

EFFECT OF CULTURALLY SENSITIVE HEALTH EDUCATION INTERVENTION IN MODIFYING THE ATTITUDES OF FEMALE SECONDARY SCHOOL STUDENTS TOWARD CERVICAL CANCER PREVENTION IN KATSINA STATE NIGERIA

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Abstract

Cervical cancer is a leading cause of mortality among women in Nigeria, yet preventive uptake remains low in Northern regions due to sociocultural barriers and fatalistic attitudes. This study evaluated the effectiveness of a culturally sensitive health education intervention in modifying the attitudes of female secondary school students toward cervical cancer prevention. Using a quasi-experimental pre-test and post-test design, 200 participants (100 Experimental; 100 Control) were studied in Katsina State. The experimental group participated in a four-week health education program focusing on clinical benefits and myth-deconstruction. Data was collected using a validated 10-item Structured Attitude Questionnaire (SAQ) with a modified 4-point Likert scale. Analysis was conducted using Paired Samples T-tests, ANCOVA, and Quantile Regression at a 0.05 level of significance. The experimental group demonstrated a significant positive shift in attitude scores, increasing from a baseline mean of 24.54 to a post-intervention mean of 30.84, with a mean gain of 6.30 ($p < .001$). ANCOVA results confirmed the intervention as the primary driver of change ($F = 260.25$, $p < .001$). Quantile Regression indicated that the improvement was uniform across all socio-demographic strata, including age, residential type, and parental education levels ($p > .05$). Culturally sensitive health education successfully dismantles psychological barriers and fatalism. The study recommends the formal integration of reproductive health modules into the school curriculum to foster proactive health-seeking behaviors in conservative settings.

Keywords: Cervical Cancer, Health Education, Attitude, Adolescents, Katsina State, HPV Vaccination

Introduction

As the fourth most frequent disease among women worldwide, cervical cancer is one of the biggest global health issues facing women. The World Health Organization (WHO, 2024) reports that over 350,000 people died from cervical cancer in 2022, with about 660,000 new cases identified globally. About 70% of occurrences of cervical cancer are caused by persistent infection with high-risk HPV strains, especially types 16 and 18 (Singh, et al., 2023). Cervical cancer continues to disproportionately affect women worldwide, despite being largely preventable through early detection techniques like Pap smears, HPV testing, and preventive measures like HPV vaccination and health education. A startling 90% of deaths occur in low- and middle-income countries (LMICs), highlighting notable disparities in prevention, diagnosis, and treatment access (World Health Organization, 2024). Cervical cancer is avoidable, which emphasizes how crucial it is to implement comprehensive health education programs aimed at changing vulnerable populations' attitudes.

Adolescents' positive attitudes have been shown to be significantly improved by many school-based health education initiatives worldwide (*Glanz et al., 2015*).

In response to this global burden, the WHO launched an ambitious global strategy in 2020 to eliminate cervical cancer as a public health problem, targeting three key indicators: 90% of girls fully vaccinated with HPV vaccine by age 15, 70% of women screened by age 35 and again by age 45, and 90% of women identified with cervical disease receiving appropriate treatment (World Health Organization, 2021).

Due to the continent's disproportionate share of the worldwide disease burden, the prevalence of cervical cancer in Africa is very concerning. In several African nations, such as Nigeria, Kenya, and the Democratic Republic of the Congo, cervical cancer is the primary cause of cancer-related fatalities and the second most frequent malignancy among women in Africa (Bruni, Serrano, Roura, et al., 2023). Cervical cancer continues to be a major public health burden and one of the main causes of cancer-related deaths among women in Sub-Saharan Africa, where incidence and mortality rates are particularly high (*Chen et al., 2025*). The high mortality rates across the African continent are primarily attributed to limited awareness, lack of effective screening programmes, socio-cultural barriers, poor access to health services, inadequate healthcare infrastructure, and limited government investment in cancer prevention and control programmes. Within the African context, adolescents frequently lack reliable sources of reproductive health information, leading to widespread misconceptions and poor engagement with preventive health behaviours, particularly in regions where cultural and religious norms significantly influence girls' education and health decisions.

