

ANALYSIS OF PATIENTS PRESENTING TO THE EMERGENCY DEPARTMENT
AT CEZA HOSPITAL FOR PERIOD OF 1 YEAR (1ST JANUARY TO 31ST
DECEMBER 2010)

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Master of Science in Medicine in Emergency Medicine

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DEDICATION

I dedicate this work to the loving memories of my parents Mr and Mrs Ogungbire for their loving kindness and for being such wonderful parents.

DECLARATION

I, John Ayodeji Abiola Ogungbire declare that this research report is my own work. It is being submitted for the degree of Master of Science in Medicine in Emergency Medicine at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other University.

Signature of candidate_____

_____ day of _____, 2012

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ABSTRACT

Patients present daily to the emergency department of Ceza hospital, Kwazulu Natal for medical treatment. Some of these patients are self-referral or referred by other health care workers. Analysis of demography of patients presenting to the emergency department from 1st January to 31st December 2010 was conducted to provide a general overview and characteristics of the studied population. It was a retrospective, transverse and descriptive study that involved patients' records reviewed from a hospital register. The results showed that the commonest primary diagnosis was assault with a patient population of 81 (16.9%) followed by gastroenteritis (12.3%) and soft tissue injuries (8.5%) respectively. Most patients were single (94.6%), black (100%) and mostly males (57.7%). The highest number of the patient population seen at the emergency department was in February (14.8%) and the patients seen were mostly in the age range of 21 to 30 years. Most cases that presented to the emergency department were non-emergencies that constituted 67.2% of the cases seen and the emergency cases were only 32.8%. The highest patient population at the emergency department of Ceza hospital was 34.83% in summer with presentation peaking from 8.00 am until 11.59 am. The highest proportion of patients' presentation was found to be during the weekends.

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NOMENCLATURE

CHC	Community Health Centres
ENT	Ear, Nose and Throat
ED	Emergency Department
GP	General Practitioner
GPR	General Practice Referred
Gynae/Obs	Gynaecology and Obstetrics
N	Number
NHS	National Health Service
RTA	Road Traffic Accident
SR	Self-Referred
PHC	Primary Health Care
HIV	Human Immunodeficiency Virus

PREFACE

Analysis of patients' demographics, patients' outcome once managed at the emergency department, gender differences, race, the primary diagnosis of the patients, their occupational status, marital status and the time period of patients presenting to the emergency department of Ceza hospital, Kwazulu Natal provided a general overview and characteristics of the studied population.

CHAPTER ONE

1 INTRODUCTION

In South Africa, health care can be categorised as primary, secondary, tertiary, and quaternary levels of health care. Patients are treated at the various levels of health care depending on the types of health problems. In addition, patients are also referred from one level of care to the other, either for more advanced care or for continuity of care. Ceza hospital is a district hospital in rural Kwazulu Natal supporting the people in the Ceza area. Three medical officers, who reside within the premises of the hospital, service all the patients attending the hospital. There is a National Health Laboratory Service (NHLS) that undertake only basic laboratory investigations. All advanced laboratory analyses are referred to Inkosi Albert Luthuli hospital in Durban, using the laboratory transport services.

The people of Ceza area are made up of the Zulu tribe with many of them unemployed. Most of them are not formally educated; they take to rearing cattle and farming as their occupations. The road network is gravel and is not motorable during the rainy seasons. Patients in this area come to the hospital by walking, taxis, private vehicles and ambulances.

Patients from Ceza area utilising Ceza district hospital are referred to Ngwelezane hospital (Secondary level), King Edward VIII hospital (Tertiary level) and Inkosi Albert Luthuli hospital (Tertiary / Quaternary level) for more advanced care. Various age groups patronise the emergency department of Ceza hospital, with the patient population being a mixture of medical, surgical, obstetric and

gynaecological cases, emergency and non-emergency cases. Most of the studies in a related field of study were conducted in overseas countries¹⁻², few research studies done in South Africa include, emergency medicine in Paarl, South Africa³, practice of medicine at a district hospital Emergency Department (ED)⁴, pattern of injuries suffered by patients treated for alleged assault in Witbank general hospital⁵ and a cross-sectional survey of patients presenting to a South Africa urban emergency centre with the aim of describing the demographics, referral mechanism and outcome⁶. There is no reported literature on the analysis of the emergency cases in Ceza district hospital, Kwazulu Natal. Therefore, the aim of this study was to conduct the analysis of patients presenting to the emergency department at Ceza hospital from 1st January 2010 to 31st to December 2010.

A brief introduction to this study have been discussed, the next chapter will review the related literature sources available.

CHAPTER TWO

2 LITERATURE REVIEW

There are various studies on patients presenting to the Emergency Department (ED), some addressed specific age groups while others specifically focused on the main types of injuries that patients presented with to the ED. Most of the studies conducted were done internationally with most of them in semi - urban hospitals and not specifically in a rural district hospital¹⁻². Emergency medicine in South Africa is in its earliest stages of development and there is a paucity of data about ED patient demographics, epidemiology, consultation and admission criteria and other characteristics³. The Ceza hospital in Kwazulu Natal province was used in this study. It is a district hospital and the only government hospital in the Ceza area that provides emergency medical services to the surrounding local population. It has 160 admission beds and provides 24-hour emergency services. The literature review broadly considered publications on patients presenting to the ED of hospitals at various levels with more focus on literature on ED of hospitals in the rural areas.

Various analysis regarding patients presentation to ED were done by Hanewinckel *et al*³, Nkombua^{4,5}, Hodgkinson and Wallis⁶, Wallis and Twomey⁷, Zwi⁸, Kakembo *et al*⁹ and Walker *et al*¹⁰ in South Africa, the outcome of these studies are discussed below.

The demographics, epidemiology, consultation and admission criteria for patients in a rural hospital in Paarl, South Africa revealed that trauma (assault with a blunt item) was the commonest presenting complaint at the ED, and there were more males than female patient population³. In addition, high proportions of the patients (88.2%) were self-referred while the remaining patients' population (11.8%) were referred from either the clinic, a General Practitioner (GP) or a specialist³. Regarding patients disposition, most patients (26.5%) were observed in the ED, 16.5% were admitted, 0.6% died and 2.2% were transferred to another facility. Furthermore, patients gender, age distribution, racial distribution, marital status, disposition, most common diagnosis in the ED of Witbank hospital and Middleburg hospital revealed more male patient population (57% in Middelburg hospital, 71.8% in Witbank hospital) have assault as the primary presenting problem for visiting the ED of Middleburg hospital^{4,5}. The majority of the patients that visited the ED were found to be single (69%) and mostly Black (91%)⁵. Age variation of the patients revealed that the age group of the majority of patients ranged between 17 and 45 years, and majority of the assault victims (81.4%) were discharged (not admitted for in-hospital treatment)⁵.

