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RESEACH ARTICLE

KNOWLEDGE AND PROPORTION OF HPV VACCINE UPTAKE AMONG PRIMARY HEALTHCARE WORKERS IN KANO MUNICIPAL LGA, KANO STATE

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Abstract

Background: Background: Despite cervical cancer being a highly preventable gynaecological cancer, it still takes many women's lives around the world. An estimated 80% of cervical cancer deaths take place in the developing countries. Although the human papilloma virus (HPV) vaccine was first introduced in Nigeria in 2009, the knowledge and vaccination against HPV as a preventive intervention against cervical cancer as well as vaccination uptake by primary healthcare workers (PHCWs) and young people remains low. In 2016, the World Health Organisation identified the HPV Vaccine as a public health priority which should be included into national immunisation programs.. **Aim of the study**: The aim of the study is to assess the knowledge and proportion of human papilloma virus vaccine uptake among primary health care workers in Kano municipal local government area, Kano State. **Methods:** A cross sectional descriptive survey design was used for the study. A sample size of 143 PHC workers are used out of a total of 223 in Kano municipal. Multi stage sampling technique was used to select the participants. An adapted structured questionnaire was used for the study. Data collected were organized and entered into SPSS version 25 and results were presented using frequency distribution and percentages. **Results:** The results of the study revealed that majority of the respondents (61.6%) fall between 15 and 30 years old. Also, the findings reveal a moderate level of knowledge among majority (78.3%) of participants. Over 43% (62 out of 143) reported having received the HPV vaccine while a significant percentage (56.6%, or 81 individuals) have not received the vaccine **Conclusion:** The study concludes that there is a moderate level of knowledge about the HPV vaccine among PHC workers in Kano Municipal LGA, with a notable proportion of participants demonstrating understanding but also highlighting areas for improvement.

Keywords: HPV vaccine, knowledge, proportion, healthcare workers.

Introduction

Despite cervical cancer is a highly preventable gynecological cancer, it still takes many women's lives around the world. An estimated 80% of cervical cancer deaths take place in the developing countries, (Jeyachelvi, Juwita & Norwati; 2016). In developed countries, the incidence of cervical cancer has decreased over the last past several decades. This is mainly attributed to increased awareness and more effective screening and prevention strategies employed in these countries. Additionally, the HPV vaccine has contributed to a decline in the incidence rate of cervical cancer, (Heena et al; 2019).

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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). Vaccination coverage remains low despite the wide availability of prophylactic HPV vaccines over the past 15 years. In low- and middle-income countries, where the incidence of cervical cancer is high, it is estimated that by achieving vaccination coverage of 70%, more than 4 million women's deaths could be avoided in the next decade (Thanasa et al; 2022).

Although the HPV vaccine was first introduced in Nigeria in 2009, the knowledge and vaccination against HPV as a preventive intervention against cervical cancer as well as vaccination uptake by HCWs and young people remains low. Similarly, there is low cervical screening uptake among more than 150 Nigerian nurses, with 60% reporting having never been checked for cervical cancer or taking the vaccine, (Ogundipe et al; 2023). Primary health workers are the main drivers of population-oriented health education programs. In Nigeria, they facilitated improvements in service utilisation, in fact, the 80% immunisation coverage in the country for vaccine-preventable diseases reported in 2013 was attributed to the role of PHC workers. The PHC workers provide care closest to community members; they mobilise and empower communities for health actions, thus promoting equity and ensuring accessible health care. Therefore, for PHC workers to be effective in providing preventive care for cervical cancer, they require capacity enhancement to assure quality service delivery and better outcomes (Onyenwenyi & Mchunu, 2019).

Human Papillomavirus (HPV) is a group of more than 200 related viruses, with over 40 types transmitted through sexual contact. HPV is known to be the most common sexually transmitted infection worldwide, and certain high-risk types are directly associated with cervical cancer (Onyenwenyi & Mchunu, 2019). Understanding HPV is crucial because it is responsible for nearly all cases of cervical cancer, making awareness and knowledge pivotal in prevention efforts. Despite this, misconceptions and lack of awareness about HPV and its link to cervical cancer remain significant barriers to vaccination and screening, especially in low- and middle-income countries. Increasing knowledge about HPV among the general population and healthcare workers can lead to better prevention strategies and reduced cervical cancer incidence (Thanasa et al; 2022).

