Acta Scientific MEDICAL SCIENCES (ISSN: 2582-0931)

Volume 9 Issue 6 June 2025

Research Article

Prevalence and Changing Trend in the Clinical Presentation of Cervical Cancer at A Tertiary Hospital in South-East Nigeria

Osita Samuel Umeononihu[1,2], Martin Chinedu Andeh[2], George Uchenna Eleje[1,2]*, Onyeka Chukwudalu Ekwebene[3], Sylvester Onuegbunam Nweze[4], Nnanyereugo Livinus Onah[4], Chidinma Theresa Ezidiegwu[2], Chukwuemeka Jude Ofojebe[1,2], Chijioke Ogomegbunam Ezeigwe[1,2], Onyecherelam Monday Ogelle[1,2], Boniface Chukwuneme Okpala[5], Ekene Agatha Emeka[5], Johnbosco Emmanuel Mamah[6], Chekwube Martin Obianyo[7], Chukwuemeka Chidindu Njoku[2], Emeka Franklin Okechukwu[8] and Gerald Okanandu Udigwe[1,2]

[1]Department of Obstetrics and Gynaecology, Nnamdi Azikwe University, Awka, Nigeria

[2]Department of Obstetrics and Gynaecology, Nnamdi Azikwe University Teaching Hospital, Nnewi, Nigeria

[3]Department of Biostatistics and Epidemiology, East Tennessee State University, Johson City, Tennessee USA

[4]Department of Obstetrics and Gynecology, ESUT Teaching Hospital, Parklane, Enugu, Nigeria

[5]Department of Family Medicine, Nnamdi Azikiwe University Teaching Hospital, Nigeria

[6]Department of Obstetrics and Gynecology, Alex Ekwueme Federal University Teaching Hospital, Abakaliki, Nigeria

[7]Jiann-Ping Hsu College of Public Health, Georgia Southern University, USA

[8]Department of Health, Population and Nutrition, US Agency for International Development (USAID), Nigeria

***Corresponding Author:** George Uchenna Eleje, Department of Obstetrics and Gynaecology, Effective Care Research Unit, Nnamdi Azikiwe University, Awka (Nnewi Campus), P.M.B. 5001, Nnewi, Anambra State, Nigeria.

DOI: 10.31080/ASMS.2025.09.2083

Received: March 07, 2025

Published: May 06, 2025

Abstract

Background: Cervical cancer is the most common gynaecological malignancy in low- and middle-income countries, including Nigeria, where it remains a major cause of morbidity and mortality. Despite being largely preventable through screening and vaccination, late-stage presentation remains a significant challenge.

Objectives: To determine the prevalence, associated risk factors, and clinical presentation of histologically confirmed cervical cancer cases at a tertiary hospital in South-East Nigeria.

Materials and Methods: A five-year retrospective study was conducted at Nnamdi Azikiwe University Teaching Hospital (NAUTH), Nnewi, Nigeria, covering cases from January 1, 2017, to December 31, 2021. Data were obtained from hospital records, including the gynaecology clinic, gynaecology ward, histopathology department, and operating theatre registers. Only histologically confirmed cases were included. Relevant patient information was retrieved from case notes, entered into SPSS version 25, and analysed using descriptive statistics.

Results: A total of 103 cervical cancer cases were identified, accounting for 49.3% of all gynaecological malignancies. The highest incidence occurred in women aged 60–69 years (34.7%), with grand multiparity being the most common reproductive history (73.7%). The predominant symptom at presentation was irregular vaginal bleeding (84.2%), with most patients experiencing multiple symptoms. Late-stage diagnosis was prevalent, with 75.4% of cases presenting at stage III. Squamous cell carcinoma was the most common histological type (90.5%). None of the patients had undergone prior cervical cancer screening or received the HPV vaccine. Due to the unavailability of radiotherapy services at the facility, 94.7% of patients were referred to another tertiary center for treatment.

Conclusion: Cervical cancer remains the leading gynaecological malignancy in this setting, with late-stage presentation and lack of access to radiotherapy posing significant challenges. Increased public awareness, improved screening uptake, and enhanced healthcare infrastructure, including accessible radiotherapy services, are crucial for improving outcomes.

