

Assessment of Knowledge, Attitude and Adoption of Human Papilloma Virus Vaccine among Females in Kwara State

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Abstract:- Cervical cancer, though preventable, is a disease caused by infection with high-risk strains of human papillomaviruses (HPVs). Adoption of cancer preventing activity such as the uptake of the HPV vaccine is essential for limiting incidences of cervical cancer globally. This study was to ascertain the knowledge, attitude and adoption of the HPV vaccine among females in Kwara state of North Central Nigeria. A descriptive cross-sectional survey involving 400 females from sixteen local government areas in Kwara State was used. Data were obtained and presented by simple descriptive statistics using tables and charts. Stepwise regression were used to test the correlation between the sociodemographic variables and acceptance of HPV vaccination. The study showed that 351(87.8%) out of the 400 female respondents were not knowledgeable about the HPV, while 49(12.2%) persons were knowledgeable of the HPV. The 49 persons that are aware, got the information from print media 17(35%), broadcast 20 (41%) health personnel's 12 (24%). 87% of those aware of HPV, know that it is transmitted sexually. However, only 31 (63%) of these 49 respondents which is equivalent to 8% of the total study participants were aware of the existence of the HPV vaccines. Therefore, we can conclude that the female in Kwara state have little knowledge about the HPV and HPV vaccine. Also from the regression analysis, the study showed that factors such as educational background, marital status and religion had p-values of (0.562, 0.08, 0.104) which is greater than $\alpha=0.05$ and so influenced the adoption of the HPV vaccine.

Keywords:- Human Papillomaviruses; Human Papillomaviruses Vaccine; Cervical Cancer; Sociodemographical Variables; Knowledge; Attitude; Adoption.

I. INTRODUCTION

The human papillomavirus infection has been described clinically as the commonest cause of cervical dysplasia, cancer, and genital warts (Adejuyigbe, Balogun, Sekoni, Adegbola, 2015; Adesina, Saka, Isiaka-Lawal, Adesiyun, Gobir, Olarinoye, Ezeoke, 2018). Cervical cancer is the most

prevailing gynecological cancer in sub-Sahara and the second commonest female cancer worldwide (Adesina, Saka, Isiaka-Lawal, Adesiyun, Gobir, Olarinoye, Ezeoke. 2018). The high epidemic of cervical cancer is currently a global concern and as such continuously calls for primary prevention especially in countries with high prevalence. In the world, the current new cases of cervical cancer as of February 2019 reported by Globocon factsheet, are estimated at 569,847 with attendant death cases of about 311,365 in women and young female adults (GLOBOCAN 2018). It is the commonest genital tract malignancy in female and the chief cause of cancer death among women world over.

An approximate of 85% of the world incidences of cervical cancer is found in the developing nations, accounting for almost 12% of all cancers in female. More than 80% of the 274,000 deaths of women and young female adults attributed to cervical cancer each year occur in developing countries, and this proportion is expected to rise to 90% by 2020 (Parkin, Bray, 2006). The result of the survey on the females in developing nations on the prevalence of cervical cancer is disturbing, even though cervical cancer can be detected through a Pap smear test and treated upon early dictation. This is in contrast with the occurrence in the developed world. According to Globocon (2018) factsheet, the current new cases of cervical cancer as of May 2019 in Nigeria are estimated at 14,943 with attendant death cases of about 10,403 in women and young female adults.

Human Papillomaviruses (HPVs) are a family of over 100 viruses, out of which 40 have been found to cause infection of the genital region. There are low-risk and high-risk strains of the human papillomavirus, the low-risk strains seldom cause cancer whereas the high-risk strains are more likely to cause cancer. Both strains of human papillomaviruses can cause the growth of abnormal cells, however only the high-risk strains of human papillomaviruses may result in genital cancers, such as anal, vaginal, vulvar, penile, and oropharyngeal cancers. The genital HPV infection can lead to the development of genital warts and are also implicated in tumors of the genital tract, but the most prominent of all the incidences of HPV is cervical cancer also

known as the cancer of the cervix. (Shetty, Prabhu, Shetty, Shetty, 2019).

Through sexual intercourse, one partner stands the risk of contracting over 30 strains of the Human Papillomavirus from another. Statistically, 50 to 80% of the people especially females are infected at some time in their lives, most of the genital human papillomavirus infection takes its full course and exit the system after a few years, without symptoms and no treatment, however, some strains linger for many more years and may or may not cause abnormal cell growth. Continuous infection of the high-risk strains of the HPV increases the risk of developing invasive cervical cancer. Nigeria, for instance, records about 10,403 cervical cancer deaths out of about 14,943 fresh cervical cancer cases annually (estimate for 2018). In Nigeria, cervical cancer ranks as the 2nd leading cases of female cancer which occur in women aged 15 to 44 years (ICO/IARC Nigeria. Summary Report 2019).

