

EFFECT OF SCHOOL-BASED INTERVENTION ON ADOLESCENT GIRLS ACCEPTABILITY AND PROMOTION ON HUMAN PAPILLOMAVIRUS VACCINATION IN GOVERNMENT GIRLS SECONDARY SCHOOLS IN KATSINA, NIGERIA

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Abstract

This study investigates the effect of school-based intervention on adolescent girls' acceptability and promotion of human papillomavirus vaccination in Government Girls Secondary Schools, Katsina, Nigeria. The study employed a quasi-experimental research design. The population of the study comprises all S.S.2 Females Adolescent Girl Students in Government Girls Secondary Schools, Katsina, Nigeria, with Population of (4,417). Multistage sampling technique was used for the study. A self-developed instrument by the researcher titled: Adolescent Girl's Acceptability and Promotion on School-based Intervention of HPV Vaccination Questionnaire (AGAPSIHPVQ) was used as instrument to collect the data. Descriptive statistics of frequency and percentage were used to interpret the demographic information of the respondents; mean and standard deviation were used to answer the research questions while inferential statistics of t-test and Analyses of Covariant (ANCOVA) was used to compare means between one group's pre- and post-intervention test of the hypotheses at a 0.05 level of significance. The Findings revealed that there is a significant effect of school-based intervention on adolescent girls' level of acceptability of HPV vaccination in Government Girls Secondary Schools, Katsina, Nigeria, with (F-statistic: 486.355 and significance (Sig.) P-value = 0.000), there is a significant effect of school-based interventions on adolescent girls' promotion of human papillomavirus vaccination in Government Girls Secondary Schools, Katsina, Nigeria, with (F-statistic: 2812.675 and significance (Sig.) P-value: =0 .000), Actually the results suggested that application of health education modules is needed in the studied population area.

Keywords: School-Based, Human papillomavirus, Adolescent Girls, Acceptability, Promotion and Government Girls Secondary School Students.

Introduction

Human papillomavirus, which is a sexually transmitted virus, is a primary cause of cervical cancer and is responsible for over 90% of cervical cancer cases worldwide (WHO, 2022). Globally there are more than 570,000 new cases and 311,000 deaths from cervical cancer every year and these numbers are predicted to increase to more 700,000 new cases and 400,000 deaths per year by 2030 (International Agency for Research on Cancer, 2018). According to the World Health Organization, (2020) Sub-Saharan Africa (SSA) has the highest prevalence of HPV with 90% mortality intervention may fail without evidence-based data on stratified prevalence and risk factors among most at-risk women across Nigeria, with a projected population of over 200 million people and a growth rate of 2.6%, is a key country in this sub-region World Population Review (World Population Review, 2019).

In Nigeria, cervical cancer is the most common female reproductive tract cancer and is only second to breast cancer as the most common cancer in women the country in 2018, there were 14,983 new cases representing 21% of all female cancers and 10,403 dies from the disease in the country (Internal

Agency for Research on Cancer (2018). Girls aged 9 –14 years will receive a single dose of the vaccine, which is highly efficacious in preventing infection with HPV types 16 and 18 that are known to cause at least 70% of cervical cancers and 92% effectiveness to prevent cervical cancers (WHO, 2020). School-based intervention programme; is the strategies implemented in a classroom setting to improve the health and well-being of students, often by reducing or preventing pathological and problem behavior e.g., depression, social anxiety, drug or alcohol use, bullying and aggression (McClure, Mac-Swain, Morrison, & Sanford (2015).

Acceptability of School-based Intervention of Human Papillomavirus Vaccination: Acceptance of vaccination by adolescent girls students is critical, although human papillomavirus vaccination is acceptable to most people surveyed, most acceptability data have emanated from North America and Europe, which may not be applicable elsewhere, this can be used to guide the assessment of acceptability from the perspective of intervention implementers and participants (Cartwright, & Francis, 2017). Promotion of School-based Intervention of HPV on Adolescent Girls Students: Public sector delivery has been slower in less developed countries, largely due to cost and challenges with delivery in under-resourced health systems that adolescents are a challenging population to reach with preventive health care service (WHO, 2020).