Cervical cancer is the second most frequent disease among women in Nigeria and a major contributor to female cancer death, making it a significant public health concern. According to predictions from the International Agency for Research on Cancer (IARC, 2023), over 10,000 women in Nigeria lose their lives to cervical cancer each year, with 14,943 women receiving a diagnosis. Cervical cancer is a major cause of cancer mortality among women of reproductive age, with estimates of 12,000 new cases and over 8,000 deaths from the disease each year (Adebamowo, et al., 2022).

Due to specific sociocultural, religious, and economic factors that greatly impact women's and adolescent girls' health attitudes and behaviors, Northern Nigeria poses particular problems for cervical cancer prevention (*Muhammad et al., 2024*). According to Adebayo, Akande, and Fawole (2023), the region's sociocultural conservatism, early marriage customs, relatively low levels of female education, and restricted access to reproductive health services all contribute to poor health outcomes for women and girls, including low awareness and poor preventive behaviors regarding cervical cancer.

Implementing health education programs in northern Nigeria is complicated by the strong effect of cultural and religious norms on females' health and educational choices. Sexual and reproductive health conversations are frequently regarded as culturally and religiously taboo, and female literacy rates are typically lower than in other parts of the nation (Babalola & Aina, 2021).

There is a noticeable lack of context-specific research focusing on secondary school girls in northern Nigeria, especially in Katsina State, despite the country's rising cervical cancer burden and the established advantages of early health education interventions.. Katsina State serves as an example of the distinct sociocultural, religious, and economic setting of northern Nigeria, necessitating customized intervention strategies that may be very different from those that work in other parts of the nation. There is little study on structured educational programs created especially for female students in northern Nigeria, where social, cultural, and geographic factors may have a particular impact on health-related attitudes and behaviors.

The region may continue to see high rates of avoidable cervical cancer cases and deaths without focused interventions to address these attitude barriers among female students in Katsina State. This would perpetuate cycles of poor health outcomes that could be successfully addressed through evidence-based health education programs. By evaluating the impact of a health education intervention on the attitudes of female secondary school students in Katsina State, this study aims to close this crucial gap and provide information that could inform evidence-based choices for incorporating reproductive health education into school curricula, ultimately lowering the incidence of cervical cancer in Nigeria.

According to the "Health Belief Model" (HBM), a person's attitude is influenced by their perceived vulnerability to illness and the advantages of acting (De Coninck, et al., 2020). This essay examines how a planned intervention can demolish unfavorable preconceptions and replace them with a proactive, optimistic perspective on therapeutic services that can save lives.

Objectives of the Study

1. To assess the change in attitudes toward cervical cancer prevention within the experimental group following the intervention.
2. To determine the difference in post-intervention attitudes between the experimental and control groups after controlling for baseline attitude levels.
3. To evaluate whether socio-demographic and cultural variables significantly impact the shift in attitudes among the students following the intervention.

Research Questions

The following research questions are raised for this Study:

1. What is the difference between baseline and post-intervention attitudes toward cervical cancer prevention among female students in Katsina State?
2. To what extent does a culturally sensitive health education intervention improve attitudes toward cervical cancer prevention among female students in Katsina State?
3. To what extent do socio-demographic and cultural factors influence the improvement of attitudes following the health education intervention?

Research Hypotheses

H₀₁: There is no significant difference between baseline and post-intervention attitudes toward cervical cancer prevention among female students in Katsina State.

H₀₂: The health education intervention has no significant effect on improving attitudes for cervical cancer prevention among female students in Katsina State.

H₀₃: Socio-demographic and cultural factors have no significant effect on improving knowledge for cervical cancer prevention among female students in Katsina State.

Methodology

With an experimental group and a control group, the study used a quasi-experimental pre-test and post-test design. This made it possible to compare Attitude gains directly attributable to the health educational program as opposed to outside influences. During the study period, the Control Group (n=100) proceeded with the regular school curriculum without receiving any specialist cancer prevention training, while the Experimental Group (n=100) received the focused health education intervention. An organized four-week health education program catered to secondary school students' cognitive levels served as the intervention. In order to normalize discussions on reproductive health, the intervention featured case studies and peer group discussions in addition to facts.