Kano Municipal was chosen because no similar study was conducted in Kano at the Local Government level, and no studies targeted PHC workers alone. PHC workers are the first line of contact in every community, and most community members have no idea about HPV and the vaccine. Increasing HCWs knowledge about the vaccine will help in greater vaccine knowledge and acceptance among the general population.

Aim and objective of the study

The aim of the study is to assess the knowledge and proportion of human papilloma virus vaccine uptake among primary health care workers in Kano municipal local government area, Kano State.

Materials and Methods

Design

A cross sectional descriptive survey design was used for the study to assess the health facilities.

Study setting

Kano State is located in North-Western Nigeria on longitude 11º 30'N 8º 30'E / 11.5º N 8.5º E. The State was created on May 27, 1967 from part of the northern region and covers an area of about 20,131 km^2 (7,772.6Sq mi). Kano State borders Katsina State to the North-West, Jigawa State to the North-East, Bauchi State to the South-East and Kaduna State to the South-West. The capital of Kano State is Kano. The State has a total population of 13,076,892 (projected 2016 size) and ranked second most populated in Nigeria with 44 Local Government Authorities. Kano State has a total number of 1,260 PHC centres 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

Multistage sampling was employed to select Primary Health Care (PHC) centres for data collection in Kano State. The process involved multiple stages of selection, ensuring a systematic and unbiased approach.

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

In the first stage, simple random sampling was used to select the Local Government Area (LGA) for the study.

Stage 2: Selection of PHCs within Kano Municipal

Using a random number generator, 10 PHCs were selected from the 20 in Municipal LGA through simple random sampling. This method ensured an unbiased selection of PHCs for the study.

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

Through simple random sampling, HCWs were selected for the study from the selected PHC centers. A total of 14 HCWs were selected from each PHC.

Instrument and Data collection

An adapted questionnaire from Omondi et al; (2020) and Ajayi; (2017) based on the reviewed literatures was used for collection of data. The questionnaire consisted of sections A-C; the section A collected socio-demographic data (age, sex, marital status, ethnicity, religion, profession, educational status and level of working experience). The section B determined HPV vaccine knowledge, while the section C identified the proportion of HCW's who have received the HPV vaccine

Data Analysis

Data collected was analyzed using the Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics such as simple frequencies, measures of central tendency, and measures of variability were used to describe the socio-demographic variables and proportion of vaccinated respondents; while mean and standard deviation was used to describe knowledge of HPV vaccine.

Ethical consideration

Ethical approval for this study was obtained from the Research Ethics Committee of the Kano State Ministry of Health/State Primary Health Care Development Agency, under reference number SHREC/2024/4797. The study adhered to ethical principles outlined in the Declaration of Helsinki, ensuring respect for participants' rights and dignity. Informed consent was obtained from all participants after explaining the study's purpose, procedures, potential risks, and benefits. Confidentiality and anonymity were maintained by coding the data and securely storing all sensitive information. Participants were informed of their right to withdraw from the study at any time without any negative consequences. Additionally, efforts were made to minimize any potential discomfort or harm associated with the study procedures.

Results

The data reveals a workforce skewed towards younger age groups, with the majority (61.6%) falling between 15 and 30 years old. Community Health

ExtensionWorkers make up the largest professional groups (38.5%). In terms of experience, a significant portion (58.7%) has 1-5 years of experience, ethnically homogenous, with 96.4% identifying as Hausa and majority of participants are married (55.2%).

A total of 11 questions were asked regarding HPV vaccine knowledge. The scoring guide ranges from 0-11, where scores of 9-11 indicates good knowledge, 5-8 indicate moderate knowledge, and 0-4 indicates poor knowledge.

