

# Prevalence, Patterns and Outcomes of Medical Emergencies in a Cardiac Center in Port Harcourt, Southern Nigeria

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**Abstract:** ***Background:** Emergency department (ED) visits are common and can occur unexpectedly. They serve as the primary location for initial care, diagnosis, treatment, and referral are an essential part of healthcare, operating around the clock to provide acute care to those in need. As such, they play a crucial role in the healthcare system of every society. **Method:** This is a retrospective cross-sectional study of prevalence, patterns and outcomes of medical emergencies in a cardiac center of Goodheart Medical Consultants Hospital in Port Harcourt over a 3-year period. The case notes of patients seen in the emergency department during the period under study were retrieved, relevant data extracted and analyzed descriptively. **Results:** A total of 1644 patients sought medical emergency care, with 861 (52.4%) being male and 783 (48.0%) being female. The mean age of the patients was 54 ±18.33 years. Cardiac emergencies were the most prevalent medical emergency, accounting for 37.1%, and the least medical emergency were the cerebrovascular disease 1.4%. The highest age group was those between 61 - 80 with 26.7%, the lowest age group was those above 80 years, with 4.5%. The treatment outcome was generally favorable, with 96% of the medical emergencies improving and being discharged home, 1.8% being referred, 2% died and 0.2% left against medical advice (LAMA). The average duration of stay in the hospital was approximately 3 days. **Conclusions:** The proportion of patients admitted increased with increasing age groups. Non-communicable diseases (NCDs) particularly cardiac emergency were the most common causes of admission and the major cause of death was heart failure, while for communicable diseases was Malaria. There is a need to estimate the most prevalent diseases from the pattern of admissions so that appropriate preventive strategies can be designed for the primary intervention.*

**Keywords:** Emergency department, cardiac emergencies, Goodheart Medical Consultants Hospital, Prevalence patterns, Non-communicable diseases

## 1. Introduction

In every society, hospital emergency departments are an essential part of healthcare (1) providing round-the-clock availability for individuals in need of acute care. (2) The Emergency Departments (EDs) remains accessible and always open, serving as one of the few institutions that assist individuals regardless of their economic or social status without requiring an appointment. Patients often visit the ED unexpectedly when they are concerned about their condition in a challenging environment. (3) The emergency room or accident and emergency department (ER/A&E) serves as the primary location for initial care, diagnosis, treatment, and referral. (4)

In 2015, half of the 28 million deaths worldwide were caused by medical emergencies, with poorer nations bearing the brunt of the burden. (5) Every year, millions of people are affected by medical emergencies, which can lead to

fatalities due to inadequate healthcare systems, limited access to timely care, and medical errors. (6) The establishment of a standard emergency department is a challenge in some sub-Saharan African countries due to poor political will from various governments. (7) The health of adults in sub-Saharan Africa is becoming increasingly important in global health policy, and the specific illnesses responsible for high mortality rates among adults in this region have not been well characterized. (8)

The Accident and Emergency Department (AED) is the primary method of admission to medical and surgical wards in Nigeria, with surgical emergencies accounting for a considerable percentage of admissions, ranging from 20% to 45%. (9) Additionally, emergency departments in Nigeria are estimated to witness 10% to 15% of the total 1.6 million deaths recorded annually. (10)

Hospital admissions have been reported to consist of 22%–40% medical cases. (11, 12) In developing countries, communicable diseases (CDs) are the primary cause of hospital admissions and have the potential to escalate into outbreaks. (11, 12) CDs account for 51% of years of life lost globally, while non - communicable diseases (NCDs) are the leading cause of death worldwide, according to the World Health Organization (WHO). (13, 14) NCDs are responsible for the deaths of 41 million people annually, which is equivalent to 74% of all deaths worldwide. (14)

Despite these challenges, a number of lives have been saved when patients with various illnesses come to the emergency department of hospitals. This study contributes to understanding the occurrence and distribution of medical emergencies among different age group as well as recognizing the most frequent types of emergencies and evaluating the quality of treatment outcomes of emergency medical services in cardiac sectors in Port Harcourt. Hence, the study aims to determine the prevalence, patterns and outcomes of medical emergencies in a cardiac center.