The reason for the disparities in the rate of morbidity and mortality between the developed and developing nations could be attributed to the fact that even though there is an awareness of the disease among women and about its prevention through Pap smear test, for its pre-malignant stage, the adoption of the test in the developing nations is low (Tervonen et al., 2017). Aside from pap smear test, vaccinating young female adults before their sexual activities can prevent the incidence of cervical cancer in them (Khan and Savoy, 2020). Also, those who have not been exposed to any of the two high-risk HPV strains are potentially not at risk of the incidence of cervical cancer by 70%. Vaccination may lead to a 66% reduction in pre-cancerous lesions which translates to about 76% decline in cervical cancer deaths. However, the HPV vaccine is not free or available in the public health centres, but obtainable at a cost in private health centres. According to available data: ICO/IARC information centre on HPV and cancer in Nigeria (ICO/IARC, 2021), HPV infection is extremely widespread, estimating the new incidences of the cervical cancer in Nigeria to be about 14,943 annually. Most of the cancer deaths are preventable through the use of the human papillomavirus vaccine. However, the HPV vaccine is neither widely available nor affordable in Nigeria. In the same vein, knowledge of cervical cancer, HPV infection, and the vaccine is fundamental to making an informed decision as regards HPV vaccine acceptance. Little or no health information is currently available in terms of HPV vaccination specifically on the female population, which is of paramount importance to meet the Healthy People 2020 immunization goal. Kilic (2012) noted that the knowledge of HPV vaccine in Turkey among adolescent girls was as low as 43.5% while a similar study carried out in the United States of America showed that the uptake of the vaccines was up to 60%, implying that developed nations have more knowledge about the virus and vaccine. The severity of HPV necessitates that females have adequate knowledge of the HPV vaccine. It has been found by Pelullo, Esposito and Di Giuseppe (2019) that high knowledge of HPV could serve as a good way to prevent it by taking the necessary vaccine early. Some scholars found that females that are educated usually gravitate towards

seeking knowledge about their health status and this was found to be true about the HPV vaccine (Patel, Pcolkina, Strazdina, 2017; Prayudi, Permatasari, Gde Sastra Winata, 2016). Various studies found that there is a strong relationship between education and knowledge of the vaccine among the different populations of the study. (Islam, Khatun, Alam, 2018). Parents with higher education are more inclined to have their children receive the HPV vaccine as observed by Maier, Maier, Neagu, (2015). Studies on different populations have shown that persons with higher knowledge of HPV vaccine are most likely to make a positive decision on the utilization of the vaccine for their health benefit (De Visser, Waites, Parikh, Lawrie, 2011). A study on a group of women on their knowledge of HPV infection, cervical cancer, Pap tests, and HPV vaccine showed that the majority of the participants have a good understanding of the Pap test; however, they did not understand the risk factors for HPV infection and the consequences of long term persistent HPV infection like cervical cancer. This general low knowledge about HPV resulted in the poor perception of the risk of contracting the HPV infection and developing HPV related diseases such as cervical cancer. Olubodun, Odukoya, Balogun, (2019) Friedman, Sheppard (2007) found that lack of Knowledge about HPV serve as a barrier to adopting the vaccine. It was also observed from various literature that knowledge of HPV and the HPV vaccine is very inconstant and very dependent on the studied populations. For instance, a review that assessed HPV knowledge in over 20,000 individuals across many countries noted that correct responses to questions regarding common facts about HPV differed greatly. Various studies have also shown that there are significant racial and ethnic differences in HPV awareness and knowledge. A study done by Joseph et al. (2014) observed that only 42% of African-American individuals identified HPV as a risk factor for cervical cancer compared to 90% of Caucasian individuals. These racial disparities in awareness and knowledge of HPV and the HPV vaccine also have been reported in a study done on only women by Gelman, Nikolajski, Schwarz, & Borrero (2011). Kennedy, Osgood, Rosenbloom, Feinglass, & Simon, (2011) conducted a study to determine if there were any difference in knowledge between publicly and privately insured women and noted that the privately insured women had more knowledge, this finding is suggestive of a link between the socioeconomic status and knowledge of HPV and HPV vaccine. Socioeconomic status may be confounded by other factors such as cultural background, level of education, ethnicity, and religion, as each of these variables has been associated with differences in HPV knowledge levels (Joseph et al., 2014; Klug et al., 2008; Marlow, Zimet, McCaffery, Ostini, & Waller, 2013; Waller, McCaffery, & Wardle, 2004).

Furthermore, people who are younger, female, and who have more education are significantly more likely to have heard of the HPV vaccine (Gollust, Attanasio, Dempsey, Benson, & Fowler, 2013). Increases in awareness and knowledge are also strongly correlated to receive the HPV vaccine (Kang & Kim, 2011; Krawczyk, Stephenson, Perez, Lau, & Rosberger, 2013), engage in health-protective

behaviours (Pask & Rawlins, 2015), and adoption of vaccine (Donadiki et al., 2013; Laz, Rahman, & Berenson, 2013).

