# Knowledge of Human Papilloma Virus Infections and Vaccination Among Midwives in University of Port Harcourt Teaching Hospital, Rivers State, Nigeria

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## ABSTRACT

**Background:**

Human papillomavirus (HPV) infection is the most common sexually transmitted infection. Persistent infection accounts for about 70% of all invasive cancers, including cervical, anal, penile, and oropharyngeal cancers.

**Objective:**

This study aimed to determine the level of knowledge of HPV infections and vaccination among midwives at the University of Port Harcourt Teaching Hospital, Rivers State.

**Study Design:**

A descriptive cross-sectional survey design was adopted. A convenience sampling technique was used to select 203 midwives from a population of 679. A self-structured and validated questionnaire was used for data collection. Data were analysed using the Statistical Package for the Social Sciences (SPSS) version 22.0, employing descriptive statistics and binary logistic regression.

**Results:**

The findings revealed that midwives had high foundational knowledge of HPV, with 87.7% of respondents correctly identifying sexual intercourse as the primary transmission route and 85.7% acknowledging its link to cervical cancer. However, significant misconceptions about HPV transmission remained evident. Educational qualification significantly influenced midwives' general knowledge of HPV and their clinical decision-making capabilities, as those with advanced degrees (MMW) consistently demonstrated superior knowledge compared to their diploma-qualified counterparts (RM, RN/M). Awareness of the HPV vaccine's preventive role was relatively high (69.5%), but misconceptions regarding its coverage and long-term protective efficacy, alongside concerns about vaccine safety and financial constraints, significantly impeded vaccine uptake.

**Conclusion:**

The study concludes that midwives have a generally high level of knowledge about HPV, but persistent misconceptions about the infection and vaccine remain. Regular training is needed to improve their understanding, increase vaccine uptake, and strengthen preventive healthcare delivery.

**Keywords:** Knowledge, Human Papilloma Virus (HPV), Infections, Vaccination, Midwives, University of Port Harcourt Teaching Hospital, Rivers State, Nigeria.

## INTRODUCTION

Cervical cancer remains a significant public health concern among African women. Globally, it is ranked as the eighth most common cancer and the fourth most commonly occurring cancer in women (World Health

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Organization [WHO], 2020). Human papillomavirus (HPV) is a major contributing factor to cancer-related mortality among women in sub-Saharan Africa (Bhatla & Singhal, 2020). HPV is a double-stranded DNA virus belonging to the Papovaviridae family. It is the most prevalent viral infection affecting the reproductive tract of both men and women, with the peak time for acquiring the infection occurring shortly after the onset of sexual activity (World Health Organization, 2020).

Presently, 200 types of HPV have been identified, of which 40 types specifically affect the human genital tract (Chan et al., 2019). HPV is transmitted primarily through sexual contact and has been linked to a range of cancers including cervical, anal, penile, and oropharyngeal cancers, as well as genital warts and recurrent respiratory papillomatosis (Agyei-Baffour et al., 2020). Globally, HPV accounts for about 5.2% of all human cancer cases, affecting both men and women at various stages of their sexual lives (World Health Organization, 2020).

Based on their carcinogenic potential, HPV types are classified into high-risk and low-risk categories. The high-risk group includes types 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, and 68, while types 53, 66, 70, 73, and 82 are considered potentially high-risk. Among them, types 16 and 18 are the most virulent, accounting for nearly 70% of all invasive cervical cancers globally, whereas types 6 and 11 are generally classified as low-risk (Chan et al., 2019).

The Catalan Institute of Oncology (ICO) and the International Agency for Research on Cancer (IARC) (2019) have observed that HPV can be transmitted even without penetrative sexual activity, as skin-to-skin contact is also a recognised route of transmission. In many cases, HPV infections resolve spontaneously without manifesting symptoms. However, persistent infection with certain types, particularly types 16 and 18 can result in precancerous lesions which, if left untreated, may progress to cervical cancer. When identified early and managed appropriately, HPV-related conditions are often curable (WHO, 2020).

Vaccination has proven to be a critical tool in the prevention of HPV infections and related cancers. Bloem and Ogbuanu (2017) noted that HPV vaccines, available since 2006, can significantly reduce the morbidity and mortality associated with cervical cancer. These vaccines protect against high-risk types 16 and 18, as well as low-risk types 6 and 11. According to WHO (2020), three vaccines, bivalent, quadrivalent, and nonvalent are widely available and highly effective in preventing infections caused by HPV types responsible for the majority of cervical cancer cases.

Midwives play a pivotal role in immunisation programmes and public health education, especially in relation to maternal and reproductive health. Their understanding of HPV and its vaccine strongly influences vaccine uptake, adherence, and acceptance among women. As frontline health professionals, their ability to inform, educate, and guide patients can substantially impact disease prevention and health promotion outcomes in their communities.

Studies from several developing countries have highlighted the link between healthcare providers' knowledge of HPV and their support for vaccination. For instance, Gol and Erkin (2016) reported that nurses' knowledge and practices regarding HPV and its vaccine were below expectations. Similarly, Ebu et al. (2021) found notable knowledge gaps among nurses and midwives concerning cervical cancer risk factors and attitudes toward HPV vaccination. Chawla et al. (2016) also observed a limited awareness among healthcare providers in India in respect to the causes, symptoms, and risk factors associated with cervical cancer.