Statements of the Problem

Human papilloma virus known as cervical cancer second most common cancer among women between 20 and 44 years worldwide and about 500,000 new cases and about 340,000 deaths occur annually. In Nigeria, cervical cancer is the third most common cancer and the second most frequent cause of cancer deaths women aged between 15 and 44 years also recorded about 12 000 new cases and 8000 deaths (Kazadi, 2023).

In West Africa include Nigeria, immunization initiative have been derailed by the force of infertility rumors to control fertility or plots to reduce the population of certain groups, anxieties, physical penetration of injection needles, gynecological screening and injection by males health practitioner rather than females counterpart and religious concerns over “non halal” in the area of study..

Objectives of the Study

1. To determine the effect of school-based intervention on adolescent girls acceptability of HPV vaccination in Government Girls Secondary Schools, Katsina, Nigeria.
2. To determine the effect of school-based intervention on adolescent girls’ promotion gained of human papillomavirus vaccination in Government Girls Secondary Schools, Katsina, Nigeria.

Research Questions

1. What is the effect of school-based intervention on adolescent girls’ level of acceptability of HPV vaccination in Government Girls Secondary Schools, Katsina, Nigeria before and after intervention?
2. What is the effect of school-based intervention on adolescents’ girls’ level on promotion gained of HPV vaccination in Government Girls Secondary Schools, Katsina, Nigeria before and after intervention?

Hypotheses

1. There is no significant effect of school-based intervention on adolescent girls’ level of acceptability of human papillomavirus vaccination in Government Girls Secondary Schools, Katsina, Nigeria.
2. There is no significant effect of school-based interventions on adolescent girls’ promotion gained of human papillomavirus vaccination in Government Girls Secondary Schools, Katsina, Nigeria.

Methodology

Inferential statistic by the use of ANCOVA on the research hypothesis was used at 0.05 level of significant. And demographic information of the respondents was described by the use of descriptive statistics of percentage, means and standard deviation. The research design used in this study was Quasi-experimental design to describing and interpreting existing mean differences between acceptability and promotion of the dependent variable (Maciejewski and Matthew. 2020). The population of the study comprised only S.S.2 Females Adolescent Girl Students in Government Girls Secondary Schools in Katsina, Nigeria, with 4,417 captured from all the Government Girls Secondary Schools in Katsina State, Nigeria.

The sample technique selected was Multi-stage sampling; meanwhile, by having twelve (12), Zonal Education Quality Assurance Offices in Katsina State, only nine (9) ZEQAOS are having G. G. S. S, with S. S. 2 adolescent girl students. Therefore, two (2) cluster Zones are randomly selected such as: Funtua and Dutsin-Ma, with 1,511 nine (9) cluster Zones with G. G. S. S out of (12) Zones in Katsina State, with 4,417 with S. S. 2 adolescent girl students. The selected two (2) cluster school involves the following such as: (G. G. S. S. Funtua) with 1,024 adolescent girls students, while (G.G.S.S. Dutsin-Ma) with 487 adolescent girls' students in the selected schools (Sourced, ZEQAOS Funtua and Dutsin-Ma, as at May, 2025).

A self-developed instrument by the researcher titled: Adolescent Girl's Acceptability and Promotion on School-based Intervention of HPV Vaccination Questionnaire (AGAPSIHPVQ) will be used for data collection about school-based intervention on HPV vaccination. The instrument contained three (3) sections: section A; demographic information's which comprised (9) items, section B; contained items on acceptability of school-based intervention of HPV vaccination which comprise 10 items and section C; which contained items on promotion of school-based intervention of HPV vaccination also composed with 10 items. The instrument was operated on the basis of Yes and No scale of measurement at 0.05 level of significant.

