Prevalence, Trends, and Factors Associated with Abortion-Related Mortality in South-South Nigeria: A Five-Year Retrospective Study

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ABSTRACT

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| **Background:** Unsafe abortion remains a significant contributor to maternal mortality, particularly in low- and middle-income countries like Nigeria, where access to safe reproductive health services is often limited. Despite global efforts to reduce abortion-related deaths, the burden persists in many regions, including South-South Nigeria, where data on trends and determinants remain insufficient.  **Aims:** To determine the prevalence, trends, and factors associated with abortion-related mortality over a five-year period in a tertiary facility in South-South Nigeria.  **Study design** **A retrospective descriptive study.**  **Place and Duration of Study:** Conducted in a tertiary health facility in South-South Nigeria, covering records from January 2019 to December 2023.  **Methodology:** Data were collected using a validated data abstraction form from authenticated patient case files of women who presented with abortion-related complications. Sociodemographic and clinical characteristics of cases that resulted in mortality were analyzed. Descriptive statistics were used to summarize the data, while chi-square tests assessed associations between variables using SPSS version 28. Significance was set at P < 0.05.  **Results:** A total of 311 abortion-related deaths were recorded over the five-year period. The overall abortion-related mortality rate was 28.8%, with the highest annual rate in 2021 (23.1%) and the lowest in 2023 (18.3%). The mean age of the deceased was 28.9 years (SD ±8.82). Sociodemographic factors significantly associated with mortality included age 25–34 years (P = 0.006), single marital status (P = 0.016), secondary level education (P =0.032), student occupation (P = 0.023), low socioeconomic status (P = 0.040), and urban residence (P = 0.037). Clinical factors associated with mortality included first-trimester abortions (P = 0.001) surgical methods (P = 0.001), hospital stay less than 24 hours (P = 0.002), and complications such as hemorrhage (P = 0.001).  **Conclusion:** Abortion-related mortality remains a major public health challenge in South-South Nigeria, with identifiable sociodemographic and clinical factors contributing to poor outcomes. Efforts to reduce abortion-related deaths should focus on community education, timely clinical interventions, and equitable access to safe reproductive health services. |

*Keywords: Abortion-related mortality; Maternal death;* *Reproductive health;* *South-South Nigeria*

1. INTRODUCTION

Abortion-related mortality remains a significant global public health concern, particularly in regions where access to safe abortion services is restricted due to legal, cultural, or economic barriers (World Health Organization [WHO], 2024). Globally, unsafe abortion accounts for an estimated 8–13% of maternal deaths, with Sub-Saharan Africa bearing the highest burden—reporting approximately 500 deaths per 100,000 abortions (WHO, 2024). In Nigeria, unsafe abortion remains a significant contributor to maternal mortality, with an estimated 10–20% of maternal deaths attributed to abortion-related complications. Earlier reports estimated up to 20,000 deaths annually (Raufu, 2002), while more recent estimates suggest approximately 6,000 women die each year, representing about 10% of maternal deaths (The Guardian, 2025).

By contrast, countries with liberal abortion laws and accessible reproductive health services have drastically reduced abortion-related deaths. For example, the United Kingdom reports a consistently low mortality rate of approximately 1 death per 100,000 abortions (Ralph et al., 2020), and Romania saw a dramatic decline in abortion-related mortality after liberalizing its abortion laws in 1989—dropping from 148 deaths per 100,000 live births in 1989 to 5 per 100,000 by 2006 (Grimes et al., 2006). These global disparities highlight the significant role of health system access and legal frameworks in shaping abortion outcomes.

In Sub-Saharan Africa, the risk is heightened for young, unmarried, and socioeconomically disadvantaged women, who often lack access to family planning resources and face societal stigma when seeking abortion care (Sedgh et al., 2016; WHO, 2021). According to the Guttmacher Institute (2018), unsafe abortion is responsible for up to 15% of maternal deaths in the region. In Nigeria, these demographic patterns persist, particularly among women in underserved or rural areas. A study in Rivers State reported unsafe abortion as the fifth leading cause of maternal mortality, with second-trimester abortions and sepsis as the primary causes of death. Over half of those cases involved adolescent schoolgirls, many of whom had resorted to herbal preparations and unskilled abortion methods (Obilahi-Abhulimen et al., 2016).