Table 1: Distribution of Respondents based on Socio-demographic Characteristics (n = 143)

Variable	Frequency (n)	Percentage (%)
Age		
15-20	22	15.4
21-30	66	46.2
31-40	31	21.7
41-50	19	13.3
51 and above	5	3.5
Profession		
Nursing	25	17.5
Community Health Extension Workers	55	38.5
Physician	3	2.1
Pharmacy Technician	7	4.9
Dental Technician	11	7.7
Environmental Health Technician	22	15.4
Others	20	14.0
Years of Working Experience		
1-5 years	84	58.7
6-10 years	27	18.9
11-15 years	11	7.7
16 years and above	21	14.7
Marital Status		
Single	63	44.1
Married	79	55.2
Divorced	1	0.7
Widowed	0	0.0
Religion		
Islam	140	98.6
Christianity	2	1.4
Ethnicity		
Hausa	133	96.4
Igbo	2	1.4
Yoruba	3	2.2
Do you have children?		
Yes	74	51.7
No	69	48.3

Table 2: Distribution of Respondents based on Knowledge on HPV Vaccine (n = 143)

Level of Knowledge	Mean	Standard deviation
Good Knowledge (9-11)	10.1	0.58
Moderate Knowledge (5-8)	6.7	0.87
Poor Knowledge (0-4)	2.3	1.15
Mean ± Standard Deviation- 6.01 ± **1.726**		

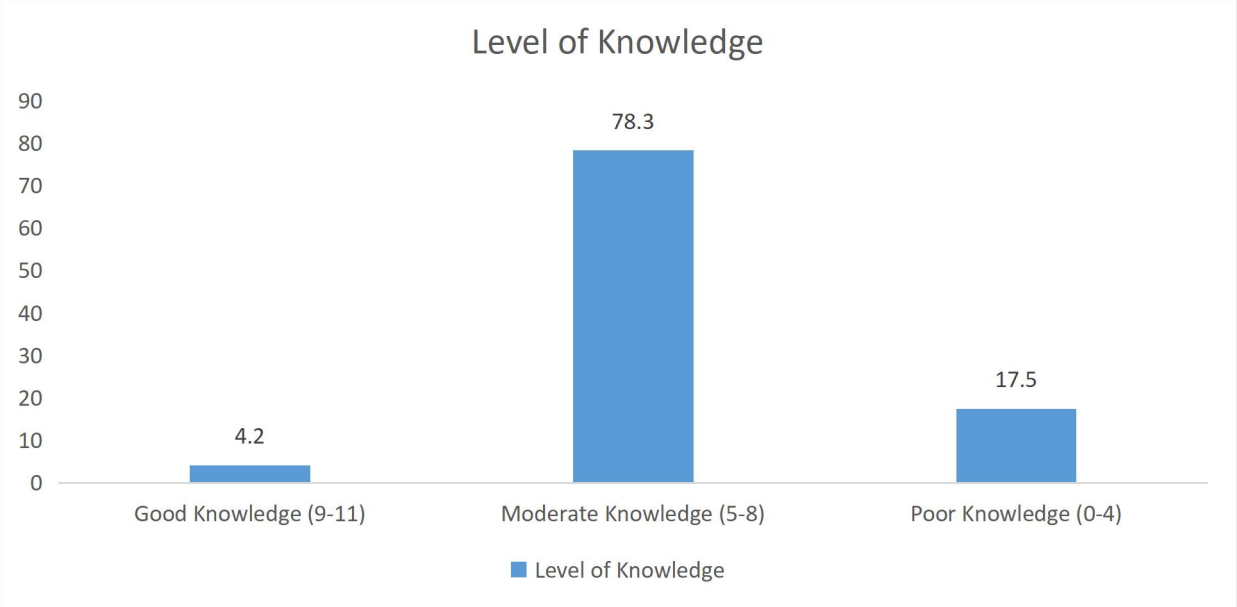

Figure 1: Distribution of Respondents based on Knowledge on HPV Vaccine

The findings reveal a moderate level of knowledge among the majority (78.3%) of participants. This suggests that a significant portion of the population has some understanding of the vaccine, but it may not be comprehensive. A scoring guide was used to score knowledge questions.