The demographics, referral mechanism and outcome of emergency consultations in patients presenting to a secondary hospital ED in New Somerset hospital, South Africa revealed that most patients presented in the daytime with an increase in more ill patients later in the day and at night, and the patient population was more of females (52%)⁶. Trauma accounted for 25.8% of the presentations and non-trauma included respiratory (14.9%), abdominal (14.2%), neurological (8.7%),

sepsis and wound care problem (6.1%), gynaecological (5.4%), ophthalmological and ENT problems (4.4%), cardiac complaints (4.1%) and 16.3% constituted miscellaneous complaints⁶. The highest number of attendances occurred on Mondays and Tuesdays, and the presenting patients' peak age group was 20-40 years⁶.

In Cape Town, the mode of presentation, mean daily attendance, presenting complaint and the emergency status of the patients at the EDs of four Community Health Centres (CHCs) revealed that trauma was the cause of most (27.9%) of all the patients presentations, with assault and Road Traffic Accidents (RTAs) being the most common (46% and 22% respectively)⁷. There was no apparent relationship between the presenting complaint and time of the day, with obvious exception of assaults, which were more common over weekends and during evening hours⁷. There were clear trends in the daily rate of attendance at all the ED units of the CHCs, with peaks on weekends and Mondays⁷. A significant proportion of the workload of the EDs of the CHCs in Cape Town were emergency or urgent in nature, involved a large paediatric casemix, and typically most patients were self-presented⁷. Furthermore, the patterns and causes of childhood injury of patients that presented to the ED of Alexandra CHC in Johannesburg, South Africa revealed that violence represented 35% of the causes of injuries, RTA constituted 14% and 51% by other unintentional causes (such as falls and sport injuries)⁸. The CHCs in Cape Town and Johannesburg (Alexandra) have assault as the leading presenting problem to their EDs.

The age distribution of African patients in Gelukspan hospital (North West province), South Africa revealed that, 26.6% of the patient population that visited the ED in Gelukspan hospital were aged 14 years and younger; 58.0% of these were boys while in Murchison hospital (Kwazulu natal province), 23% were aged 12 years and younger¹⁰. In Gelukspan hospital, the main causes of the admission of young patients (14 years and younger) were pneumonia, gastroenteritis, trauma and poisoning⁹. Of the adult population that visited the ED, there were more males (54.7%) than the females, and among the males, the chief causes of admission were pulmonary tuberculosis, trauma and accidents, congestive cardiac failure, psychosis, cancer and diabetes, while in the female patient population, the causes of admission were pulmonary tuberculosis, trauma and accidents, pregnancy related disorders, gastroenteritis, anaemia and pneumonia⁹.

In Murchison hospital (Kwazulu natal, South Africa), the chief causes of admission in the female patient population, apart from pregnancy, were disorders of pregnancy, tuberculosis, congestive cardiac failure, pneumonia, diabetes, and hypertension¹⁰.

The trend in South Africa was that assault was the commonest presenting primary diagnosis and male gender was predominantly affected; most of the patients were of black race and single, with most patients discharged or observed at the ED, and the predominant cause for admission was pulmonary tuberculosis due to high prevalence of HIV^{3,4,5,6,10}. Most of these patients presented to the ED during days of the week (Mondays and Tuesdays) and during the weekends^{6,7}.

These previously analysed studies were conducted in the ED of South African hospitals, the following sections contain studies conducted in overseas countries.

In United Kingdom, the temporal and demographic variations in attendance at ED across the West Midland region of the National Health Service (NHS) revealed that there were no differences in the attendance pattern with respect to gender unlike the preceding studies done in South Africa that have predominantly male patient population. Most of the patients presented to the ED on Mondays and assault was common in those aged 18-30 years and the predominant gender was male (56.6%)¹¹. Seasonal variation of patients revealed that there was higher ED attendance during summer months (July-September) in patients aged between 15-24 years, while in patients above 65 years old, the attendance increased during December due to their increased susceptibility to respiratory tract infection during the winter months¹¹. The seasonal variation and categorization of patients that attended a semi-rural ED in Eastbourne District General Hospital (United Kingdom) showed that the proportion of the patients attending semi-rural ED were 30% higher in summer than in winter and most of the patients were Primary Health Care (PHC) cases (non-emergency)¹². The trend in the United Kingdom was that most of the patients presented during the summer months and most of the patients have non-emergency cases^{11,12}.

In Australia, the demographics of an ED at a small rural hospital named Cobram District Hospital, revealed that the greatest number of emergency presentations was found to be in December, but in addition the patient numbers were higher by 50% during the summer months compared to the winter months, an outcome

similar to that obtained from the Eastbourne District General Hospital in United Kingdom^{12,13}. The age distribution of the patients consisted predominantly of patients above 60 years, with a mean age of 70.3 years and relatively few paediatric or young adult patients that presented to the ED¹³. The demographics and presentations to the ED in other developed countries analysed were Canada and the United States of America as highlighted below.

ED utilization in the United States of America compared to that of Ontario, Canada revealed that the rate of annual visits to the ED in the United States of America was virtually identical to that of Ontario (Canada). Patients aged 75 years and older had the highest ED visits, while the women had higher rate of visit than the men¹⁴. The most common discharge diagnosis was injury / poisoning, accounting for 25.6% of all the visits in the United States of America and 24.7% in Ontario, Canada¹⁴. This was similar to the outcome obtained in Australia where most of the patients that attended the ED were above 60 years¹³ but in contrast to the situation in South Africa where majority of the patients were younger (17-45 years) and assault was the most common presenting diagnosis^{4,5}.

The incidence and characteristics of injuries in Eldoret, Kenya revealed a predominant male patient population (71%) with assault being the leading cause of visit to the ED and the most vulnerable groups were males aged between 20 and 30 years¹². Most of the patients (80%) were discharged at the ED¹⁵. This was similar to the outcome in South Africa which has assault as the commonest presenting primary diagnosis and male gender being predominantly affected and most patients discharged or observed at the ED^{3,4,5}.

The findings in South Africa, Uganda, and United Kingdom as outlined in the preceding paragraphs revealed that most patients that presented to the ED were non-emergencies; the situation was similar in United States of America (Arizona), where 70.4% of the patients that presented to the rural tertiary care ED had non-emergency problems¹⁶.

