

Pattern and Outcome of Medical Admissions in Ekiti State University Teaching Hospital, Ado-Ekiti- A 5 Year Review

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Abstract Background: The trend in medical admission is very dynamic and it is very important for planning, policy formulation and assessment of health status of the populace. **Aim:** To investigate the pattern and outcome of medical admissions in Ekiti State University Teaching Hospital, Ado-Ekiti, over a period of 5 years. **Method:** Medical records of adult admissions between January 2008 and December 2012 were reviewed for the retrospective study. **Results:** A total of 3750 patients were admitted with a male to female ratio of 1.1 to 1. The mean age was 50.87 ± 19.82 years and the age range was 16 to 102 years. Non communicable diseases constituted a majority of the admissions with the highest percentages in persons with stroke (21%), diabetes mellitus (18%), systemic hypertension (13%) and heart failure (11%). Notably, communicable diseases (CD) ravaged the young adults where HIV/AIDS (73.0%), pulmonary tuberculosis (60.0%), and malaria (60.0%) affected this age group. Overall mortality rate was 16.0%. Stroke, diabetes mellitus, HIV/AIDS, pulmonary tuberculosis and heart failure accounted for most deaths. Patients with NCD stayed longer on admission than those with CD (8.37 ± 8.07 vs 7.18 ± 7.24 days, $p < 0.0001$), although patients with stroke, diabetes mellitus and HIV/AIDS stayed longest. **Conclusions:** In view of the huge burden of NCD and CD in the elderly and young adults respectively found in this study, the need for aggressive preventive measures and scaling-up resources for quick intervention to curb this menace is imperative.

Keywords Medical admissions, Communicable diseases, Non communicable diseases, Nigeria

1. Introduction

Nature of health related conditions across populations and the intriguing imbalance in the rate of reproduction and death has been a subject of discussion since primeval times. [1, 2] Presumably, the prevailing ailments in the society is said to determine the trend in hospital admissions which will also give an overview of the health status of the community. Therefore, hospitalization often gives an idea of the dynamics in disease pattern in a community, although, the precise prevalence of such might not be determined. [3] This insight is important for planning, policy formulation and eventually will determine the allocation of resources for health services, research and training. [4] Information in this regard is often lacking, especially in developing countries, which would have been helpful in the proper distribution of the meager resources allocated to healthcare in such setting. [4] Lately, the drift towards non-communicable diseases (NCD) as the leading cause of medical admission in developing countries due to epidemiological transition have been highlighted, [1, 3, 5, 6] however the communicable

diseases (CD) still account for a bulk of patients by virtue of its high burden in the developing countries. [3] Previous studies on the pattern and outcome of medical admission in hospitals in Nigeria [4, 5, 7-9] have been documented but none to the best of our knowledge in Ekiti state, south western, Nigeria. This study aimed at describing the pattern and outcome of medical admissions in a sub-urban tertiary institution in Ekiti state, Nigeria and compared it to previous studies.

2. Methods

This retrospective study was conducted at the Ekiti State University Teaching Hospital (EKSUTH), Ado-Ekiti, Ekiti State, Nigeria between January 2008 and December 2012. All medical admissions during this period were included in the study. EKSUTH is a 300 bed hospital with 46 devoted for admission of adult male (23 beds) and female (23 beds) medical cases. Patients are admitted to the medical ward via accident and emergency unit, medical outpatient and general outpatient clinics. It is located in south western part of Nigeria, serving as a tertiary centre for 16 General Hospitals and 32 Comprehensive health centers in the state that cater for the health needs of a population of over 2 million people. Referrals are also received from neighbouring states of Kwara, Osun, Ondo, and Kogi within the catchment area of

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150km radius. Eight Physicians are saddled with the responsibility of determining the final diagnosis of admitted patients and their work is often complemented by the results from the laboratories and radiology units.

Admission and discharge records were retrieved and the following information was captured: name, age, hospital number, sex, duration of hospital stay, outcome of treatment. Outcome variables were discharge following improvement, death, referred to other hospitals and left against medical advice. Medical diagnoses of the admitted patients were categorized using ICD-10 coding system. Institutional ethical approval was obtained from the hospital's ethical committee. The data were analyzed with Statistical Package for Social Sciences (SPSS Inc, Chicago, version 20.0). Continuous variables were expressed as means \pm standard deviation while categorical variables as frequencies and percentages. Comparisons of categorical data were performed using Pearson's chi-square test and p value of less than 0.05 was considered as statistically significant.