Despite global awareness campaigns, few studies have specifically examined the level of HPV-related knowledge among midwives working in tertiary health institutions in southern Nigeria. Therefore, this study was designed to assess the knowledge of HPV infection and vaccination among midwives in the University of Port Harcourt Teaching Hospital, Rivers State.

## METHODS AND METHODS

This study adopted a descriptive cross-sectional survey design involving midwives working at the University of Port Harcourt Teaching Hospital (UPTH), Rivers State. A total sample of 203 midwives was selected from a

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population of 679 midwives serving in the referral hospital, using convenience sampling technique. A self-structured questionnaire was employed to collect data on socio-demographic characteristics, general knowledge of Human Papillomavirus (HPV), clinical and behavioural knowledge of HPV infection, and knowledge of HPV vaccination. Data were analysed using the Statistical Package for the Social Sciences (SPSS), version 22.0. Descriptive statistics were presented as percentages, and inferential analysis was conducted using binary logistic regression at a 0.05 level of significance.

## RESULTS AND DISCUSSIONS

The result presented in Table 3.1 revealed that 100% of the respondents were females. Twenty-five percent (25%) of the respondents were between the ages of 21 and 30 years, 45% were between 31 and 40 years, 20% were between 41 and 50 years, while 10% were between 51 and 60 years. None of the respondents were above 61 years. Regarding educational qualification, 25% had Registered Midwife (RM), 40% had Registered Nurse/Registered Midwife (RN/RM), 25% had a Bachelor of Science (B.Sc.) in Nursing or a related field, while 10% had a Master of Midwifery (MMW). Concerning religious affiliation, 84% of the respondents were Christians, 1% were Muslims, and 5% belonged to other religions. With regard to ethnicity, 25% of the respondents were Yoruba, 46% were Igbo, 9% were Hausa, and 20% were from other ethnic groups.

**Table 3.1: Percentage and frequency of demographic data**

| **Gender** | **Frequency** | **Percentage (%)** |
|---|---|---|
| Male | 0 | 0 |
| Female | 203 | 100 |
| **Age** | | |
| 21 -30 | 50 | 25 |
| 31- 40 | 93 | 45 |
| 41– 50 | 40 | 20 |
| 51- 60 | 20 | 10 |
| 61 and above | 0 | 0 |
| **Qualification** | | |
| RM | 50 | 25 |
| RN/M | 83 | 40 |
| Bsc | 50 | 25 |
| Mmw | 20 | 10 |
| **Religion** | | |
| Christianity | 170 | 84 |
| Muslim | 10 | 5 |
| Others | 23 | 11 |

**Table 3.2.1: Binary Logistic Regression results on midwives' knowledge of HPV and their educational qualification**

| **S/n** | **Item** | **% Correct (Yes)** | **Wald** | **p-value** | **Exp (B)** | **95% CI Lower** | **95% CI Upper** |
|---|---|---|---|---|---|---|---|
| 1 | HPV is a double stranded | 72.9% | 30.833 | 0.000 | 1.462 | 1.278 | 1.671 |

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | DNA virus | | | | | | |
| 2 | HPV belong to Papovaviridae family | 45.8% | 3.522 | 0.061 | 0.894 | 0.795 | 1.005 |
| 3 | There are more than 150 types of HPV | 70.4% | 11.314 | 0.001 | 1.231 | 1.091 | 1.39 |
| 4 | HPV does not attack only genital tracts of women | 63.1% | 2.333 | 0.127 | 1.095 | 0.975 | 1.231 |
| 5 | HPV does not cause only cervical cancer | 63.5% | 6.31 | 0.012 | 1.164 | 1.034 | 1.311 |
| 6 | HPV is transmitted through skin-to-skin contact | 82.3% | 45.856 | 0.000 | 1.672 | 1.441 | 1.94 |
| 7 | HPV accounts for 90% of cervical cancer | 85.7% | 58.284 | 0.000 | 1.928 | 1.629 | 2.283 |
| 8 | HPV is the most common causes of sexually transmitted infection in humans | 75.9% | 31.948 | 0.000 | 1.475 | 1.289 | 1.689 |
| 9 | HPV cause of genital wart | 94.6% | 70.251 | 0.000 | 3.192 | 2.433 | 4.187 |
| 10 | HPV type 16 and 18 is the type that causes cervical cancer | 69.5% | 5.746 | 0.017 | 1.156 | 1.027 | 1.301 |
| 11 | HPV type 6 and 11 causes genital warts | 70.0% | 7.513 | 0.006 | 1.181 | 1.049 | 1.331 |
| 12 | Having sex at early age increases the risk of having HPV infection | 88.2% | 70.827 | 0.000 | 2.923 | 2.277 | 3.752 |

Table 3.2.1 shows that the midwives demonstrated basic structural knowledge, as 72.9% of them knew that HPV is a double-stranded DNA virus (item 1, p = 0.000, OR = 1.462), indicating that this foundational concept is well understood by the respondents. However, only 45.8% of the midwives knew that HPV belongs to the Papovaviridae family (item 2), and this was not statistically significant (p = 0.061), suggesting that this technical detail was weakly understood across qualification levels.