Despite the high burden, there is a dearth of localized data on abortion-related mortality in Delta State, particularly in Sapele, which limits the development of targeted reproductive health interventions (Sedgh et al., 2016). Both sociodemographic factors—such as age, marital status, education, occupation, and income—and clinical variables—such as gestational age, type of abortion procedure, and complications like hemorrhage or sepsis—have been identified as significant contributors to abortion-related deaths (Kumar, 2017; Bankole et al., 2017; WHO, 2021).

Central Hospital Sapele, a major healthcare facility in Delta State, serving a diverse urban and peri-urban population, has not been the subject of any published studies on abortion-related mortality. Given the absence of published studies on abortion-related mortality in this setting, this study was undertaken to assess the prevalence, trends, and associated sociodemographic and clinical factors over a five-year period. The findings are expected to provide evidence for targeted interventions, inform reproductive health policy, and improve maternal health outcomes in the region.

2. material and methods

**2.1** **Study Design**

This study adopted a retrospective observational design to investigate abortion-related mortality and the associated sociodemographic and clinical factors over a five-year period, from January 2019 to December 2023. This design was selected to allow for the systematic examination of existing records to identify patterns and associations. The approach aligns with the methodology employed by Obilahi-Abhulimen et al. (2016), who conducted a similar retrospective study on maternal mortality due to unsafe abortion in Rivers State, Nigeria.

**2.2 Study Area**

The study was conducted at Central Hospital, Sapele, located in Delta State, Nigeria. This hospital was purposively selected due to its large patient population, comprehensive maternal health services, and its role as a referral center for surrounding urban and peri-urban communities. Established in 1929, Central Hospital Sapele is a major secondary healthcare institution equipped with modern facilities and medical technologies that support emergency care, outpatient and inpatient services, diagnostic investigations, maternity, and pediatric services. The hospital has approximately 68 nurses and a team of doctors, midwives, and allied health professionals working across 11 wards and units. For the purpose of this study, data were extracted from the gynecology and records departments.

**2.3 Study Population and Eligibility Criteria**

The study population comprised all female patients treated for abortion-related complications at Central Hospital, Sapele, between January 2019 and December 2023. Only case files that met specific eligibility criteria were included. These included documentation within the specified five-year period, clear indication of abortion-related complications or mortality, and complete recording of sociodemographic and clinical information relevant to the study objectives. Case files with missing or incomplete data were excluded to maintain the validity and reliability of the findings.

**2.4 Sample Size and Sampling Technique**

A total population sampling approach was adopted for this study. All available case files that met the inclusion criteria were reviewed. This method enabled a comprehensive examination of every eligible case to capture the full extent of abortion-related mortality in the study setting. After careful screening, 311 case files were deemed suitable for analysis. The use of total population sampling reduced the risk of selection bias and ensured that the findings were representative of the actual burden and characteristics of abortion-related mortality within the hospital during the study period.

**2.5 Instrument for Data Collection**

Data were collected using a structured Data Extraction Form (DEF) developed based on the study objectives and findings from relevant literature. The form was designed to facilitate consistent and systematic documentation of relevant variables from each case file. It was used to extract data on sociodemographic variables including age, marital status, educational level, and socioeconomic status. Clinical information such as gestational age at the time of abortion, type of abortion procedure, prior medical history, and complications like hemorrhage or sepsis were also recorded. Additionally, the outcomes of each case, including survival or mortality, as well as documented cause of death, were captured.

