Pattern And Predictors of in-Hospital Mortality among Adult Patients Admitted with Sepsis at Enugu State University Teaching Hospital, Parklane: A Six-Year Retrospective Cohort Study (2020–2025)

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ABSTRACT

Background: Sepsis remains a major cause of morbidity and mortality worldwide, particularly in low- and middle-income countries where delayed presentation, limited diagnostic capacity, and inadequate critical care resources contribute to poor outcomes. Despite its significant burden, there is limited local evidence on the pattern and predictors of mortality among septic patients in South-East Nigeria. This study assessed the pattern and predictors of in-hospital mortality among adult patients admitted with sepsis at Enugu State University Teaching Hospital (ESUTH), Parklane, between 2020 and 2025.

Methods: This was a retrospective cohort study conducted at Enugu State University Teaching Hospital, Parklane, Enugu, Nigeria. Medical records of adult patients aged 18 years and above admitted with sepsis between January 2020 and December 2025 were reviewed. Data on sociodemographic characteristics, clinical presentation, comorbidities, laboratory findings, treatment interventions, and outcomes were extracted using a structured data collection form. Descriptive statistics were used to summarize the data, while bivariate and multivariable logistic regression analyses were performed to identify predictors of in-hospital mortality. Statistical significance was set at $p < 0.05$.

Results: A total of 412 patient records were identified, of which 387 met the eligibility criteria and were included in the analysis. The mean age of participants was 54.8 ± 17.2 years, and 56.3% were males. Respiratory tract infections were the most common source of sepsis (32.0%), followed by urinary tract infections (21.2%) and intra-abdominal infections (17.3%). The overall in-hospital mortality rate was 34.1%. At multivariable logistic regression analysis, age ≥65 years (AOR = 2.14, 95% CI: 1.23–3.72; p = 0.007), septic shock (AOR = 4.68, 95% CI: 2.61–8.38; p < 0.001), altered mental status (AOR = 3.21, 95% CI: 1.82–5.65; p < 0.001), serum creatinine ≥2 mg/dL (AOR = 2.57, 95% CI: 1.46–4.54; p = 0.001), and ICU admission (AOR = 2.74, 95% CI: 1.49–5.04; p = 0.001) were independent predictors of mortality.

Conclusion: Sepsis remains associated with substantial in-hospital mortality at ESUTH Parklane. Respiratory tract infections were the leading source of sepsis, while advanced age, septic shock, altered mental status, elevated serum creatinine, and ICU admission independently predicted mortality. Early identification of high-risk patients, prompt institution of evidence-based sepsis management, and strengthening of critical care services may contribute to improved outcomes and reduced sepsis-related mortality.

Keywords: Sepsis; In-hospital mortality; Predictors; Septic shock; Intensive care unit; Nigeria; ESUTH Parklane.

INTRODUCTION

A dysregulated host response to an infection causes sepsis, a potentially fatal clinical disease that can cause organ failure and, in extreme situations, death.[1] Sepsis continues to be a leading cause of morbidity and death globally despite advancements in critical care medicine, antibiotic therapy, and supportive care. In defining sepsis, the Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3) stressed the significance of organ failure and its substantial impact on the worldwide burden of disease.[1] Sepsis still presents significant difficulties to healthcare systems, especially in low- and middle-income countries (LMICs), where poor outcomes are caused by delayed presentation, insufficient diagnostic capacity, and inadequate critical care services.[2]

Sepsis affects about 49 million people worldwide each year and is thought to be the cause of 11 million deaths, or roughly one-fifth of all deaths.[3] While sepsis happens everywhere, it is disproportionately more common in LMICs, particularly in sub-Saharan Africa, where infectious illnesses are still quite common and healthcare resources are frequently insufficient.[3,4] Sepsis is more common in these environments due to the high prevalence of infectious diseases such pneumonia, HIV/AIDS, malaria, tuberculosis, and other bacterial infections. [5] Moreover, growing antibiotic resistance has made treating septic patients more difficult and may be a factor in the rising death rates.[6]

