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Pattern of hospitalization in Bingham University Teaching Hospital

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A retrospective study was carried out to assess the pattern of hospital admission in a teaching hospital; to determine the frequency of the most common diagnoses and the medication prescribe during admission. 1099 male and female medical records were used to collect information on age, sex, clinical conditions, drugs prescribed and length of stay in hospital. 61.9% were females and most of them were within the age groups of 11-30 yrs (45.8%). The most common diagnosis was normal delivery (17.7%); hypertension and diabetes mellitus (1.3%) were the highest associated diseases. Antimicrobials were the most common drug prescribed for the patients (25%), 77.8% of the patients were admitted in the hospital for up to 7 days. This study is important as it will throw some light on improvement of admission and provide implications for understanding disease etiology and health care policy and planning.

Keyword: Patients, Hospitalization, Diagnosis, Medication, Length of stay.

1. Introduction

Health itself is also a complex concept, with multiple determinants including genetic, socio-cultural, economic and environmental influences. At the center of this complex system is the hospital. Arguably, after a physician visit, the hospital admission represents the key event in the delivery of health care [1].

The pattern of admission in a hospital is of utmost importance in terms of the epidemiology of diseases in that environment as well as in the provision of equipment, drugs, and manpower in such health institutions [2].

A number of patients are admitted to hospitals when it is not medically appropriate [3]. Similarly, large proportion of inpatient stays are inappropriate [4]. Inappropriate admissions and delayed discharges are relatively high on the research and policy agenda due to concerns about bed pressures, hospital acquired infections and a drive to control increasing healthcare costs [5].

General practitioners' referral practices may be influenced by patient pressure or fear of litigation and ultimately this could have an impact on the appropriateness of hospital referrals [6]. The solution to this problem has not been solved; therefore there has been no impact on the appropriateness of admissions [5].

The problem of inaccurate medication lists at hospital admission and discharge is extensive [7] and has gained attention, specifically with regard

to the issue of patient safety, in recent years [8]. An accurate medication list at hospital admission is essential for the evaluation and further treatment of patients, to prevent medication errors and adverse drug events in hospital and after discharge [9].

Lack of health and social care resources, the admitting (generalist) clinician's lack of knowledge of the patient or the condition; communication difficulties between primary and secondary care clinicians; patient preferences; the perceived benefits of admission to hospital are the causes of inappropriate admission and inappropriate length of stay [5] while studies that examine the appropriateness of admissions and lengths of stay, often strive to highlight the causes underlying the event or to identify predictive factors [5].

In summary, no studies have focused solely on the hospitalization; therefore a study will be conducted to examine admission of patients in a teaching hospital and the objectives are to determine the frequency of the most common diagnoses and pattern of medications prescribe during admission, as well as length of stay for hospitalized patients. Therefore, the finding of this study may alter the standard medical management of hospitalized patients as well as identify ways of improving the appropriate use of medications in hospitalized patients.

2. Materials and Methods
The study was conducted in Bingham University Teaching Hospital (BHUTH) for 1099 hospitalized patients from January 1, 2010 to December 2010. Patient data forms were used to collect information from the medical records, including demographic characteristics, diagnoses, medication prescribed and date of admission and discharge. The study was approved by the Ethical Committee of the Department of Health Research and Ethics Committee, Bingham University Teaching Hospital. BHUTH is a missionary hospital in Northern region of Plateau state of Nigeria with a total capacity of 1000 beds; it is a major center for providing tertiary care for patients in the Northern Province in Nigeria.

Statistical analysis; Descriptive statistics of frequency and percentage were used for analysis using EPI info

3. Results
A total of 1129 medical records were analyzed, 30 were excluded due to incomplete information. 61.9% of the hospitalized patients were females and the majority of them were within the age group of 11 to 30 years as shown in Tab 1.

Table 1: Patient characteristics

Characteristics	No	Patients (%)
Gender		
Male	419	38.1
Female	680	61.9
Age group (Years)		
11-30	503	45.8
31-50	420	38.2
51-70	14.8	14.8
>71	13	1.2

The most common clinical diagnoses were normal delivery (17.7%) followed by infection (10.4%), caesarian section (9.4%), injury (8.6%) and peptic ulcer disease (4.6%) as presented in Tab 2.