**2.6 Validity of the Instrument**

The validity and reliability of the Data Extraction Form (DEF) were established through a systematic, multi-phase process. To ensure content validity, the form was developed following an extensive review of literature on abortion-related mortality, with particular focus on the sociodemographic and clinical factors frequently associated with such outcomes. A panel of experts in maternal health, reproductive health, and nursing research critically reviewed the form to assess the relevance, clarity, and comprehensiveness of each item. Based on their feedback, necessary revisions were made to improve the instrument’s ability to capture essential data accurately and completely. To confirm reliability, the revised form was pilot-tested on a subset of patient case files. This testing phase identified areas of potential ambiguity or inconsistency in data interpretation. Definitions for all variables were refined, and instructions for data abstraction were clarified to ensure uniformity in use. These measures minimized inter-observer variation and enhanced consistency across the data collection process. Together, these steps strengthened the DEF’s validity and reliability, ensuring it was both appropriate and dependable for extracting relevant data in this retrospective study.

**2.7 Method of Data Collection**

Data collection was carried out over a three-week period following ethical clearance and formal approval from the hospital management. The researcher, with the support of authorized hospital staff, accessed the medical records of patients treated for abortion-related complications. Using the structured Data Extraction Form, relevant data were retrieved from eligible case files. The researcher ensured strict adherence to the inclusion criteria, reviewing only files within the specified timeframe that contained complete and relevant information. To protect patient privacy, all extracted data were anonymized and coded. The collected data were stored in a secure, password-protected electronic database, and continuous checks were carried out to ensure data accuracy and completeness.

**2.9 Method of Data Analysis**

The data collected were analyzed using the Statistical Package for the Social Sciences (SPSS) version 28. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarize the sociodemographic and clinical characteristics of the cases. Chi-square tests were applied to examine the associations between abortion-related mortality and selected sociodemographic variables such as age, marital status, and education level. Similarly, clinical variables including gestational age and specific complications (e.g., hemorrhage, sepsis) were analyzed to determine their relationship with mortality outcomes. The results were presented in tables and charts to ensure clarity and effective interpretation.

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3. results and discussion

Data obtained showed that a total of 311 abortion-related deaths occurred over the five-year period, beginning January 2019 to December 2023, with marked fluctuations in annual rates. Specifically, in 2019, 61 cases were recorded, representing 19.6% of the total deaths. In 2020, there was a slight decrease to 58 cases (18.6%), followed by a noticeable increase in 2021, with 72 cases (23.1%), the highest in the study period. In 2022, the prevalence decreased to 63 cases (20.3%), and in 2023, it further declined to 57 cases (18.3%). The upward trend in 2021 could be linked to various factors, such as the impact of the COVID-19 pandemic, which may have disrupted healthcare services and increased the risk of unsafe abortions. Additionally, the increased number of deaths in 2021 could reflect higher rates of unsafe abortion practices, inadequate access to safe reproductive health services, or socio-economic factors affecting women’s ability to seek appropriate care. In comparison to previous studies, where abortion-related mortality has shown a gradual decline due to improvements in healthcare access and the availability of safer abortion methods, this year-on-year fluctuation calls attention to potential gaps in health systems, particularly in times of crisis.

The subsequent decrease in 2022 and 2023 suggests some recovery or improvement in healthcare responses, or perhaps an increase in public awareness and access to safer reproductive health services. This aligns with research indicating that improved maternal health services, better education on reproductive health, and legal reforms can lead to a reduction in unsafe abortions and related mortality (Fabamwo et al., 2019; Gerdts et al., 2023; Sedgh et al., 2022). However, the persistence of abortion-related deaths despite these trends highlights the need for continued efforts in improving access to safe abortion services, addressing socio-economic determinants of health, and reinforcing public health initiatives focused on maternal health.

These findings also underscore the importance of ongoing interventions aimed at reducing abortion-related deaths. They suggest that while progress may be made in some areas, the variability in the data emphasizes the need for targeted and sustained efforts to address the underlying causes of unsafe abortions, especially in times of public health emergencies like the COVID-19 pandemic.