Keywords: Histologically Confirmed; Prevalence; Radiotherapy; Screening; Squamous Cell Carcinoma; NAUTH; Nigeria

Introduction

Cervical cancer is the most prevalent gynaecological malignancy in low- and middle-income countries and ranks as the third most frequently diagnosed gynaecological cancer and cause of death in high-income nations [1]. In Nigeria, it is the second most commonly diagnosed cancer among women, following breast cancer [2]. In 2020, cervical cancer contributed to 604,000 (3.1%) of all newly diagnosed cancer cases and 342,000 (3.4%) of global cancer-related deaths among females [3]. The majority (84%) of new cases occur in less developed regions, where cervical cancer is the second most prevalent cancer (15.7 per 100,000) and the third leading cause of cancer-related mortality (8.3 per 100,000) among women [3,4].

In 2011, an estimated 36.59 million Nigerian women over the age of 15 were considered at risk of developing cervical cancer, with approximately 9,922 new cases and 8,030 deaths reported annually [2]. More recently, around 12,075 new cases of cervical cancer are diagnosed in Nigeria each year [5], with the highest incidence occurring in women aged 40–44 years [5]. Globally, the incidence and mortality of cervical cancer are influenced by the availability of screening programs for precancerous lesions and cancer, as well as human papillomavirus (HPV) vaccination, which are widely implemented in developed countries. These preventive measures have contributed to a 75% reduction in cervical cancer incidence and mortality in high-income nations over the past five decades [6].

The major histologic types are squamous cell carcinoma (70-75%) and adenocarcinoma (25%) [7-12]. The pre invasive of both types share many of the risk factors [11,12]. Majority of these risk factors are associated with an increased risk of acquiring human papillomavirus infection (HPV) [12]. These include: early onset of sexual activity, multiple sexual partners, high risk sexual partner, history of sexually transmitted infections (Chlamydia trachomatis and genital herpes), immunosuppression, early age at first birth, high parity, history of vulvar or vaginal squamous intraepithelial neoplasia or cancer [8-12]. Other non-HPV related risk factors include: low socioeconomic status, use of oral contraceptives, cigarette smoking, genetics and having an uncircumcised male sexual partners [13]. Human papilloma virus is central to the development of cervical cancer and can be detected in 99.7 percent of cervical cancers [13].

Early-stage cervical cancer is often asymptomatic and is typically detected through cervical cancer screening or as an incidental finding during a pelvic examination [7-10]. The most common symptom of invasive disease is abnormal vaginal bleeding, particularly post-coital bleeding, which may be accompanied by

a foul-smelling, excessive vaginal discharge [8-11]. Additional clinical manifestations vary depending on the disease stage and may include urinary symptoms such as increased frequency, haematuria, or total incontinence associated with urinary fistula. Bowel-related symptoms like haematochezia, as well as anaemia, pelvic or lower back pain, leg swelling (oedema), and unintended weight loss, may also be present [10].

The burden of cervical cancer among women can be significantly reduced through effective primary prevention strategies, including awareness and avoidance of risk factors, HPV vaccination, and secondary prevention measures such as screening and treatment of precancerous lesions [11,12]. These interventions align with the WHO global targets for cervical cancer elimination: achieving 90% HPV vaccination coverage among girls by age 15, ensuring 70% of women undergo high-performance screening by ages 35 and 45, and providing proper management for 90% of those diagnosed with preinvasive and invasive cervical cancer by 2030 [11,12]. For individuals presenting with advanced disease, appropriate treatment and palliative care can help improve outcomes. Additionally, strong political commitment and coordinated efforts are necessary to expand health insurance coverage for cancer treatment and enhance access to radiotherapy services. This study aimed to assess the prevalence and sociodemographic characteristics of patients with histologically confirmed cervical cancer at Nnamdi Azikiwe University Teaching Hospital (NAUTH), Nnewi, South-East Nigeria.

Materials and Methods

Study design

This is a 5 year retrospective cross-sectional study of all cases of cervical carcinoma seen in Nnamdi Azikiwe University Teaching Hospital (NAUTH), Nnewi, South-east Nigeria, from 1st January 2017 to 31th December, 2021.

