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## **Effect of Health Education Intervention Programme on Attitude Towards Cervical Cancer Prevention among Female Students in Tertiary Institutions in North-East Nigeria**

**IMAM, Rabiata Abubakar<sup>1</sup>**

**[imamikararabiat@gmail.com](mailto:imamikararabiat@gmail.com)**

**SANI, M. U. <sup>1</sup>**

**AHMAD, Sani Getso<sup>1</sup>**

**ALIYU, Mohammed<sup>1</sup>**

**ABDULLAHI, Lawan<sup>1</sup>**

<sup>1</sup>Human Kinetics and Health Education, Faculty of Education, Ahmadu Bello University Zaria, Kaduna State

### **Abstract**

*Cervical cancer remains a major public health challenge in Nigeria, particularly in the North-East, where incidence and mortality are disproportionately high. Although awareness of cervical cancer is gradually increasing, negative attitudes such as stigma, fear, and misconceptions continue to hinder preventive practices, including screening and vaccination. This study examined the effect of a health education intervention programme on attitude toward cervical cancer prevention among female students in tertiary institutions in North-East Nigeria. A sequential explanatory mixed-methods design was employed. A total of 180 students were selected through multistage sampling and divided equally into experimental and control groups. Data were collected using a validated questionnaire (reliability coefficient = 0.851) and focus group discussions. Quantitative data were analysed using descriptive statistics and a one-sample t-test at the 0.05 significance level, while qualitative data were analysed thematically. Findings revealed a significant positive shift in attitude among the experimental group after the intervention, with post-test aggregate mean scores of 4.960 (universities), 4.4733 (polytechnics), and 4.3711 (colleges of education), all above the decision mean of 3.5 ( $p < 0.05$ ). Qualitative results corroborated the quantitative findings, as students expressed greater willingness to adopt preventive behaviors, including HPV vaccination and cervical cancer screening. The study concludes that structured health education interventions are effective in fostering positive attitudes toward cervical cancer prevention among young women in tertiary institutions. It is recommended that such interventions be integrated into health promotion programmes to reduce the burden of cervical cancer in Nigeria.*

**Keywords:** Cervical cancer, health education, attitude, prevention, female students, Nigeria

### **Introduction**

According to the World Health Organization (WHO, 2023), cervical cancer is a significant public health issue affecting women globally. It is the second most commonly diagnosed cancer and the third leading cause of cancer-related deaths in women. Nearly 90% of new cases and 85% of deaths occur in developing countries, including Nigeria (Rimande-Joel & Ekenedo, 2023). Despite its preventable nature, cervical cancer continues to claim more women's lives annually than childbirth, with global estimates showing 804,127 new cases and over 500,000 deaths each year (GLOBOCAN, 2022). Cancer of the cervix starts when cells in the cervix begin to grow out of control due to DNA damage, often triggered by persistent infection with high-risk human papillomavirus (HPV) types 16, 18 and 22 (World Health Organization (WHO), 2023; American Cancer Society (ACS), 2023). The incidence and mortality rates vary widely across countries. For example, the United States recorded 13,960 new cases and 4,310 deaths in 2023 (ACS, 2023), while India reported 96,922 new cases and 60,078 deaths (ICMR, 2023). Ghana reported 3,151 new cases and 2,119 deaths annually (ICO/IARC, 2023). In Nigeria, about 14,089 new cases and nearly 10,000 deaths are reported annually, with eight out of ten women presenting at late stages (John-Akinola, Ndikom, Oluwasanu, Adebisi, & Odukoya, 2022). The burden is especially severe in the North East, where cervical cancer accounts for over 70% of gynaecological malignancies at University of Maiduguri Teaching Hospital (Kabir, Bukar, Nggada, Rann, Gidado, & Musa, 2023) and more than 68% at Abubakar Tafawa Balewa University Teaching Hospital. Poverty, insecurity, early marriage, polygamy, and limited healthcare access contribute to poor outcomes (Aminu, Ibrahim, Garba, Umar, Khan, & Usman, 2023). Although awareness of cervical cancer is gradually increasing, attitude remains a key determinant of prevention and control.