The sociodemographic profile of patients who experienced abortion-related mortality at Central Hospital, Sapele, from January 2019 to December 2023, reveals several noteworthy patterns that align with findings in the literature. The mean age of the patients was 28.9 years (SD ± 8.82), indicating that women in their reproductive prime are disproportionately affected. Notably, the age group 25–34 years had the highest proportion of cases (34.4%), while the youngest group, 15–19 years, accounted for only 14.5%. This finding aligns with studies conducted in Nigeria and other sub-Saharan African countries, which consistently identify women in this age range as being at increased risk of abortion-related deaths (Benson et al., 2019; Ganatra et al., 2017). This trend likely reflects a combination of high fertility rates, greater exposure to unintended pregnancies, and limited access to safe abortion services among this group (Ganatra et al., 2017).

In terms of marital status, single women constituted the majority of cases (45.3%), with a significant drop in representation among widowed (7.4%) and divorced (20.9%) women. The prevalence of abortion-related deaths among single women may reflect limited access to family planning resources, societal stigma, or unplanned pregnancies, which can drive individuals to seek unsafe abortion services (Bankole et al., (2019). This finding corroborates research from other parts of Africa, where single women have been identified as particularly vulnerable due to societal stigma, limited family support, and reduced access to reproductive healthcare (Benson et al., 2019).

Educational attainment data also revealed that the majority of patients (43.4%) had completed secondary education, followed by those with tertiary education (32.8%). However, individuals with no formal education represented only 1.6% of the cases. The prominence of secondary-educated individuals could indicate that incomplete education hinders access to comprehensive reproductive health information, increasing vulnerability to unsafe abortion (Guttmacher Institute, 2018). This result aligns with findings in studies from Ghana and Ethiopia, which suggest that women with moderate educational attainment may lack adequate reproductive health literacy or face barriers to accessing safe services (Guttmacher Institute, 2018).

Regarding occupation, students were the most represented group (45.3%), followed by housewives (35.1%). The predominance of students could be attributed to financial dependency and fear of social ostracism, factors that often compel younger individuals to seek unsafe abortions (Jewkes & Rees, 2020). Socioeconomic status (SES) analysis also showed that low-income patients formed the majority (61.1%), while only 10.6% were from high socioeconomic backgrounds. This disparity underscores the role of economic barriers in accessing safe abortion services and post-abortion care. Women from low SES groups are more likely to depend on unsafe providers due to financial constraints (Jewkes & Rees, 2020; Fjerstad et al., 2021). This pattern is well-documented in global and regional studies, which highlight how poverty exacerbates barriers to accessing safe and timely abortion care (Jewkes & Rees, 2020; Fjerstad et al., 2021).

Furthermore, residential area analysis showed that urban dwellers constituted 60.8% of the cases, compared to 39.2% for rural residents. While urban areas generally offer better healthcare access, the high prevalence may reflect increased population density or greater anonymity that drives women to seek unsafe abortions (Ganatra et al., 2017; Campbell et al., 2018; Bearak et al., 2020). Overall, these findings emphasize the intersection of sociodemographic factors with abortion-related mortality, underscoring the need for targeted interventions focusing on high-risk groups such as single women, students, and those from low-income households. Comprehensive reproductive health education and affordable healthcare services could mitigate these disparities.

**Table 1:** Sociodemographic Data

|  |  |  |
| --- | --- | --- |
| **Category** | **Frequency**  ***(n = 311)*** | **Percentage (%)** |
| **Age** |  |  |
| 15-19 | 45 | 14.5 |
| 20-24 | 72 | 23.2 |
| 25-34 | 107 | 34.4 |
| 35-45 | 87 | 27.9 |
| Mean Age | 28.9(SD±8.82) |  |
| **Marital Status** |  |  |
| Single | 141 | 45.3 |
| Married | 82 | 26.4 |
| Widowed | 23 | 7.4 |
| Divorced | 65 | 20.9 |
| **Education Level** |  |  |
| Primary | 69 | 22.2 |
| Tertiary | 102 | 32.8 |
| No Formal Education | 5 | 1.6 |
| Secondary | 135 | 43.4 |
| **Occupation** |  |  |
| Student | 141 | 45.3 |
| House Wife | 109 | 35.1 |
| Unstated | 61 | 19.6 |
| **Socioeconomic Status** |  |  |
| Low | 190 | 61.1 |
| Middle | 88 | 28.3 |
| High | 33 | 10.6 |
| **Residential Area** |  |  |
| Rural | 122 | 39.2 |
| Urban | 189 | 60.8 |