In 2006, the HPV vaccine was internationally accepted as the vaccine to help reduce greatly the burden of HPV and some of its related diseases (WHO, 2008), many studies have been done to ascertain the attitude of females towards the vaccine. Studies by (Hoque, Monokoane, Van-hall, 2014; Bal-Yilmaz, Koniak-Griffin, 2018; Shetty, Prabhu, Shetty, Shetty, 2019) showed that persons with higher level of Education have higher knowledge of the HPV and display positive attitude towards the vaccine uptake. Although in Nigeria there are studies on cancer of the cervix among women, the issue of human papillomavirus and vaccine among females in Kwara state, Nigeria has received little attention resulting in scarce data on the state of awareness, knowledge, attitude, and adoption of the HPV and the vaccine.

The research explored the current level of acceptance and the use of the vaccine in combating this deadly but preventable female aliment in Kwara state. Also the influences of social characteristics such as age, educational qualification, religion, on the use of the HPV vaccine was investigated.

This research will be beneficial to all females in Nigeria and particularly those in Kwara State, this is because females are prone to contract the virus and so will be guided rightly as health workers will be better informed of the state of knowledge and attitude of the females in the state with regards to HPV and its vaccine and address health seekers correctly in their routine health talks in the various health facilities within the state. Similarly, media campaign planners will also benefit immensely from the findings of this study because it will enable them come up with strategic messages that will address the peculiarity of females in Kwara State and in that wise avoid media waste of their planned campaigns.

II. METHODOLOGY

A. Research Design

The research design was based on the utilization a concurrent method such as quantitative data: survey research method and qualitative data: in-depth interview in investigate the effect of media campaigns on knowledge, attitude and adoption of human papillomavirus vaccine among market woman in Kwara State, Nigeria (Creswell, 2012).

B. Population of the Study

The population of the study is the The entire population of females (1,171,570) in Kwara State of North Central Nigeria was used in this research using the data available at National Population Census of 2006 (Nigerian Population Commission). However, the 2010 projected female population from the National Population Commission and the National Bureau of Statistics is 1,320,941.

C. Sample Size

The research employed the Wimmer and Dominick online sample calculator to determine the sample size. with a confidence level of 95% and a margin error of 0.05% the calculated sample size was 385. Taking into cognizance the probable mortality of instruments, a total of 420 questionnaire were distributed within the 16 Local Government Areas of the State. The population of females in the Local Government Areas of Kwara State was collected from the State National Population Commission. The number of questionnaire to be distributed in each Local Government Area was determined using a simple ratio formular:

$$Q_L = \frac{Q_K \times P_L}{P_K} \quad (1)$$

Where:

Q_L is the number of distributed questionnaire in a Local Government Area

Q_K is the number of distributed questionnaire for the entire state

P_K is the total population of females in Kwara State

P_L is the total population of females in each Local Government Area of the State

D. Sampling Technique

The sampling technique used in this study was the multi-staged sampling technique. This technique enabled the researcher to get a true representation of the population especially since the population is very large. The females in Kwara State were grouped into 16 clusters and each Local Government area represented a cluster. For each Local Government Area systematic sampling was used to select four towns a market day for each town. The questionnaire were distributed using simple random sampling of females at the markets on the select market days.

E. Measuring Instrument

The measuring instrument used by the researcher in the study were questionnaire and interview guide. These were used to generate both qualitative and quantitative data for the study.

III. RESULTS AND DISCUSSIONS

The data were analyzed using a descriptive statistical analysis program including Frequencies, Mean, and Standard Deviation (SD) and Percentage. A codebook was developed to ensure that data were entered correctly into the system. The returned copies of questionnaire were reviewed carefully for data clarification before entering data into IBM SPSS software program. The data were then analyzed to present sample and result in an organized arrangement, all numeric data of the questionnaire were presented as frequency distribution in tables.

Table 1 showed that the sample size is 400, while the minimum and maximum age were 15 and 39 respectively. Also, the mean and standard deviation age were 24.35 and standard deviation 4.889 respectively.

Table 1: Descriptive Statistics

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Knowledge	400	0	1	.12	.328
Attitude	400	0	1	.79	.406
Adoption	400	0	1	.80	.399
Mar.status	400	1	2	1.41	.492
Edu.bckgrd	400	1	2	1.47	.499
Religion	400	1	2	1.53	.499
Age	400	15	39	24.35	4.889
Valid n (listwise)	400				

Table 2 shows the marital status of the participants, where we have single (= 164) and married (=236), implying

that 59% of the respondents were married and 41% were single.

Table 2: Marital Status of the Participant

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Married	236	59.0	59.0	59.0
Single	164	41.0	41.0	100.0
Total	400	100.0	100.0	

The frequency of the religion of the participants were mostly muslim with 214 response, while 186 are Christians representing 53.5 and 46.5% respectively (Table

3), indicating the fact that Kwara State was a predominantly a Muslim state.