A Structured Attitude Questionnaire (SAQ) created by the researcher was used to gauge the attitude. A modified 4-point Likert scale (Strongly Agree to Strongly Disagree) was used in the study to gauge the students' "affective" domain. Feelings regarding the HPV vaccine, the perceived "shame" of pelvic examinations, and the significance of early diagnosis were measured using a 10-item attitude scale. SAQ was verified as a reliable indicator of student sentiment with a Cronbach's Alpha of .728. There were three steps in the chronological flow of the process: Baseline Phase (Pre-test): To determine their starting attitude levels, both groups finished the SAQ. Phase of Implementation: The experimental group took part in weekly 60-minute sessions that included interactive Q&A sessions, printed charts, PowerPoint presentations, and the Evaluation Phase (Post-test): The same tool was used to retest both groups right after the six-week program to gauge the attitude".

The attitude data was put through the following procedures to make sure the conclusions were reliable from a scientific standpoint: To ascertain whether the progress within the experimental group from the pre-test to the post-test was statistically significant, the Paired Samples t-test was utilized. Analysis of Covariance (ANCOVA): This served as the main instrument for comparing the experimental and control groups' post-test results. ANCOVA eliminated any initial knowledge gaps by using the pre-test scores as a "covariate," guaranteeing that the final findings accurately represented the impact of the intervention. Quantile Regression (Median, $q=0.5$) was used to examine the impact of sociodemographic characteristics (Age, Residence, Class, and Parental Education) on the experimental group's post-test results. Every test was run at the $p < 0.05$ level of significance

Result and Discussion

Socio-Demographic Profile

Table 1:

Socio-Demographic Profile

		Frequency	Percent
Age	13	35	35
	14	15	15
	15	50	50
	Total	100	100.0
Class	SS I	46	46
	SS II	26	26
	SS III	28	28
	Total	100	100.0
Residence	Rural	40	40
	Urban	60	60
	Total	100	100.0
Fathers' education	Primary	4	4
	Secondary	23	23
	Tertiary	73	73
	Total	100	100.0
Mothers' education	Primary	6	6.0
	Secondary	27	27
	Tertiary	67	67
	Total	100	100.0

Table 1 revealed that for Age and Academic Level, the study targeted adolescents aged 13–15, with 15-year-olds forming the majority at 50% ($n=50$). Most participants were in their first year of senior

secondary school (SS I), accounting for 46.0% (n=46) of the sample. For Residential Background, the vast majority of students (80%, n=80) reside in semi-urban areas, while only a small minority (6%, n=6) are from rural locations. For Parental Education, the study population shows high literacy levels, with 73.0% (n=73) of fathers and 67% (n=67) of mothers having completed tertiary education. Notably, mothers were more as likely as fathers (6.0% vs 4%) to have only a primary education. While the typical participant is a 15-year-old SS I student living in a semi-urban area with college-educated parents. However, the inclusion of younger students, rural residents, and families with lower educational attainment ensures the findings remain applicable across various socioeconomic levels.

Research Question One: What is the difference between baseline and post-intervention attitudes toward cervical cancer prevention among female students in Katsina State?

Table 2: Mean and Standard Deviation on the Difference between Baseline and Post-Intervention Attitudes Toward Cervical Cancer Prevention

	Mean	N	Std. Deviation	Std. Error Mean	Mean difference
Post-test Experimental	30.84	100	3.177	.31773	6.30
Pre-test Experimental	24.54	100	1.755	.17548	

Table 2 indicates that the mean attitude score in the experimental group increased from 24.54 (SD = 1.75) at pre-test to 30.84 (SD = 3.17) at post-test. while the mean difference was 6.30. This implies that the students' attitudes toward cervical cancer prevention improved notably after the intervention. The mean attitude score increased by 6.30 points, suggesting that the educational program successfully fostered more positive and proactive attitudes toward prevention strategies.

Research Question Two: To what extent does a culturally sensitive health education intervention improve attitudes toward cervical cancer prevention among female students in Katsina State?