In terms of strain-specific awareness, the results show moderate understanding. A total of 70.4% of the midwives knew there are more than 150 types of HPV (item 3, p = 0.001), and 63.5% understood that HPV causes more than just cervical cancer (item 5, p = 0.012). Building on this, recognition of high-risk and low-risk strains followed consistent trends, as 69.5% of the midwives correctly identified types 16 and 18 as cancer-causing strains (item 10, p = 0.017), while 70.0% recognised types 6 and 11 as responsible for genital warts (item 11, p = 0.006). Responses to these items showed that educational qualification had a meaningful influence, suggesting that higher academic training enhanced midwives' ability to recall and apply clinically specific knowledge. Beyond strain awareness, knowledge related to transmission and behavioural risk was both high and strongly associated with qualification. A total of 82.3% of the midwives understood that HPV is transmitted through skin-to-skin contact (item 6, p = 0.000), while 75.9% knew it is the most common cause of sexually transmitted infections in humans (item 8, p = 0.000). This understanding was further reinforced in item 12, where 88.2% of the midwives recognised that early sexual activity increases the risk of HPV infection (p = 0.000, OR = 2.923), reflecting the highest behavioural awareness with the strongest observed qualification effect.

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**Table 3.2.2: Binary Logistic Regression Results Showing the Effect of Educational Qualification on Midwives' Knowledge of HPV.**

| | B | S.E. | Wald | df | Sig. | Exp(B) | 95% C.I.for EXP(B) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lower | Upper |
| Qualification | | | 19.488 | 3 | .000 | | | |
| RM | -.909 | 1.133 | .644 | 1 | .422 | .403 | .044 | 3.711 |
| RN/M | -2.846 | 1.060 | 7.203 | 1 | .007 | .058 | .007 | .464 |
| BSc | -3.273 | 1.114 | 8.637 | 1 | .003 | .038 | .004 | .336 |
| Constant | 3.892 | 1.010 | 14.843 | 1 | .000 | 49.000 | | |
| a. Variable(s) entered on step 1: Educational Qualification. | | | | | | | | |

**Note:** MMW (Master's in Midwifery) was the reference category for educational qualification.

The analysis in Table 3.2.2 provides comparative regression coefficients for each educational qualification group, measured against the reference category, MMW. Results show that midwives with BSc degrees had the steepest negative coefficient (B = -3.273, p = .003, Exp(B) = 0.038), indicating they were significantly less likely to demonstrate HPV knowledge at the same level as their MMW counterparts. The RN/M group also showed a significant knowledge deficit (B = -2.846, p = .007, Exp(B) = 0.058), further confirming that diploma-level training may be clinically intensive but does not match the theoretical and epidemiological depth gained through bachelor and master's-level academic training. In contrast to these statistically significant effects, the RM group showed a negative but non-significant effect (B = -0.909, p = .422), suggesting the presence of a variability, which may stem from the possibility that some registered midwives benefit from field experience.

**Table 3.2.3: Table: Summary of Regression analysis of showing the Strength and Significance of Relationship between Midwives Qualification and Knowledge of HPV**

| Predictor | R | $R^2$ | Adjusted $R^2$ | Std. Error of Estimate | t | p-value |
|---|---|---|---|---|---|---|
| Qualification | 0.343 | 0.118 | 0.113 | 0.31020 | 20.343 | 0.000 |

Dependent Variable: Midwives' Knowledge Predictors: (Constant), Educational Qualification.

The regression summary presented in Table 3.2.3 shows a moderate but statistically significant relationship between midwives' educational qualification and their overall HPV knowledge. The correlation coefficient (R = 0.343) and the coefficient of determination ($R^2$ = 0.118) indicate that educational qualification accounted for approximately 11.8% of the total variation in knowledge scores. The model is significant (t = 20.343, p < .001) and confirms that the midwives' educational qualification had a meaningful effect on their knowledge of HPV.

**Table 3.3.1: Binary Logistic Regression Results for Items Assessing Midwives' Clinical and Behavioural Knowledge of HPV by Educational Qualification**

| S/n | Items | % Correct (Yes) | Wald | p-value | Exp (B) | 95% CI Lower | 95% CI Upper |
|---|---|---|---|---|---|---|---|
| 1 | Human papilloma virus infection is a viral infection that affect both men and women | 74.4% | 0.687 | 0.407 | 0.866 | 0.617 | 1.217 |