Table 3: Showing the Religion of the Participant

	Frequency	Percent	Valid Percent	Cumulative Percent
Christain	186	46.5	46.5	46.5
Muslim	214	53.5	53.5	100.0
Total	400	100.0	100.0	

The minimum age was 15 and the maximum 39, the mean age was (=24.35) with standard deviation (=4.889)

Table 4: Age Distribution of the Participant

Age (Mean =24.35, SD= 4.889)	N (%)
≤ 20	102 (25.5)
21-25	130 (32.5)
26-30	116 (29)
>30	52 (13)

Table 5 shows the frequency and percentage of the Knowledge of HPV vaccine among females in Kwara state. 351 out of the 400 female respondents were not knowledgeable about the HPV vaccine which was equivalent to 87.8% of female in Kwara state, while 49 persons were knowledgeable of the HPV representing 12.2% of female in Kwara state. The 49 persons that are aware, got the information from print media 17(35%), broadcast 20 (41%) health personnels 12 (24%). 87% of those aware know that it is transmitted sexually. However, only 31 (63%) of these

49 respondents which was equivalent to 8% of the total study participants were aware of the existence of the HPV vaccines. Therefore, comparing the percentages, we can conclude that the female in Kwara state have little knowledge about the HPV and HPV vaccine. This satisfies the research question one which sought to know the level of knowledge of females in Kwara State about HPV vaccine. This finding agrees with similar research by Adesina, Saka, Isiaka-Lawal, Adesiyun, Gobir, Olarinoye, Ezeoke. (2018), which showed that there was low knowledge of HPV in the Ilorin Kwara state.

Table 5: Frequency and Percentage of Knowledge of HPV Vaccine among Females in Kwara State

	Frequency	Percent	Valid percent	Cumulative percent
Not knowledgeable	351	87.8	87.8	87.8
Knowledgeable	49	12.2	12.2	100.0
TOTAL	400	100.0	100.0	

Table 6 indicates shows that 83 persons representing 20.8% of the respondents were worried about implication of the HPV vaccine on their health and 317 persons representing 79.2% indicated no concern about HPV vaccine, this is

probably because of their remarkably low level of awareness of HPV, HPV vaccines, and cervical cancer. Greater number of the respondents were not aware of the existence of the vaccine and so they had no idea of the implication of the

vaccine on the cervical cancer. This is in line with the findings of a similar study by Ndikom, Oboh 2017 which indicated that female adolescents in Ibadan Nigeria had low

knowledge of HPV vaccine, HPV infection and cervical cancer.

Table 6: Showing the Attitude of Females Towards HPV Vaccine

		Frequency	Percent	Valid Percent	Cumulative Percent
	Worried	83	20.8	20.8	20.8
	Not worried	317	79.2	79.2	100.0
	Total	400	100.0	100.0	

From Table 7, the number of persons not willing (No) to take the HPV vaccine was 9, representing 2.3% of the respondents the number of persons willing to take (Yes) the HPV vaccine if available were 70 accounting for 17.5 % and those that were not sure if they will take the vaccine if available were 321 representing 80.3%. The percentage of adoption is 17.5.% (Yes). The reasons given by those

respondents who were unwilling or indifferent to taking the HPV vaccine were the high cost 167 (51%), concerns about the side effects 115(35%), and poor availability 40 (12%) of the vaccines. 8 (2%) respondents could not give any specific reason for their lack of willingness to accept this vaccination. However this implies that if the HPV vaccine is available and affordable in Kwara State 17.5% of the females will take it.

Table 7: Showing the Adoption of HPV Vaccine Reaction (Willing (Yes), Not Willing (No) and Not Sure of Taking the Vaccine.

		Frequency	Percent	Valid percent	Cumulative percent
	Yes	70	17.5	17.5	17.5
	No	9	2.25	2.3	19.8
	Not sure	321	80.25	80.3	100
	Total	400	100.0	100.0	

The bar chart (Figure 1) depicts the percentage distribution of knowledge of HPV vaccine among females in

Kwara State. It can be deduced that a low level of knowledge of HPV vaccine was recorded among females in Kwara State.