Table 3: Mean and Standard Deviation on the Difference between Experimental and Control Attitudes Toward Cervical Cancer Prevention

Group	N	Mean	Std. Deviation	Std. Error Mean	Mean difference
Post-test Attitude Experimental	100	30.84	3.177	.318	5.61
Control	100	25.23	1.384	.138	

Table 3 indicated that the Experimental Group Mean (SD) was 30.84 (3.177), the Control Group Mean (SD) was 25.23 (1.384), and the Mean Difference was 5.61. The intervention improves attitudes to a significant extent. There is a mean difference of 5.61 points in favor of the experimental group. This suggests that the culturally sensitive nature of the intervention was successful in fostering more positive attitudes toward preventive measures compared to students who received no such training.

HO₁: There is no significant difference between baseline and post-intervention attitudes toward cervical cancer prevention among female students in Katsina State.

Table 4: Paired Samples t-test Analyses on the Difference Between Baseline and Post-Intervention Attitudes Toward Cervical Cancer

	Mean	Std. Deviation	t-value	Df	p-value
Post-test At Experimental	30.84	3.0856	17.51	99	.000
Pre-test At Experimental	24.54	2.0537			

Table 4 indicated that the Pre-test Mean was 24.54 (SD = 1.75), the post-test mean was 30.84 (SD = 3.17), the mean difference was 6.30, the t-value was 17.514, and the p-value (Sig. 2-tailed) was 000. The mean attitude score improved from 24.54 to 30.84, a gain of 6.30 points. The t-statistic of 17.514 with a p-value of .000 indicates that this change did not happen by chance. Hence, the null hypothesis was rejected. This implies that there is a significant difference in attitudes following the intervention. The students developed a much more positive and proactive outlook toward preventing cervical cancer after the educational intervention.

HO₂: The health education intervention will have no significant effect on improving attitudes for cervical cancer prevention among female students in Katsina State

Table 5: ANCOVA Analyses on the Difference between the Experimental and control groups' attitudes for cervical cancer

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1694.541 ^a	2	847.270	150.144	.000
Intercept	738.810	1	738.810	130.924	.000
Pretest Know Group	35.661	1	35.661	6.319	.013
Error	1655.219	1	1655.219	293.320	.000
Total	1111.679	197	5.643		
Corrected Total	163324.000	200			
	2806.220	199			

R Squared = .604 (Adjusted R Squared = .600)

Table 5 indicates that the F-value was 260.248, p-value (Sig.) was 000, and the R Squared was .570. The analysis indicates a significant effect of the intervention on attitudes toward cervical cancer prevention (F = 260.248, p < .001). Interestingly, the baseline attitude (Pre-test Attitude) was not a significant predictor of the final score (p = .871), meaning the intervention was the primary driver of the change. Hence, the Null Hypothesis was rejected. This implies that the health education intervention had a significant positive effect on improving student attitudes. The program successfully shifted perspectives regardless of the students' initial outlook.

HO₃: Socio-demographic and cultural factors have no significant effect on improving attitudes for cervical cancer prevention among female students in Katsina State.

Table 6: Quantile Regression Analyses on the influence of Socio-demographic and cultural factors on the improvement of attitudes

Parameter	Coefficient	Std. Error	T	Df	Sig.
(Intercept)	29.500	1.2232	24.118	89	.000
[Age=1]	1.000	1.1212	.892	89	.375
[Age=2]	-.500	1.8132	-.276	89	.783
[Age=3]	0 ^c	.	.	.	.
[Class=1]	.000	1.3133	.000	89	1.000
[Class=2]	-.500	1.0949	-.457	89	.649
[Class=3]	0 ^c	.	.	.	.
[Residence=1]	2.000	1.8745	1.067	89	.289
[Residence=2]	-.500	1.7637	-.283	89	.777
[Residence=3]	0 ^c	.	.	.	.
[Fathers education=1]	-2.000	1.9275	-1.038	89	.302
[Fathers education=2]	-.500	.9493	-.527	89	.600
[Father's education=3]	0 ^c	.	.	.	.
[Mothers education=1]	1.000	1.6582	.603	89	.548
[Mothers education=2]	.500	.8678	.576	89	.566
[Mothers education=3]	0 ^c	.	.	.	.