The comparism of ED visits in rural and non-rural community hospitals in the United States of America (USA) revealed that the patient population that visited the rural ED was lower (6.4%) in contrast to a population of 84.6% that visited the non-rural ED¹⁷. Incidentally, the most frequently treated conditions among adults (ages 18 and older) in rural ED and non - rural ED were similar, the leading presenting problem being sprains and strains¹⁷. Upper respiratory infections, (superficial injury; contusions), ear infections, sprains and strains, and open wounds of extremities, head, neck and trunk were the leading conditions among children (0-17 years) in rural and non-rural EDs¹⁷. The predominant race that presented to the ED of rural and non-rural community hospitals was White (82.8%) in contrast to the predominant Black population in South Africa^{5, 17}.

The epidemiology of injury patients in Bugando Medical Centre in Tanzania had assault as the leading presenting problem followed by RTA and male patient population was the predominant gender that presented to the ED¹⁸.

The epidemiology of childhood injury in Wesley Guild Hospital in Nigeria revealed that trauma represented 9% of the entire patients seen at the ED, and the patients mean age was 6.9 years¹⁹. In terms of the ED attendance and presenting problem,

more male patient population attended the ED and RTA was the leading presenting problem¹⁹. Nigeria is a poor resourced country with poor roads that could have accounted for RTA being the leading cause of the presenting problem.

In Canada, the ED use in a small rural hospital (South Huron Hospital), revealed that there was near equal representation of genders and poisoning were the leading cause of presentation to the ED²⁰. Contrary to the outcomes in South Africa and United Kingdom, most of the patients (81%) that presented to the ED of small rural hospital (Sundre Hospital) in Canada were emergency cases²¹.

Trauma in a predominantly male population was the leading cause of presentation to the ED of a rural cottage hospital (Gatineau Memorial Hospital) in Quebec, Canada²². The trend in Canada was that most of the cases that presented to the ED were emergencies and poisoning as opposed to assault was the leading presenting problem.

Assault (63.2%) was the most common cause of presentation to the ED of a rural hospital (Mus Hospital) in Turkey²³. Patients' disposition revealed that the majority of patients (89.8%) were managed and discharged from the ED and males (87%) constituted the preponderance gender that visited the ED²³.

The demographic profile of the patients that attended the ED of Saint Joseph's hospital (rural community in Northern Ontario, Canada) comprised of patients aged 61-70 years with near equal representation of gender, mostly married, composed mainly of retirees (36.1%), and the predominant presenting problem

was musculoskeletal conditions such as lower back pain, shoulder pain, fractures, and sprains (non-emergency cases)²⁴.

RTAs were the leading cause of trauma in a rural ED of Kuvula Hospital in Uganda with 64.2% of admissions, followed by assaults with 16.5% of admissions²⁵. The mean age and median age of the patients seen at the ED was 31.3 years and 28 years respectively and the majority of the patients were males (70.2%)²⁵. This outcome in a poor resource country (Uganda) was similar to the outcome in Nigeria where RTA was the leading presenting problem¹⁹.

In summary, assault was the leading cause of presentation to the ED of Turkey (European country) and African countries, namely South Africa, Kenya and Tanzania with the exception of Uganda and Nigeria that had RTA as the leading problem, this was in contrast to the findings in developed world (Canada and United States of America) that had injury, poisoning and musculoskeletal problems. Patients' classification in South Africa, Uganda, United States of America, Canada and United Kingdom as outlined in the preceding paragraphs revealed that most of the patients that presented to the ED were mostly non-emergencies. Gender distribution of patients revealed that more male patients presented to the ED in African countries namely, South Africa, Nigeria, Kenya, Uganda and Tanzania, but there was near equal representation of gender representation in Canada and United Kingdom. Seasonal variation of patients revealed that more patients presented to the ED during the summer months in Australia and United Kingdom (reason attributed to tourists visit). The distribution of patients revealed that the patients that presented to the EDs were older in

developed countries (Canada, Australia, and United States of America) than in African countries (South Africa, Kenya, and Uganda).

The related literatures to this study have been reviewed in this chapter; it was observed that most studies did not analyse the seasonal variation, the employment status, the emergency status of the patients, the nationality of the patients', variation of patients' population during the days of the week and on public holidays; all these will be considered and analysed in this study in order to provide a general overview and characteristics of the studied population. The next chapter will present the materials and methods employed in this research study.

CHAPTER THREE

3 MATERIALS AND METHODS

3.1 Aims and objectives

Aim

The research study analysed the profile and patterns of patients presenting to the Emergency Department of Ceza Hospital, Kwazulu Natal from 1st January 2010 to 31st December 2010.

Specific Objectives were to:

1. Describe the demographics of patients presenting to the Ceza hospital emergency department such as age, gender, race, state of employment, marital status, nationality, residential location and occupation category.
2. Describe the primary diagnosis of patients presenting to the emergency department at the Ceza hospital.
3. Describe the patients' clinical outcome once managed in the emergency department.
4. Describe the various time periods of presentation of patients presenting to the emergency department at Ceza hospital.

5. Describe if the patients presenting to the emergency department at Ceza hospital are true emergencies or cases that were expected to be managed at Primary Health Care centres.

3.2 Methods

3.2.1 Design

This was a retrospective, transverse and descriptive study that involved patient record review from a hospital register using a data tool.

3.2.2 Study Population

The population studied were all patients that attended the ED of Ceza district hospital during the research period irrespective of their residence or nationality. There were no subjects used for the research study; it was a retrospective study that involved patient record review from the hospital register.

The sample included all patients who presented to the ED from 1st January to 31st December 2010. The data was obtained from the hospital register at the ED of Ceza Hospital.

All the patients who presented to the ED of Ceza Hospital from 1st January to 31st December 2010, irrespective of how they came, who referred them, what the medical complaint was as long as their names were in the register were included in the study.

3.2.3 Exclusions criteria

Files with incomplete data, names not included in the register, for whatever reason, patients that were returning for follow-up dressings, wound care, medications, missing files and patients that visited the emergency department before 1st of January 2010 and after 31st of December 2010 were all excluded.

3.2.4 Sampling

A periodic nonprobability sampling technique was used for this study. Medical records of all emergency patients who were attended to from 1st January to 31st December 2010 and fulfil the inclusion criteria were reviewed.

3.2.5 Measurement

A retrospective, transverse and descriptive study design was used. Data tools containing various questions about patients' demography were used in order to obtain the required information from the patients. The information obtained from the qualified patients using the data tools were recorded on the excel spreadsheet for analysis.

3.2.6 Data Collection

Permission was obtained from the Hospital manager of the Ceza district hospital in order to gain access to patient files for the purpose of this research study. The data obtained was collected by the researcher. Information from patients' files that

attended the emergency unit during the study period was used for the research study. Patient's name were not entered or used in the data collection sheet for confidentiality purpose. The data was obtained from patients' files using the data tool in Appendix 1.