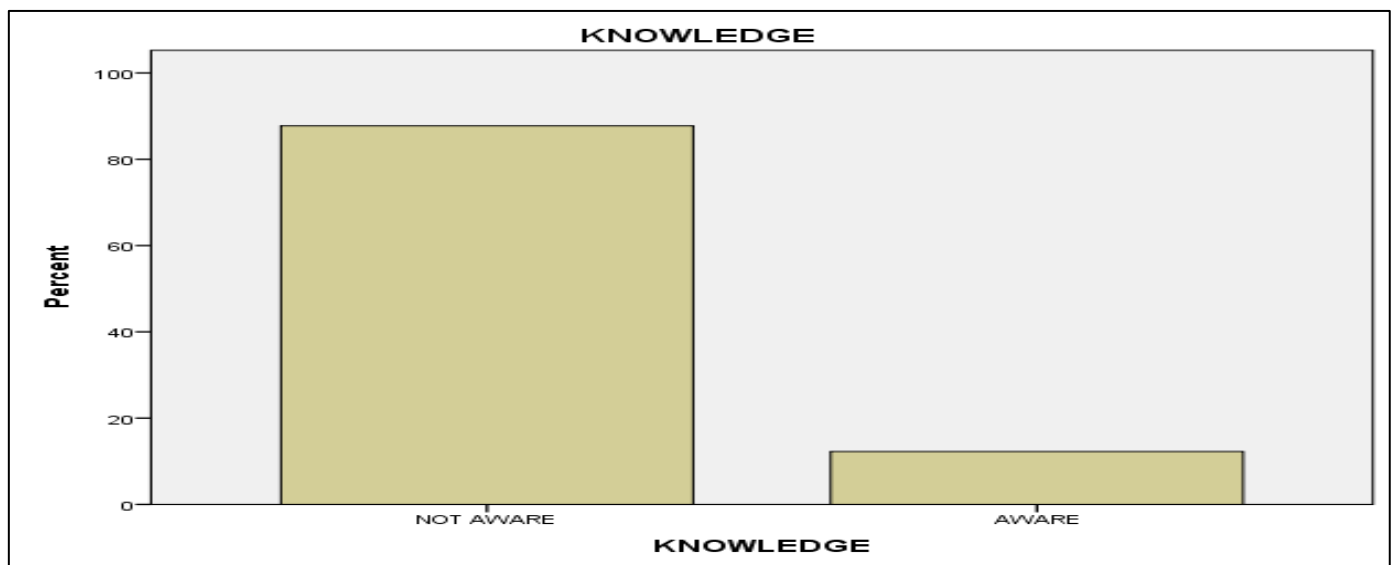


Fig 1: Graphical Representation Showing the Level of Knowledge of HPV among Females in Kwara State

The bar chart (Figure 2) shows the Attitude flow among Kwara State females towards the awareness of HPV. From the bar chart (Figure 2), It can be seen that the level of worried

and not worried suggests positive attention towards the availability of vaccine in Kwara State.

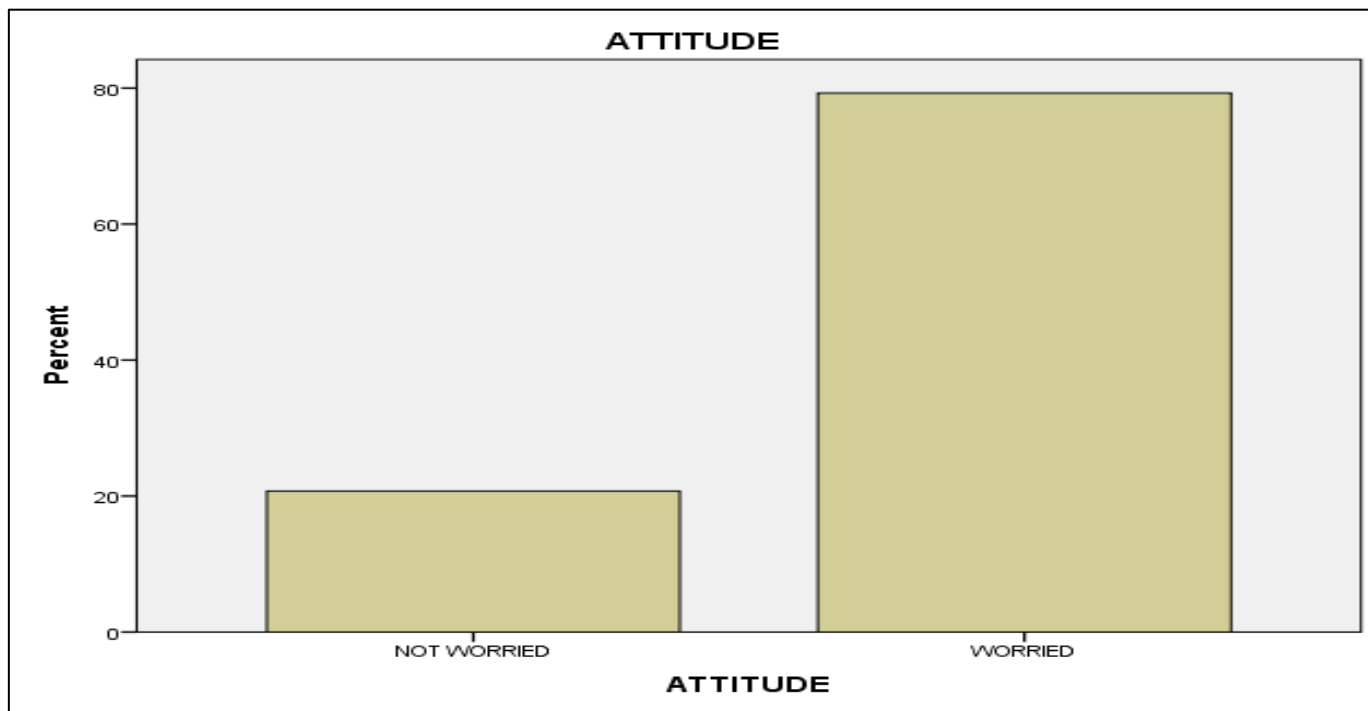


Fig 2: Graphical Representation of the Attitude of Kwara State Females towards the Awareness of HPV