Attitude refers to an individual's perception, beliefs, and disposition toward preventive practices such as HPV vaccination and screening (Mbacu, 2022). Negative attitudes including fear, stigma, and misconceptions-discourage women from seeking preventive care (Abdullah & Suleiman, 2022). Studies in Nigeria reveal that even among female students who are aware of cervical cancer, many underestimate their risk, delay health-seeking behaviour, and perceive screening as

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unnecessary unless symptoms are present (Audu, Elnafaty, Khalil & Otubu, 2023). Mbacu (2022) notes that cultural stigma, myths, and superstitions further reinforce resistance to preventive services. These attitudinal barriers are critical because they undermine the effectiveness of preventive strategies such as HPV vaccination and regular screening, which remain the most cost-effective interventions compared to treatment (Haruna, Ibrahim, & Emanuel, 2023). Consequently, promoting positive attitudes through targeted health education interventions is essential, particularly among young women in tertiary institutions, who represent a critical group for breaking the cycle of ignorance, fear, and late presentation.

Although cervical cancer is preventable, many Nigerian women demonstrate poor attitudes toward preventive services, resulting in low uptake of screening and HPV vaccination. In North East Nigeria, socio-cultural norms, misconceptions, and fear of discrimination further discourage young women from seeking preventive care. Kabir et al. (2023) reported that even among women who are aware of screening services, less than 30% showed willingness to undergo testing, citing fear of pain, stigma, and cost as barriers. Similarly, Audu, et al (2023) found that in Bauchi State, over 60% of female students perceived cervical cancer screening as unnecessary unless symptoms were present. Such negative attitudes undermine preventive efforts, perpetuate late diagnosis, and worsen mortality rates. Since students represent an important sub-population of future mothers and role models, addressing their attitudes through structured health education interventions is essential to improve cervical cancer prevention in the region.

### **Research Objective**

The purpose of this study was to determine the effect of a health education intervention programme on the attitude toward cervical cancer prevention among female students in tertiary institutions in North East Nigeria.

### **Research Question**

Does health education intervention programme have positive effect on attitude toward cervical cancer prevention among female students in tertiary institutions in North East Nigeria?

### **Research Hypothesis**

**Ho:** There is no significant effect of health education intervention programme on attitude toward cervical cancer prevention among female students in tertiary institutions in North East Nigeria.

### **Methodology**

A sequential explanatory mixed methods approach was employed, in which quantitative data were collected and analysed first, followed by qualitative data to explain and elaborate on the quantitative findings. This approach provided a comprehensive, validated, and in-depth understanding of how the health education intervention programme affected female students' attitudes. The study population consisted of all 38,828 female students of federal tertiary institutions in North East Nigeria, while the sample included 180 female students, equally divided into the control and experimental groups (90 participants each). A multistage sampling technique was used to ensure representativeness and minimize bias. This process involved simple random sampling through balloting to select three states from the North East (Adamawa, Gombe, and Yobe), purposive sampling to include all available tertiary institutions in these states (federal universities, polytechnics, and colleges of education), and volunteer sampling to enrolled 60 female students from each state, with 10 allocated to the control group and 10 to the experimental group. Two researcher-developed instruments were used for data collection. Quantitative data were gathered using a closed-ended questionnaire with a five-point Likert scale, while qualitative data were obtained through focus group discussions guided by semi-structured open-ended questions. Both instruments were validated by five experts in health education and community medicine. The reliability of the quantitative instrument was tested using the split-half method and Pearson product-moment correlation, yielding a coefficient of 0.851, indicating strong reliability. Thematic analysis and member checking were employed for qualitative reliability, with positive feedback confirming that the findings aligned with participants' intended meanings and experiences. Data collection occurred in three phases: pre-intervention assessment, intervention sessions, and post-intervention assessment. Descriptive statistics such as frequency counts and percentages were used to present demographic information and distribution of attitude scores, while mean, median, and standard deviation were applied to summarize central tendency and variability. Inferential statistics using a one-sample t-test were employed to test the hypothesis at the 0.05 level of significance.