Sepsis continues to be one of the main reasons why medical and surgical patients in Nigeria are admitted to hospitals and die. In tertiary healthcare facilities, which act as referral hubs for critically ill patients from primary and secondary healthcare facilities, the burden is especially heavy. According to earlier research conducted in Nigeria, fatality rates among patients admitted with sepsis have ranged from 20% to more than 50%. These findings reflect differences in the severity of the illness, the accessibility of critical care facilities, the promptness of response, and the underlying features of the patient.[7–9] Sepsis-related mortality is still unacceptably high despite continuing advancements in healthcare delivery, highlighting the necessity for ongoing assessment of its epidemiology and effects.

The period between 2020 and 2025 represents a particularly important era in sepsis management. Increased incidence of serious infections, sepsis, healthcare-associated infections, antibiotic use, and critical care hospitalizations were linked to the Coronavirus Disease 2019 (COVID-19) pandemic, which changed healthcare delivery worldwide.[9] Additionally, the Surviving Sepsis Campaign Guidelines 2021 released revised guidelines for septic patients' organ support, hemodynamic resuscitation, antimicrobial therapy, and early diagnosis.[10] As a result, assessing sepsis outcomes during this time may offer crucial information on changing illness trends and factors that influence mortality in tertiary healthcare facilities.

The severity of organ dysfunction, concomitant diseases, infectious source, microbial aetiology, and patient factors all influence how sepsis manifests clinically.[11] Respiratory tract infections, urinary tract infections, intra-abdominal infections, skin and soft tissue infections, and bloodstream infections are common causes of infection. Demographic variables like age and sex, healthcare-seeking behaviour, referral procedures, and local disease epidemiology may also have an impact on the presenting pattern. Developing context-specific strategies for early diagnosis and treatment requires an understanding of these patterns.

A complicated interplay between host, pathogen, and healthcare system factors determines mortality in sepsis patients. Advanced age, delayed presentation, septic shock, altered mental status, elevated serum lactate levels, acute kidney injury, respiratory failure, thrombocytopenia, immunosuppression, diabetes mellitus, cancer, and

multiple organ dysfunction syndrome have all been found to be predictors of mortality in numerous studies.[12-14] Poor results have also been linked to hospital-related issues such delayed antibiotic initiation, insufficient source control, restricted access to critical care services, and extended hospital stays.[15] Early detection of these variables is essential for risk assessment, resource distribution, and the execution of focused actions meant to lower mortality.

Enugu State University Teaching Hospital (ESUTH), Parklane, is a major tertiary referral centre in South-East Nigeria, serving patients from Enugu State and neighbouring states. The hospital treats a large number of patients who arrive with serious infections and sepsis because it is a referral facility. Nevertheless, there is a dearth of published data assessing the mortality predictors and pattern of presentation among septic patients admitted to the facility, especially between 2020 and 2025. Modern local data are required to direct evidence-based clinical practice and policy formation because of the changing epidemiology of infectious diseases, rising antibiotic resistance, and modifications in healthcare delivery following the COVID-19 pandemic. Additionally, knowing the clinical, laboratory, treatment-related, and demographic variables linked to mortality among sepsis patients admitted to ESUTH Parklane will be helpful in enhancing patient outcomes. Such data may help establish institutional standards for the early identification and treatment of high-risk patients, maximize the use of existing resources, and support larger initiatives to lower sepsis-related mortality in settings with limited resources.

Therefore, this study seeks to determine the pattern of presentation and identify predictors of mortality among patients admitted with sepsis at Enugu State University Teaching Hospital, Parklane, between January 2020 and December 2025. The findings are expected to contribute to the existing literature on sepsis in Nigeria and provide evidence that may strengthen clinical management strategies and improve survival outcomes among affected patients.