The chart flow (Figure 3) indicates that more respondents were not sure if they will adopt HPV vaccine. This shows the correctness of the analysis in table 7 (=80.3%)

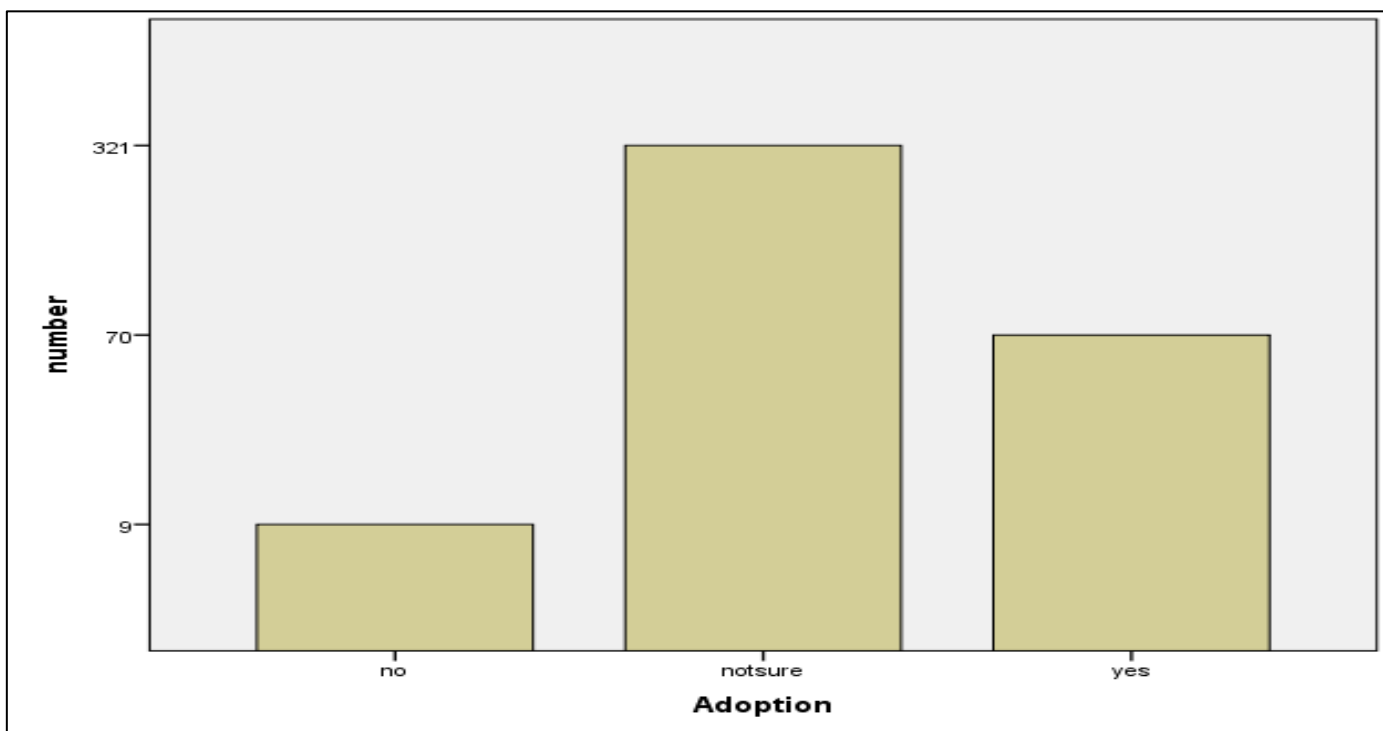


Fig 3: Graphical Representation showing the level of willingness and not willing to take the HPV vaccine if available in Kwara State

Figure 4 confirmed the correctness of Table 6, which show that the married participants in the survey were more than the single.