The data was recorded using an Excel® spread sheet and the spread sheet papers were locked in a cupboard. The data was stored secured, using a password protected personal computer and analysed using STATA® software.

3.2.7 Sources of Bias

The year 2010 was an exceptional year because South Africa hosted the Federation International Football Association – 2010 FIFA World Cup South Africa™, as such; the outcome of this study may be difficult to extrapolate to other years. Ceza had a large efflux of people to a neighbouring town called Ulundi where a giant television screen was installed at the Ulundi stadium for the people to watch the soccer matches. As such, many of the people would rather go to Nkonjeni hospital which is a nearby district hospital for treatment rather than travelling about 60 km to Ceza district hospital. The patient population that visited the ED of Ceza hospital during the period may not be the actual representation of the patient population since some of them went to a neighbouring town to watch the world cup soccer games.

3.3 Ethics Approval

Approval to conduct the research was obtained from the Human Research Ethics Committee (Medical) of the University of the Witwatersrand, Johannesburg. The research was approved unconditionally with clearance certificate M110710 (Appendix 2).

Permission was granted by the Hospital manager of Ceza district hospital to conduct the research study and a copy of the letter was handed over to the hospital personnel in charge of the patients' files. A copy of the letter is in Appendix 3.

CHAPTER FOUR

4 RESULTS

4.1 Introduction

This chapter reports the summary of the results obtained on the data captured during the investigation.

4.2 Age distribution of patients

The total number of patients' files used in this study was 419. Figure 4.1 presents the age distribution of the patients that attended the Emergency Department (ED) of the Ceza district hospital.

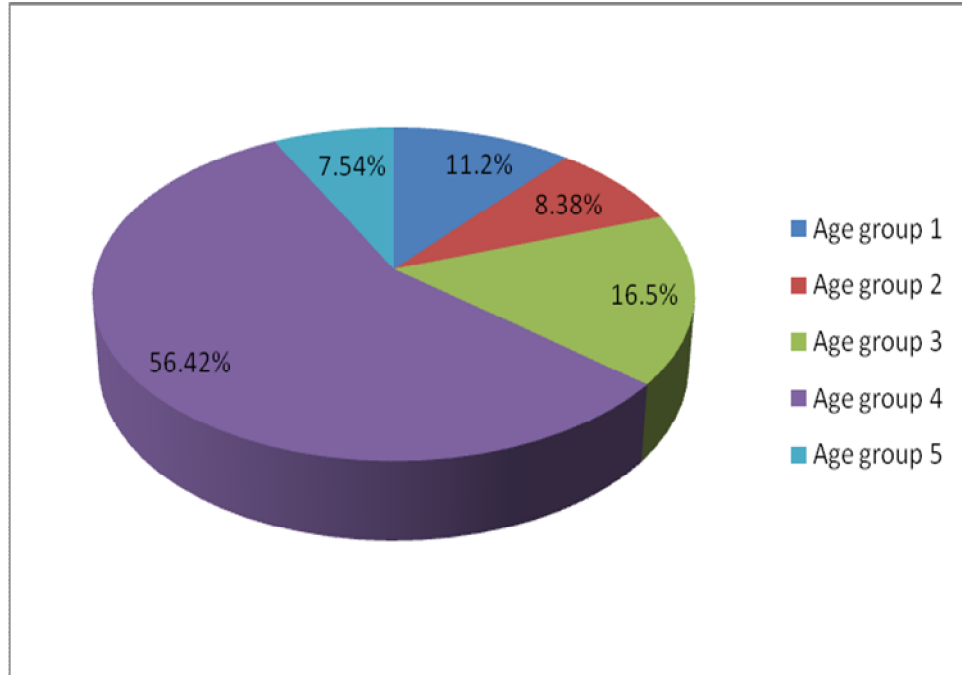


Figure 4.1: Age distribution of patients at Ceza hospital

The predominant age group was from 21 to 30 years (group 4). The mean age of patients that present to the ED of the Ceza district hospital was 27 years.

4.3 Gender distribution of patients

Gender distribution of patients that presented to the ED revealed that the patient population was majorly male (56.42%).

4.4 Marital status of patients

The marital status of the patients that attended the Ceza district hospital were found to be single (99.59%), with only 0.20% of the patients being married and 0.20% of the patients' population widowed.

4.5 Nationality of the patients

The nationality of the patients that visited the ED was made up of South Africans only. All the patients that visited the ED of the Ceza district hospital were asked of their addresses, identity numbers or passport numbers as part of the demographic profile, and it was noted that all the patients were South African citizens as evidenced by the identity document numbers in the files of adults patients or immunization card or birth certificate containing the child's identity number as documented in the files of the paediatric patients.

4.6 Employment and racial distribution of patients

The employment statuses of the patients revealed that majority of the patients (99.19%) were unemployed. All the patients that attended the ED were of black race. Patients that attended the ED were asked about their employment status and their clan names, the documentary evidence revealed that they are black South Africans.

4.7 Seasonal distribution of patients

The seasonal distribution of patients that presented to the ED is presented in Figure 4.2.

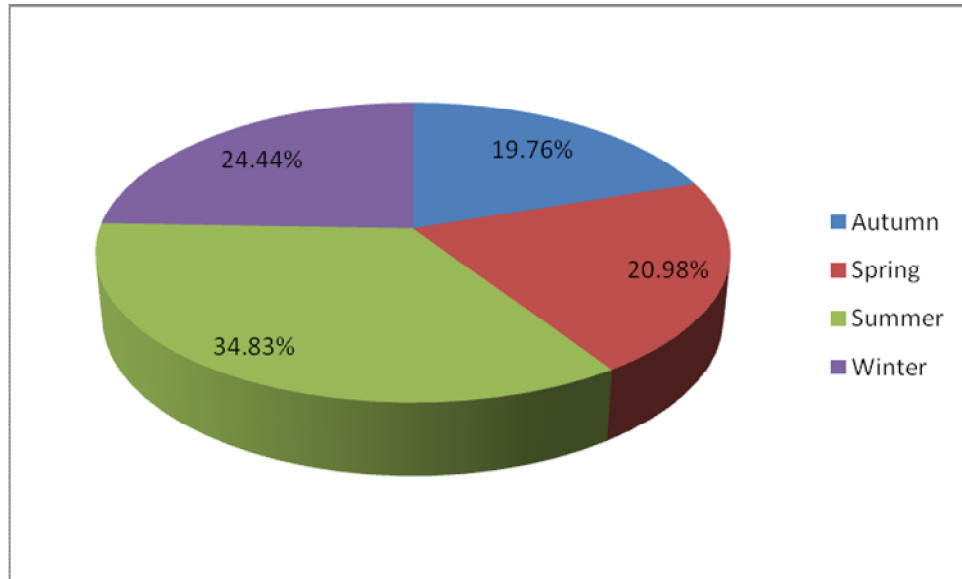


Figure 4.2: Seasonal distribution of patients that attended the ED

The greatest patients' population in attendance at the ED of the Ceza district hospital was in the summer season with a population of 34.83%.