### **Presentation of Result**

**Table 1: Demographic information of Respondents**

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| <i>Variables</i> |                              |               | <b>Frequency</b> | <b>Percentage</b> |
|------------------|------------------------------|---------------|------------------|-------------------|
| <b>1.</b>        | <b>Age</b>                   | 18-29years    | 56               | 31.1              |
|                  |                              | 30-39-years   | 92               | 51.1              |
|                  |                              | 40-49years    | 32               | 17.8              |
|                  |                              | <b>Total</b>  | <b>180</b>       | <b>100.0</b>      |
| <b>2.</b>        | <b>Groups</b>                | Experimental  | 90               | 50.0              |
|                  |                              | Control       | 90               | 50.0              |
|                  |                              | <b>Total</b>  | <b>180</b>       | <b>100.0</b>      |
| <b>3.</b>        | <b>Institutions</b>          | MAUT Yola     | 20               | 11.1              |
|                  |                              | FCE Yola      | 20               | 11.1              |
|                  |                              | FP Mubi       | 20               | 11.1              |
|                  |                              | FU Kashere    | 20               | 11.1              |
|                  |                              | FCET Gombe    | 20               | 11.1              |
|                  |                              | FP Kaltingo   | 20               | 11.1              |
|                  |                              | F U Gashuwa   | 20               | 11.1              |
|                  |                              | FCET Potiskum | 20               | 11.1              |
|                  |                              | FP Damaturu   | 20               | 11.1              |
|                  |                              | <b>Total</b>  | <b>180</b>       | <b>100.0</b>      |
| <b>4.</b>        | <b>Types of Institutions</b> | Universities  | 60               | 33.3              |
|                  |                              | FCE           | 60               | 33.3              |
|                  |                              | Polytechnics  | 60               | 33.3              |
|                  |                              | <b>Total</b>  | <b>180</b>       | <b>100</b>        |
| <b>5.</b>        | <b>Students' Level</b>       | 100level      | 18               | 10.0              |
|                  |                              | 200level      | 54               | 30.0              |
|                  |                              | 300level      | 82               | 45.6              |
|                  |                              | 400level      | 23               | 12.8              |
|                  |                              | 500level      | 3                | 1.7               |
|                  |                              | <b>Total</b>  | <b>180</b>       | <b>100.0</b>      |

**Table 1** Revealed the demographic characteristics of the participants. The table shows that majority of the participants, 92 (51.1%), were within the age range of 30–39 years, followed by 56 (31.1%) aged 18–29 years, and 32 (17.8%) aged 40–

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49 years. The sample was equally divided between the experimental and control groups, with 90 respondents (50.0%) in each group. Furthermore, participants were evenly selected from nine different tertiary institutions, with each institution contributing 20 respondents, representing 11.1% of the total sample. In terms of institutional type, there was an equal distribution of respondents across universities, colleges of education, and polytechnics, with each category accounting for 60 respondents (33.3%). Regarding students' academic levels, the majority were 300-level students, accounting for 82 (45.6%) of the total respondents, followed by 54 (30.0%) in 200 level, 23 (12.8%) in 400 level, 18 (10.0%) in 100 level, and 3 (1.7%) in 500 level.

**Research Question:** Does Health Education Intervention programme have positive effect on attitude towards cervical Cancer prevention among female students in tertiary institutions in North East Nigeria?

**Table 2: Mean, Standard Deviation and Aggregate Mean on the Effect of Health Education Intervention Programme among Female Students after the Intervention on Attitude towards Cervical Cancer Prevention**

| S/N | Attitude                                                                                                                                                                                                                                           | Polytechnics |        | FCE    |        | Universities |        |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------|--------|--------|--------------|--------|
|     |                                                                                                                                                                                                                                                    | Mean         | STD    | Mean   | STD    | Mean         | STD    |
| 1   | I Prefer to maintain healthy body weight through regular exercise, physical activities and healthy eating habit in order to reduce the risk of cervical cancer.                                                                                    | 4.5333       | .50742 | 4.3667 | .49013 | 4.8667       | .34575 |
| 2   | I Prefer to take preventive measures against sexually transmitted infection such HPV genital herpes, gonorrhea Chlamydia and HIV/AIDS which predispose individual to cervical cancer.                                                              | 4.7000       | .53498 | 4.4667 | .62881 | 4.9000       | .30513 |
| 3   | I prefer to engage in adequate personal hygiene, avoiding vaginal douching and the use of herbs or traditional medication in the vagina in order to minimize cervical cancer                                                                       | 4.5333       | .62881 | 4.4000 | .62146 | 4.9333       | .25371 |
| 4   | I believe it is not healthy to be an active or passive smoker as it increases the risk of cervical cancer.                                                                                                                                         | 4.4667       | .62881 | 4.4667 | .57135 | 4.9667       | .18257 |
| 5   | Since I have a family history (Heredity) of cervical cancer, I think it is necessary to avoid all the risk factors.                                                                                                                                | 4.5333       | .57135 | 4.3000 | .65126 | 4.9667       | .18257 |
| 6   | As a female student of tertiary institutions in north east Nigeria, I will take preventive actions to minimize the occurrence of cervical cancer as much as possible.                                                                              | 4.6000       | .49827 | 4.3000 | .59596 | 5.0000       | .00000 |
| 7   | I believe that observing vaginal bleeding, changes in the menstrual cycle, pains during sex, vaginal discharge tinged with blood can help in the early detection and treatment of cervical cancer.                                                 | 4.3333       | .60648 | 4.2667 | .58329 | 5.0000       | .00000 |
| 8   | I would like to stick to one partner, avoid early exposure to sexual contact and reckless sex as these significantly increase the risk of cervical cancer.                                                                                         | 4.3333       | .47946 | 4.4000 | .62146 | 4.9667       | .18257 |
| 9   | I feel that cervical cancer is 93% preventable because many predisposing factors, such as Human Papilloma Virus (HPV) infection, smoking, multiple sexual partners, early sexual activity and long-term use of oral contraceptives are modifiable. | 4.4000       | .56324 | 4.4333 | .62606 | 4.9333       | .25371 |
| 10  | I feel that avoiding prolonged use of oral contraceptive pills and choosing an appropriate family planning method help in cervical cancer prevention,                                                                                              | 4.4333       | .56832 | 4.3667 | .55605 | 5.0000       | .00000 |