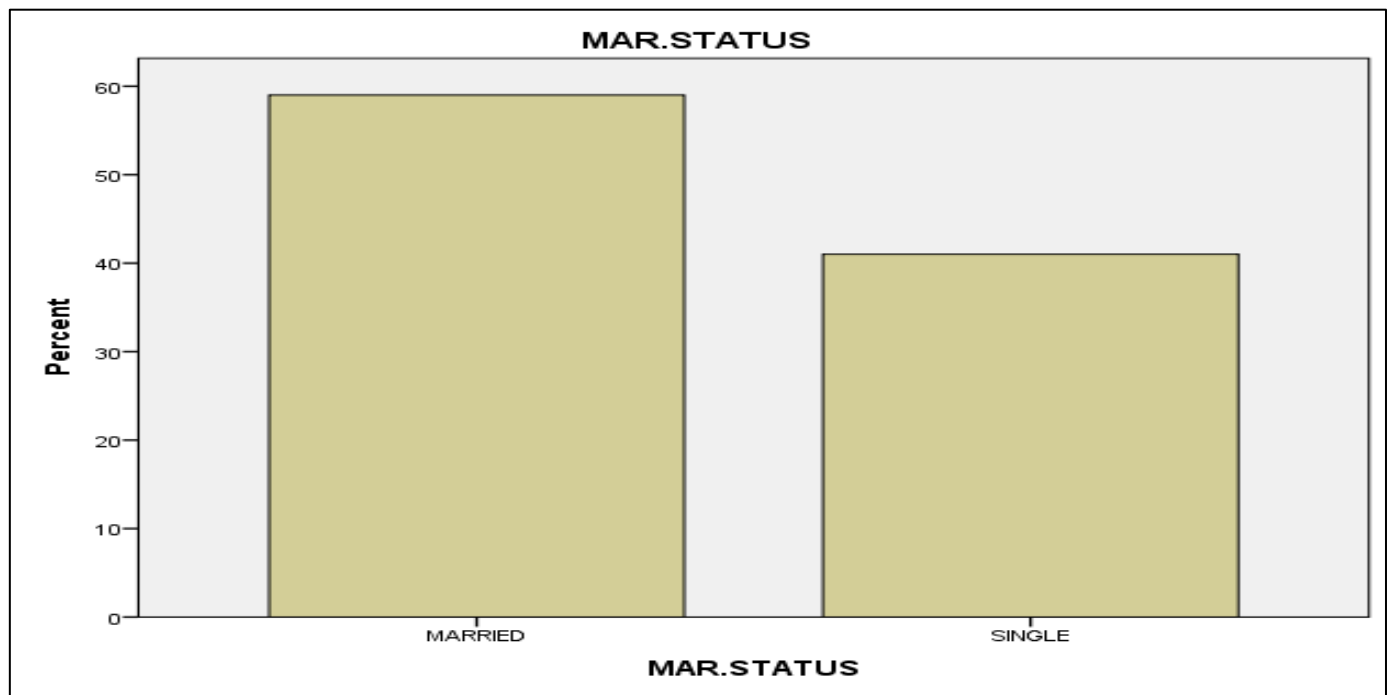


Fig 4: Graphical Representation of the Marital Status of the Participant

This age distribution chart (Figure 5) shows that the minimum age participant was 15, while the maximum age of the participant was 39.