3. Results

During the study period of five years (January 2008 to December 2012), a total of 3,750 patients were admitted into the male and female wards which constituted 1963(52.3%) males and 1787(47.3%) females with a male to female ratio of 1.1 to 1. The mean age was 50.87 ± 19.82 years with age

range of 16 to 102 years. The male patients were older (51.81 ± 19.82 vs 49.84 ± 19.78 years; $p=0.002$). About two third of patients admitted were younger than 65 years.

3.1. Pattern of Diseases

Table 1. Patients' Age in Relation to Disease Category

Age	Communicable diseases	Non-communicable diseases
Less than 45 years	751(55.5%)	601(44.5%)
45 -64 years	285(25.8%)	818(74.2%)
65 years and above	235(20.8%)	896(79.2%)

$$X^2 = 389.6 \quad p\text{-value} < 0.0001$$

Table 2. Common Diagnosis in Relation to Patient' Age Group

Diagnosis	Less than 45 years	45 -64 years	65 years and above
HIV/AIDS	195(73.0%)	55(20.6%)	17(6.4%)
Heart failure	43(16.7%)	73(28.4%)	141(54.9%)
Chronic kidney disease	54(48.6%)	33(29.8%)	24(21.6%)
Diabetes mellitus	92(22.4%)	188(45.7%)	131(31.9%)
Hypertension	70(23.8%)	128(43.5%)	96(32.7%)
Stroke	44(9.1%)	182(37.4%)	260(53.5%)
Tuberculosis	98(60.0%)	46(26.7%)	28(16.3%)
Malaria	102(60.4%)	38(22.5%)	29(17.1%)

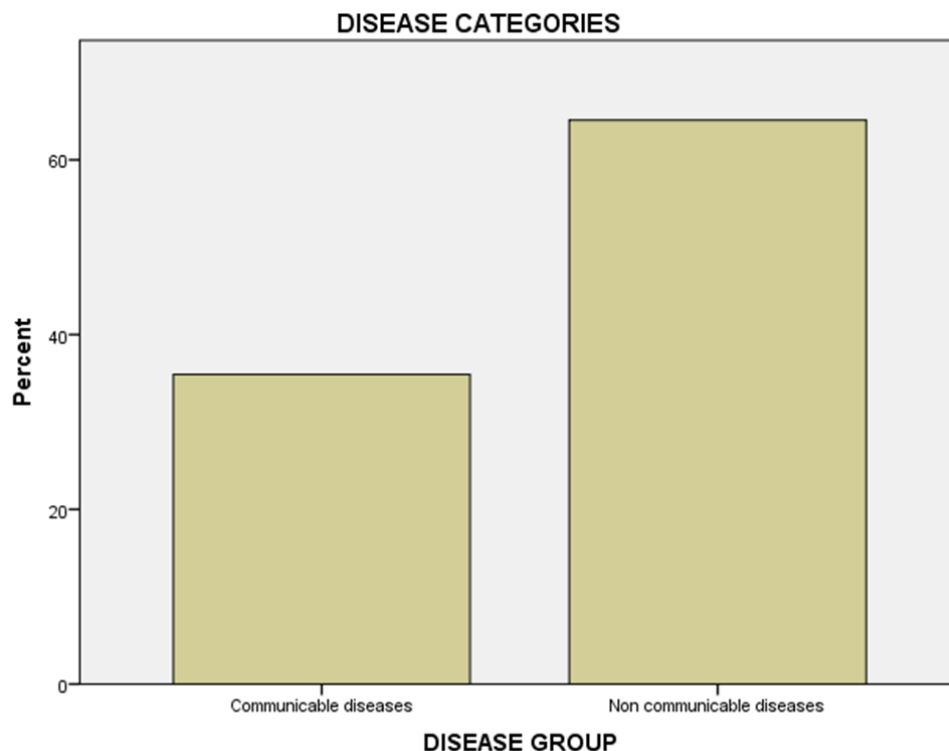


Figure 1.