4.8 Time of presentation

The time of presentation of the patients is presented in Table 4.1.

Table 4.1: Time of presentation of patients

Time group	Time of presentation	Frequency	Percentage %
1	8.00 am -11.59 am	178	36.25
2	12.00 pm -15.59 pm	113	23.01
3	16.00 pm - 19.59 pm	110	22.40
4	20.00 pm - 23.59 pm	75	15.27
5	24.00 hr - 3.59 am	9	1.83
6	4.00 am - 7.59 am	6	1.22

The majority of the patients presented to the ED between 8.00 am and noon. The least number of patients (1.22%) presented between 4.00 am and 7.59 am.

The patient distribution during the school term holidays, world cup holidays and school session is presented in Table 4.2.

Table 4.2: Patients presentation during the school term holidays, world cup holiday and school sessions

Period of presentation	Frequency	Percentage %
School holiday Term 1 (1st – 12th January)	16	3.26
School holiday Term 2 (March 27th – 11th April)	21	4.28
School holiday Term 3 (June 10th – 12th July)	19	3.87
School holiday Term 4 (11th – 31 December)	16	3.26
World cup holiday (11th June- 11th July)	48	9.78
School sessions	371	75.56

Most patients (75.56%), presented to the ED during the school sessions, followed by 9.78% of the patient population during the world cup holiday. Most patients presented during days of the week because there are obviously more days of the week in a year compared to the weekends and the public holidays in 2010.

4.9 Days of presentation

Table 4.3 presents the distribution of patients at the ED regarding the days of the week.

Table 4.3: Distribution of patients during days of the week

Day of the week	Frequency	Percentage %
Monday	41	8.35
Tuesday	60	12.22
Wednesday	73	14.87
Thursday	69	14.05
Friday	60	12.22
Saturday	97	19.76
Sunday	91	18.53

Saturday and Sunday were the busiest individual days of the week with a patient population of 38.29%.

Table 4.4 presents the data obtained with respect to the patients seen on public holidays, working days and weekends.

Table 4.4: Days that patients were seen

Day seen	Frequency	Percentage %
Public holiday	15	3.05
Weekend	178	36.25
Working day	298	60.69

Most patients (60.69%), presented during the working days, followed by 36.25% of patients during the weekends and the least number of patients (3.05%) presented during the public holidays. The higher proportion of patients during the working days is expected due to the higher number of days of the week compared to the

public holidays and the weekends. There were 365 days in the year 2010, out of which 8 days were public holidays, two holidays (Christmas on the 25th December and Workers day on May 1st were during weekends (Saturday), in addition, there were 100 weekend days, 227 working days and 30 days special holidays during the world cup tournament making the number of public holidays in the year 2010 to be a total of 38 days. The number of working days in the year 2010 outnumbered the number of days for the public holiday; hence for every 1 patient seen during the public holiday, 20 patients were seen during the working days, and for every 1 patient seen during the weekend, approximately 2 patients were seen during a working day. The least number of patients (3.05%) seen during the public holidays comprised of (5 patients during Christmas day on 25th December, 9 patients during the day of Goodwill on December 26th, 1 patient during the Day of reconciliation on the 16th of December, 3 patients during the Youth day on the 16th of June, and 2 patients on Women's day on the 9th of August.

4.10 Monthly distribution of patients

The data obtained was analysed with respect to the monthly distribution of patients visiting the ED, and this is presented in Table 4.5.

Table 4.5: Monthly distribution of patients

Month	Frequency	Percentage %
January	23	4.68
February	70	14.26
March	23	4.68
April	31	6.31
May	44	8.96
June	67	13.36
July	35	7.13
August	18	3.67
September	23	4.68
October	31	6.31
November	49	9.98
December	77	15.68

Most patients (15.68%), presented to the ED during the month of December, this was followed by February with 14.26% patients.

4.11 Primary presenting diagnosis and emergency status of patients

The presenting primary diagnosis of the data obtained during the period of this research study is presented in Table 4.6.

Table 4.6: Presenting primary diagnosis

Presenting primary diagnosis	Frequency	Percentage
		%
Obstetrics and Gynaecology diagnosis		
Abortion	3	0.61
Dysmenorrhoea	1	0.20
Per vaginal bleeding	10	2.04
Pregnancy related hypertension	1	0.20
Medical diagnosis		
Arthritis	3	0.61
Asthma	9	1.83
Cardiac failure	3	0.61
Cerebrovascular accident	2	0.41
Diabetes	13	2.65
Ear infection	1	0.20
Epilepsy	18	3.67
Gastroenteritis	69	14.05
Gingivitis	1	0.20
Hypertension	16	3.26
Meningitis	5	1.03
Mental illness	9	1.83
Poisoning	7	1.43
Peptic ulcer disease	6	1.22
Respiratory tract infection	71	14.46
Sexual assault	3	0.61
Snake bite	11	2.24
Soft tissue infection	9	1.83
Urinary tract infection	15	3.05
Trauma diagnosis		
Assault	90	18.33
Burns	14	2.85
Dog bite	13	2.65
Fracture	6	1.22
Gunshot	3	0.61
Road traffic accident	31	6.31
Soft tissue injury	11	8.35
Stabbed chest	1	0.20
Infectious disease	5	1.02

Most patients that presented to the ED of the Ceza hospital have assault (18.33%) as the predominant presenting primary diagnosis; this was followed by respiratory tract infection (14.46%), and gastroenteritis (14.05%) respectively.

Based on the data presented in Table 4.6, it was found that most of the patients (76.37%) seen at the ED were categorised as non-emergencies, the emergency patients' population constituted only 22.63%. The emergency status of the patients was obtained using the acuteness of the presenting problems as documented in the history, vital signs, physical examinations, and the presenting primary diagnosis.

4.12 Patients outcome

Table 4.7 presents the patients' outcome and the frequency after treatment in the ED.