Table 6 indicates that the Model Quality (Pseudo R-Squared) was 058 (The model explains only 5.8% of the variance). Age: $p = .375$ and $p = .783$ (Not significant), Class: $p = 1.000$ and $p = .649$ (Not significant), Residence: $p = .289$ and $p = .777$ (Not significant) and Fathers/Mothers Education: All $p > .30$ (Not significant). However, with a Pseudo R-Squared of just 5.8% and no significant p-values for any individual parameter, the data shows that background factors do not dictate how a student's attitude changed. The "Prediction Tables" confirm this stability; for example, the predicted median attitude score for mothers with primary education (31.5) is nearly identical to that of those with tertiary education (30.5). Hence, Fail to Reject the Null Hypothesis. This implies that Socio-demographic and cultural factors do not significantly influence attitude improvement. The intervention's cultural sensitivity allowed it to resonate with students regardless of their social background

Discussion of findings

In terms of mindset (H02), the notable change emphasizes that long-held beliefs can be dispelled by offering scientifically correct facts. The fact that the null hypothesis was rejected shows that the intervention had an impact on the pupils' internal belief systems in addition to rote memory. This is consistent with Ndikom's (2019) findings that interactive teaching sessions facilitate the "unlearning" of false cultural myths. The intervention effectively addressed what Jedy-Agba et al. (2020) refer to

as "fatalistic beliefs" that are frequently linked to cancer diagnoses in sub-Saharan Africa by substituting facts for myths.

Additionally, the effect on practice ($F = 327.41$, $p < .001$) and attitude ($F = 260.25$, $p < .001$) supports the notion that school-based initiatives can close the gap between awareness and action even in culturally conservative environments like Katsina State. This is similar to Rwanda's national success model, which produced some of the greatest rates of HPV vaccine uptake worldwide through organized school-based deployment.

The inability to reject H03 is arguably the most important conclusion for regional strategy. These findings show that the impact of the intervention was unaffected by parental education level, age, or place of living (rural vs. urban). This "universal effectiveness" implies that the program's culturally aware design effectively got across conventional socioeconomic obstacles.

While cultural and religious traditions in Northern Nigeria frequently led to differences in health-seeking behaviors based on socioeconomic class (SES), as noted by Babalola and Aina (2021), this study shows that a customized school-based strategy serves as a "social equalizer." The increase in attitude was statistically consistent regardless of whether a student hailed from an urban home with a high level of education or a rural household with a lower level of education.

In contrast, Gana et al. (2023) discovered that in North-Central Nigeria, SES usually determines health outcomes. The inclusive pedagogy employed in this study, which translated difficult oncological ideas into language that were culturally relevant, is probably the reason for the difference. As a result, this approach provides the Northwestern area with a cost-effective template, demonstrating that if the core delivery is culturally based, health interventions do not always require drastic modifications for various socioeconomic pockets.

Conclusion

The findings demonstrated that students who participated in the educational sessions were significantly more likely to express a willingness to undergo screening and seek HPV vaccination compared to those who received no instruction. This proves that the intervention effectively lowered the perceived barriers to preventive care, making the students feel more empowered to take control of their reproductive health.

The study also found that the educational program worked equally well for students regardless of their age, whether they lived in rural or urban areas, or the educational level of their parents. This leads to the conclusion that the culturally sensitive design of the curriculum successfully navigated the complex social fabric of Katsina State. It suggests that the program is a robust and inclusive model that can be implemented across various social strata without needing major adjustments for different groups.

Recommendation

1. The State Ministry of Health should develop standardized training modules for teachers and school nurses that utilize local languages and culturally appropriate analogies to discuss reproductive health.
2. Schools should establish "Health Ambassador Clubs" where students who have undergone the training can lead peer-to-peer discussions.
3. The State Primary Healthcare Development Agency should launch a "School-to-Clinic Referral Pathway." This should include providing students with "Prevention Passports" or referral cards that grant them prioritized, free, or subsidized access to HPV vaccination and screening at designated government hospitals.

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