**Table 2** Clinical Data

|  |  |  |
| --- | --- | --- |
| **Category** | **Frequency**  ***(n = 311)*** | **Percentage (%)** |
| **Gestational Age at Abortion** |  |  |
| First Trimester (0 – 12 weeks) | 192 | 61.7 |
| Second Trimester (13 -20 weeks) | 119 | 38.3 |
| **Method of Abortion** |  |  |
| Surgical | 158 | 50.8 |
| Medical | 85 | 27.3 |
| Herbal | 54 | 17.4 |
| Unstated | 14 | 4.5 |
| **Length of Hospital Stay** |  |  |
| Less than 24 hours | 85 | 27.3 |
| 1-3 days | 103 | 33.1 |
| 4-7 days | 78 | 25.1 |
| 8-14 days | 30 | 9.6 |
| 15-30 days | 9 | 2.9 |
| More than 30 days | 6 | 1.9 |
| **Complications** |  |  |
| Hemorrhage | 135 | 34.4 |
| Septicaemia | 52 | 16.7 |
| Pelvic Abscess | 41 | 13.2 |
| Acute Renal Failure | 33 | 10.6 |
| Gangrenous Uterus | 24 | 7.7 |
| Genital Sepsis | 26 | 8.4 |

**Table 3 Prevalence of Abortion-related Mortality from 2019 to 2023**

|  |  |  |
| --- | --- | --- |
| **Year** | **Frequency**  ***(n = 311)*** | **Percentage (%)** |
| January 2019 - December 2019 | 61 | 19.6 |
| January 2020 - December 2020 | 58 | 18.6 |
| January 2021 - December 2021 | 72 | 23.1 |
| January 2022 - December 2022 | 63 | 20.3 |
| January 2023 - December 2023 | 57 | 18.3 |

**Figure 1:** Trends in Monthly Abortion-Related Deaths Over Five Years (2019–2023)

**Table 4 Sociodemographic Factors associated with Abortion-related Mortality**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable** | **Chi-Square Value *(χ2)*** | **Degrees of Freedom *(df)*** | **P-value** | **Significance** | **Category Associated with Higher Deaths** |
| Age Group | 63.29 | 3 | 0.006 | Significant | 25–34 years |
| Marital Status | 103.92 | 3 | 0.016 | Significant | Single |
| Education Level | 104.57 | 3 | 0.032 | Significant | Secondary |
| Occupation | 32.35 | 2 | 0.023 | Significant | Student |
| Socioeconomic Status | 124.88 | 2 | 0.040 | Significant | Low |
| Residential Area | 14.36 | 1 | 0.037 | Significant | Urban |

The analysis of sociodemographic factors associated with abortion-related mortality revealed significant associations with several key variables. These associations highlight the complexity of abortion-related deaths and offer insights into the groups most at risk.

**Age Group**: The age group 25–34 years was identified as having the highest association with abortion-related mortality (χ² = 63.29, df = 3, p = 0.006). This finding suggests that women in this age range are at greater risk of experiencing abortion-related complications and deaths. This could be due to various factors, including higher fertility rates, socio-economic pressures, and possibly a lack of access to safe abortion services. Previous studies have also shown that women in this age group tend to have higher rates of unsafe abortions due to limited access to legal and safe abortion options (Guttmacher Institute, 2018; Bankole et al., (2019).

**Marital Status**: A significant association was observed between marital status and abortion-related mortality (χ² = 103.92, df = 3, p = 0.016), with single women being most affected. This is consistent with previous research indicating that unmarried women may face greater barriers in accessing reproductive health services, including abortion care. They may also be less likely to seek timely medical attention due to social stigma or financial constraints (Benson et al., 2019; Jewkes & Rees, 2020). The findings suggest that unmarried women are particularly vulnerable to the risks associated with unsafe abortion practices.