**2. Materials and Methods**

This is a retrospective cross - sectional study of the prevalence, patterns and outcomes of medical emergencies in a cardiac center seen at the emergency department of the Goodheart Medical Consultants Hospital, Port Harcourt over a 3years period between January 2019 and December 2021. The case notes of patients seen in the emergency department during the period under study were retrieved, relevant data extracted including the gender, age, level of education, occupation, diagnosis, duration of hospital stay, and treatment outcome were analyzed descriptively. In this study, the outcome was defined as follows: Discharged, deceased, Left against medical advice (LAMA) and referred.

**3. Results**

A total of 1644 patients 861 (52.4%) males and 783 (48.0%) females presented to the medical emergency during the study period. The age range was 3 - 92 years and mean age was 54 ±18.33 years. There was a normal distribution of age among all emergency room admissions with the highest age group being those between 41 - 60year age group 563 (34.2%), followed by the 61 - 80 year age group 466 (30.4%) and the least age group were those above 80 years 108 (6.6%). Other sociodemographic indices are outlined in the table below (Tables 1 and 2)

**Prevalence and pattern of medical emergencies**

The most prevalent medical emergency was cardiac emergencies (610 cases, 37.1 %), followed by malaria (275cases, 16.7%), Hyperglycemic state (115cases 7.0%) and chest infection (76 cases, 4.6%). (Table 3)

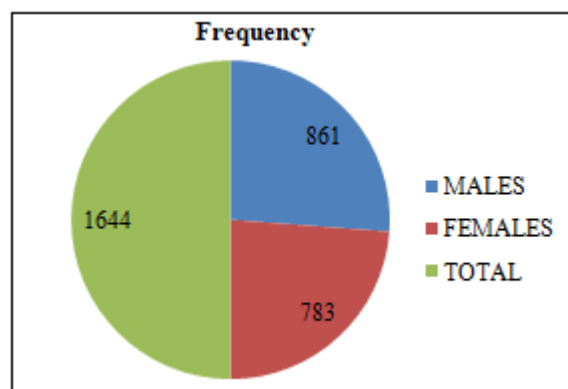
The age group between 61 - 80 years was more predominant in the medical emergency with (439cases, 26.7%), followed by 41 - 60 years with (421cases, 25.6%) and the least age group was those above 80 years with (74cases, 4.5%). (Table 4)

Treatment outcome was generally fair. Of the 1644 patients who were diagnosed, 1578 (96%) improved and were discharged home, 30 (1.8%) were referred, 3 (2%) deteriorated and died in the emergency department (ED) while 3 (0.2%) were left against medical advice (LAMA) within the period under review. The treatment outcome where predominant in females than males. Table 5

The treatment outcomes according to age group revealed that the age group above 80 years has more death cases as compared to other age group and that the age between 41 - 60 has a highest number of discharged and referred patients. Table 6

Treatment outcomes of the major disease that caused medical emergencies were cardiac emergency, it has the highest rate of deceased, discharged and referred patient as compared to other medical emergency cases. (Table 7). The average duration of stay in the hospital was approximately 3 days, table 8

Non - communicable diseases (NCDs) and the communicable diseases (CDs) were responsible for 50.1% and 25.2% respectively of the medical emergency illness shown in Table 9.



**Figure 1:** Gender Distribution showing total number of study participant

**Table 1:** Age and Gender distribution

| Gender                | <18         | 18 - 40     | 41 - 60     | 61 - 80     | >80        |
|-----------------------|-------------|-------------|-------------|-------------|------------|
| Male n= 861 (52.4%)   | 105 (6.4%)  | 103 (6.3%)  | 286 (17.4%) | 243 (14.8%) | 46 (2.8%)  |
| Female n= 783 (47.6%) | 94 (5.7%)   | 172 (10.5%) | 277 (16.8%) | 256 (15.6%) | 62 (3.8%)  |
| Total n=1644 (100%)   | 199 (12.1%) | 275 (16.7%) | 563 (34.2%) | 499 (30.4%) | 108 (6.6%) |