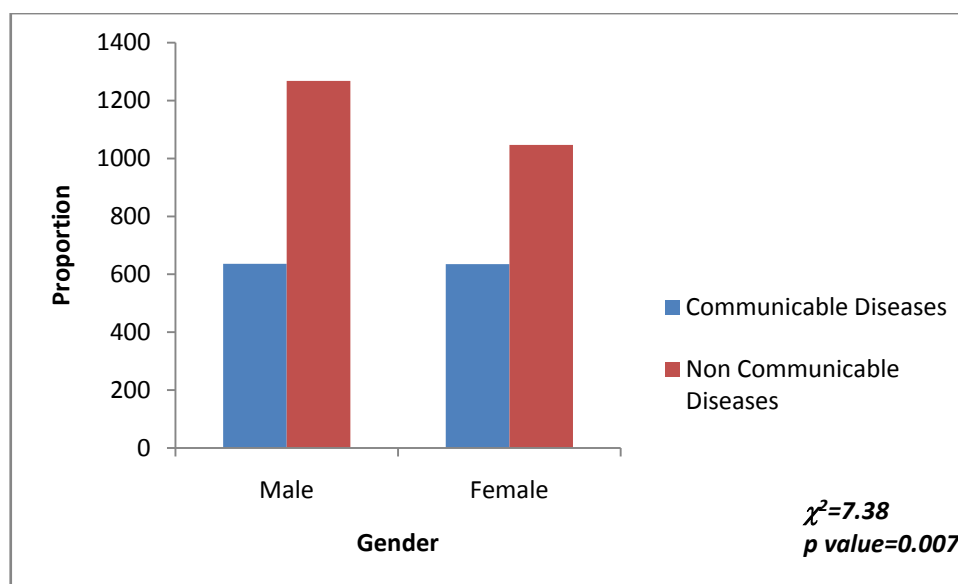


Figure 2. Gender Distribution of Diseases Categories

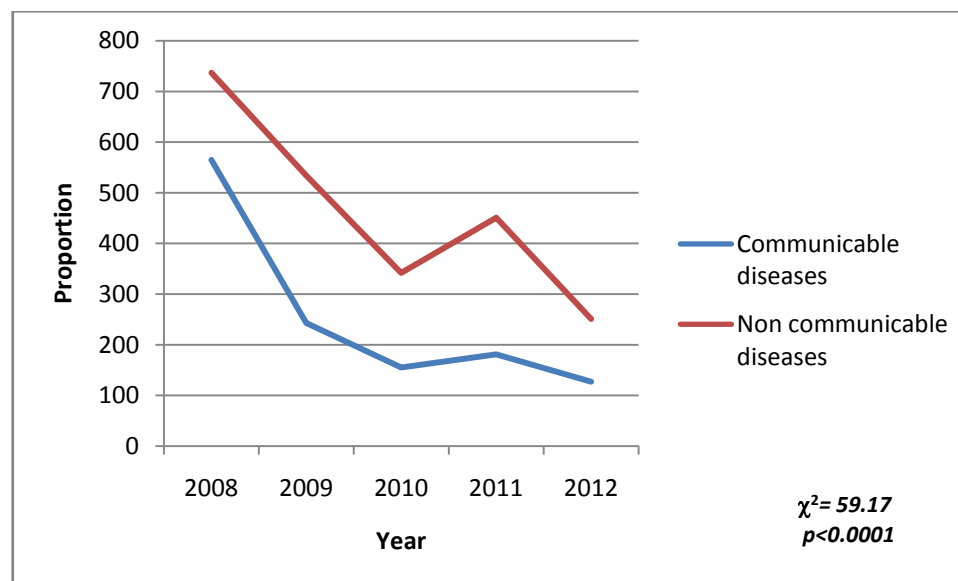


Figure 3. Trend in Annual Admissions

Non-communicable diseases 2315(64.6%) constituted the majority of admitted cases during the period under review [Figure 1]. The major non-communicable diseases (NCD) were stroke (21%), diabetes mellitus (18%), hypertension (13%), and heart failure (11%) while the main cases of communicable diseases (CD) admitted were HIV/AIDS (21%), pulmonary tuberculosis (16%) and malaria (13%). Despite constituting the same percentage in their individual groups, stroke and HIV/AIDS represented 13.6% and 7.4% of the total medical admissions respectively. With increasing age, there was a stepwise rise in the number of NCD admitted whereas a decline with increasing age was observed in the number of patients with CD [Table 1]. As shown in Table 2, the young adult population had more admissions due to HIV/AIDS (73.0%), PTB (60.0%), malaria (60.4%). On the contrary, the elderly patients had a greater proportion of patients admitted with stroke (53.5%), heart failure

(54.9%) whereas the middle aged individuals constituted more of those with diabetes mellitus (45.7%), and systemic hypertension (43.5%). Gender distribution of diseases into CD/NCD (figure 2) showed NCD to be more predominant in both sexes and this difference was statistically significant (chi square=7.38, p-Value=0.007).