Over 43% (62 out of 143) reported having received the HPV vaccine. This suggests a notable portion of the population has taken steps to protect themselves against HPV-related illnesses. However, a significant percentage (56.6%, or 81 individuals) have not received the vaccine.

Among the participants who reported receiving the HPV vaccine (43.4% of the total sample), the analysis of vaccine types revealed a strong preference for bi-valent vaccines (88.8%). This suggests that a significant majority of vaccinated individuals opted for a vaccine protecting against two HPV strains. A small percentage (2.1%) received the quadrivalent vaccine targeting four strains, and another small portion (9.1%) received a non-valent vaccine (which does not target specific strains but stimulates a general immune response).

Discussion

Knowledge of HPV vaccine

The findings of this study indicate that the majority of PHC workers in Kano Municipal LGA possess a moderate level of knowledge regarding the HPV vaccine. This highlights the need for targeted educational programs to fill knowledge gaps and improve their effectiveness as vaccine advocates. Enhancing PHC workers' knowledge can significantly boost their ability to address vaccine hesitancy and promote higher vaccination rates within the community.

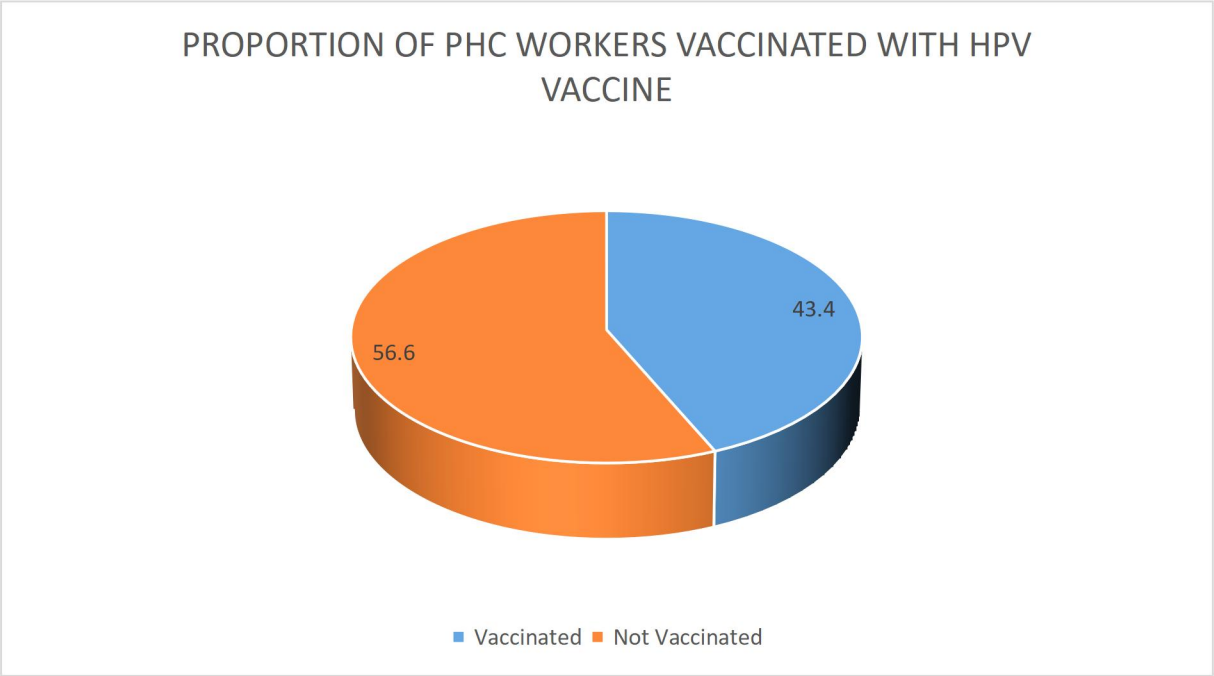

Figure 2: Distribution of PHC workers vaccinated with HPV vaccine

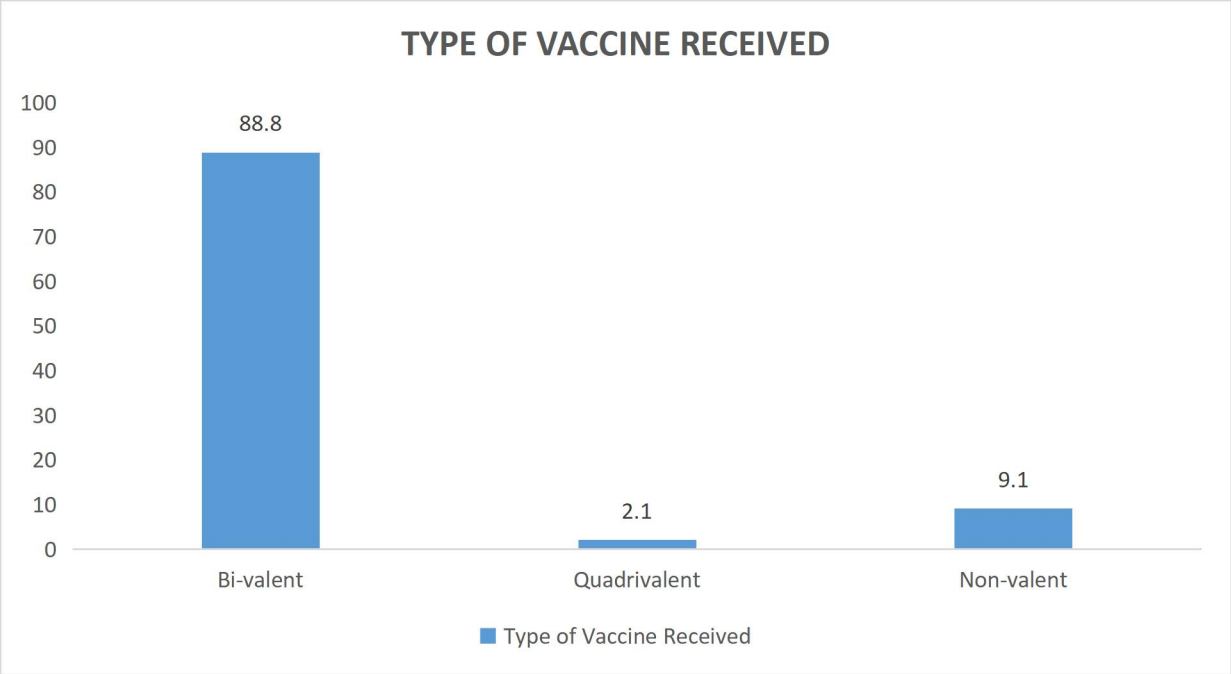

Figure 3: Distribution of Respondents by Type of HPV Vaccine Received

In comparison to other studies, the level of knowledge among PHC workers in Kano Municipal LGA appears to be moderate but not as high as observed in some developed countries. For instance, a study conducted in England by Patel et al. (2016) reported a 60.6% knowledge level among primary care practice nurses, and in Turkey, 94.4% of healthcare workers (HCWs) demonstrated knowledge of the HPV vaccine (Yakşi & Topaktaş, 2023). These figures are significantly higher than the moderate knowledge level (78.3%) found in this study.

Conversely, the findings from Kano are somewhat similar to those from developing countries. For example, in South Africa, Hoque (2016) reported that 50% of doctors had adequate knowledge, and another study found that 67% of respondents were knowledgeable about HPV vaccination (Ajayi, 2017). Similarly, in Zambia, 70.2% of HCWs working in a tertiary hospital were knowledgeable about the HPV vaccine (Lubeya et al., 2022). These studies reflect a range of knowledge levels that are comparable to the findings in Kano.