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|---|---|---|---|---|---|---|---|
| 2 | Human papilloma virus infection is a viral infection that causes cervical cancer. | 75.9% | 9.348 | 0.002 | 1.863 | 1.25 | 2.777 |
| 3 | HPV infection does not affect only those that are promiscuous | 72.9% | 1.499 | 0.221 | 0.812 | 0.581 | 1.134 |
| 4 | HPV infection cannot affect those that have single sex partners | 47.3% | 21.712 | 0.000 | 2.271 | 1.608 | 3.207 |
| 5 | HPV is transmitted through skin to skin contact | 84.7% | 0.055 | 0.814 | 1.051 | 0.692 | 1.597 |
| 6 | HPV is transmitted through sexual intercourse | 87.7% | 7.19 | 0.007 | 2.11 | 1.222 | 3.641 |
| 7 | Most women will acquire the HPV infections within their life | 77.3% | 0.141 | 0.707 | 1.071 | 0.748 | 1.535 |
| 8 | Most genital HPV infections can resolve spontaneously. | 70.9% | 0.053 | 0.818 | 0.962 | 0.693 | 1.336 |
| 9 | People can transmit to their partner even if they don't have symptom | 74.4% | 0.002 | 0.966 | 1.008 | 0.715 | 1.419 |
| 10 | Risk factors include multiple partners, commercial sex workers, homosexuals | 81.3% | 0.766 | 0.382 | 1.192 | 0.805 | 1.764 |
| 11 | HPV infection does not always present with visible signs and symptoms | 72.9% | 0.021 | 0.886 | 1.025 | 0.732 | 1.435 |
| 12 | HPV cannot be diagnosed by doing High vaginal swab | 77.8% | 0.117 | 0.732 | 1.065 | 0.742 | 1.53 |
| 13 | HPV infection can be diagnosed by having cervical screening test | 70.0% | 36.811 | 0.000 | 5.005 | 2.975 | 8.421 |
| 14 | HPV infection can be cured with antibiotics | 42.4% | 17.206 | 0.000 | 2.078 | 1.471 | 2.936 |
| 15 | HPV does not require any treatment at times | 84.2% | 0.021 | 0.884 | 0.97 | 0.645 | 1.46 |
| 16 | HPV infection cannot be prevented by taking balanced diet | 78.8% | 12.271 | 0.000 | 2.191 | 1.413 | 3.398 |
| 17 | HPV infection can be prevented by HPV vaccination | 85.2% | 7.503 | 0.006 | 0.552 | 0.361 | 0.845 |
| 18 | Using condoms reduces the risk of getting HPV | 62.6% | 1.218 | 0.270 | 0.84 | 0.617 | 1.144 |

Table 3.3.1 highlights how midwives responded to items measuring their clinical and behavioural knowledge of HPV. In item 1, 74.4% of the midwives were aware that HPV affects both men and women. This was a widely held view across qualification levels, with no significant difference observed ($p = 0.407$). A similar trend was observed in item 3, where 72.9% of the respondents rejected the belief that HPV affects only promiscuous individuals ($p = 0.221$). Likewise, in item 7, 77.3% recognised that most women are likely to contract HPV at some point in their lives, again without significant variation ($p = 0.707$). These findings suggest that basic awareness was fairly distributed among all respondents. However, some questions revealed sharper contrasts. In item 2, for instance, 75.9% of the respondents identified a link between HPV and cervical

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cancer, and this was significantly influenced by educational qualification (p = 0.002). The odds ratio was 1.86, indicating that midwives with higher qualifications were nearly twice as likely to understand this connection. An even stronger divide appeared in item 4, where only 47.3% correctly stated that HPV can affect individuals with a single sex partner. Yet, the difference here was statistically significant (p = 0.000, OR = 2.27), suggesting that educational qualification played a key role in dispelling this common misconception. Transmission-related knowledge was generally strong in item 5 and 6. In item 5, 84.7% of the midwives mentioned skin-to-skin contact as a means of spreading HPV, though responses here did not differ much across qualification (p = 0.814). Midwives also demonstrated a reasonable understanding of HPV's clinical progression as evidenced in items 8 and 11. In item 8, 70.9% of the respondents showed strong awareness that many infections linked to HPV resolve spontaneously (p = 0.818).

When it came to diagnosis, the pattern was more mixed. In item 12, 77.8% of the midwives correctly ruled out high vaginal swab as a diagnostic tool (p = 0.732), but item 13 clearly stood apart, as only 70.0% of the respondents identified cervical screening as the correct method, yet qualification made a striking difference (p = 0.000). In terms of treatment knowledge, only 42.4% of the respondents correctly answered that antibiotics are not used to treat HPV, yet the result was statistically significant (item 14, p = 0.000, OR = 2.08), indicating that the education level of the respondents helped to reduce this misconception. Conversely, 84.2% of the participants in item 15 knew that treatment is not always necessary (p = 0.884), which appeared to be common knowledge across all qualification levels. Prevention-related questions brought in some variation in items 16 and 17. In item 16, 78.8% of the respondents answered correctly that a balanced diet cannot prevent HPV, and qualification made a clear difference in their responses (p = 0.000, OR = 2.19). In contrast, item 18, which assessed knowledge of condom use in HPV prevention, showed that 62.6% of the respondents answered correctly; however, the variation in responses across qualification levels was not statistically significant (p = 0.270).

**Table 3.3.2: Binary Logistic Regression Results for the Effect of Educational Qualification on Midwives' Clinical Decision-Making Regarding HPV Infection**

| | B | S.E. | Wald | df | Sig. | Exp(B) | 95% C.I.for EXP(B) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lower | Upper |
| Qualification | | | 14.315 | 3 | .003 | | | |
| RM | -1.627 | .489 | 11.066 | 1 | .001 | .197 | .075 | .513 |
| RN/M | -1.503 | .524 | 8.235 | 1 | .004 | .222 | .080 | .621 |
| BSc | -.258 | .763 | .114 | 1 | .735 | .773 | .173 | 3.445 |
| Constant | 1.992 | .435 | 20.960 | 1 | .000 | 7.333 | | |
| a. Variable(s) entered on step 1: Educational Qualification. | | | | | | | | |

**Note:** MMW (Master's in Midwifery) was the reference category for educational qualification.

The binary logistic regression analysis (Table 3.3.2) revealed that educational qualification significantly influenced midwives' clinical decision-making regarding HPV infection (Wald = 14.315, df = 3, p = .003). Compared to the reference group (Master of Midwifery), RM-qualified midwives were significantly less likely to make accurate clinical decisions (B = -1.627, p = .001, OR = 0.197), as were RN/M-qualified midwives (B = -1.503, p = .004, OR = 0.222). These findings indicate a marked disadvantage among midwives trained at the diploma level. BSc-qualified midwives also showed reduced odds (OR = 0.773), but this was not statistically significant ( = .735). The constant (OR = 7.333, p = .000) confirms that MMWs had the highest likelihood of correct decision-making.