Table 2: Sociodemographic characteristics

| Variable              | Category     | Frequency (1644) | Percent (100) |
|-----------------------|--------------|------------------|---------------|
| <b>Gender</b>         | Male         | 861              | 52.4          |
|                       | Female       | 783              | 48.0          |
| <b>Age (years)</b>    | <18          | 199              | 12.1          |
|                       | 18 - 40      | 275              | 16.7          |
|                       | 41 - 60      | 563              | 34.2          |
|                       | 61 - 80      | 499              | 30.4          |
|                       | >80          | 108              | 6.6           |
| <b>Mean Age</b>       | 54.75±18.53  |                  |               |
| <b>Marital Status</b> | Divorced     | 29               | 1.8           |
|                       | Married      | 1009             | 61.4          |
|                       | Single       | 214              | 13.0          |
|                       | Unspecified  | 187              | 11.4          |
|                       | Widowed      | 205              | 12.5          |
| <b>Education</b>      | Basic        | 30               | 1.8           |
|                       | None         | 18               | 1.1           |
|                       | Secondary    | 62               | 3.8           |
|                       | Tertiary     | 1085             | 66.0          |
|                       | Unspecified  | 449              | 27.3          |
| <b>Occupation</b>     | Artisan      | 77               | 4.7           |
|                       | Business     | 3                | 0.2           |
|                       | Entrepreneur | 365              | 22.2          |
|                       | None         | 16               | 1.0           |
|                       | Professional | 449              | 27.3          |
|                       | Retired      | 201              | 12.2          |
|                       | Student      | 62               | 4.0           |
|                       | Unspecified  | 418              | 25.4          |
| Vocational            | 48           | 2.9              |               |

Table 3: Pattern of diseases according to gender

| Diagnosis                               | Male        | Female      | Frequency %  |
|---|-------------|-------------|--------------|
| <b>Cardiac Emergency 610 (37.1%)</b>    |             |             |              |
| - Cardiac Arrhythmia                    | 43          | 34          | 77 (4.7%)    |
| - Hypertensive Emergency                | 139         | 153         | 292 (17.8%)  |
| - Heart Failure                         | 125         | 116         | 241 (14.7%)  |
| Acute Exacerbation of PUD               | 25          | 24          | 49 (3.0%)    |
| Chest Infection                         | 39          | 37          | 76 (4.6%)    |
| Cerebrovascular Disease                 | 16          | 7           | 23 (1.4%)    |
| Electrolyte Imbalance                   | 12          | 14          | 26 (1.6%)    |
| Gastroenteritis                         | 27          | 36          | 63 (3.8%)    |
| Hyperglycemic state                     | 49          | 66          | 115 (7.0%)   |
| Malaria                                 | 123         | 152         | 275 (16.7%)  |
| <b>Others Minor Medical emergencies</b> | 407 (24.8%) |             |              |
| <b>Total</b>                            | 598 (36.4%) | 639 (38.9%) | 1237 (75.2%) |

Table 4: Pattern of disease according to age group

| DIAGNOSIS                              | <18               | 18 - 40          | 41 - 60            | 61 - 80            | >80              |
|--|-------------------|------------------|--------------------|--------------------|------------------|
| <b>Cardiac Emergency 610 (37.1%)</b>   |                   |                  |                    |                    |                  |
| - Cardiac Arrhythmia                   | 8                 | 12               | 29                 | 24                 | 4                |
| - Hypertensive Emergency               | 28                | 31               | 121                | 95                 | 17               |
| - Heart Failure                        | 29                | 10               | 71                 | 113                | 18               |
| Acute Exacerbation of PUD              | 3                 | 11               | 24                 | 10                 | 1                |
| Chest Infection                        | 6                 | 3                | 18                 | 39                 | 10               |
| Cerebrovascular Disease                | 2                 | 2                | 10                 | 9                  | 0                |
| Electrolyte Imbalance                  | 4                 | 4                | 6                  | 11                 | 1                |
| Gastroenteritis                        | 9                 | 14               | 20                 | 18                 | 2                |
| Hyperglycemic state                    | 9                 | 7                | 41                 | 49                 | 9                |
| Malaria                                | 40                | 71               | 81                 | 71                 | 12               |
| <b>Total</b>                           | <b>138 (8.4%)</b> | <b>165 (10%)</b> | <b>421 (25.6%)</b> | <b>439 (26.7%)</b> | <b>74 (4.5%)</b> |
| <b>Other Minor medical emergencies</b> | 407 (24.8%)       |                  |                    |                    |                  |