Study population

The study was conducted among women with histologic diagnosis of cervical cancer in Nnamdi Azikiwe university teaching hospital Nnewi within the study period.

Study settings

Over a five-year period, from January 1, 2017, to December 31, 2021, the study was carried out in the gynecological sections of Nnamdi Azikiwe University Teaching Hospital (NAUTH), Nnewi, South-East Nigeria. The facility is a 400-bed tertiary hospital supported by the Federal government of Nigeria and offers first-rate emergency obstetrics and gynaecology care round the clock. It acts as a referral facility for adjacent states in addition to offering specialised services to the host community and the entire state. The hospital acts as a training institution for undergraduate and postgraduate medical education. As a training institution, it has a large number of consultants, junior and senior resident doctors, and other supporting medical staff.

Eligibility criteria

Those eligible for the study were women who presented and were managed for cervical cancer at NAUTH from January 1st, 2017, to December 31st, 2021.

Sampling technique and sample size determination

The sampling method used was a non-random sampling technique. The sample size was an all-population base study. During the study period, all case files of cervical cancer were obtained, and pertinent data was extracted.

Study procedure

The registers of the gynaecology clinic, gynaecology ward, histopathology department and operating theatre registers were used to identify cases of cervical cancer managed within the study period. Their case files were obtained from the hospital's medical records division. Relevant information were obtained from the case files which includes age, parity, marital status, highest level of education, age at coitarche, number of sexual partners, symptoms at presentation, history of cervical cancer screening and HPV vaccination, clinical stage after examination under anaesthesia and histological type of the cancer were extracted from the case files. The data obtained were analyzed manually using a tally numeration system. The results were summarized using frequencies, percentages, tables and charts for categorical variables. Ethical approval for the research was granted by the hospital ethical committee.

Results

During the study period, from 1st January 2017 to 31th December, 2021, there were a total of 209 cases of gynaecological cancers that were diagnosed and treated. One hundred and three cases

were cervical cancer; accounting for 49.3% of all gynaecological malignancies. However, only 95 case notes out of the 103 cervical cancer cases were available from the Health Records Department for analysis (giving a retrieval rate of 92.2%).

Table 1 shows the sociodemographic characteristics of the patients that had cervical cancer. The age range of patients was from 27 to 90 years. Most of the patients were between the age of 50 and 69 years with the modal age range between 60-69years.Majority of the patients were from rural areas (81.1%). Out of the 95 cervical cancer patients, 67 were married, 4 were single, 5 were separated or divorced and 19 were widows. Majority of the cervical cancer patients had primary level of education (40%) and only 4.2% of them had tertiary level of education. None of the patients had any method of cervical cancer screening or HPV vaccination. The disease was more prevalent in women that are grand multiparous (70) 73.7%. Nulliparous patients accounted for 4.2% of the study group. Most of the patients had coitarche before 18 years in 82.1% (78) while 28 of the patients had multiple sexual partners. Four of the patients had HIV (4.2%) and none of the patients studied smoked cigarette.

Table 1: Sociodemographic characteristics of patients.

Variable	Options	Frequency n (%)
Age (years)	<30	1 (1.1)
	30-39	4 (4.2)
	40-49	20 (21.1)
	50-59	26 (27.4)
	60-69	33 (34.7)
	>70	11 (11.6)
Marital status	Single	4 (4.2)
	Married	67 (70.5)
	Divorced	5 (5.3)
	Widowed	19 (20.0)
Parity	0	4 (4.2)
	1	3 (3.2)
	2-4	18 (18.9)
	>4	70 (73.7)
Level of education	None	21 (22.1)
	Primary	38 (40.0)
	Secondary	32 (33.7)
	Tertiary	4 (4.2)
Occupation	Trader	52 (54.7)
	Civil Servant	14 (14.7)
	Farmer	18 (18.9)
	Unemployed	11 (11.6)
Patient's residence	Rural	77 (81.1)
	Urban	18 (18.9)

Table 2 shows the presenting complaints and risk factors among women with cervical cancer, while Figure 1 shows the chart showing presenting complaints among women with cervical cancer. Most patients presented with multiple symptoms however, irregular vaginal bleeding was the most common presentation occurring in 84.2% (80) of the patients, purulent vaginal discharge in 23.2% (22) while 12.6% had painful intercourse and 5.3% had lower abdominal pain.