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|                |                                                                                                                                                                                                                                 |        |        |        |        |        |        |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--------|--------|--------|--------|
| 11             | I will like to vaccinate against HPV infection as a means to reduce the risk of developing cervical cancer,                                                                                                                     | 4.3000 | .59596 | 4.3333 | .60648 | 5.0000 | .00000 |
| 12             | I feel that education about cervical cancer through intervention programme can reduce cervical cancer risk.                                                                                                                     | 4.3667 | .66868 | 4.3667 | .49013 | 4.9667 | .18257 |
| 13             | I would like to engage in various cervical cancer screening procedures such as pap smears, HPV-DNA testing and Visual Inspection with Acetic Acid (VIA) because they help in the early detection and management of the disease. | 4.4333 | .62606 | 4.3333 | .54667 | 4.9667 | .18257 |
| 14             | I belief that understanding Human Papilloma Virus (HPV) as a main cause of cervical cancer can aid in preventing the disease.                                                                                                   | 4.5333 | .57135 | 4.3667 | .55605 | 5.0000 | .00000 |
| 15             | I belief that early cervical cancer detection helps in effective treatment                                                                                                                                                      | 4.6000 | .49827 | 4.4000 | .62146 | 4.9333 | .25371 |
| Aggregate Mean |                                                                                                                                                                                                                                 | 4.4733 |        | 4.3711 |        | 4.960  |        |

### Decision Mean 3.5

**Table 2** Revealed the mean, standard deviation, and aggregate mean on the effect of the health education intervention programme on the knowledge of cervical cancer prevention among female students in tertiary institutions in North-East Nigeria. The results reveal that the aggregate mean scores were: Polytechnics: 4.455, Federal Colleges of Education: 4.348, Universities: 4.968. All the aggregate means are above the decision benchmark of 3.5, indicating a high level of knowledge acquisition following the intervention. Therefore, the findings demonstrate a significant positive effect of the health education intervention programme on the knowledge of cervical cancer prevention across all types of tertiary institutions.

**Hypothesis:** There is no significant effect of Health Education Intervention programme on attitude towards cervical cancer prevention among female students in tertiary institutions in North East Nigeria.

**Table 3: analysis of one-sample t-test on the effect of health education intervention programme on attitude towards prevention of cervical cancer among female students of tertiary institutions in north east Nigeria.**

| Variables                            | N  | Mean    | Std. Deviation | Std. Error Mean | df | t-cal  | Sig. |
|--------------------------------------|----|---------|----------------|-----------------|----|--------|------|
| <b>Federal Colleges of Education</b> |    |         |                |                 |    |        |      |
| Attitude after Experimental          | 30 | 18.9667 | 3.32683        | .60739          | 29 | 25.464 | .000 |
| Decision Mean                        |    | 3.5     |                |                 |    |        |      |
| <b>Federal Polytechnics</b>          |    |         |                |                 |    |        |      |
| Attitude after Experiment            | 30 | 66.7667 | 4.80433        | .87715          | 29 | 72.128 | .000 |
| Decision Mean                        |    | 3.5     |                |                 |    |        |      |
| <b>Universities</b>                  |    |         |                |                 |    |        |      |
| Attitude after Experimental          | 30 | 74.4000 | .96847         | .17682          | 29 | 400.97 | .000 |
| Decision Mean                        |    | 3.5     |                |                 |    |        |      |

**Table 3** Revealed the results of a one-sample t-test on the effect of the health education intervention programme on knowledge of cervical cancer prevention among female students in tertiary institutions in north east Nigeria. The findings show that the calculated t-values were 23.091 for Federal Colleges of Education, 75.060 for Federal Polytechnics, and 534.730 for universities. The corresponding p-values of .000 for all institutions are less than the alpha level of 0.05, indicating statistically significant results; therefore, the null hypothesis was rejected. Additionally, the mean scores for knowledge after the intervention across all institutions were above the decision mean of 3.5, suggesting a high level of knowledge acquisition following the intervention.