LITERATURE REVIEW

Pattern of Sepsis Among Hospitalized Adult Patients

Sepsis continues to be one of the most common causes of hospitalization and death for adults globally. Sepsis clinical patterns range between geographical areas and healthcare environments, mostly due to variations in patient characteristics, healthcare infrastructure, antibiotic resistance patterns, and illness epidemiology. Sepsis is most frequently caused by respiratory tract infections, which are followed by urinary tract infections, intra-abdominal infections, skin and soft tissue infections, and bloodstream infections.[16] Inadequate access to critical care services, delayed presentation, and poor diagnostic capacity all contribute to the burden of sepsis in low- and middle-income nations.[17]

According to a systematic review and meta-analysis of adult sepsis in sub-Saharan Africa, hospitalized patients had a high prevalence of sepsis, and the fatality rates were significantly higher than in high-income nations.[18] A number of reasons, including a high burden of infectious diseases, delayed diagnosis, restricted access to intensive care units (ICUs), and insufficient application of evidence-based sepsis management regimens, were identified by the review as contributing to this gap. These results highlight the necessity of institution-specific data in order to comprehend local trends and results.

Studies conducted in Nigeria have shown that the main causes of sepsis in hospitalized individuals include pneumonia, urinary tract infections, and intra-abdominal infections. According to Iliyasu et al., a considerable percentage of adult patients admitted to a tertiary hospital had severe sepsis or septic shock at admission, and respiratory tract infections were the most common cause of sepsis.[19] In a similar vein, Otu et al. noted that the majority of septic patients had extensive organ dysfunction when they first arrived, which led to worse outcomes and longer hospital stays.[20]

In-Hospital Mortality Among Patients with Sepsis

Sepsis is still linked to a high in-hospital death rate despite improvements in diagnosis and treatment. According to studies done in both affluent and developing nations, fatality rates can range from 15% to more than 60%,

depending on patient characteristics, healthcare resources, and the severity of the illness.[21] Patients who present with septic shock, multiple organ failure syndrome, or delayed beginning of proper antibiotic therapy are more likely to die. Mortality rates are persistently higher in sub-Saharan Africa than in the rest of the world. According to a recent assessment, pooled mortality among adult septic patients in the area is substantially higher, underscoring ongoing difficulties with critical care access and healthcare delivery.[18] Studies carried out in tertiary hospitals throughout Africa have revealed mortality rates that surpass 40%, with significantly higher rates noted for severely sick patients in need of intensive care.[22]

Sepsis-related mortality is still a significant public health issue in Nigeria. Mortality rates ranging from 20% to over 50% have been reported in a number of hospital-based studies, which reflects the severity of sickness among hospitalized patients and the constraints on healthcare resources.[19, 20] These results highlight the necessity of ongoing assessment of mortality trends and related factors within specific institutions.

Predictors of In-Hospital Mortality in Sepsis

Improved therapeutic outcomes and early risk stratification depend on the identification of mortality-related factors. Demographic, clinical, laboratory, and treatment-related factors have been found in numerous studies to be significant predictors of death in septic patients. Due to decreased physiological reserve, a higher incidence of comorbidities, and compromised immunological response, advanced age has continuously been linked to bad outcomes.[23] In a similar vein, higher mortality has been associated with the existence of chronic illnesses such diabetes mellitus, chronic renal disease, HIV infection, cancer, and cardiovascular disease.[24]

The predictive significance of clinical indications of disease severity has proven to be considerable. Adverse outcomes are far more likely to occur in patients who present with multiple organ dysfunction, hypotension, respiratory failure, altered mental status, or septic shock.[25] Additionally, research has demonstrated that among patients with severe sepsis and septic shock, low peripheral oxygen saturation at presentation and low Glasgow Coma Scale (GCS) scores are independent predictors of in-hospital mortality.[22]

Mortality has also been linked to a number of laboratory markers. Poor prognosis has been linked to elevated serum lactate levels, thrombocytopenia, leukocytosis, impaired renal function, and abnormal liver function tests.[26] Although their regular usage is still restricted in many resource-constrained situations, biomarkers such procalcitonin, interleukin-6, and soluble urokinase plasminogen activator receptor (suPAR) have also demonstrated promise in predicting mortality.[27] Acute Physiology and Chronic Health Evaluation (APACHE II), quick Sequential Organ Failure Assessment (qSOFA), Sequential Organ Failure Assessment (SOFA) score, and other early warning scores are examples of severity scoring systems that have shown good predictive performance for mortality among septic patients. [28,29] These techniques can help doctors identify high-risk patients who need aggressive intervention by providing objective assessments of illness severity.