Table 2: Presenting complaints and risk factors among women with cervical cancer.

Variable	Options	Frequency n (%)
Presenting complaints	Irregular vaginal bleeding	80 (84.2)
	Purulent vaginal discharge	22 (23.2)
	Dyspareunia	12 (12.6)
	Lower abdominal pains	12 (12.6)
	Waist pain	11 (11.6)
	Weight loss	8 (8.4)
Associated Risk factors	Grand multiparous	70 (73.7)
	Early coitarche	78 (82.1)
	Multiple sexual partner	28 (29.5)
	HIV Status	4 (4.2)
	Family history: gynaecological cancer	3 (3.2)
	Smoking	0
	HPV vaccination	0
	Cervical screening	0

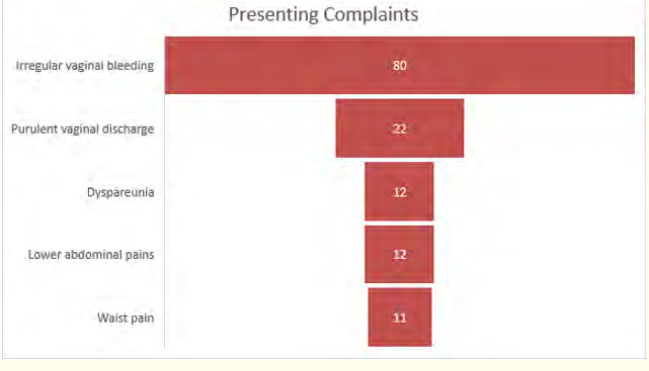

Figure 1: Chart showing presenting complaints among women with cervical cancer.

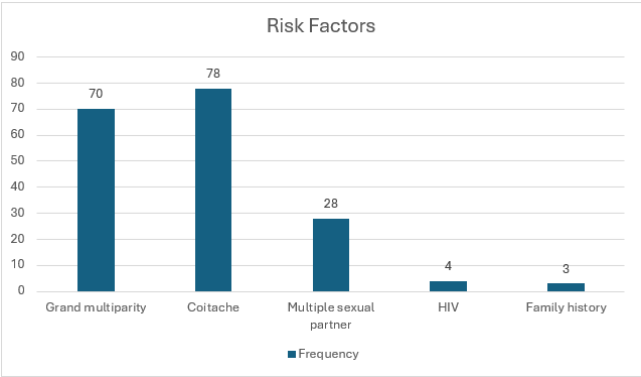

Figure 2: Chart showing risk factors among women with cervical cancer.

Table 3 shows the stage of cervical cancer at presentation, while Figure 3 shows the chart showing stage of cancer at presentation. Most of the patients presented late with 56.8 % of the patients presenting at stage 3disease. Majority of the patients (94.7%) in the study due to late presentation were referred to another tertiary health facility for radiotherapy due to unavailability of radiotherapy in our facility.

Table 3: Stage of cervical cancer at presentation.

Variable	Options	Frequency n (%)
Stage at presentation	Stage 1	2 (2.1)
	Stage 2	28 (29.5)
	Stage 3	54 (56.8)
	Stage 4	11 (11.6)

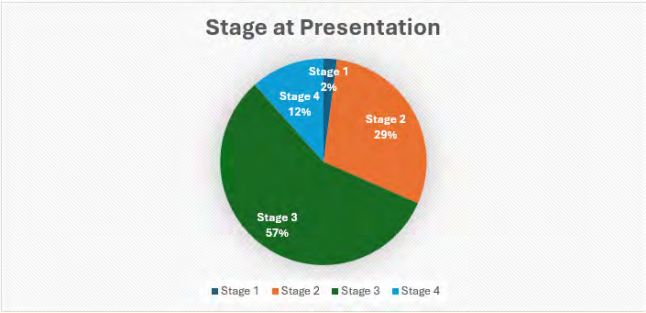

Figure 3: Chart showing stage of cancer at presentation.