**Table 5:** Overview of treatment outcomes of medical emergency according to gender

| Gender        | Deceased | Discharged | LAMA    | Referred |
|---------------|----------|------------|---------|----------|
| <b>Male</b>   | 15 0.9%  | 753 45.8%  | 2 0.12% | 13 0.8%  |
| <b>Female</b> | 18 1.1%  | 825 50.2%  | 1 0.1%  | 17 1.0%  |
| <b>Total</b>  | 33 2.0%  | 1578 96%   | 3 0.2%  | 30 1.8%  |

LAMA: Left against medical advice

**Table 6:** Treatment Outcomes of medical emergencies according to age group

| Age Group | Deceased | Discharged | LAMA | Referred |
|-----------|----------|------------|------|----------|
| <18       | 0        | 170        | 0    | 7        |
| 18 - 40   | 2        | 269        | 2    | 4        |
| 41 - 60   | 3        | 549        | 0    | 11       |
| 61 - 80   | 6        | 485        | 1    | 7        |
| >80       | 22       | 105        | 0    | 1        |

**Table 7:** Treatment Outcomes of the major disease that caused medical emergencies

| Diagnosis  | Deceased  | Discharged | LAMA     | Referred  |
|--|-----------|------------|----------|-----------|
| <b>Cardiac Emergency</b>                           | <b>17</b> | <b>583</b> | <b>0</b> | <b>10</b> |
| - Cardiac Arrhythmia                               | 4         | 71         | 0        | 2         |
| - Heart Failure                                    | 7         | 232        | 0        | 2         |
| - Hypertensive Emergency                           | 6         | 280        | 0        | 6         |
| Acute Exacerbation Of PUD                          | 0         | 49         | 0        | 0         |
| Chest Infection                                    | 1         | 75         | 0        | 0         |
| Cerebrovascular Disease                            | 0         | 23         | 0        | 0         |
| Electrolyte Imbalance                              | 1         | 24         | 0        | 1         |
| Gastroenteritis                                    | 2         | 61         | 0        | 0         |
| Hyperglycemic State                                | 1         | 111        | 0        | 3         |
| Malaria  | 4         | 271        | 0        | 0         |
| <b>Other Minor medical emergencies 407 (24.8%)</b> | <b>7</b>  | <b>391</b> | <b>3</b> | <b>6</b>  |

**Table 8:** Duration of admission

| No Days   | Female | Male | <18 | 18 - 40 | 41 - 60 | 61 - 80 | >80 | Grand Total |
|-----------|--------|------|-----|---------|---------|---------|-----|-------------|
| <24hrs    | 76     | 64   | 22  | 37      | 50      | 24      | 7   | 140 (8.5%)  |
| <b>1</b>  | 206    | 191  | 53  | 76      | 147     | 104     | 17  | 397 (24.1%) |
| <b>2</b>  | 179    | 187  | 47  | 57      | 117     | 111     | 34  | 366 (22.3%) |
| <b>3</b>  | 163    | 137  | 27  | 50      | 103     | 106     | 14  | 300 (18.2%) |
| <b>4</b>  | 88     | 75   | 21  | 25      | 51      | 58      | 8   | 163 (10.0%) |
| <b>5</b>  | 37     | 39   | 5   | 8       | 28      | 29      | 6   | 76 (4.6%)   |
| <b>6</b>  | 43     | 23   | 7   | 9       | 27      | 19      | 4   | 66 (4.01%)  |
| <b>7</b>  | 14     | 17   | 3   | 1       | 15      | 8       | 4   | 31 (1.9%)   |
| <b>8</b>  | 17     | 11   | 4   | 3       | 6       | 10      | 5   | 28 (1.7%)   |
| <b>9</b>  | 7      | 10   | 1   | 2       | 6       | 6       | 2   | 17 (1.03%)  |
| <b>10</b> | 7      | 4    | 3   | 1       | 2       | 5       | 0   | 11 (1.0%)   |
| >10       | 24     | 25   | 7   | 6       | 11      | 18      | 7   | 49 (3.0%)   |