The similarities in knowledge levels between Kano and other developing regions can be attributed to shared challenges such as limited access to training, insufficient integration of HPV vaccines into routine immunization programs, and financial constraints. For instance, the lack of formal training on HPV vaccination campaigns, as noted by a participant in this study, mirrors findings from Tanta City, Egypt, where nurses' knowledge was limited due to the unavailability and high cost of the vaccine (El-Gamal et al., 2013).

However, significant disparities exist when comparing the knowledge levels in Kano with those in certain parts of Africa and other developing regions. For example, only 25.3% of nurses at Lagos University Hospital in Nigeria and a quarter of HCWs in Benin City were aware of the HPV vaccine (Makwe & Anorlu, 2011; Sadoh et al., 2018). These lower figures highlight the variability in knowledge levels within different regions of the same country.

The higher knowledge levels in developed countries can be attributed to better access to continuous professional development, more robust health education systems, and comprehensive integration of HPV vaccination into public health policies. The use of diverse information sources such as specialist physicians, social media, and health websites in Turkey (Yakşi & Topaktaş, 2023) also contrasts with the more limited access to such resources in developing regions.

These findings underscore the critical need for comprehensive training programs and continuous professional development for PHC workers in Kano Municipal LGA. The disparities between knowledge levels in Kano and those in developed countries highlight the importance of addressing systemic barriers such as financial constraints, lack of training, and limited access to information. Implementing regular training sessions, integrating HPV vaccination education into routine health worker training, and leveraging multiple information sources could significantly enhance knowledge levels.

Furthermore, the moderate knowledge level among the majority of PHC workers suggests that there is a foundational understanding that can be built upon. Tailored educational programs that address specific knowledge gaps and misconceptions can help transform this foundational knowledge into comprehensive understanding. As healthcare providers are pivotal in influencing vaccination uptake, empowering them with thorough knowledge of the HPV vaccine is essential for the success of cervical cancer prevention efforts.

Complacency is characterized by a low perceived risk of vaccine-preventable diseases and the belief that vaccination is not necessary. In the context of this study, the findings indicate a moderate level of knowledge about the HPV vaccine among PHC workers. This moderate knowledge level suggests that some healthcare workers may not fully comprehend the severity and risks associated with HPV, leading to complacency regarding vaccination. The study found that many PHC workers did not view HPV as a significant threat, which aligns with the complacency component of the 3C model. To address this, targeted educational interventions focusing on the risks of HPV and the benefits of vaccination are essential. Increasing awareness about the severe consequences of HPV-related diseases could reduce complacency and enhance vaccine uptake among PHC workers. Improving knowledge among these frontline workers is crucial, as they play a significant role in health education and vaccine advocacy within the community. The finding that only a small percentage had good knowledge highlights a potential resource for peer education programs, where these knowledgeable workers can help educate their colleagues and the community.

The findings of this study reveal that almost half of PHC workers in Kano Municipal LGA have been vaccinated against HPV. This indicates that while a significant portion of healthcare workers have taken proactive steps to protect themselves from HPV-related illnesses, there is still a substantial number who remain unvaccinated. This section compares and contrasts these findings with similar research conducted in other regions, identifies areas of similarities and disparities, provides possible reasons for these differences, and discusses their implications.

The proportion of vaccinated PHC workers in Kano Municipal LGA is notably higher compared to findings from some studies in other countries. For instance, in Turkey, two studies reported very low vaccination rates among male healthcare workers, with only 1% and 5% of male nurses being vaccinated (Nergisli et al., 2016; Sagtas & Gursoy, 2023). The low vaccination rates in Turkey were attributed to a lack of knowledge about HPV infection and vaccination among healthcare workers. Similarly, in Ghana, only 17.6% of healthcare workers had received at least one dose of the HPV vaccine (Ebu, Abotsi-Foli, & Gakpo, 2021).

In contrast, the vaccination rate among healthcare workers in China was higher, with 22.8% of female healthcare workers being vaccinated, and this was related to age (Shao et al., 2023). These figures are still lower than the 43.4% vaccination rate observed in Kano Municipal LGA. The lack of comprehensive studies covering HCWs vaccination status in Nigeria further emphasizes the importance of this study, as it provides a crucial baseline for understanding HPV vaccine uptake among PHC workers in Kano.