Table 4 shows the histological subtypes of cervical cancer, while Figure 4 shows a chart of histological subtypes of cervical cancer. Squamous cell carcinoma was identified in 90.5% of the cases while adenocarcinoma accounted for 6.3% of the cases.

Table 4: Histological subtypes of cervical cancer.

Variable	Options	Frequency n (%)
Histological Subtype	Squamous cell carcinoma	86 (90.5)
	Adenocarcinoma	6 (6.3)
	Adenosquamous carcinoma (mixed)	3 (3.2)
Squamous cell carcinoma (Keratinization)	Non-keratinized	62 (72.1)
	Keratinized	24 (27.9)

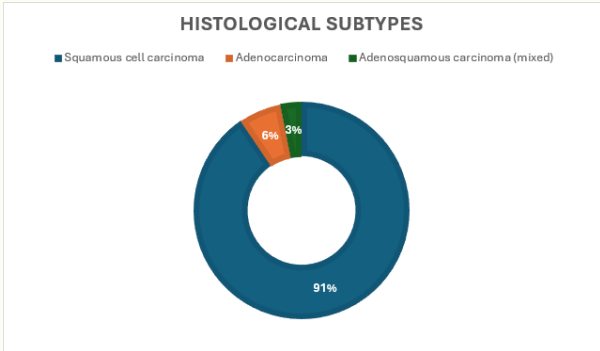

Figure 4: Chart showing histological subtypes of cervical cancer.

Discussion

In this study, cervical cancer accounted for 49.3% of all diagnosed and treated gynecological cancers during the study period. This finding is consistent with prevalence rates reported in Bayelsa (45.6%), Kano (48.6%), and Abakaliki (49.2%) [14-16] but lower than those observed in Orlu (60.1%) and Jos (74.9%), all in Nigeria [17,18]. It also falls below the prevalence recorded in a 2010 study conducted at the same institution, which reported a rate of 65.2% [19]. This decline may be attributed to increased community awareness efforts, cervical cancer screening programs, and the early detection and treatment of precancerous lesions before they progress to invasive cancer. However, it is notable that in this study, none of the affected individuals had undergone cervical cancer screening or received the HPV vaccine.

The highest incidence of cervical cancer was observed in the 60–69-year age group, which aligns with findings from a study conducted in Abakaliki, Nigeria [16], but is higher than the peak age range of 50–59 years reported in studies from Orlu, Kano, and Bayelsa, also in Nigeria [14,15,17]. This trend highlights the increased risk of cervical cancer with advancing age, emphasizing the need for regular cervical cancer screening up to the eighth decade of life. In this study, the disease was most prevalent among grand multiparous women, with a mean parity of six, a finding consistent with studies by Allagoa., *et al*. and Awolude., *et al*. [14,20]. Other identified risk factors included early sexual debut (before 18 years) (82.1%), multiple sexual partners (29.5%), and retroviral disease (4.2%). Notably, none of the patients reported cigarette smoking, and none had undergone a Pap smear or received HPV vaccination.

The commonest presenting complaints were vaginal bleeding (84.2%), followed by vaginal discharge, dyspareunia and lower abdominal pain. However, majority of the patients had more than one of the above symptoms at presentation. These presenting complaints were similar to work done by Kani., *et al*. and Allagoa., *et al*. [2,14]. Squamous cell carcinoma was the most common type accounting for 90.5% of the cases. This high incidence was also observed in studies done by Kani., *et al*. Allagoa., *et al*. Awolude., *et al*. Ikechebelu., *et al*. and Musa., *et al*. with an incidence of 70%, 80.6%, 88.7%, 90.3%, and 91% respectively [2,19-21].