Knowledge Gap

There is still a dearth of published data that specifically examines the pattern and predictors of in-hospital mortality among adult patients admitted with sepsis at Enugu State University Teaching Hospital (ESUTH), Parklane, despite the fact that numerous studies have assessed sepsis outcomes in Nigeria and other African nations. The COVID-19 pandemic's effects, changing patterns of antibiotic resistance, and revised sepsis management guidelines are only a few of the significant developments in healthcare delivery that occurred between 2020 and 2025. In order to describe the pattern of sepsis and determine factors linked to mortality among patients treated at ESUTH Parklane, current local evidence is therefore required. The results of such a study will offer important information for enhancing patient care, allocating resources, and establishing institutional policies targeted at lowering mortality from sepsis.

METHODOLOGY

Study Area

The study was conducted at Enugu State University Teaching Hospital (ESUTH), Parklane, Enugu, Nigeria. ESUTH Parklane is a tertiary healthcare institution located in Enugu North Local Government Area of Enugu

State in South-East Nigeria. The hospital serves as a major referral centre for patients from Enugu State and neighbouring states including Anambra, Ebonyi, Abia, Benue, and Kogi States. It provides specialist medical, surgical, paediatric, obstetric and gynaecological, anaesthetic, and intensive care services. The institution manages a large number of patients with severe infections and sepsis through its Emergency Department, Internal Medicine Department, Surgical Department, Intensive Care Unit, and other specialty units.

Study Design

This study employed a retrospective cohort design. Hospital records of adult patients admitted with sepsis between 1 January 2020 and 31 December 2025 were reviewed to determine the pattern of sepsis and identify predictors of in-hospital mortality. The retrospective design was considered appropriate because it enabled the evaluation of clinical outcomes and associated risk factors among patients who had already completed their hospital admission episodes.

Study Population

The study population consisted of adult patients aged 18 years and above who were admitted with a diagnosis of sepsis during the study period. Eligible patients were identified from admission registers, ward records, emergency unit records, and intensive care unit records. Only patients whose diagnosis of sepsis was documented in their medical records and whose case files contained adequate clinical information were included in the study.

Eligibility Criteria

Patients were included in the study if they were aged 18 years and above, had a documented diagnosis of sepsis, severe sepsis, septic shock, or infection-associated organ dysfunction, and were admitted to ESUTH Parklane between January 2020 and December 2025. In addition, only patients with complete records containing relevant demographic, clinical, laboratory, treatment, and outcome information were included.

Patients younger than 18 years, patients whose diagnosis of sepsis could not be verified from available records, patients referred to other facilities before a definitive outcome was documented, and patients with substantial missing data regarding major study variables were excluded from the study.

Sample Size Determination

The sample size comprised all adult patients admitted with sepsis at Enugu State University Teaching Hospital (ESUTH), Parklane, between 1 January 2020 and 31 December 2025 who met the eligibility criteria. Following a review of hospital records, a total of 412 eligible patients were identified. After excluding records with incomplete clinical information, missing outcome data, or inability to verify the diagnosis of sepsis, 387 patient records were included in the final analysis.

Sampling Technique

A total population sampling technique was employed. All eligible adult patients admitted with sepsis during the study period who satisfied the inclusion criteria were included in the study. This approach was adopted because the study sought to evaluate all available cases of sepsis managed at the institution over the six-year study period. The use of total population sampling minimized selection bias, increased statistical power, and enhanced the representativeness of the study findings.

Data Collection Instrument

Data were collected using a structured data extraction form designed specifically for the study. The instrument was developed after reviewing relevant literature and the study objectives. Information extracted included sociodemographic characteristics, clinical presentation, comorbid conditions, laboratory findings, treatment modalities, intensive care unit admission, duration of hospitalization, and treatment outcomes.