The higher vaccination rate in Kano Municipal LGA compared to some other regions may be attributed to several factors. First, targeted education and awareness campaigns about the HPV vaccine may have been more effective in Kano. The relatively higher vaccination rate could also reflect better accessibility and availability of the vaccine in this region. Furthermore, cultural factors and the presence of proactive health policies might have contributed to higher vaccine uptake among PHC workers.

Conversely, the lower vaccination rates observed in Turkey and Ghana could be due to insufficient knowledge and awareness about the HPV vaccine among healthcare workers, as noted in the literature. In Turkey, the lack of adequate knowledge was a significant barrier, while in Ghana, the low vaccination rate could be linked to similar issues of awareness and accessibility. Additionally, gender and age dynamics, as seen in the Chinese study, could influence vaccination rates, suggesting that demographic factors play a role in vaccine uptake.

The findings of this study highlight the need for continuous education and outreach initiatives to increase HPV vaccination rates among PHC workers in Kano Municipal LGA. The fact that 56.6% of PHC workers remain unvaccinated indicates significant room for improvement. Increased vaccination among healthcare workers is crucial, as they are key influencers in the community and can advocate for vaccine uptake among patients, friends, and family.

These findings underscore the critical need for targeted interventions to boost HPV vaccine coverage among PHC workers in Kano Municipal LGA. The relatively high vaccination rate observed in this study compared to other regions is encouraging but also highlights the potential for further improvement. Tailored educational programs addressing specific knowledge gaps and misconceptions about the HPV vaccine are essential. Additionally, ensuring the availability and accessibility of the vaccine can further enhance uptake. The disparities observed between Kano and other regions suggest that localized strategies are necessary to address unique challenges faced by healthcare workers in different settings. For instance, the lack of knowledge in Turkey and Ghana points to the importance of comprehensive training programs. In contrast, leveraging the relatively higher awareness in Kano can help create peer education initiatives where knowledgeable healthcare workers advocate for the vaccine within their professional circles and communities.

Confidence in vaccines refers to trust in their effectiveness, safety, and the competence of the healthcare system delivering them. The significant proportion of unvaccinated healthcare workers suggests that there are still concerns about the vaccine's safety and efficacy. This lack of confidence can be attributed to insufficient information and potential mistrust in the healthcare delivery system. To improve vaccine confidence, the study highlights the need for robust communication strategies that provide clear and accurate information about the HPV vaccine's safety and efficacy. Ensuring that healthcare workers receive reliable and consistent information from trusted sources

can build their confidence in the vaccine and encourage higher vaccination rates.

Conclusion and Recommendations

The study concludes that there is a moderate level of knowledge about the HPV vaccine among PHC workers in Kano Municipal LGA, with a notable proportion of participants demonstrating understanding but also highlighting areas for improvement. Vaccination coverage rates among PHC workers are promising, but significant barriers to vaccine acceptance exist, including cost concerns, perceived vaccine efficacy, and limited access to vaccination services. However, it is recommended that healthcare administrators and local health authorities should collaborate with educational institutions and public health experts to develop and implement structured training programs. These programs should focus on providing accurate information about the HPV vaccine, its benefits, and addressing misconceptions among PHC workers, there should be more availability of vaccines and vaccine related programs, etc. By implementing these recommendations, stakeholders can work together to overcome barriers to HPV vaccine acceptance among PHC workers and ultimately improve vaccination coverage rates, leading to better protection against HPV-related diseases in the community.

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Conflict of Interest

There was no conflict of interest among authors while conducting the study.

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Authors' Contributions

MRU Guarantor, MRU & AS Literature search, data acquisition, data analysis, manuscript editing, JCM Definition of intellectual content, design, data analysis, manuscript editing, MRU & AS Design, definition of intellectual content, literature search, MRU, AS & JCM Data analysis, manuscript editing

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