Stage III cervical cancer was the most frequently diagnosed stage in this study, accounting for 56.8% of cases, a trend also observed in studies by Kani., *et al*. Ikechebelu., *et al*. and Awolude., *et al*. [2,19,20]. Disease staging considers tumour size, lymph node involvement, and distant metastasis to assess prognosis and survival chances. Due to the high rate of late presentation, the majority of patients (94.7%) were referred to another tertiary health facility for radiotherapy, as this service was unavailable at the study center. This study emphasises the significant challenge of late cervical cancer presentation in Nigeria, compounded by limited treatment facilities. Patients diagnosed at advanced stages have fewer treatment options, often restricted to chemo-radiation or palliative care. These findings underscore the urgent need for strong political commitment to establish well-equipped oncology units with trained personnel in tertiary institutions.

This study has a number of clinical implications for practice. The absence of prior screening or HPV vaccination highlights the urgent need to improve awareness and access to these preventive measures. Public health campaigns should target at-risk populations, emphasising early detection and prevention. Expanding cervical cancer screening programmes, particularly among older women and those with high parity, could facilitate early detection and reduce late-stage presentation. The lack of local radiotherapy services significantly impacts patient care. Investment in oncology infrastructure, including radiotherapy units and trained personnel, is essential to improve treatment accessibility and patient outcomes. Increased government commitment is necessary to subsidise screening programmes and integrate cervical cancer care into primary healthcare services.

This study has a number of strengths. The study provided valuable epidemiological data on cervical cancer prevalence, risk factors, and clinical presentation in South-East Nigeria. Data were drawn from multiple hospital sources, ensuring comprehensive case capture. The study emphasises the critical gaps in screening, vaccination, and treatment access, informing healthcare policy and practice. The significant limitation of this study is that it is a retrospective study with associated average to poor documentation of some of the relevant information sought. The study was conducted at a single tertiary hospital, which may limit generalisability to the broader Nigerian population. There is lack of follow-up data on patient survival outcomes and treatment responses.

Conclusion

Cervical cancer remains a major public health concern in South-East Nigeria, with a high prevalence, late-stage presentation, and limited access to treatment facilities. The absence of screening and HPV vaccination the urgent need for targeted interventions to improve early detection and prevention. Strengthening public health initiatives, enhancing treatment infrastructure, and increasing policy support for cervical cancer care are essential steps toward reducing disease burden and improving patient outcomes. There is also need for political will for extensive health insurance coverage for cancer therapy as well as well-equipped oncology unit and personnel in most tertiary institution as advanced cases in this study had to be referred to other facilities due to non-availability of

radiotherapy equipment in our hospital, thereby delaying care to these patients and worsening the morbidity and mortality caused by the disease.

Acknowledgement

The authors are grateful to all the study participants whose information was used for the study and also to the NAUTH hospital staff that participated in this study.

Disclosure Statement for Publication

This work has not been submitted to any journal for consideration for publication. The conceptualization, design, writing, and critical editing of the article, data collection, and analysis were all greatly aided by the efforts of each author. The submission of this work to a journal for consideration was approved in full by the authors.

Declaration of Conflicting Interest

The authors declare no conflict of interest.

Ethical Approval

Ethical clearance for the study was sought and obtained from the Nnamdi Azikiwe University Teaching Hospital (NAUTH) ethics review committee on July 5, 2022, with approval reference number NAUTH/CS/66/VOL.15/VER.3/106/2022/066. The research was conducted according to ethical principles for human scientific research according to the Helsinki Declaration.

Consent to Participate

This is not applicable as this is a retrospective study.

Consent for Publication

This is not applicable.

Author Contributions

OSU and MCA are the principal investigators. OCE, SON, NLO, CTE, CJO, COE and GUE conceived the study. Data assessment was performed by EAE, JEM, CMO, CCN, EFO, GOU and GUE. Calculations and data interpretation were performed by OSU, MCA, and GUE. Statistical analysis was performed by MCA, OCE and SON. NLO and CTE prepared tables and figures. The first draft of the paper was written by OSU, MCA, OCE, SON, EAE, JEM, CMO, CCN, EFO, GOU and GUE. NLO, CTE, CJO, COE, OMO, BCO and GUE critically revised the paper. All authors reviewed and edited the final draft. All authors critically reviewed the article, gave final approval of the version to be published, agreed on the journal to which the article has been submitted, and agreed to be accountable for all aspects of the work.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

Data Availability Statement

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Bibliography

1. Siegel RL., *et al*. "Cancer statistics, 2022". *CA: A Cancer Journal for Clinicians* 72.1 (2022): 7-33.

2. Kani YA., *et al*. "Prevalence of cervical cancer - A 6-year retrospective study in Jigawa State, Nigeria*". World Journal of Biology Pharmacy and Health Sciences* 4.1 (2020): 8-13.