Table 2: Clinical diagnoses among hospitalized patients

Diagnosis	No	Percent (%)
Pain	39	3.6
Infection	113	10.4
Anaemia	17	1.6
Sickle cell anaemia crisis	4	0.4
Injury	95	8.6
Cataract	28	2.6
Malaria	44	4.0
Typhoid fever	20	1.8
Normal delivery	194	17.7
Caesarian section	103	9.4
Hypertension	35	3.2
Congestive heart failure	26	2.4
Cardiac arrhythmia	20	1.8
Stroke	5	0.5
Peritonitis	2	0.2
Deep vein thrombosis	3	0.3
Peptic ulcer disease	51	4.6
Pelvic inflammatory disease	10	0.9
Renal failure	11	1.0
Liver failure	22	2.0
Hernia	20	1.8
Diabetes mellitus	25	2.3
Meningitis	9	0.8
Poisoning	5	0.5
Fibroid	16	1.5
Appendicitis	21	1.9
Surgery	25	2.3
Cancer	40	3.6
Abortion	25	2.3
Burns	5	0.5
Seizure	11	1.0
Osteomyelitis	3	0.3
Systemic erythematous	1	0.1
Loss of consciousness	2	0.2
Asthma	1	0.1

+- and, HT-Hypertension, DM-Diabetes mellitus, UTI-Urinary tract infection, PUD-Pelvic ulcer disease, RTI-Respiratory tract infection, CA-Cardiac arrhythmia, RVD-Retroviral disease, TB-Tuberculosis, CHF-Congestive heart failure.

Figure 1 shows associated medical diseases in which HT and DM (1.3%), DM and Malaria (0.9%), RVD and TB (0.6%) top the list. About 25% of the hospitalized patients were prescribed antimicrobials followed by analgesics (22%), anti-

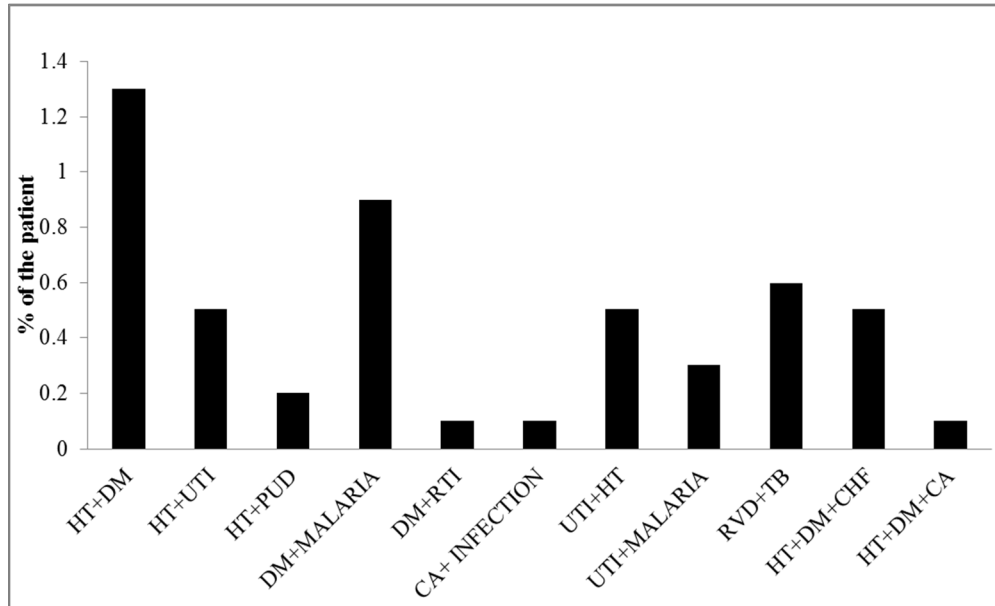anaemia (15.1%) and antihypertensives (11.6%) as indicated in Fig 2.