Table 4.7: Patients outcome and their frequency

Patients outcome	Frequency	Percentage %
Admitted	179	36.46
Discharged	308	62.73
Transferred	4	0.81

Most of the patients (62.73%) seen at the ED were treated and discharged to go home, 36.46% were admitted into the wards and only 0.81% of the patients (3 gun shots injuries, 1 stabbed abdomen) were transferred to another health institutions for specialist management.

4.13 Objects used for assault

The beer bottle constituted 25.56% of the objects used to assault the patients that presented to the ED with assault. This was followed by 20% of the patients who could not identify the object used to attack them because the attack was late in the evening with no light in the footpaths and the streets. Figure 4.3 presents the causes of the assault.

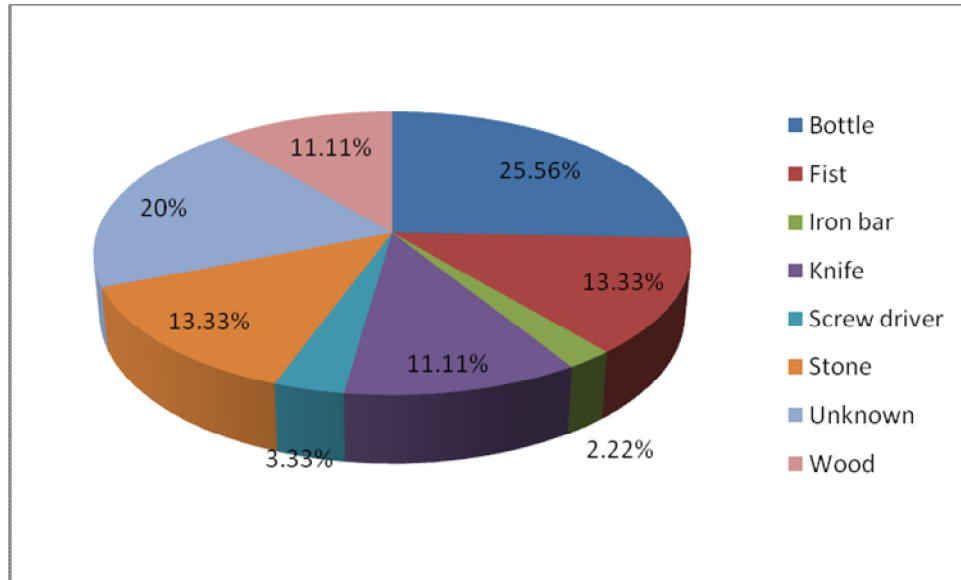


Figure 4.3: Objects used for assault

4.14 Pattern of injuries sustained by assaulted patients

The pattern of injuries sustained by the patients assaulted revealed that most of the patients sustained injury in the face (30%), followed by the upper limb (24.44%) and head (16.67%) respectively. The pattern of injuries sustained by assault patients is represented in Figure 4.4.

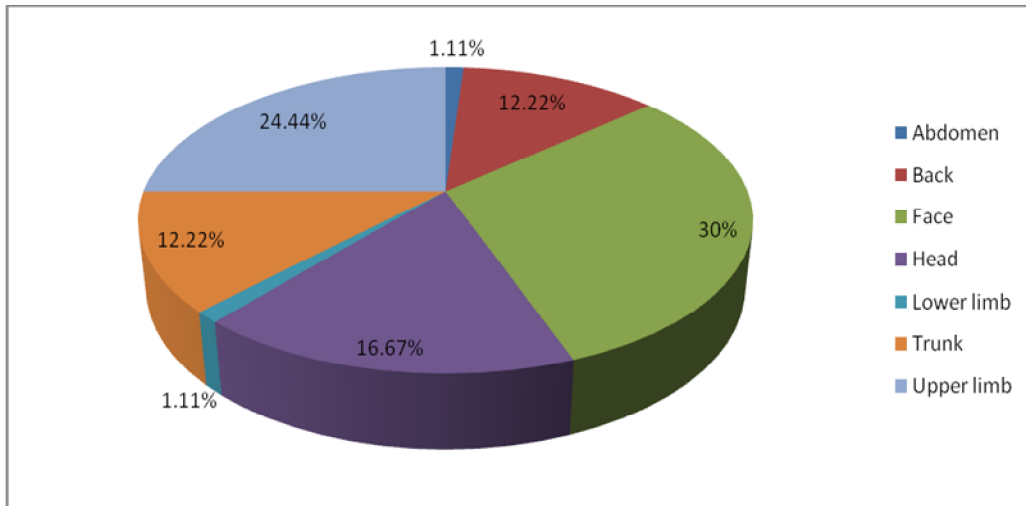


Figure 4.4: Pattern of injuries sustained by assault patients

4.15 Age distribution of patients with assault

Most patients (74.44%), who presented to the ED with assault were within the age range of 21-30 years (age group 4). This was followed by patients within the age of 11-20 years in age group 3 (20%). The age distribution of patients with assault at the ED is represented in Figure 4.5.

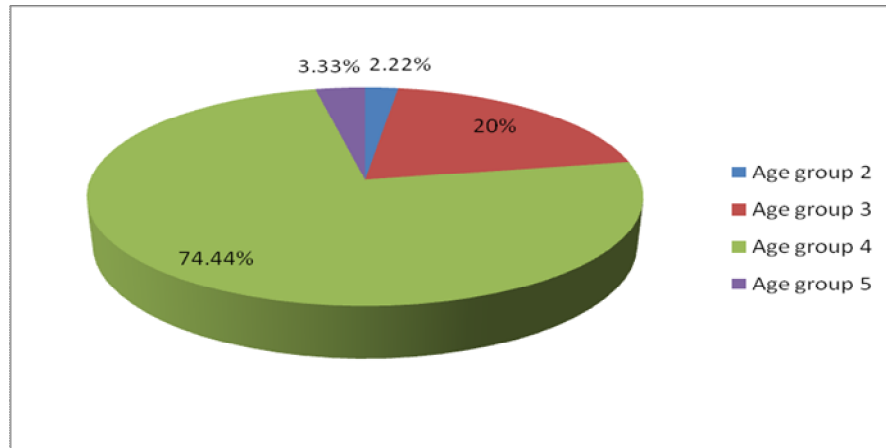


Figure 4.5: The age distribution of patients with assault at the ED

4.16 Analgesic use in assault patients

Most of the assault patients that presented to the ED, received analgesics as part of their treatment. Analgesics were given for the treatment of pain in assault patients, either as a monotherapy or as a combined therapy. A combination of Brufen and Paracodeine (70%) was the most commonly used analgesic, followed by Brufen monotherapy (17.78%). The analgesic usage in patients with assault is represented in Figure 4.6.