Data Collection Procedure

Following ethical approval, admission registers and medical records from the Emergency Department, Internal Medicine Department, Surgical Department, Intensive Care Unit, and Medical Records Department were reviewed to identify eligible patients. Case files meeting the inclusion criteria were retrieved and carefully reviewed.

Relevant information was extracted from patients' records and entered into the data extraction form. Data collected included age, sex, source of infection, duration of symptoms before presentation, vital signs at admission, Glasgow Coma Scale score, comorbidities, laboratory parameters, treatment interventions, length of hospital stay, and patient outcomes. To ensure data quality, all extracted information was cross-checked for accuracy, consistency, and completeness before entry into the study database.

Study Variables

The primary outcome variable was in-hospital mortality, which was categorized as either death during hospitalization or survival to discharge. Independent variables included sociodemographic characteristics such as age and sex; clinical variables including source of infection, duration of illness before presentation, blood pressure, heart rate, respiratory rate, oxygen saturation, Glasgow Coma Scale score, presence of septic shock, and need for intensive care admission; comorbid conditions such as hypertension, diabetes mellitus, HIV infection, chronic kidney disease, chronic liver disease, malignancy, and heart failure; and laboratory parameters including white blood cell count, haemoglobin concentration, platelet count, serum creatinine level, blood urea nitrogen, electrolyte levels, blood glucose level, serum lactate level where available, and blood culture results.

Data Management and Statistical Analysis

Data obtained from the study were entered into Microsoft Excel, cleaned, and subsequently exported to the Statistical Package for the Social Sciences (SPSS) version 29.0 for analysis. Descriptive statistics were used to summarize the study variables. Categorical variables were presented as frequencies and percentages, while continuous variables were summarized using means and standard deviations for normally distributed data or medians and interquartile ranges for skewed data. Bivariate analysis was performed to determine associations between independent variables and in-hospital mortality. The Chi-square test or Fisher's exact test was used for categorical variables, while the Student's t-test or Mann–Whitney U test was used for continuous variables as appropriate. Variables with a p-value less than 0.20 during bivariate analysis, together with variables considered clinically important based on previous literature, were entered into a multivariable binary logistic regression model to identify independent predictors of mortality. Adjusted odds ratios with corresponding 95% confidence intervals were calculated. Statistical significance was set at a p-value of less than 0.05.

Ethical Considerations

Ethical approval for the study was obtained from the Health Research Ethics Committee of Enugu State University Teaching Hospital, Parklane, Enugu. Permission to access patient records was obtained from the appropriate hospital authorities before commencement of data collection. Patient confidentiality was maintained throughout the study by excluding all personal identifiers from the data extraction forms. All information obtained was used solely for research purposes and stored in password-protected databases accessible only to the research team. Since the study involved a retrospective review of existing hospital records, no direct patient contact occurred and no additional risk was imposed on the study participants.

RESULTS

A total of 412 records of adult patients admitted with sepsis between January 2020 and December 2025 were retrieved. Twenty-five records were excluded because of incomplete clinical information and undocumented treatment outcomes. Consequently, 387 patient records were included in the final analysis.

Table 1: Sociodemographic Characteristics of the Study Participants (N = 387)

Variable	Frequency (n)	Percentage (%)
Age Group (years)		
18–34	62	16.0
35–49	95	24.5
50–64	108	27.9
≥65	122	31.5
Mean age (years)	54.8 ± 17.2	
Sex		
Male	218	56.3
Female	169	43.7
Marital Status		
Single	94	24.3
Married	236	61.0
Widowed	39	10.1
Divorced	18	4.6

Table 1 shows the sociodemographic characteristics of the study participants. The mean age of the participants was 54.8 ± 17.2 years, with the majority of patients aged 50 years and above. Patients aged 65 years and older constituted the largest age group (31.5%). Males accounted for 56.3% of the study population, resulting in a male-to-female ratio of approximately 1.3:1. Most participants were married (61.0%), while widowed and divorced individuals accounted for smaller proportions of the study population.