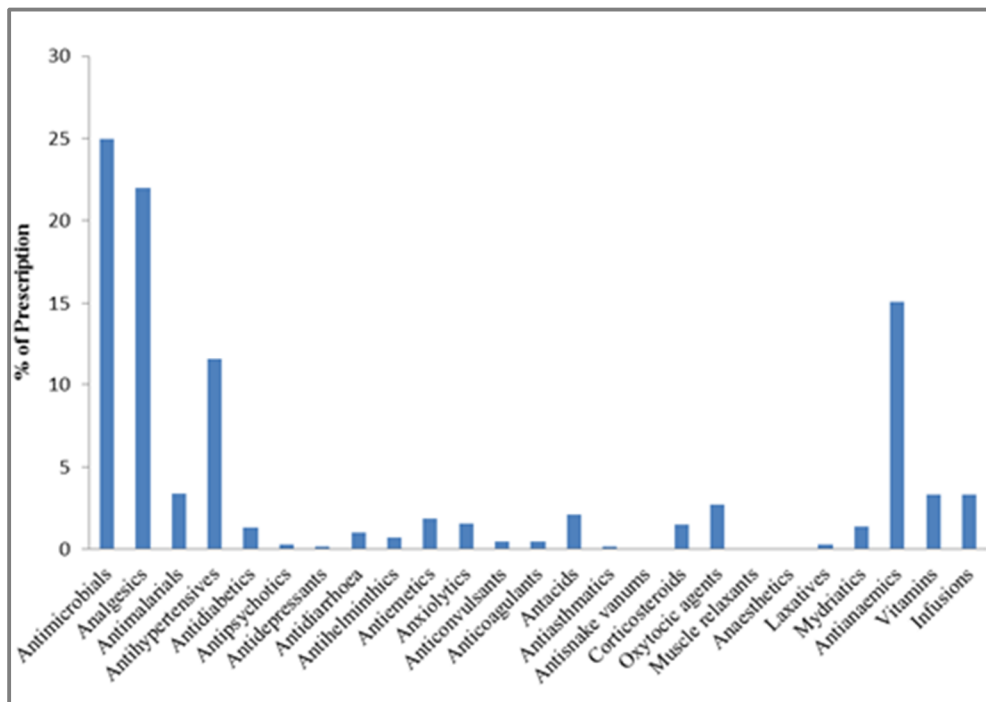**Fig 1:** % of associated diseases in the hospitalized patients.

Fig 2: Percentage of drugs consumed by hospitalized patients.

Majority of the patients (77.8%) were admitted in the hospital from 1 to 7 days and 0.64% stayed more than 30 days as shown in Fig 3.
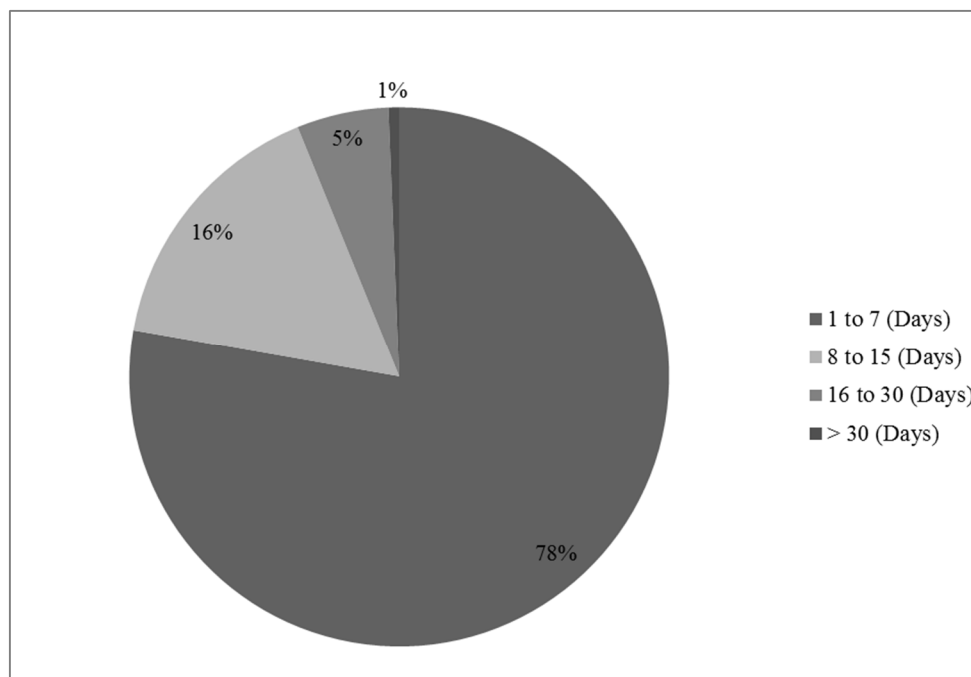
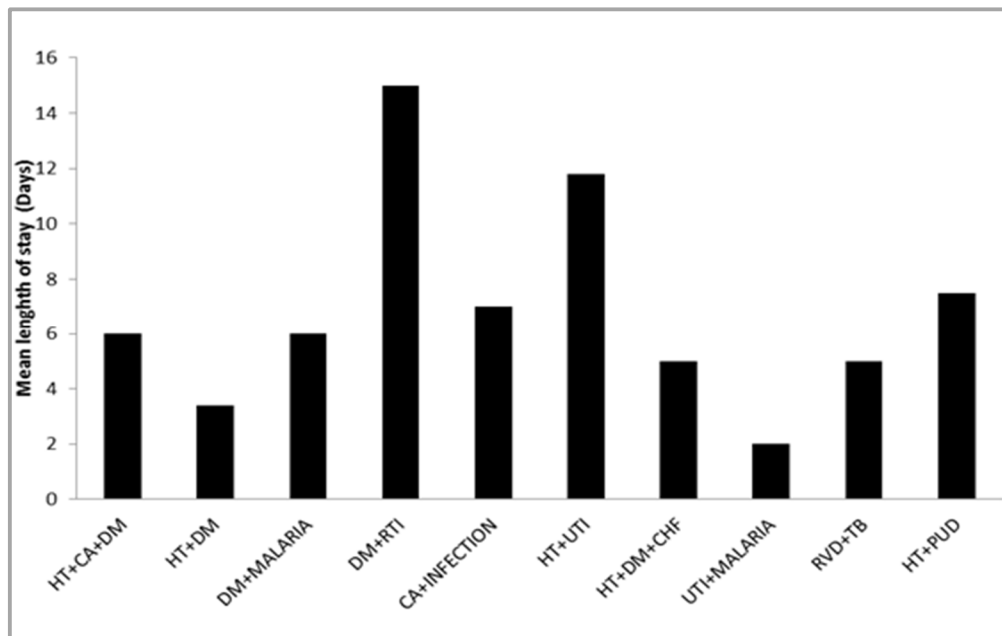**Fig 3:** Length of stay in hospital of all patients.