Over the five years period under review, there was a steady decline in admission of both CD and NCD except for a spike in the year 2011(Figure 3).

3.2. Outcome

A larger percentage of medical admissions (71.1%) were discharged home following remarkable improvement in their clinical conditions. Patients who left against medical advice constituted 7.6%, while those who were referred to other facilities accounted for 5.3% and the mortality was 16.0%. Stroke, diabetes mellitus, HIV/AIDS, pulmonary

tuberculosis and heart failure with percentage mortality of 119(21.5%), 64(11.6%), 64(11.6%), 40(7.2%) and 34(6.1%) respectively accounted for most of the cases who died. There was a rise in mortality with increasing age viz 28.7%, 29.6% and 41.6% in the young adults (less than 45years), middle age (between 45 and 64 years) and elderly (65years and above) patients respectively.

As shown in figure 4, there was a steady rise in annual mortality rate from the year 2008 to 2011, subsequently a decline in this trend was observed after the year 2011.

3.3. Duration of Hospital Stay

The mean duration of hospital stay was 7.88 ± 7.75 days (range 1-59 days). Males stayed longer than females with a statistically significant difference (8.14 ± 7.98 vs 7.53 ± 7.41

days, $p=0.03$). The duration of hospital stay increased with patients' age, as those younger than 45 years had a significantly shorter duration of hospital stay compared to those older than 45 years. The difference in the hospital stay in those between 45 and 64 years and those above 65 years was not statistically significant [Table 3]. Patients with NCD stayed longer in hospital than those with CD (8.37 ± 8.07 vs 7.18 ± 7.24 days, $p<0.0001$). As shown in Figure 5, based on system involvement, most patients were on admission for the first 20 days however majority of those who stayed beyond 40 days were admitted on account of neurological (mainly stroke) and infectious diseases (mainly HIV/AIDS). The bulk of patients discharged (78.6%) were within the first 20 days likewise those who left against medical advice (75.4%), referred (84.0%) and died (76.3%) as shown in figure 6.