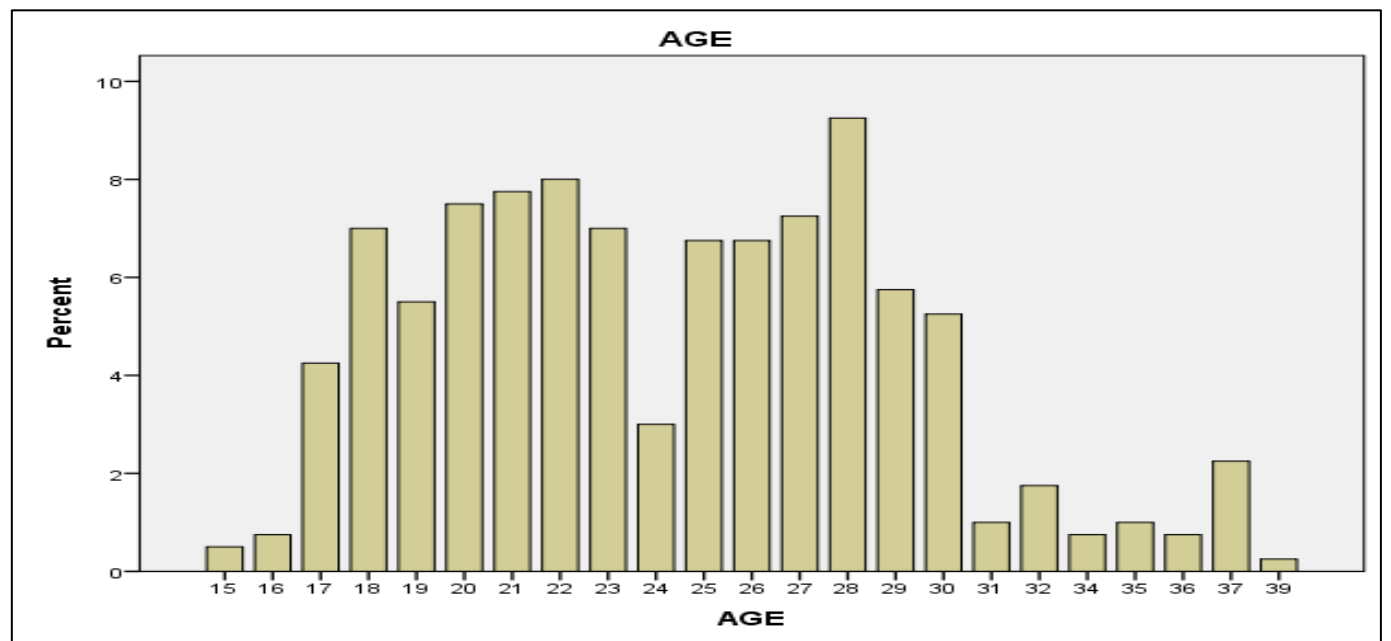


Fig 5: Flow Chart of the Age of the Participant

Results obtained from Table 8 and 9 shows that there were three outcomes of interest in our dependent variable (Y): Adoption (willingness to take) of HPV vaccine (no = 0; not sure=1; yes =2), In the models, the independent variables included were: age (four categories: ≤20 years; 21–25 years; 26-30 ; >30 years), educational level (tertiary= 1; secondary = 2), The following variables were also included: Marital status (Married=1,single=2), Religion (Christian=1, Muslim=2). Binary logistic regression analysis was performed to evaluate the association between the

independent variables and the dichotomous outcomes of interest (Adoption of HPV Vaccine). Variables were selected for the multivariate model, using a *p*-value of 0.05 for entry and 0.10 for exclusion, based on the likelihood ratio test statistic. Odds ratios (ORs) and 95% confidence intervals (CIs) were presented for logistic regression models; *p*-values > 0.05 were considered to be statistically significant. IBM Stata statistical software, version 23 was used for the analyses.

➤ *The Logistic Regression Model is given by:*

$$\bullet \text{ Logit } (P(X)) = \beta_1x_1 + \beta_2x_2 + \beta_3x_3 + \beta_4x_4$$

Given that,
 Y= {0 if No ; 1 if Yes }
 X= X₁, X₂, X₃, X₄

Where,
 X₁ Age of the Participant
 X₂ Religion of the Participant
 X₃ Marital Status of the Participant
 X₄ Education level of the Participant

The collected data were analyzed and interpreted using appropriate statistical methods to actualize the aforementioned aims and objectives of the study.

H₁: Age, Religion, level of Education, marital status also affect the adoption of the HPV vaccine in Kwara state
 H₀: Age, Religion, level of Education, marital status do not affect the adoption of the HPV vaccine in Kwara state

Decision Rule: Reject H₀ if the p-value is less than α=0.05 and accept H₁

IV. DECISION

• *Step : Regressing other Factors that Affect the Adoption of the HPV Vaccine with the Adoption Reaction Data*

- H₀ Level of Education p-value (0.562) is greater than α=0.05 ACCEPT
- H₀ Marital Status p-value (0.08) is greater than α=0.05 ACCEPT
- H₀ Religion p-value (0.104) is greater than α=0.05 ACCEPT
- H₀ Age p-value (0.000) is less than α=0.05 REJECT

Therefore, we can see that throughout the tests that only Age suggested the Rejection of H₀ which simply means that all other factors - marital status, education level, and

Religion- are some of the other factors that affect the adoption of HPV vaccine in Kwara State

Table 8: Demographic Characteristics of the Respondents

Age	Marital Status	Education Level	Religion
≤20 102(25.5)	Married 236 (59)	SSCE 186 (46.5)	Muslim 214 (53.5)
20- 25 130 (32.5)	Unmarried 164 (41)	Higher degree 214 (53.5)	Christian 186 (46.5)
26 – 30 116 (29)			
>30 52 (13)			

Table 9: Variables in the Equation

Step		DF	P-value
	Education Background	1	.562
	Marrital Status	1	.082
	Religion	1	.104
	Age	1	.000

V. CONCLUSION AND RECOMMENDATIONS

The poor awareness and knowledge of the existence and availability of the HPV vaccine found in this study showed that for the incidence of cervical cancer and other genital infections to be greatly reduced if not eradicated in Nigeria, there is still need to create more awareness for HPV vaccines in Nigeria. The study also indicated that providing education about HPV infection and vaccine to the general public will help bring about a change in the peoples attitude, as well as improve the HPV vaccine uptake.

It is recommended that continuous efforts should be made to improve knowledge of the HPVs and HPV vaccine through education so as to reduce drastically the incidences of cervical cancer in Nigeria.

Again the government should include the HPV vaccine in the national expanded programme on immunization schedule to ensure that almost everyone especially the young female adult take the vaccine before their sexual debut for maximum effects of the vaccine.

Further studies could also be conducted to include all the North Central States to get a wholestic status of the states.

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- **Disclosure Statement:** Authors declare that there is no competing interest whatsoever.
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