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**Table 3.3.3: Regression Analysis of Educational Qualification as a Predictor of Midwives' Clinical and Behavioural Knowledge on HPV Infection**

| Predictor | R | $R^2$ | Adjusted $R^2$ | Std. Error of Estimate | t | p-value |
|---|---|---|---|---|---|---|
| Qualification | 0.234 | 0.055 | 0.050 | 0.34193 | 16.948 | 0.000 |

Dependent Variable: Clinical and Behavioural Knowledge on HPV Infection

Predictors: (Constant), Educational Qualification.

The analysis in Table 3.3.3 shows that the correlation coefficient (R = 0.234) indicates a weak but positive relationship, while the $R^2$ value (0.055) reveals that educational qualification explains 5.5% of the variance in knowledge levels. The adjusted $R^2$ (0.050) confirms that the model has a modest explanatory strength. The standard error of estimate (0.34193) indicates that the prediction is moderately accurate. Furthermore, the high t-value of 16.948 is significant at a p-value of 0.000, implying that higher educational qualifications are significantly linked to better knowledge of HPV among midwives.

**Table 3.4.1: Binary Logistic Regression Results for Items Assessing Midwives' Knowledge of HPV Vaccination by Educational Qualification**

| S/n | Items | % Correct (Yes) | Wald | p-value | Exp (B) | 95% CI Lower | 95% CI Upper |
|---|---|---|---|---|---|---|---|
| 1 | HPV vaccines help to prevent HPV infection | 69.5% | 20.451 | 0.000 | 0.436 | 0.304 | 0.625 |
| 2 | HPV vaccines prevent all types of cancer | 30.0% | 2.208 | 0.137 | 1.28 | 0.924 | 1.772 |
| 3 | HPV vaccine is best taken before starting to have sexual activities | 65.5% | 14.131 | 0.000 | 0.526 | 0.376 | 0.735 |
| 4 | HPV vaccination is taken as two injections doses six months apart | 69.5% | 1.253 | 0.263 | 0.831 | 0.602 | 1.149 |
| 5 | HPV vaccines are given to all women | 28.1% | 0.652 | 0.419 | 1.146 | 0.823 | 1.595 |
| 6 | The HPV vaccine is given to girls and boys | 66.0% | 10.478 | 0.001 | 1.779 | 1.255 | 2.522 |
| 7 | Girls should be given the vaccine before they become sexually active | 80.3% | 2.85 | 0.091 | 1.409 | 0.946 | 2.098 |
| 8 | The HPV vaccine does not last a life time | 71.3% | 7.966 | 0.005 | 1.694 | 1.175 | 2.443 |
| 9 | The HPV vaccine is cervarix and qardasil | 73.4% | 7.923 | 0.005 | 1.71 | 1.177 | 2.484 |
| 10 | HPV vaccine is not given to children below 9 years | 79.3% | 4.393 | 0.036 | 1.531 | 1.028 | 2.281 |
| 11 | The HPV vaccine is started from 9yrs – 14yrs | 75.9% | 2.915 | 0.088 | 1.376 | 0.954 | 1.985 |
| 12 | The HPV vaccine can be given at 26 years | 85.2% | 0.038 | 0.845 | 1.043 | 0.683 | 1.593 |
| 13 | The HPV vaccine is given to adults | 68.0% | 0.017 | 0.895 | 1.022 | 0.742 | 1.408 |
| 14 | The dose of the 0.5ml and given intramuscularly | 75.4% | 1.459 | 0.227 | 1.246 | 0.872 | 1.78 |

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 15 | The HPV vaccines have no adverse effect | 25.1% | 35.456 | 0.000 | 0.174 | 0.098 | 0.31 |
| 16 | The HPV vaccine is readily available | 46.0% | 0.173 | 0.678 | 0.936 | 0.686 | 1.277 |
| 17 | The HPV vaccine is very expensive | 90.6% | 7.277 | 0.007 | 2.448 | 1.277 | 4.69 |

Table 3.4.1 shows that midwives demonstrated fair knowledge of HPV vaccination; however, educational qualification significantly shaped their responses in several critical areas. For instance, 69.5% of the respondents correctly recognised that the vaccine prevents HPV infection (item 1), while 65.5% affirmed that the ideal time for vaccination is before the onset of sexual activity (item 3). Both findings were statistically significant (p = 0.000), with odds ratios of 0.436 and 0.526, respectively, indicating that midwives with higher academic qualifications were significantly more likely to respond correctly. This understanding was further supported by 80.3% of respondents who agreed that girls should be vaccinated before their sexual debut (item 7), although this particular association did not reach statistical significance (p = 0.091). By contrast, knowledge relating to the broader scope of the vaccine was less robust. Only 30.0% correctly rejected the misconception that HPV vaccines prevent all cancers (item 2), and just 28.1% disagreed with the notion that the vaccine is administered to all women (item 5). Both items lacked statistically significant association with educational qualification, suggesting that foundational misconceptions were present across all qualification levels. In contrast, 66.0% of respondents correctly identified that the HPV vaccine is recommended for both boys and girls (item 6), and this response demonstrated a statistically significant association with educational qualification (p = 0.001, OR = 1.779). This indicates that midwives with higher academic exposure were substantially more likely to possess accurate knowledge regarding vaccine eligibility.