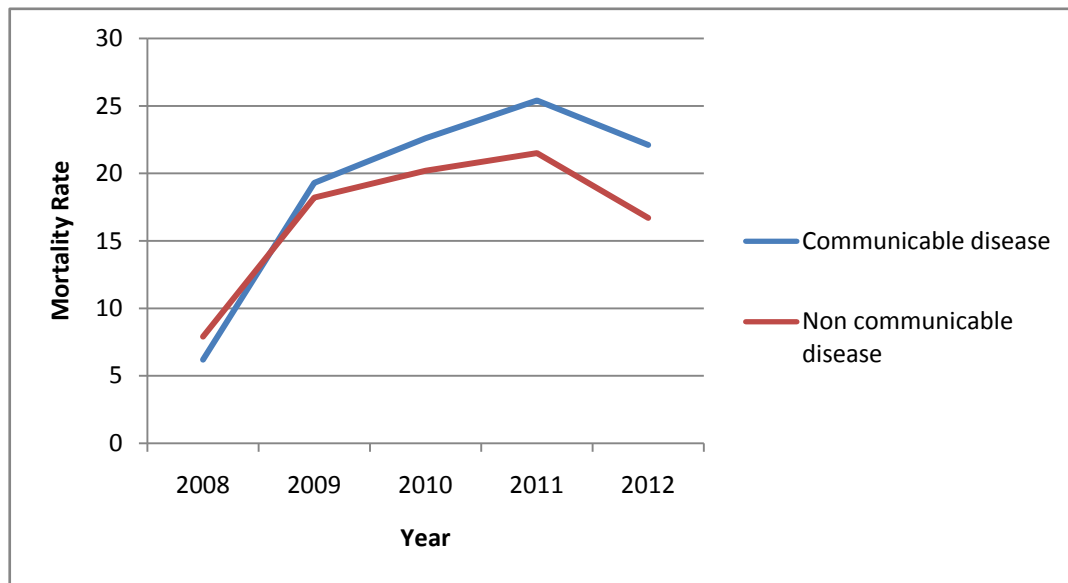


Figure 4. Trend in Annual Mortality Rate

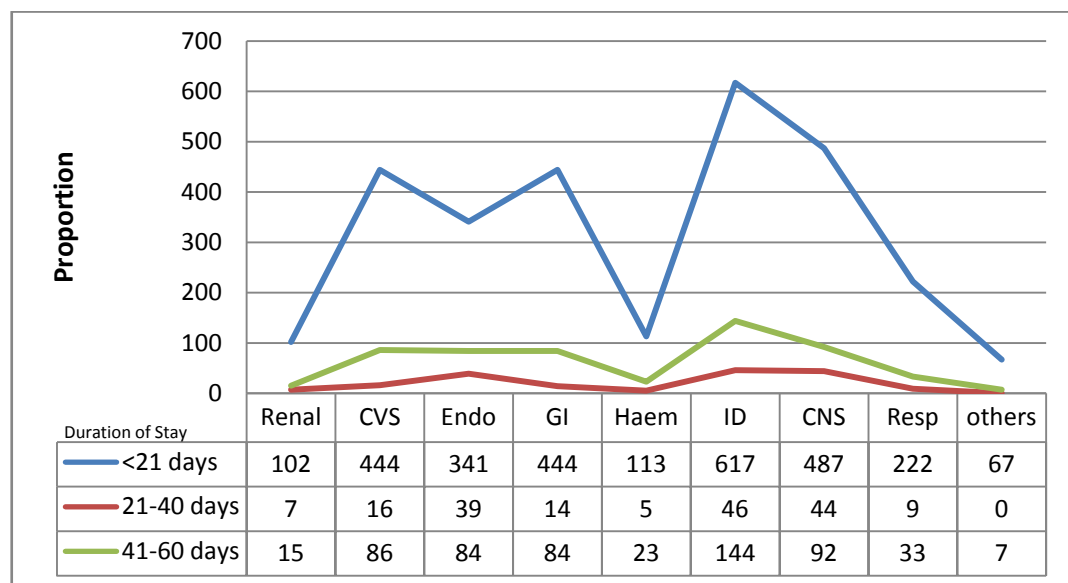


Figure 5. Duration of Hospital Stay in Relation to Disease Categories

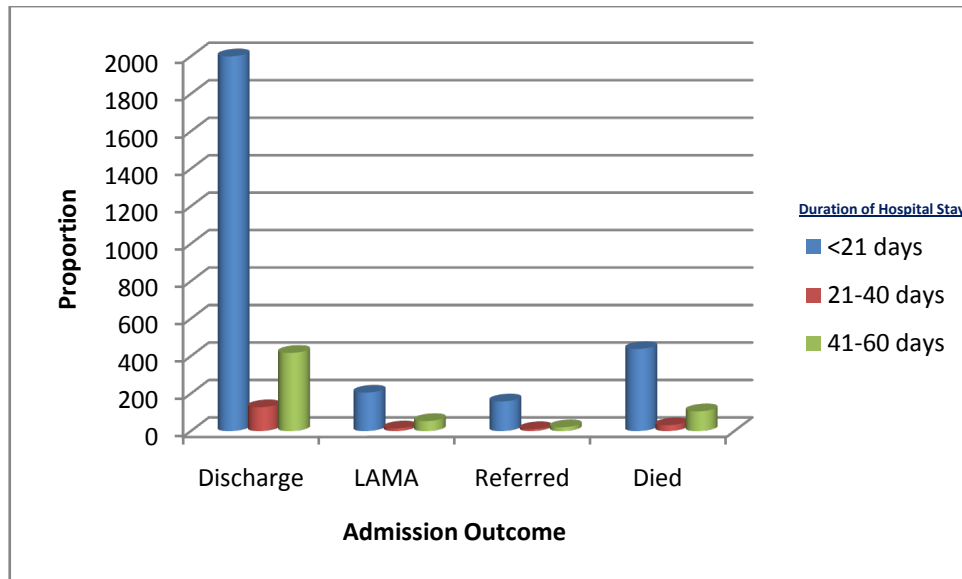


Figure 6. Duration of Hospital Stay in Relation to Admission Outcome

Table 3. Patients' Age Group in Relation to Duration of Hospital Stay

Age group	Duration of Hospital stay(in days)
Less than 45 years (a)	6.92±7.25
45 -64 years (b)	8.36±8.24
65 years and above (c)	8.56±7.72

a versus b : $p < 0.0001$ a versus c : $p < 0.0001$ b versus c : $p = 0.828$

4. Discussion

This study has shown a huge burden of both CD and NCD in our locality. However, NCD is a more likely cause of medical admission in EKSUTH, Ekiti State and the elderly patients were more affected. Communicable diseases on the other hand, ravaged the young adults as HIV/AIDS, pulmonary tuberculosis and malaria had higher occurrences in them which could portend an impending epidemic and consequently a huge economic burden.