3. Sung H., *et al*. "Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries". *CA: A Cancer Journal for Clinicians* 71.3 (2021): 209-249.

4. Torre LA., *et al*. "Global cancer statistics, 2012". *CA: A Cancer Journal for Clinicians* 65.2 (2015): 87-108.

5. Bruni L., *et al*. "ICO/IARC Information Centre on HPV and Cancer (HPV Information Centre)". Human Papillomavirus and Related Diseases in Nigeria. Summary Report (2021).

6. Simelela PN. "WHO global strategy to eliminate cervical cancer as a public health problem: An opportunity to make it a disease of the past". *International Journal of Gynecology and Obstetrics* 152.1 (2021): 1-3.

7. Ilika CP., *et al*. "Effects of speculum lubrication on cervical smears for cervical cancer screening: A double blind randomized clinical trial". *PLoS One* 19.5 (2024): e0292207.

8. Umemmuo MU., *et al*. "Improving Treatment Outcome for Cervical Cancer Using 2-Point Assessment of Quality of Life Among Nigerian Women: A Protocol for a Multi-Center Study". *Clinical Medicine Insights: Oncology* 17 (2023): 11795549231212339.

9. Enechukwu CI., *et al*. "Comparative study on the adequacy of cervical smears using wooden Ayre's spatula, VS Papcone® sampling device". *Gynecologic Oncology Reports* 38 (2021): 100860.

10. Eleje GU., *et al*. "Palliative interventions for controlling vaginal bleeding in advanced cervical cancer". *Cochrane Database of Systematic Reviews* 5 (2025): CD011000.

11. Eke NO., *et al*. "Knowledge of Cervical Cancer and its Screening amongst Female Workers in Nnewi, Nigeria". *Afrimedic Journal* 1.1 (2010): 31-33.

12. Ezechi O., *et al*. "High-risk human papillomavirus infection among Nigerian women: A systematic review and meta-analysis". *Journal of International Medical Research* 51.7 (2023): 3000605231182884.

13. Frumovitz M. "Invasive cervical cancer: Epidemiology, risk factors, clinical manifestations, and diagnosis". *Uptodate* (2022).

14. Allagoa DO., *et al*. "Cervical Cancer in a Tertiary Hospital in South-South, Nigeria: A 5-Year Review". *JCTI* (2021): 28-36.

15. Yakasai IA., *et al*. "Gynecological malignancies in Aminu Kano Teaching Hospital Kano: A 3 year review". *Nigerian Journal of Clinical Practice* 16 (2013): 63-66.

16. Olaleye AA., *et al*. "Profile of Gynaecological Malignancies in Alex Ekwueme Federal University Teaching Hospital, Abakaliki, Southeastern Nigeria". *IJCM* 10 (2019): 428-438.

17. Umeobika JC., *et al*. "Gynaecological Malignant Tumours at Imo State University Teaching Hospital Orlu South Eastern Nigeria". *Afrimedic Journal* 6.1 (2018): 52-58.

18. Sanni WO., *et al*. "Pattern of Gynaecological Malignancies in Jos". *Tropical Journal of Obstetrics and Gynaecology* 30 (2013): 97-100.

19. Ikechebelu JI., *et al*. "Clinicopathological analysis of cervical cancer seen in a tertiary health facility in Nnewi, south-east Nigeria". *Journal of Obstetrics and Gynaecology* 30 (2010): 299-301.

20. Awolude OA and Oyerinde SO. "Invasive cervical cancer in Ibadan: socio-sexual characteristics, clinical stage at presentation, histopathology distributions and HIV status". *African Journal of Infectious Diseases* 13.1 (2018): 32-38.

21. Musa J., *et al*. "Cervical cancer survival in a resource-limited setting-North Central Nigeria". *Infectious Agents Cancer* 11 (2016).