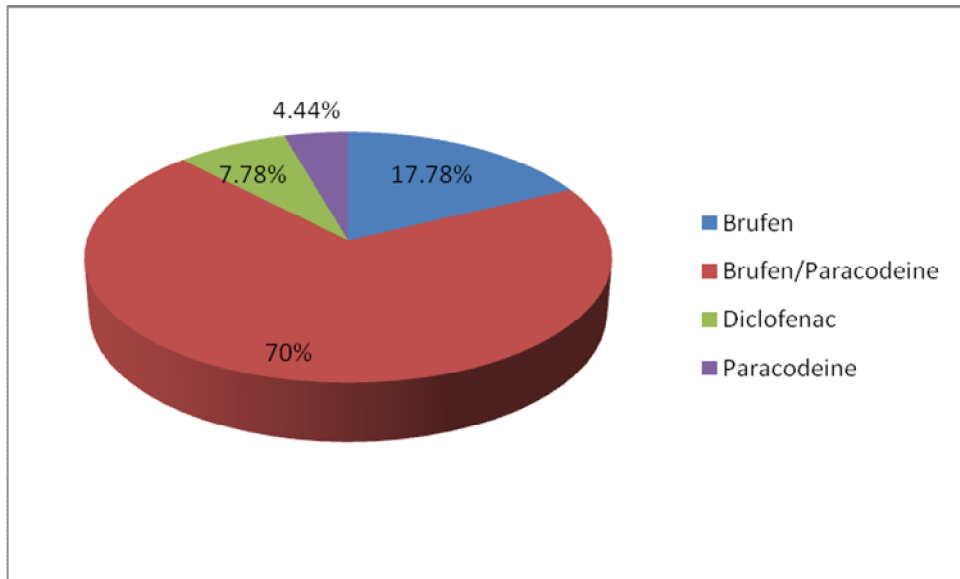


Figure 4.6: Analgesic usage in assault patients

4.17 Wound treatment in assault patients

Of the assault patients that presented to the ED, 28.89% had wound dressing and 71.11% has both wound dressing and wound suturing .

4.18 Time of presentation of assault patients

Most of the patients with assault presented to the ED from 20:00 pm to 23:59 pm (time group 4) during the evening period, followed by patients that presented from 16:00 pm to 19:59 pm (time group 3). The time of presentation of assault patients is represented in Figure 4.7.

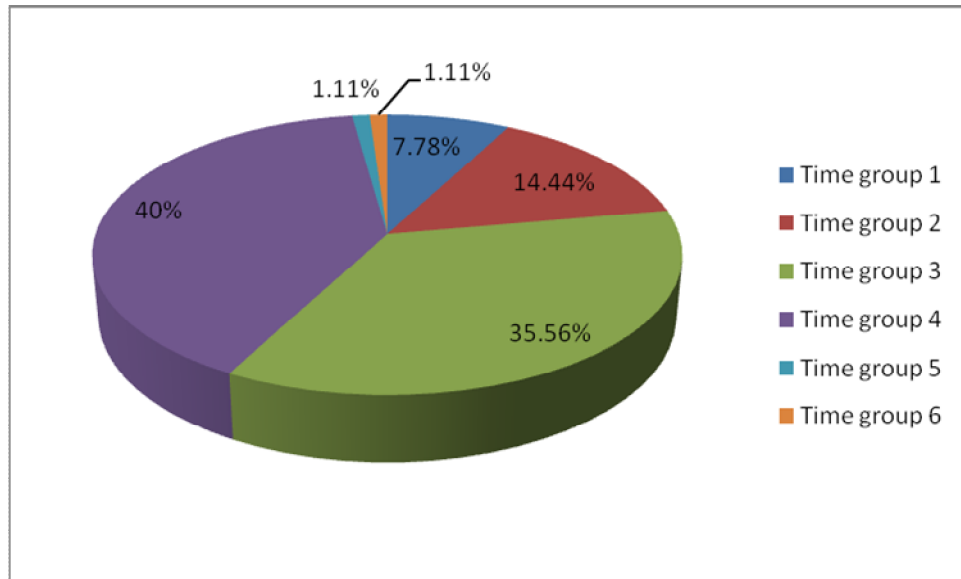


Figure 4.7: Time of presentation of assault patients

4.19 Antibiotic use in assault patients

Most of the patients that visited the ED were commonly treated with augmentin (66.67%), and flucloxacillin (23.33%) respectively . The antibiotics were given to these patients because of the risk of wound infection. The antibiotic use in patients with assault is presented in Figure 4.8

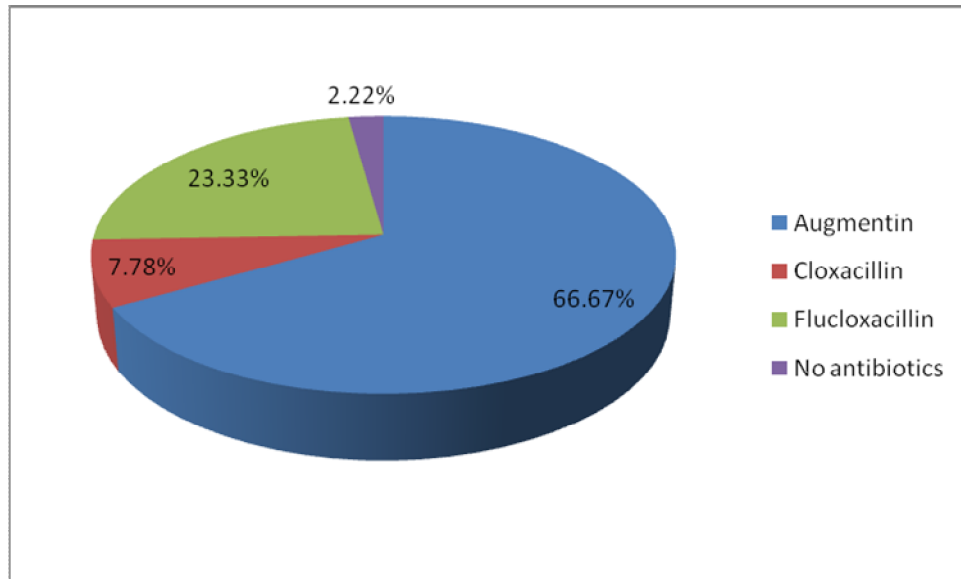


Figure 4.8: Antibiotic use in assault patients

4.20 Age distribution of patients with respiratory tract infection

Medical problems constituted 55.18% of the total presenting primary diagnosis out of which respiratory tract infection constituted 14.46%. Most patients (54.93%) with respiratory tract infection were from 21-30 years of age (age group 4), followed by patients with the ages less than 1 year of age (age group 1) that constituted 28.17%. The age distribution of patients with respiratory tract infection is presented in Figure 4.9.