**Education Level**: Women with a secondary education level had a significantly higher likelihood of experiencing abortion-related mortality (χ² = 104.57, df = 3, p = 0.032). This result is counterintuitive, as higher education levels are typically associated with better health outcomes. However, it may reflect a range of factors, including the possible misconception that secondary-educated women may be more aware of abortion methods but lack proper guidance or access to safe services. Alternatively, this could be indicative of socio-economic challenges faced by this group, which may prevent them from accessing safe, legal abortion care despite their educational level (Guttmacher Institute, 2018).

**Occupation**: The occupation variable revealed that students had the highest association with abortion-related mortality (χ² = 32.35, df = 2, p = 0.023). This finding is concerning as it points to the challenges that young women, particularly students, face in terms of reproductive health care. Many students may not have the financial means or the support to access safe abortion services, and they may resort to unsafe methods due to stigma or lack of knowledge. This finding is in line with research highlighting the vulnerability of young women, especially students, to unsafe abortion practices (Jewkes & Rees; Fjerstad et al., 2021).

**Socioeconomic Status**: Women from low socioeconomic backgrounds were found to be most affected by abortion-related mortality (χ² = 124.88, df = 2, p = 0.040). This is a significant finding, as it emphasizes the role of financial constraints in accessing safe abortion services. Previous studies have consistently shown that low socioeconomic status is a major risk factor for unsafe abortion, as women in this group are more likely to experience barriers such as lack of healthcare access, inadequate information, and inability to afford legal abortion services (Benson et al., 2019). This highlights the need for targeted interventions aimed at improving access to reproductive health services for economically disadvantaged women.

**Residential Area**: The residential area variable indicated that women living in urban areas were more likely to experience abortion-related mortality (χ² = 14.36, df = 1, p = 0.037). While this finding may seem surprising given the assumption that urban areas have better access to healthcare, it may reflect the higher population density and the greater number of unsafe abortion practices in urban settings. Additionally, urban areas often have diverse populations with varying levels of education and access to healthcare, which may contribute to inconsistent care outcomes. However, some studies suggest that the availability of unsafe, illegal abortion services in urban areas, combined with barriers to accessing formal healthcare, can increase the risk of complications and mortality (Ganatra et al., 2017; Campbell et al., 2018; Bearak et al., 2020)

In summary, the sociodemographic factors associated with abortion-related mortality suggest that certain groups—women aged 25–34 years, unmarried women, those with secondary education, students, women from low socioeconomic backgrounds, and those living in urban areas—are at higher risk. These findings highlight the need for targeted interventions that address the unique challenges faced by these groups. Efforts to reduce abortion-related mortality should focus on improving access to safe, legal abortion services, providing education on reproductive health, and addressing the social determinants of health that contribute to unsafe abortion practices.

**Table 5** **Clinical Factors associated with Abortion-related Mortality**

| **Variable** | **Chi-Square Value (χ²)** | **Degrees of Freedom *(df)*** | **P-value** | **Significance** | **Category Associated with Higher Deaths** |
| --- | --- | --- | --- | --- | --- |
| Gestational Age at Abortion | 10.89 | 1 | 0.001 | Significant | First Trimester |
| Method of Abortion | 22.34 | 3 | 0.001 | Significant | Surgical |
| Length of Hospital Stay | 18.76 | 5 | 0.002 | Significant | Less than 24 hours |
| Complications | 26.54 | 5 | 0.001 | Significant | Hemorrhage |

The clinical factors associated with abortion-related mortality were thoroughly analyzed, and the findings revealed several significant associations that provide insights into the medical and procedural factors contributing to higher mortality rates. These factors include gestational age at the time of abortion, the method of abortion, the length of hospital stay, and the presence of complications.

**Gestational Age at Abortion**: The analysis showed that abortions performed in the first trimester were significantly associated with higher mortality rates (χ² = 10.89, df = 1, p = 0.001). Although first-trimester abortions are generally considered safer compared to those performed later in pregnancy, the result suggests that even within the first trimester, unsafe procedures or lack of timely medical intervention can increase the risk of mortality. This finding may also point to potential delays in seeking care or difficulties in accessing appropriate healthcare early in the pregnancy. Similar studies have shown that early-stage abortions, when not conducted safely, still pose significant risks, including hemorrhage and infection, which can be fatal if not promptly managed (Chireh et al., 2021; Pun et al., 2021).