Fig 4: Relationship between associated disease and mean length of stay of hospitalized patients.

Table 3 shows the relationship between clinical diagnoses and mean length of stay of the patients, patients with stroke had the highest mean length of stay (16.8 days) followed by infection (15.8 days), renal failure (15.5 days) and burns (13.4 days).

Table 3: Relationship between length of stay of patients and clinical diagnoses.

Diagnoses	No	Mean length of stay(days)
Pain	39	5.4 ±1.04
Infection	92	15.4±3.20
Anaemia	17	4.2±1.10
Sickle cell anaemia crisis	4	6.5±0.95
Retroviral disease	21	5.4±1.18
Injury	95	6.8±2.05
Cataract	28	3.6±1.35
Malaria	44	4.3±1.20
Typhoid fever	20	5.9±2.01
Normal delivery	194	4.5±1.53
Caesarian section	103	6.6±3.00
Hypertension	35	9.4±2.79
Congestive heart failure	26	5.2±1.88
Cardiac arrhythmia	20	5.6±0.98
Stroke	5	16.8±3.56
Peritonitis	2	7.5±1.12
Deep vein thrombosis	3	4.3±1.00
Peptic ulcer disease	51	5.8±2.10
Pelvic inflammatory disease	10	10.5±3.21
Renal failure	11	5.0±1.17
Liver failure	22	15.5±1.85
Hernia	20	5.2±2.12
Diabetes mellitus	25	9.0±1.62
Meningitis	9	8.6±3.15
Poisoning	5	3.0±1.90
Fibroid	16	7.0±0.88
Appendicitis	21	4.7±0.92
Surgery	25	4.8±1.02
Cancer	40	7.3±2.11
Abortion	25	5.1±1.86
Burns	5	3.8±1.91
Seizure	11	13.4±3.23
Osteomyelitis	3	4.7±2.49
Systemic erythematous	1	4.0±1.87
Loss of consciousness	2	1.0±1.01
Asthma	1	5.0±2.22

Patients with more than one clinical condition DM and RTI (15.0 days), HT and UTI (11.8days), HT and PUD (7.5 days) had the highest mean length of stay while UTI and MALARIA had the lowest mean length of stay as indicated in Fig 4.

4. Discussion

The hospital admission indicated a heterogeneous group of health conditions ranging from communicable and non-communicable diseases, acute and chronic diseases, surgical and medical conditions. Research has shown that non-communicable diseases are more prevalent in the adult population, while communicable diseases are less; this is attributed to their better developed immunity [10]. More than half of the patients admitted in the hospital were females; most of them were with clinical conditions of normal delivery and caesarian section which head the list of hospital admission.