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### **Discussion of Finding**

The findings of this study also revealed that the Health Education Intervention Programme (HEIP) had a significant effect on improving attitudes toward cervical cancer prevention among female students in tertiary institutions in North-East Nigeria. However, despite the significant effect, the degree of improvement varied slightly across the different institution types. The post-test aggregate mean scores were 4.960 for universities, 4.4733 for polytechnics, and 4.3711 for colleges of education all above the decision mean of 3.5. This indicates that the intervention effectively promoted favourable attitudes across all institution types, although the extent of change differed. Students in universities recorded the highest attitude mean score (4.960), followed by students in polytechnics (Mean = 4.4733), while students in colleges of education had the lowest mean attitude score (4.3711), though still indicative of a positive shift. Qualitative data collected through Focus Group Discussions (FGDs) further supported these findings, as participants demonstrated a more positive attitude toward cervical cancer prevention following the intervention. Notably, university students exhibited the most pronounced positive attitudinal change compared to students from polytechnics and colleges of education.

**Pre-Test Views of Students (FGD) on Attitude Toward Cervical Cancer Prevention:**

Before the intervention, participants displayed low awareness and concern regarding cervical cancer prevention, as reflected in the following statements:

*"I don't think it's that big of a deal. I haven't really heard about it being a major issue like other diseases."*

*"I'm not sure if it's important for me. I don't feel like I'm at risk, so I don't think much about prevention."*

*"I don't think it's preventable. If someone's going to get it, they'll get it."*

**Post-Test Views of Students (FGD) on Attitude Toward Cervical Cancer Prevention:**

After the intervention, participants exhibited a more informed and proactive attitude toward cervical cancer prevention:

*"I now understand that cervical cancer is a serious health issue for women, and preventing it is important."*

*"I have learned that every woman is at risk, so it is necessary to take preventive measures like vaccination and screening."*

*"Cervical cancer is largely preventable, and early detection can help save lives."*

These findings clearly demonstrate that the HEIP significantly improved attitudes toward cervical cancer prevention among female students in tertiary institutions in North-East Nigeria. The outcome of this study aligns with the findings of Shakya et al. (2023), who demonstrated that community-based health education interventions significantly enhanced women's willingness to participate in cervical cancer screening in rural Nepal. Furthermore, the study is supported by the findings of George and Batra (2023), who conducted a randomized controlled trial on the effect of a community-based multicomponent intervention on cervical cancer prevention behaviors among women in India. Their study reported a significant improvement in women's attitudes toward cervical cancer prevention following a structured health education intervention. Similarly, the findings of this study align with those of Fawzy et al. (2023), who highlighted the effectiveness of structured educational initiatives in fostering awareness and promoting preventive attitudes among female nursing students in Saudi Arabia toward cervical cancer prevention. Furthermore, this study aligns with the findings of Ifediora and Azuike, (2022), who explored the impact of integrating cervical cancer awareness modules into secondary school curricula in Nigeria and found that early exposure to structured education significantly improved students' attitudes and increased their intention to adopt preventive behaviour. Consistent with these findings, Mohammad et al. (2022) demonstrated a statistically significant improvement in female nursing students' attitudes toward human papillomavirus (HPV) and cervical cancer screening following a health education intervention programme in Egypt. Moreover, the qualitative study by Williams et al. (2023) on cervical cancer and cervical cancer screening awareness among nurses in Ghana further supports these findings. Their research highlighted that health education intervention programme was highly effective in improving women's attitudes toward cervical cancer prevention. Additionally, the findings align with the study of Rimande-Joel and Ekenedo (2023), which reported that an education and communication-based intervention programme on cervical cancer prevention significantly increased participants' positive attitudes in Jalingo, Nigeria.

### **Conclusion**

The seven-week health education intervention programme had a positive effect on the attitude of female students toward cervical cancer prevention in tertiary institutions in North East Nigeria after exposure to the programme.

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## Recommendation

Tertiary institutions in north east Nigeria should collaborate with health professionals and advocacy groups to organize regular awareness campaigns, panel discussions, and testimonial sharing sessions to reinforce positive attitudes toward cervical cancer prevention.

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