**Method of Abortion**: The method of abortion was another critical factor, with surgical abortion being significantly associated with higher mortality (χ² = 22.34, df = 3, p < 0.001). Surgical procedures, particularly those performed under unsafe conditions or by untrained providers, carry a higher risk of complications, including perforation, hemorrhage, and infection. This aligns with findings from other studies that highlight the dangers associated with surgical abortion when not performed in a regulated medical environment (Allen & Singh, 2018; Moseson et al., 2020). The increased mortality risk from surgical methods emphasizes the need for improved access to safe, legal abortion services and skilled healthcare providers to reduce these risks.

**Length of Hospital Stay**: A significant association was also observed between the length of hospital stay and abortion-related mortality, with patients who stayed less than 24 hours being at higher risk (χ² = 18.76, df = 5, p = 0.002). This finding could reflect several factors, including the possibility that patients with more severe complications might be discharged prematurely due to healthcare resource constraints, lack of appropriate follow-up care, or mismanagement of medical conditions. The lack of extended monitoring may lead to undetected complications, which can escalate into life-threatening situations. Previous studies have similarly highlighted that inadequate post-abortion care, particularly for those with complications, increases the risk of mortality (Bankole et al., 2019). This finding underscores the need for proper post-procedure care and adequate hospital stays to ensure patient recovery. The short lent of stay in the hospital before death may also be attributed to late arrival to the hospital when complications have gone beyond management. This indicates the need for reproductive health education and increasing access to abortion care.

**Complications**: The analysis also revealed that complications, particularly hemorrhage, were strongly associated with abortion-related mortality (χ² = 26.54, df = 5, p < 0.001). Hemorrhage, whether caused by surgical trauma or an incomplete abortion, remains one of the leading causes of abortion-related deaths. This result is consistent with other studies that have shown hemorrhage as a critical factor in abortion-related mortality, particularly when healthcare systems fail to provide timely intervention (Campbell et al., 2018; Ganatra et al., 2017; Shah et al., 2009). The findings emphasize the importance of immediate medical intervention for managing complications such as hemorrhage, as delays in treatment can quickly lead to severe outcomes, including death.

In summary, the clinical factors associated with abortion-related mortality highlight key areas that need attention to reduce death rates. First-trimester surgical abortions, the method of abortion, the length of hospital stay, and complications such as hemorrhage all contribute to higher mortality rates. These findings suggest that improving the safety of abortion procedures, ensuring adequate post-procedure care, and addressing complications promptly can significantly reduce abortion-related deaths. Furthermore, these results underscore the importance of providing healthcare services that include skilled providers, access to appropriate resources, and adequate follow-up care to manage any arising complications.

4. Conclusion

This study revealed a significant prevalence of abortion-related mortality over the five-year period at Central Hospital, Sapele, with fluctuating rates across the years. The highest prevalence was observed in 2021, while 2023 had the lowest. Sociodemographic factors such as age, marital status, education level, occupation, socioeconomic status, and residential area were significantly associated with higher mortality rates, with individuals aged 25–34 years, single, with secondary education, students, from low socioeconomic backgrounds, and residing in urban areas being most at risk. Clinically, first-trimester abortions, surgical methods, shorter hospital stays, and complications like hemorrhage were significant risk factors. These findings underscore the importance of targeted interventions to address both sociodemographic and clinical determinants in reducing abortion-related mortality.

Ethical approval

Ethical approval for this study was obtained from the Research Ethics Committee of Central Hospital, Sapele, Delta State. As a retrospective study, data were collected solely from existing case records without direct interaction with patients. No personally identifying information such as names or hospital identification numbers was recorded. To maintain confidentiality, all data were anonymized and securely stored, with access restricted to the researcher and designated personnel. The findings are presented in aggregate form, and all data were used exclusively for academic and policy development purposes related to maternal health.

**Disclaimer (Artificial intelligence)**

Authors hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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