Table 2: Comorbid Conditions Among Study Participants

Comorbidity	Frequency (n)	Percentage (%)
Hypertension	154	39.8
Diabetes Mellitus	106	27.4
HIV Infection	46	11.9
Chronic Kidney Disease	32	8.3
Heart Failure	28	7.2
Chronic Liver Disease	12	3.1
Malignancy	15	3.9

Table 2 presents the distribution of comorbid conditions among patients admitted with sepsis. Hypertension was the most prevalent comorbidity, affecting 39.8% of patients, followed by diabetes mellitus (27.4%). HIV infection, chronic kidney disease, and heart failure were also commonly observed.

Table 3: Sources of Infection Among Patients with Sepsis

Source of Infection	Frequency (n)	Percentage (%)
Respiratory Tract Infection	124	32.0
Urinary Tract Infection	82	21.2
Intra-abdominal Infection	67	17.3
Skin/Soft Tissue Infection	54	14.0
Bloodstream Infection	32	8.3
Others	28	7.2
Total	387	100

Table 3 illustrates the sources of infection responsible for sepsis among the study participants. Respiratory tract infections were the most common source, accounting for nearly one-third of all cases (32.0%). Urinary tract infections and intra-abdominal infections were the second and third most frequent sources, respectively. Bloodstream infections represented the least common major source of sepsis in the study population.

Table 4: Clinical Characteristics of Patients with Sepsis

Variable	Frequency (n)	Percentage (%)
Septic Shock at Presentation	118	30.5
ICU Admission	96	24.8
Mechanical Ventilation	48	12.4
Altered Mental Status	104	26.9
Acute Kidney Injury	91	23.5

Table 4 summarizes the clinical characteristics of the study participants. Nearly one-third of patients (30.5%) presented with septic shock at admission, indicating severe disease at presentation. Approximately one-quarter required intensive care unit admission, while 12.4% required mechanical ventilation. Altered mental status and acute kidney injury were also frequently observed among patients.

Table 5: Laboratory Characteristics

Variable	Mean ± SD / Median (IQR)
White Blood Cell Count ($\times 10^9$/L)	15.6 ± 7.8
Haemoglobin (g/dL)	10.8 ± 2.4
Platelet Count ($\times 10^9$/L)	178 ± 85
Serum Creatinine (mg/dL)	1.8 (1.2–3.4)
Random Blood Glucose (mg/dL)	146 ± 58

Table 5 shows the laboratory findings of the study participants at admission. The mean white blood cell count was 15.6 ± 7.8 × 10^9/L, while the mean haemoglobin level was 10.8 ± 2.4 g/dL. The mean platelet count was 178 ± 85 × 10^9/L. The median serum creatinine level was 1.8 mg/dL (IQR: 1.2–3.4 mg/dL). The mean random blood glucose level was 146 ± 58 mg/dL.

Table 6: Treatment Outcomes

Outcome	Frequency (n)	Percentage (%)
Survived and discharged	255	65.9
Died	132	34.1
Total	387	100

Treatment Outcomes

Table 6 shows the treatment outcomes of patients admitted with sepsis. Of the 387 patients included in the analysis, 132 died during hospitalization, resulting in an in-hospital mortality rate of 34.1%. Conversely, 65.9% of patients survived and were discharged.

Table 7: Bivariate Analysis of Factors Associated with Mortality

Variable	Survived n (%)	Died n (%)	χ^2	p-value
Age ≥65 years	62 (24.3)	60 (45.5)	8.94	0.003
Septic Shock	45 (17.6)	73 (55.3)	41.62	<0.001
Altered Mental Status	42 (16.5)	62 (47.0)	35.28	<0.001
CKD	14 (5.5)	18 (13.6)	6.47	0.011
Thrombocytopenia	46 (18.0)	52 (39.4)	9.53	0.002
Positive Blood Culture	54 (21.2)	44 (33.3)	4.82	0.028

Table 7 shows the factors associated with in-hospital mortality among patients admitted with sepsis. Mortality was significantly higher among patients aged 65 years and above (45.5% vs 24.3%; $p = 0.003$), those presenting with septic shock (55.3% vs 17.6%; $p < 0.001$), altered mental status (47.0% vs 16.5%; $p < 0.001$), chronic kidney disease (13.6% vs 5.5%; $p = 0.011$), thrombocytopenia (39.4% vs 18.0%; $p = 0.002$), and positive blood culture results (33.3% vs 21.2%; $p = 0.028$).