Midwives also demonstrated moderate awareness of the vaccine's characteristics. Specifically, 71.3% correctly stated that the HPV vaccine does not offer lifelong protection (item 8), and 73.4% accurately identified Cervarix and Gardasil as the approved vaccines (item 9). Both items showed statistically significant associations with educational qualification (p = 0.005), reinforcing the influence of academic training on clinical accuracy. Additionally, 79.3% of respondents correctly noted that the vaccine is not administered to children under the age of nine (item 10, p = 0.036), reflecting good procedural understanding among the respondents. Items related to age eligibility (items 11–13) recorded high correct response rates ranging from 68.0% to 85.2%, but none showed statistically significant variation across qualification levels. Similarly, knowledge of administration details, such as the dosing schedule and injection route (items 4 and 14), appeared widely shared among respondents, with no significant influence attributable to educational qualification.

A critical knowledge gap emerged in item 15, where only 25.1% of respondents correctly rejected the claim that HPV vaccines have no adverse effects. This item yielded the strongest statistical significance (p = 0.000, OR = 0.174), clearly indicating that higher academic qualifications provided substantial protection against misinformation. Furthermore, 46.0% of respondents reported that the HPV vaccine is readily available (item 16), revealing that more than half of the midwives perceived access to the vaccine as inconsistent. This perception did not differ significantly by qualification (p = 0.678), suggesting a shared systemic concern. Notably, 90.6% of the respondents recognised that the vaccine is expensive (item 17, p = 0.007, OR = 2.448), with those holding higher qualifications significantly more likely to identify cost as a key barrier. This underscores the role of academic training not only in strengthening clinical knowledge but also in enhancing awareness of structural and financial constraints that impact HPV vaccine accessibility.

Table 3.4.2: Binary Logistic Regression Results Showing the Effect of Educational Qualification on Midwives' Knowledge of HPV Vaccination

| | B | S.E. | Wald | df | Sig. | Exp(B) | 95% C.I.for EXP(B) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lower | Upper |
| Qualification | | | 17.132 | 3 | .001 | | | |
| RM | -1.823 | .701 | 6.764 | 1 | .009 | .161 | .041 | .638 |
| RN/M | -1.396 | .613 | 5.190 | 1 | .023 | .247 | .074 | .823 |

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| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| BSc | .541 | .731 | .547 | 1 | .459 | 1.717 | .410 | 7.196 |
| Constant | 2.442 | .521 | 21.951 | 1 | .000 | 11.500 | | |
| a. Variable(s) entered on step 1: Educational Qualification. | | | | | | | | |

**Note.** MMW (Master's in Midwifery) was the reference category for educational qualification.

The data presented in Table 3.4.2 clearly establish a statistically significant association between educational qualification and midwives' knowledge of HPV vaccination (Wald = 17.132, p = .001). Using the Master of Midwifery (MMW) group as the reference category, the analysis revealed that midwives who possessed RM and RN/M qualifications demonstrated markedly lower levels of vaccination knowledge. In particular, RM-qualified midwives exhibited the weakest knowledge profile, as indicated by a significantly negative coefficient (B = -1.823, p = .009, Exp(B) = 0.161), followed by those with RN/M qualifications (B = -1.396, p = .023, Exp(B) = 0.247). These results indicate a substantial knowledge gap between midwives with diploma-level training and those with advanced academic preparation. Although midwives that hold a BSc degree recorded higher odds of possessing strong vaccination knowledge (Exp(B) = 1.717), the non-significant p-value (p = .459) indicates that this difference is not supported statistically and should not be interpreted as a reliable effect. Collectively, these findings underscore the critical role of academic advancement in shaping professional competence. Midwives with master's-level qualifications consistently outperformed their less-educated peers, reinforcing the value of postgraduate education in enhancing the depth and accuracy of HPV vaccination knowledge

**Table 3.4.3: Linear Regression Summary Showing the Predictive Effect of Educational Qualification on Midwives' Knowledge of HPV Vaccination**

| Predictor | R | $R^2$ | Adjusted $R^2$ | Std. Error of Estimate | t | p-value |
|---|---|---|---|---|---|---|
| Qualification | 0.331 | 0.110 | 0.105 | 0.4007 | 5.91 | 0.000 |

Dependent Variable: Knowledge HPV Vaccination

Predictors: (Constant), Qualification

The regression summary in Table 3.4.3 confirms that educational qualification has a statistically significant

influence on HPV vaccination knowledge. The correlation coefficient (R = 0.331) and the coefficient of determination ($R^2$ = 0.110) indicate that qualification accounted for 11.0% of the variance in vaccine knowledge scores. The t-value of 5.91 and a p-value of 0.000 imply that the relationship is statistically significant.