However, the finding of this study does not agree with other studies [11, 12], which showed that a male predominance in the incidence of diseases and this may be explained by the fact that during childhood, the extra X-chromosome or absence of Y-chromosome confers inherent survival advantage in females [13]. A second explanation which may be peculiar to the Eastern part of Nigeria and some parts of Asia is family, male sex preference making it possible for families to seek health care for their males than for females [14] and it could also be that the males are financially more empowered than the females and therefore could afford the cost of hospital treatment [2].

Infections are common causes of admissions in developing countries [15]. In this study infections were the second causes of hospital admission and these include bacterial, fungal and viral infections. This observation is in contrast with other studies in which infectious diseases are the leading causes of hospital admission [16]. This difference may be due to the fact that our study reviewed only patients above 10 years, excluding children from 1to 10 years, since children under this age group are vulnerable to various infections [10] and it could also be that there has been improvement in the management of infectious diseases as was suggested by Adeyokunnu *et al* [17].

As a result of the epidemiologic transition, chronic diseases, especially cardiovascular diseases, including hypertension and diabetes mellitus are attaining prevalence of heightened proportion [18]. This prevalence is attested to by the preponderance of chronic non-communicable diseases in various hospitals across developing countries including Nigeria which has also been documented [19].

Cardiovascular disease (CVD) is a broad term used to describe a range of diseases that affect the heart and the circulatory system. Heart disease develops as a result of complex interactions between genes and the environment [20]. The most frequent forms of CVD are coronary heart disease and stroke, and other forms include hypertensive heart disease, arrhythmia and heart failure [21].

Hypertension, diabetes mellitus, cardiac arrhythmia and congestive heart failure (CHF) were found to be associated with some clinical conditions. In Western countries studies have shown that aging increases incidence and prevalence of cardiovascular diseases [22, 23]. Studies from most parts of Africa and other developing countries implicate infections are responsible for most hospital admissions [10], in our study, infectious diseases such as malaria, respiratory tract infection , urinary tract infection, tuberculosis and retroviral diseases were associated with some clinical diseases .

Antimicrobial agents are among the most commonly prescribed drugs on worldwide basis [24], antimicrobial along with vaccines and oral rehydration salts represent potential agents in preventing mortality as well as morbidity [25], therefore in this study antimicrobial agent was the highest prescribed drug for the hospitalized patients. Also, normal delivery and caesarean section were the major clinical diagnoses for patients' admission. Research has shown that in obstetrics practice, use of antimicrobial agents either prophylactically or to treat infection has reduced the infectious morbidity following caesarian section and other infections associated with deliveries [25].

Pain is the commonest symptom that takes patients to doctors in Nigeria [26], pain killers (Analgesics) currently represent the mainstay of pain management, with an array of drugs available, aspirin, acetaminophen, non-steroidal anti-inflammatory drugs (NSAIDs), mixed agonist and antagonists and narcotic analgesics [27]. Therefore, it is not surprising that analgesics were the second drugs prescribed for the patient.

Research has also been conducted to show that a number of patients, with a variety of diagnoses, are admitted to hospital when it is not essential and can remain in hospital unnecessarily [5]. However, our research is in contrast with this study, the majority of the patients stayed in the hospital up to 7 days and the findings of our study are also in agreement with a study conducted by [16].

Patients with stroke had the highest mean length of stay, in the olden days in Nigeria most people believe that stroke is a result of a spell cast on the patient by supposed enemies or as a result of a curse by the gods thus they first seek help from the traditional medicine practitioners before coming to orthodox hospital. This delay in seeking treatment contributes to the poor prognosis [28]. The result of this finding is also similar to research conducted by [10].

Uncontrolled hypertension is associated with several complications such as heart failure, ischemic heart disease, stroke, chronic renal failure and others [29]. Furthermore hypertension often co-exists with other potent cardiovascular risk factors [30], thus in this study there was an association of hypertension with other clinical conditions thereby prolonging the mean length of stay of some patients.

The limitations of this study include its retrospective design, lack of computerization of hospital records and exclusion of pediatrics from the study.

5. Conclusion
The study has shown the pattern of diseases in Northern part of Nigeria and also throws some lights on the pattern of medications prescribe during admission as well as length of stay of the hospitalized patients. There is thus the need to place emphasis on programs to reduce admissions and ultimately save money and also address issues at home that may increase a patient's risk for another hospitalization.

6. Acknowledgement
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