The male preponderance in this study (male to female ratio of 1.1 to 1) is comparable to most similar studies [6, 8, 10] in the country as males being the main earners would likely have more resources to cater for their health needs and would not want to stay out of job for too long hence they would probably attend hospitals earlier than the female counterpart. [11-13] This is however in disagreement with earlier study in Nigeria [4] where female preponderance was found.

Similarly, the mean age of patients (50.87±19.82 years) recorded is higher than what was found in the study done by Ogun et al [4] in Nigeria as well as Ali et al [3] in an Ethiopian population but it was comparable to the other findings in Nigeria. [6, 8] Due to control of most childhood killer diseases, more individuals tend to live to adulthood.

Contrary to earlier studies where communicable diseases were more prevalent in Nigeria, [4] current research has found a rising trend in admission of patients with NCD. [10, 14-16] This pattern was also seen in our study where NCD

accounted for a larger percentage of admissions. This could be explained by the epidemiologic transition in our study population. [2] Stroke was the most common reason for admission and the NCD with the highest occurrence in our study. It was responsible for 13.6% of medical admissions which was higher than 4.5%, 7.3% and 8.7% reported in previous studies in Nigeria. [4, 14, 15] This probably could be due to the rising prevalence of most risk factors for stroke like hypertension and diabetes mellitus in developing countries. [17, 18] Globally, NCD are reaching epidemic proportion and likewise the incidence in the elderly is on the increase. [19, 20] Aging is associated with progressive atherosclerosis and change in circulating hormone concentration which could be responsible for higher occurrence of NCD in the elderly. [21]

Unlike other studies where tuberculosis was the commonest CD admitted, [4, 5] HIV/AIDS had the highest percentage among the CD admissions in our study. This high prevalence in our study could be due to ready availability of screening kits and sensitization programmes on HIV/AIDS during which all consenting patients are tested. Tuberculosis, a re-emerging disease, was however second to HIV/AIDS in prevalence among CD which may be fuelled by the interaction between the duo in which HIV/AIDS could cause a reactivation of latent tuberculosis and rapid progression of the disease. [22] Unsurprisingly, young adults were more affected, as they are at the peak of their strength and likely to experiment as well as venture into highly risky behaviours which could expose them to certain communicable diseases.

Hospital mortality is a veritable tool for assessing the quality of health care given by an institution. In our study, the mortality rate (16%) was higher than that obtained in western world [23] but similar to findings in some previous studies in Africa. [3, 6, 8] However, it was lower than 23.9% and 25% reported in other parts of Nigeria. [4, 24] The difference may be due to the availability of modern equipment for diagnosis and the presence of more specialists

to cater for the patients. Admissions from both NCD and CD accounted for a high disease-specific mortality rate. Patients with stroke had the highest mortality (21.5%) which is comparable to 22.3% reported in south eastern part of Nigeria. [6] Stroke is a major cause of mortality in low and middle income, and the rising prevalence of hypertension and diabetes mellitus often diagnosed when patients would have developed complications. [16, 25]

HIV/AIDS and tuberculosis contributed significantly to mortality due to communicable diseases which is in accordance with other studies conducted in Nigeria. [24, 26] The re-emergence of tuberculosis has been attributed to the HIV/AIDS epidemics with a high prevalence in sub-Saharan Africa. Although the prevalence of HIV/AIDS and tuberculosis in Ekiti state is among the lowest in Nigeria, our institution is a major treatment center in our locality and may probably have contributed to the high mortality.

Duration of hospital stay was longest in patients with neurological disease (mainly stroke) and infectious diseases (mainly HIV/AIDS). These diseases are associated with severe disabilities and accompanying complications which often warrant longer hospital stay than the other medical admissions resulting in neglect by relatives and sometimes inability to settle hospital bills. [27-29]

This study is not without some limitations, one of which is the reliance on the accuracy of the health record for patients' information as it a retrospective study. In conclusion, with this dual burden of NCD and CD in our study, it is imperative to scale up on preventive measure towards health education and promotion. Furthermore, a boost in healthcare finance, upgrade of health centers as well as training and retraining of staff cannot be over-emphasized.

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