## DISCUSSION OF FINDINGS

The findings from this study revealed that midwives demonstrated a robust foundational high knowledge of HPV, as 72.9% identified it as a double-stranded DNA virus and 85.7% recognised its association with cervical cancer. This aligns with the observations of Sherman et al. (2018), who reported that general HPV knowledge was high among healthcare providers, although some notable misconceptions still persisted For instance, 12.7% of participants in Sherman et al.'s study mistakenly linked HPV to HIV/AIDS, underscoring the persistence of misinformation even among otherwise knowledgeable health workers. Similarly, the present study reveals notable gaps, particularly in the classification of HPV into the Papovaviridae family, which was correctly identified by less than half of the midwives. This indicates an area that requires targeted educational interventions. This study further revealed notable variability in clinical and behavioural knowledge among midwives. Findings showed that the midwives had high levels of understanding of the modes of HPV transmission, particularly through sexual intercourse (87.7%), a result that is corroborated by Görkem et al. (2015), who observed high awareness level among nurses and midwives on HPV transmission routes.

However, notable gaps were identified in relation to common misconceptions among the midwives, particularly the belief that HPV infection affects only individuals with multiple sexual partners. This

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misconception was correctly refuted by only 47.3% of respondents in the present study and was significantly influenced by educational qualification. This supports the findings of Dinas et al. (2009), who reported a significant association between higher educational levels and increased awareness.

This study revealed significant differences in the knowledge levels of midwives based on educational qualification, particularly in relation to their clinical decision-making capabilities concerning HPV infection management. Midwives and nurses with diploma-level training (RM, RN/M) demonstrated statistically significant knowledge deficits when compared to their counterparts with master's degrees (MMW). This finding is consistent with the report by Genc et al. (2013), who observed a notable improvement in HPV-related knowledge among Turkish midwifery students following advanced academic training.These studies collectively reinforce the fact that higher academic qualification enhances theoretical and practical clinical understanding necessary for informed HPV-related healthcare decisions.

Concerning HPV vaccination knowledge, midwives demonstrated uneven knowledge distribution. Although awareness among midwives regarding the vaccine's ability to prevent HPV infection was relatively high (69.5%), some critical misunderstandings were still prevalent, particularly misconceptions about the vaccine's ability to protect against all types of cancer. This finding aligns with the report by Ebu et al. (2021), who identified significant misconceptions and knowledge gaps among nurses and midwives concerning cervical cancer risk factors and HPV vaccination in Ghana. These persistent gaps underscore a broader global need for intensification of educational strategies and sustained professional development initiatives.

Furthermore, regression analysis shed light on the pivotal role of educational qualification as a significant predictor of vaccination knowledge. RM and RN/M midwives significantly lagged behind their MMW and BSc counterparts in knowledge of HPV vaccination - a pattern that mirrors the report of Goddy et al. (2020), who reported a considerable gap between awareness and the practical application of knowledge among health workers in Nigeria. These disparities reinforce the urgent need for structured educational interventions at the diploma training level. This study identified leading barriers to HPV vaccination uptake; with vaccine safety concerns and financial constraints standing out as key challenges that have continues to hinder access. These same issues were also highlighted in the reports by Sherman et al. (2018) and Onyema et al. (2023) as major obstacles to vaccine acceptance. These authors also reported that additional material costs, misinformation, and safety concerns were significant hindrances to vaccine acceptance, underscoring the urgency of the need to address these barriers through targeted awareness campaigns and well-structured government interventions, in order to substantially improve vaccine uptake and reduce associated risks within the population.

## CONCLUSION

The findings from this study clearly demonstrate that midwives at the University of Port Harcourt Teaching Hospital possess a commendable foundational knowledge of HPV infections and vaccination. Their overall knowledge level was significant; however, substantial gaps were also observed in specific areas. Educational qualification emerged as a key factor influencing their understanding of various aspects of HPV. Midwives who hold advanced academic degrees consistently demonstrated superior clinical insight compared to those with diploma-level training. The presence of critical misconceptions regarding HPV transmission, its clinical implications, and knowledge deficits related to aspects of the HPV vaccine underscores the need for structured educational interventions and continuous professional development programmes, particularly for midwives with lower academic qualifications. Ultimately, improving midwives' knowledge and correcting the prevalent misinformation will contribute significantly to better healthcare outcomes, increased vaccination uptake, and reduced HPV-related health risks within the broader community served by the University of Port Harcourt Teaching Hospital.

## RECOMMENDATIONS

Based on the findings, the following solutions are recommended:

1. The UPTH Management should mandate structured CPD programmes for diploma-qualified midwives (RM, RN/M), with focus on HPV transmission, vaccine schedules, and clinical decision-making.

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Participation should be tracked and integrated into routine performance appraisal systems to ensure compliance and measurable improvement.

2. The Nursing Education Unit of UPTH should organise quarterly in-service training sessions on HPV-related topics to address identified misconceptions, including the vaccine's scope, cancer prevention efficacy, and transmission myths.
3. The Rivers State Ministry of Health and Public Health Department should develop and deploy targeted HPV awareness campaigns within the hospital and communities. The campaigns should include visual aids, translated materials, and interactive sessions to address misinformation about HPV and improve community understanding regarding vaccine safety and eligibility.
4. The Rivers State Ministry of Health should initiate a policy directive to subsidise the cost of HPV vaccines in public health institutions. This policy should prioritise hospitals serving large female populations, including University of Port Harcourt Teaching Hospital, and should include a funding mechanism to ensure sustained access and uptake.