Mean duration of stay = 3.1

**Table 9:** Classification of diseases

| Medical Emergencies                                | Frequency | Percentage % |
|--|-----------|--------------|
| <b>Non communicable diseases 823 (50%)</b>         |           |              |
| <b>Cardiac emergency;</b>                          | 610       | 37.1         |
| - Heart failure 241 (14.7%)                        |           |              |
| - Cardiac arrhythmia 77 (4.7%)                     |           |              |
| - Hypertensive emergency 292 (17.8%)               |           |              |
| Acute Exacerbation of PUD                          | 49        | 3.0          |
| Cerebrovascular disease                            | 23        | 1.4          |
| Electrolyte Imbalance                              | 26        | 1.6          |
| Hyperglycemic state                                | 115       | 7.0          |
| <b>Communicable diseases 414 (25.2%)</b>           |           |              |
| Chest infection                                    | 76        | 4.6          |
| Gastroenteritis                                    | 63        | 3.8          |
| Malaria  | 275       | 16.7         |
| <b>Other Minor medical emergencies 407 (24.8%)</b> |           |              |

#### 4. Discussion

The study described the prevalence, patterns and outcomes of medical emergencies in a cardiac center of a private hospital in Port Harcourt, Nigeria. Over the past decade, several studies have shown a consistent increase in the number of emergency department admissions for a specific population. (15) The primary reason for these admissions was medical emergencies, with most patients being admitted to medical wards. Unfortunately, a significant number of patients also experienced mortality while in the A&E department. The study revealed that non - communicable diseases (NCDs) were the primary cause of medical emergency admissions, likely due to increased awareness and vaccine administration. Finally, the study compared the leading causes of emergency admissions and outcomes with existing literature.

The proportions of emergency cases across different age groups indicate that the largest proportion (34.2%) consists of patients aged 41 - 60 years, followed by those aged 61 - 80 years (30.4%), 18 - 40 years (16.7%), and below 18 years (12.1%) Patients aged above 80 years make up the smallest proportion (6.6%). The highest proportion of admitted and diagnosed patients falls within the middle and elderly age range of 41 - 80 years, compared to the younger adult age groups. This observation may be attributed to the weakening and aging of the body, which reduces immunity and increases vulnerability to diseases. The global population is experiencing an unexpected increase in aging, with the average life expectancy rising in the second half of the 20th century and declining fertility rates. It is projected that the elderly population in sub - Saharan Africa may double between 2000 and 2030, reaching a significant number of individuals. (16)

In this study, the age range of the patients admitted over the period was 2 - 93 years, the mean age of the patients with medical emergencies was  $54 \pm 18.33$  years although higher than the  $45.50 \pm 17.66$  years reported in medical emergencies in a tertiary health institution in Port Harcourt (4) , but similar to  $51.56 \pm 18.35$  years reported in medical centre, Asaba. (12) This shows that no age group is exempted from severe or life - threatening illnesses, the mean age of about 54 years shows that the productive age is mainly affected. Provision and distribution of health resources should be done in a way that all age groups are well represented especially in developing countries where the resources are scarce. (17)