The instrument AGAPSIHPVQ was validated by the experts from the Department of Human Kinetics and Health Education Federal University Dutsin-Ma, all the observations and corrections was effective. The reliability of the instrument on school-based intervention on adolescent girl's acceptability and promotion of HPV vaccination questionnaire on use Cranbach's Alpha coefficient to find the internal consistency of the instrument from the responses of the adolescent girls' pilot tested from the outcome of the analysis shown in the appendix as; (0.781) which indicates a high reliability index.

A pilot test was conducted to establish the reliability to thirty (30) adolescent girls' students in Government Girls Secondary School Giwa L.G.A Kaduna State, Inferential statistics of Test-test and ANCOVA was used to test all the hypotheses at 0.05 level of significant. Also demographic information of the respondents was analyzed using descriptive statistics of percentage, means and standard deviation.

Results

The data obtained from the questionnaire in section A, B and C are shown in Tables below:

Table 1: Demographic Information of the Respondents

Item	Response	Frequency	Percent
Age	9-11	5	2.0
	12-14	22	8.9
	15-17	0	0
	18-20	209	89.0
	Total	246	100.0
Marital Status	Single	221	89.8
	Married	21	8.5
	Divorced	4	1.6
	Total	246	100.0
Religion	Islam	245	99.6
	Christian	1	.4
	Others	0	0
	Total	246	100.0
Ethnicity/Tribe	Hausa/Fulani	237	96.3
	Yoruba	6	2.4
	Igbo	0	0
	Others	3	1.2
	Total	246	100.0
Locations	Urban	228	92.7
	Rural	18	7.3
	Total	246	100.0
Parents Economic Status	Lower	75	30.5
	Middle	139	56.5
	Higher	28	11.4
	Highest	4	1.6
	Total	246	100.0
Parents Educational Status	Primary Cert	53	21.5
	S.S.C.E	102	41.5
	N.C.E/ND	46	18.7
	B.sc	41	16.7
	Master's Degree	4	1.6
	Total	246	100.0
Parents Employments	Farmer	79	32.1
	Business	91	37.0
	Civil Servant	36	14.6
	Others	40	16.3
	Total	246	100.0

Table 1 revealed that the majority of the respondents, 89.0%, are between 18-20 years old. A smaller proportion of 8.9%, are 12-14 years old, 15-17 are 0% and only 2.0% are 9-11 years old. This indicates that the study primarily surveyed older adolescents. The table also indicated that overwhelming majority of the respondents of (89.8%) is single. A smaller percentage of (8.5%) are married and 1.6% is divorced. This aligns with the target demographic of adolescent girls in secondary school, although the presence of married and divorced individuals among this group is notable. Moreover, the table shows that nearly all respondents (99.6%) identify as Muslim, with a very small minority (0.4%) identifying as Christian. This reflects the predominant religious demographic of Katsina, a state in Northern Nigeria. The table also revealed that the dominant ethnic group among the respondents is Hausa/Fulani, accounting for 96.3%. Yoruba respondents make up 2.4%, while other ethnic groups

constitute 1.2%. This also aligns with the ethnic composition of the region. The table also indicated that the vast majority of the respondents (92.7%) reside in urban areas, with only 7.3% living in rural areas. This suggests the study primarily focused on schools in more populated centers within Katsina. Moreover, the table indicated that more than half of the respondents' parents (56.5%) are in the middle economic status. The lower economic status accounts for 30.5%, followed by higher (11.4%) and highest (1.6%) economic statuses. The table also revealed that a significant portion of parents (41.5%) have an SSCE (Senior School Certificate Examination) as their highest educational qualification. Primary Certificate holders are 21.5%, NCE/ND (National Certificate of Education/National Diploma) is 18.7%, B.Sc. holders are 16.7%, and those with a Master's Degree are a small minority at 1.6%. This indicates varying levels of parental education, with a substantial group having secondary-level education. The table also indicated that most common parental employment is business (37.0%), followed by farming (32.1%). Civil servants account for 14.6%, and other occupations make up 16.3%. This suggests a diverse economic background among the families, with a strong presence of agricultural and entrepreneurial activities.

Research Question One: What is the effect of school-based intervention on adolescent girls' level of acceptability of HPV vaccination in Government Girls Secondary Schools, Katsina, Nigeria after intervention?