## REFERENCES


1. Agyei-Baffour,P., Asare,M., Lanning,B., Koranteng,A. Millan,C. & Commeh, E (2020).Human papilloma virus vaccination practices and perceptions among Ghanaian healthcare providers. A qualitative study based on multi-theory model. PLoS ONE,15(10), 741-749. https://doi.org/10.1371/journal.pone.0240657
2. Bhatla, N. & Singhal S. (2020). Primary HPV screening for cervical cancer**.** Best Pract. Res. Clin. Obstet. Gynaecol., 65 (1), 98-108. https://doi.org/10.1016/j.bpobgyn.
3. Bloem P., & Ogbuanu, I. (2017). Vaccination to prevent human papillomavirus infections: From promise to practice. PLoS Med, 14(6), https://doi.org/10.1371/journal.pmed.1002325
4. Chan, C. K., Aimagambetova, G., Ukybassova, T., Kongrtay, K., & Azizan, A. (2019). Human papillomavirus infection and cervical cancer: epidemiology, screening, and vaccination-review of current perspectives. Journal of Oncology, 2(1), 1687-8450. https://doi.org/10.1155/2019/3257939
5. Chawla, P. C., Chawla, A., & Chaudhary, S. (2016). Knowledge, attitude & practice on human papillomavirus vaccination: A cross-sectional study among healthcare providers. The Indian Journal of Medical Research, 144(5), 741–749. https://doi.org/10.4103/0971-5916.200895
6. Dinas, K., Nasioutziki, M., Arvanitidou, O., Mavromatidis, G., Loufopoulos, P., Pantazis, K., ... & Loufopoulos, A. (2009). Awareness of human papillomavirus infection, testing and vaccination in midwives and midwifery students in Greece. Journal of Obstetrics and Gynaecology, 29(6), 542–546
7. Ebu, N. I., Abotsi-Foli, G. E., & Gakpo, D. F. (2021). Nurses' and midwives' knowledge, attitudes, and acceptance regarding human papillomavirus vaccination in Ghana: A cross-sectional study. BMC Nursing, 20(11). https://doi.org/10.1186/s12912-020-00530-x
8. Genc, R. E., Sarican, E. S., Turgay, A. S., Icke, S., Sari, D., & Saydam, B. K. (2013). Determination of knowledge of Turkish midwifery students about human papilloma virus infection and its vaccines. Asian Pacific Journal of Cancer Prevention, 14(11), 6775–6778. http://dx.doi.org/10.7314/APJCP.2013.14.11.6775
9. Goddy, B., Tamunomie, N. K., & Samuel, J. C. (2020). Assessment of cervical cancer prevention practice among female health workers at a Level Three Hospital in Port Harcourt, Nigeria. Niger Delta Journal of Medical Sciences, 2(3), 7–16
10. Gol,I. & Erkin, O.(2016). Knowledge and practices of nurses on cervical cancer, HPV and HPV vaccine in Cankiri state hospital, Turkey. Journal of Pakistan Medical Association, 66 (12), 1621-1626. PMID: 28179702
11. Görkem, Ü., Toğrul, C., İnal, H. A., Özgü, B. S., & Güngör, T. (2015). Knowledge and attitudes of allied health personnel in university hospital related to human papilloma virus and the vaccine. Turkish Bulletin of Hygiene and Experimental Biology, 72(4), 303–310
12. Jeyachelvi, K., Su, T. T., & Sulaiman, A. S. (2016). Knowledge, attitude and practice of HPV vaccination among nurses in Kelantan, Malaysia. Journal of Obstetrics and Gynaecology Research, 42(10), 1286–1292

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI | Volume XII Issue XV May 2025 | Special Issue on Public Health

13. Makwe, C. C., & Anorlu, R. I. (2011). Knowledge of and attitude toward human papillomavirus infection and vaccines among female nurses at Lagos University Teaching Hospital. Nigerian Journal of Clinical Practice, 14(3), 364–368
14. Nancy, I. E., Gifty, E. A., & Doris, F. G. (2021). Nurses' and midwives' knowledge, attitudes, and acceptance regarding human papillomavirus vaccination in Ghana: A cross-sectional study. BMC Nursing, 20(11). https://doi.org/10.1186/s12912-020-00530-x
15. Onyema, C., & Uche, O. F. (2023). Knowledge of human papillomavirus infections and level of vaccination among women attending antenatal in tertiary hospitals in Rivers State. IPS Journal of Public Health, 2(1), 23–25. https://doi.org/10.54117/ijph.v2i1.13
16. Pelullo, C. P., & Di Giuseppe, G. (2019). Human papillomavirus infection: Knowledge, attitudes, and behaviour among nursing students in Italy. Journal of Infection and Public Health, 12(4), 617–623. https://doi.org/10.1016/j.jiph.2019.01.004
17. Sazali, M. F., Isa, M. R., & Ramli, R. (2021). Knowledge, attitude, and practice of HPV vaccination among nurses in a tertiary hospital in Malaysia. Journal of Preventive Medicine and Hygiene, 62(E1), E90–E98. https://doi.org/10.15167/2421-4248/jpmh2021.62.1.1643
18. Sherman, S. M., Bartholomew, K., Denison, H. J., Patel, H., Moss, E. L., Douwes, J., & Bromhead, C. (2018). Knowledge, attitudes and awareness of the human papillomavirus among health professionals in New Zealand. PLOS ONE, 13(12), e0197648. https://doi.org/10.1371/journal.pone.0197648
19. World Health Organization (2020). Human papillomavirus vaccines (HPV). Retrieved from https://www.who.int/teams/immunization-vaccines-and-biologicals/diseases/human-papillomavirus-vaccines-(HPV)