce the burden of cervical cancer in the community.

Willingness to recommend the HPV vaccine among PHC workers

The study revealed a unanimous willingness among PHC workers in Kano to recommend the HPV vaccine to their patients, aligning with findings from other regions. In Turkey, a high percentage of family physicians and nurse midwives expressed readiness to recommend the vaccine to their patients (ÖzbakırAcar, Özşahin & Edirne, 2019). Similarly, studies conducted in Nigeria among female medical students and health workers reported a favourable attitude towards recommending the vaccine for clients (Ojiyi et al., 2013; Morhason-Bello et al., 2013).

Despite these similarities, there are disparities in the willingness to recommend the HPV vaccine among HCWs across different countries. Studies from India and Zambia reported lower rates of recommendation among participants, citing factors such as years of working experience, knowledge of the HPV vaccine, and gender as influencing factors (Chawla et al., 2016; Lubeya et al., 2022). In Malaysia, concerns about side effects, halal certification, and vaccine cost were associated with low recommendations (Sazali et al., 2021).

The similarities observed in the willingness to recommend the HPV vaccine among PHC workers in Kano and other regions may stem from a shared understanding of the importance of vaccination in preventing cervical cancer. Healthcare workers often serve as trusted sources of information for their communities, influencing vaccine uptake through their recommendations. Additionally, training and educational campaigns may have contributed to a positive attitude towards vaccination among PHC workers.

Disparities in vaccine recommendation could be attributed to cultural beliefs, religious considerations, and healthcare infrastructure differences across regions. Concerns about vaccine safety, efficacy, and accessibility may influence healthcare workers' attitudes towards vaccination and their willingness to recommend it to patients. Additionally, variations in healthcare policies and guidelines may impact recommendations among healthcare professionals.

The unanimous willingness of PHC workers in Kano to recommend the HPV vaccine underscores their potential role in promoting vaccine uptake and reducing the burden of cervical cancer in the community. Targeted interventions, such as comprehensive training programs and awareness campaigns, can further empower healthcare workers to advocate for vaccination. Strengthening communication channels and addressing concerns about vaccine safety and accessibility are essential steps towards enhancing vaccine recommendation practices among PHC workers.

These findings highlight the pivotal role of PHC workers in promoting HPV vaccination and preventing cervical cancer in Kano Municipal LGA. By expressing their readiness to recommend the vaccine despite existing challenges, healthcare workers demonstrate their commitment to public health. Moving forward, collaborative efforts between healthcare providers, policymakers, and public health organizations are needed to support PHC workers in their advocacy efforts and ensure equitable access to HPV vaccination services. Through targeted interventions and sustained engagement, we can harness the potential of healthcare workers to bridge the gap in HPV vaccine recommendation and contribute to improved vaccination coverage in the community.

CONCLUSION

The study concludes that there is a strong willingness among PHC workers to recommend the HPV vaccine to patients, indicating an opportunity for targeted interventions to address hesitancy and promote informed decision-making. Based on the findings of the study, several recommendations can be made to address HPV vaccine hesitancy among PHC workers in Kano Municipal LGA which includes implementing comprehensive education and training programs, creating more access to HPV vaccination, conducting targeted community engagement and advocacy campaigns, providing opportunities for research, etc.

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