To answer research question two, the post-test scores in the experimental and control groups for the acceptability were subjected to descriptive statistics in form of Means and Standard Deviations. This is presented in Table 2:

Table 2: Mean and Standard Deviation on Post-test Scores in the Experimental and Control Groups for the Acceptability

	Group	N	Mean	Std. Deviation	Std. Error Mean	Mean Difference
Post-test acceptability	Experimental	129	18.89	1.393	.123	4.695
	Control	117	14.20	2.478	.229	

Table 2 Indicated that, for Experimental Group: N (number of participants) = 129, Mean acceptability score = 18.89, Standard Deviation = 1.393 and Standard Error Mean = 0.123 while for Control Group: N (number of participants) = 117, Mean acceptability score = 14.20, Standard Deviation = 2.478 and Standard Error Mean = 0.229. The mean difference in acceptability scores between the experimental and control groups after the intervention are 4.695, this indicates that, on average, the experimental group scored approximately 4.7 points higher on the acceptability assessment than the control group. The higher mean acceptability score (18.89) in the experimental group compared to the control group (14.20), along with the positive mean difference of 4.695, suggests that the school-based intervention of HPV vaccination had a positive effect on adolescent girls' level of acceptability towards school-based intervention of HPV vaccination in Government Girls Secondary Schools, Katsina, Nigeria.

Research Question Two: What is the effect of school-based intervention on adolescents' girls' level of promotion on HPV vaccination in Government Girls Secondary Schools, Katsina, Nigeria after intervention?

To answer research question three, the post-test scores in the experimental and control groups for the promotion were subjected to descriptive statistics in form of Means and Standard Deviations. This is presented in Table 3:

Table 3: Mean and Standard Deviation on Post-test Scores in the Experimental and Control Groups for the Promotion

	Group	N	Mean	Std. Deviation	Std. Error Mean	Mean Difference
Post-test promotion	Experimental	129	19.19	1.029	.091	7.827
	Control	117	11.36	1.482	.137	

Table 4.3: Indicated that, For Experimental Group: N (number of participants) = 129, Mean promotion score = 19.19, Standard Deviation = 1.029 and Standard Error Mean = 0.091 while for Control Group: N (number of participants) = 117, Mean promotion score = 11.36, Standard Deviation = 1.482, Standard Error Mean = 0.137. The mean difference in promotion scores between the experimental and control groups after the intervention are 7.827, this indicates that, on average, the experimental group scored approximately 7.8 points higher on the promotion assessment than the control group. The substantially higher mean promotion score (19.19) in the experimental group compared to the control group (11.36), coupled with the positive mean difference of 7.827, strongly suggests that the school-based intervention had a considerable positive effect on adolescent girls' level of promotion of HPV vaccination in Government Girls Secondary Schools, Katsina, Nigeria.

Testing of Hypotheses

This section analysed data using statistical tools to test the two (2) null hypotheses formulated for the study, using the inferential statistics of Analyses of Covariant (ANCOVA) at 0.05 level of significance
 Post-test result

Table 4: t-Test Analysis of the Pre-test Scores in the Experimental and Control Groups for the Acceptability and Promotion

	Group	Mean	t-value	df	P-value
Pre-test Acceptability	Experimental	13.89	.573	244	.567
	Control	14.08			
Pre-test Promotion	Experimental	10.84	.476	244	.635
	Control	10.92			
	Control	10.15			

The table presents the pre-test results for acceptability, and promotion of HPV vaccination among two groups: experimental and control. The results are analyzed using t-tests to compare the means of the two groups.

Pre-test Acceptability: Experimental Group Mean = 13.89, Control Group Mean = 14.08, t-value = 0.573 and P-value: 0.567, with a P-value of 0.567 (greater than 0.05), there is no statistically significant difference in pre-test acceptability between the experimental and control groups. This implies that both groups had similar levels of acceptability towards HPV vaccination before the intervention.