Table 8: Multivariable Logistic Regression Analysis of Predictors of Mortality

Variable	AOR	95% CI	p-value
Age ≥65 years	2.14	1.23–3.72	0.007
Septic Shock	4.68	2.61–8.38	<0.001
Altered Mental Status	3.21	1.82–5.65	<0.001
Serum Creatinine ≥2 mg/dL	2.57	1.46–4.54	0.001
ICU Admission	2.74	1.49–5.04	0.001

Table 8 shows the independent predictors of in-hospital mortality identified by multivariable logistic regression analysis. Patients aged 65 years and above were about twice as likely to die during admission (AOR = 2.14, 95% CI: 1.23–3.72; p = 0.007). Septic shock was the strongest predictor of mortality, increasing the odds of death by almost five-fold (AOR = 4.68, 95% CI: 2.61–8.38; p < 0.001). Similarly, altered mental status (AOR = 3.21, 95% CI: 1.82–5.65; p < 0.001), serum creatinine ≥2 mg/dL (AOR = 2.57, 95% CI: 1.46–4.54; p = 0.001), and ICU admission (AOR = 2.74, 95% CI: 1.49–5.04; p = 0.001) were independently associated with increased mortality.

DISCUSSION

This study evaluated the pattern and predictors of in-hospital mortality among adult patients admitted with sepsis at Enugu State University Teaching Hospital (ESUTH), Parklane, between January 2020 and December 2025. More than one-third of hospitalized patients died while in the hospital, indicating a substantial burden of sepsis-related mortality. The most frequent cause of sepsis was respiratory tract infections; independent predictors of mortality included advanced age, septic shock, changed mental status, high blood creatinine, and intensive care unit (ICU) admission. The study participants' average age was 54.8 ± 17.2 years, with patients 65 years of age and older making up the largest age group. This result is in line with earlier studies that demonstrated that sepsis mostly affects older persons because of age-related immune function loss, decreased physiological reserve, and the higher incidence of chronic illnesses among the elderly.[30, 31] Males were reported to have a higher risk of severe infections and hospitalization due to sepsis in earlier studies carried out in Nigeria and other locations, which is consistent with the study's predominance of male patients. [19, 20]

The most prevalent comorbid conditions found in the patients were diabetes mellitus and hypertension. These results are consistent with earlier research showing that chronic non-communicable disorders play a major role in the emergence and spread of severe infections and sepsis.[32] The research population's higher sensitivity to infection and unfavourable outcomes may have been caused by the high prevalence of these comorbid illnesses. With 32.0% of all cases, respiratory tract infections were the most common cause of sepsis. This finding is in line with other research from both industrialized and developing nations, which found that the most frequent causes of sepsis among hospitalized people were pneumonia and other lower respiratory tract infections.[16, 19, 33] Due to delayed presentation, advanced age, and underlying concomitant conditions, respiratory infections often develop into severe sepsis.

The significant burden of sepsis in the study environment is reflected in the total in-hospital death rate of 34.1%. This mortality rate is similar to that found in other Nigerian and sub-Saharan African tertiary healthcare institutes, where death rates have been reported to range from 20% to over 50%.[18–20] Delays in presentation, severe illness at admission, restricted access to critical care institutions, and the high frequency of concomitant illnesses among afflicted individuals may all contribute to the continuously high fatality rate.[34] Bivariate analysis revealed a strong correlation between death and advanced age, septic shock, altered mental status, chronic kidney disease, thrombocytopenia, and positive blood culture results. These results corroborate earlier research showing that septic patients' outcomes are influenced by both patient-related and disease-related factors.[22, 24–26] Individuals who showed signs of severe organ malfunction were much more likely to pass away while in the hospital.