The study found that the most common medical emergencies were cardiac emergencies 610 (41.1%), Malaria 275 (26.7%) and Hyperglycemic state 115 (7.0%). More females were diagnosed with medical cases than males, which is consistent with findings in another study in Abakiliki. (18) Men tend to deny illness until it becomes severe. This behavior may be cultural and a sign of strength, but it leads to higher mortality rates as men often present to hospitals in advanced stages of their disease. Females may have better health - seeking behavior. (19)

In our study, we found that non - communicable diseases (NCDs) accounted for 50.1% of medical emergency cases,

while communicable diseases (CDs) accounted for 25.2%. These percentages are similar to 52.4% and 47.4% reported Abeokuta (20) Southwest of Nigeria. The majority of medical emergencies were caused by non - communicable diseases, which is consistent with findings from other studies conducted in Aba (64.7%), (21) , and Port Harcourt (54.7%) (22) studies. This suggests that the burden of non - communicable diseases is increasing in sub - Saharan Africa due to the adoption of a Westernized lifestyle. (21, 22) NCDs were found to be the leading cause of death, accounting for 50.1% of all deaths. Among NCDs, cardiac emergency diseases were responsible for the majority of cases at 17 (1.0%). The hospital's high quality of services was evident in the high proportion of patients discharged home (96%) and those referred (1.8%). However, there is still work to be done in improving early presentation, health education, reducing poverty, and enhancing access to healthcare services, as indicated by the proportion of deaths (2%) and LAMA cases (0.2%). LAMA cases were often attributed to poverty, incorrect cultural or religious beliefs, or attributing illness to spiritual attacks. (23)

Cardiac emergencies, particularly hypertensive emergencies 292 (17.8%) and heart failure 241 (14.7%), were the most common non - communicable diseases. This trend was also observed in other regions such as Ekiti, (23) Zaria (24) , kano (25) and Enugu (26) . Limited access to healthcare and a high prevalence of cardiovascular risk factors may be contributing factors (27) According to the World Health Organization, cardiovascular disease is a significant contributor to the global disease burden. Non - communicable diseases are currently the leading cause of death, with a rising trend, (23) and the majority of these deaths occur in low - and middle - income countries. . (14)

The admissions in this study have shown positive results in terms of successfully treating and discharging patients. The mortality rate observed in this study is 2.0%, which is lower than the rates reported in Lagos (9%) (28) and Port Harcourt (9.2%), (4) but similar to the overall emergency room mortality rate of 2% recorded in a study conducted between 2000 and 2003 However, there is still a need to further reduce the mortality rate to the lowest possible level. This can be achieved by promptly making accurate diagnoses and implementing appropriate management strategies. It is crucial to equip the A and E department with functional instruments and supplies, as well as enhance the skills of the staff and regularly update management protocols for common illnesses. Taking these steps is invaluable in achieving the goal of reducing mortality rates. (24).

The mean duration of hospital stay for all patients was 3.1 days, which aligns with findings from other local studies. (29, 30) (17) One possible explanation for the shorter average stay of around 3 days is that survivors are stabilized over a longer period of time before being admitted to the wards or transferred to other treatment centers. (17)

In addition, the current study reported minor medical emergency involving 407 cases (24.8%) in which patients were admitted to the medical department for conditions such



as food poisoning, assault, appendicitis, fracture, and anemia etc

### Limitation of the study

The limitations of the present study include underreporting of cases and missing data, which are common limitations in retrospective studies.

## 5. Conclusion and Recommendation

To design appropriate preventive strategies for primary intervention, it is necessary to estimate the prevalence of diseases based on admission patterns. According to this study, there were a higher proportion of male admissions in medical wards compared to females. However, the number of females diagnosed with diseases cases had a higher proportion. The proportion of patients admitted increased as age groups increased, with the middle and elderly patients forming the largest proportion.

Non - communicable diseases (NCDs), particularly cardiac emergencies, were the most common reasons for admission. Among these, hypertensive emergency followed by heart failure were the top causes. Heart failure was the major cause of death, while Malaria was the leading cause of deaths from communicable diseases.

To improve the outcome of medical emergencies in our hospitals, Healthcare practitioners should promptly diagnose cases and initiate immediate treatment.

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