Pre-test Promotion: Experimental Group Mean = 10.84, Control Group Mean = 10.92, t-value = 0.476 and P-value: 0.635. The P-value of 0.635 (greater than 0.05) indicates no statistically significant difference in pre-test promotion behaviors or intentions between the experimental and control groups. Both groups were similar in this aspect prior to the intervention.

Table 5: ANCOVA Analysis of the Post-test Scores in the Experimental and Control Groups for the Acceptability

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	1616.488a	2	808.244	281.853	.000
Intercept	907.085	1	907.085	316.321	.000
Pre-test	264.130	1	264.130	92.108	.000
Group	1394.675	1	1394.675	486.355	.000
Error	696.829	243	2.868		
Total	70580.000	246			
Corrected Total	2313.317	245			

Table 5 revealed that the F-statistic: 486.355 and significance (Sig.) P-value = 0.000. Since the P-value (.000) is less than the conventional significance level of 0.05, we reject the null hypothesis. This implies that there is a statistically significant effect of school-based intervention on adolescent girls' level of acceptability of HPV vaccination in Government Girls Secondary Schools, Katsina, Nigeria. This means the intervention had a significant positive impact on the girls' acceptability of the vaccine (F (1, 245) = 486.355, P = 0.000).

Table 6: ANCOVA Analysis of the Post-test Scores in the Experimental and Control Groups for the Promotion

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	3822.165a	2	1911.083	1420.139	.000
Intercept	402.883	1	402.883	299.385	.000
Pre-test	63.453	1	63.453	47.152	.000
Group	3785.020	1	3785.020	2812.675	.000
Error	327.005	243	1.346		
Total	62972.000	246			
Corrected Total	4149.171	245			

Table 4.6: Indicated that F-statistic: 2812.675 and significance (Sig.) P-value: .000. Since the P-value (.000) is less than the conventional significance level of 0.05, we reject the null hypothesis. This implies that there is a statistically significant effect of school-based intervention on adolescent girls' promotion of HPV vaccination in Government Girls Secondary Schools, Katsina, Nigeria. This indicates that the intervention had a significant positive impact on the girls' promotion of the vaccine (F (1, 245) = 2812.675, P = 0.000).

Discussion

The findings of this study revealed that there is a significant effect of school-based intervention on acceptability and promotion of HPV vaccination among adolescent girls' in Government Girls Secondary Schools, Katsina, Nigeria. This indicates a statistically significant positive effect of the intervention on their level of acceptability and promotion (See table. 2). The study's findings indicate a significant effect of school-based intervention on adolescent girls' level of acceptability of HPV vaccination in Government Girls Secondary Schools, Katsina, Nigeria" (P-value = .000). This demonstrates a statistically significant positive effect of the intervention on the girls' acceptability of the vaccine.

(See table 6). Furthermore, the study's results revealed significant effect of school-based interventions on adolescent girls' promotion of HPV vaccination in Government Girls Secondary Schools, Katsina, Nigeria" (P-value = .000). This indicates a statistically significant positive effect of the intervention on the girls' promotion of the vaccine. However, the concept of "promotion" by adolescent girls, particularly within a school setting, is a crucial outcome.

Recommendations

Given the proven effectiveness, it is highly recommended to continue and expand school-based interventions of HPV vaccination across all Government Girls Secondary Schools in Katsina, Nigeria. The positive effect on "promotion" suggests that informed and accepting of adolescent girls can become powerful advocates for HPV vaccination to the entire populations and also recommendations which include; designing peer education programs or leadership roles within schools where vaccinated girls can share their positive experiences and knowledge, acceptability intend and promotion benefits with their peers and its potentially to their families and general population at large.

For the intervention to be truly impactful, the HPV vaccine must be consistently accessible and available within the school setting or through easily reachable health facilities linked to the schools during campaign exercise. This includes ensuring adequate supply, trained personnel, and efficient cold chain management systems.

To ensure sustained effectiveness and adapt to evolving needs, it is recommended to implement a continuous monitoring and evaluation framework for school-based HPV vaccination programs.

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