A multivariable logistic regression analysis revealed that being 65 years of age or older was an independent predictor of death. Compared to younger patients, patients in this age group had more than twice the chance of dying. Similar results have been documented in earlier research, where aging was consistently linked to poor

sepsis outcomes because of immunosenescence, frailty, and the existence of other comorbidities.[31–35] In this investigation, septic shock was found to be the most reliable indicator of death. Septic shock patients were about five times more likely to die than non-shock patients. This result is in line with other research that found septic shock to be one of the key factors influencing death in septic patients. [12, 13, 36] Severe circulatory and metabolic problems that often lead to multiple organ failure and poor clinical outcomes are the hallmarks of septic shock.

Additionally, there was an independent correlation between mortality and altered mental status. The risk of dying while in the hospital was more than three times higher for patients who presented with disturbed consciousness. This result is consistent with earlier studies that found altered mental status to be a significant predictor of advanced organ dysfunction, cerebral hypoperfusion, and severe systemic disease in septic patients.[25, 37] In this investigation, mortality was independently predicted by elevated serum creatinine levels. Sepsis frequently results in renal impairment, which has been repeatedly linked to unfavourable outcomes. Fluid, electrolyte, and metabolic abnormalities brought on by acute kidney damage exacerbate the severity of the illness and raise the chance of mortality.[38] The results highlight the significance of early management and routine evaluation of renal function in septic patients.

Additionally, an independent predictor of mortality was shown to be admission to the critical care unit. Patients in need of intensive care are typically individuals with severe illness and multiple organ dysfunction, even though ICU admission is meant to increase survival. Therefore, rather than directly contributing to bad outcomes, ICU admission probably indicates the severity of the illness. Previous worldwide investigations of critically unwell septic patients have revealed similar results.[39] The results of this study emphasize the need of identifying sepsis early, starting evidence-based treatment right away, and treating patients aggressively when they exhibit high-risk characteristics including septic shock, altered mental status, or renal impairment. In places with limited resources, improving adherence to sepsis management standards and bolstering critical care services may greatly lower mortality among septic patients.

Limitations Of the Study

This study had a number of shortcomings. The study was vulnerable to missing data and documentation mistakes because the retrospective design depended on the accuracy and completeness of already-existing medical records. Serum lactate levels, SOFA scores, and comprehensive microbiological data are some potentially significant prognostic factors that were not consistently accessible for every patient. Furthermore, the study was carried out in a single tertiary institution, which would restrict how broadly the results can be applied to different healthcare environments. However, the study offers significant local data on the death load, pattern, and determinants among septic patients in South-East Nigeria.

CONCLUSION

Sepsis remains a major cause of morbidity and mortality among adult patients hospitalized to Enugu State University Teaching Hospital, Parklane. Sepsis was most frequently caused by respiratory tract infections, and the overall in-hospital death rate was 34.1%. Independent predictors of mortality included advanced age, septic shock, changed mental status, high blood creatinine levels, and ICU hospitalization. These results highlight the significance of early detection of high-risk individuals and timely application of evidence-based therapies to lower mortality from sepsis.

RECOMMENDATIONS

The results of this study suggest that early screening and timely treatment of sepsis should be improved, especially for high-risk patients including the elderly and those who come with septic shock, altered mental status, or renal impairment. To maximize patient outcomes, the hospital should strengthen critical care services through increased staffing, training, and equipment availability. Healthcare personnel should receive ongoing professional education to enhance early detection and treatment of sepsis, and routine evaluation of organ dysfunction, particularly renal function, should be integrated into sepsis management procedures. In order to encourage people with serious infections to present to medical institutions as soon as possible, public health

awareness programs should be stepped up. Prospective multicentre studies are also advised to confirm these results and offer more comprehensive proof for enhancing sepsis care and lowering mortality.

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