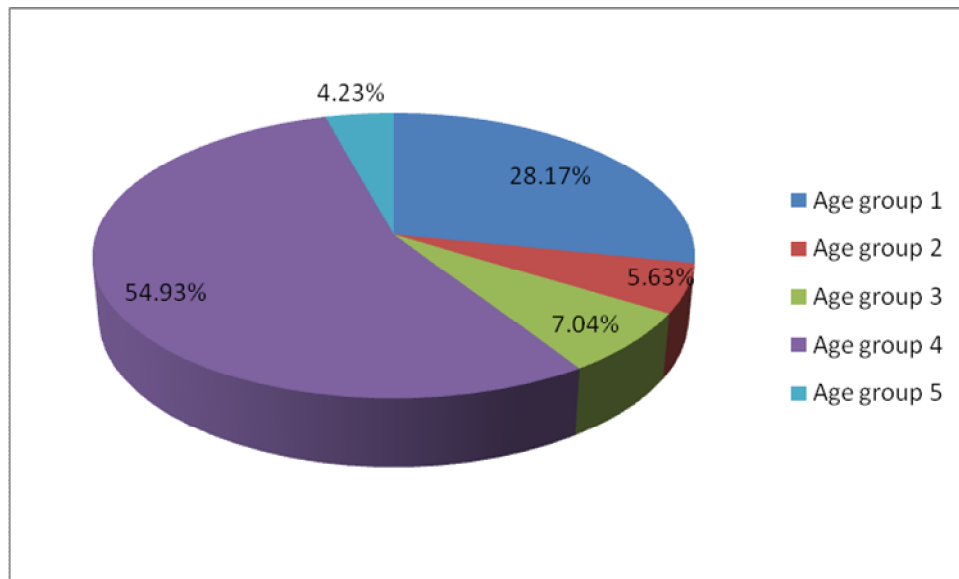


Figure 4.9: Age distribution of patients with respiratory tract infection

4.21 Antibiotic use in patients with respiratory tract infection

Majority of the patients were treated with augmentin (74.65%), and by Bactrim (11.27%), respectively. Antibiotic usage in patients with respiratory tract infection is represented in Figure 4.10.

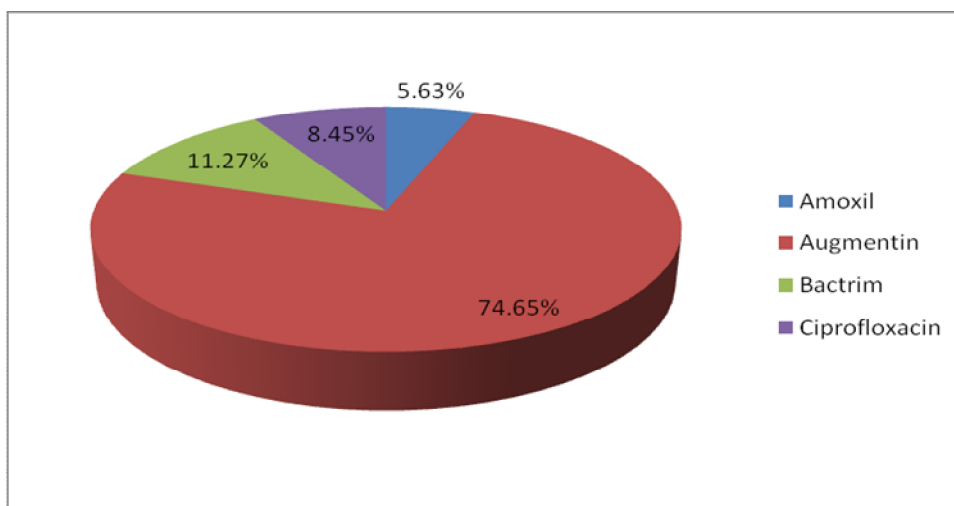


Figure 4.10: Antibiotic use in patients with respiratory tract infection

4.22 Time of presentation of patients with respiratory tract infection

Most patients with respiratory tract infection presented from 8.00am to 11.59 am, followed by patients that presented from 16.00 to 19.59 pm. The time of presentation of patients is presented in Table 4.8.

Table 4.8: Time of presentation of patients with respiratory tract infection

Time group	Time	Frequency	Percentage %
1	8.00 am -11.59 am	30	42.25
2	12.00 pm - 15.59 am	7	9.86
3	16.00 am - 19.59 pm	26	36.62
4	20.00 pm - 23.59 pm	3	4.23
5	24.00 hr - 3.59 am	4	5.63
6	4.00 am – 7.59 am	1	1.41

4.23 Age distribution of patients with gastroenteritis

The age group of most patients with gastroenteritis was from 21 to 30 years, followed by patients (18.44%) that were less than 1 year old. The age distribution of patients with gastroenteritis is represented in Figure 4.11.

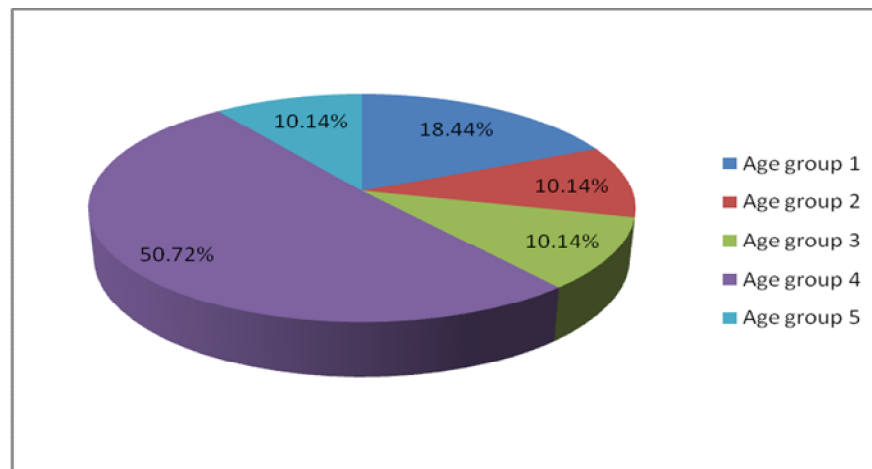


Figure 4.11: Age distribution of patients with gastroenteritis

4.24 Antibiotics use in patients with gastroenteritis

Most patients with gastroenteritis were treated with augmentin and metronidazole (50.72%), this was followed by patients who were treated with augmentin only (13.04%), and 10.14% who were treated with Ciprofloxacin. Antibiotics usage in patients with gastroenteritis is represented in Figure 4.12.

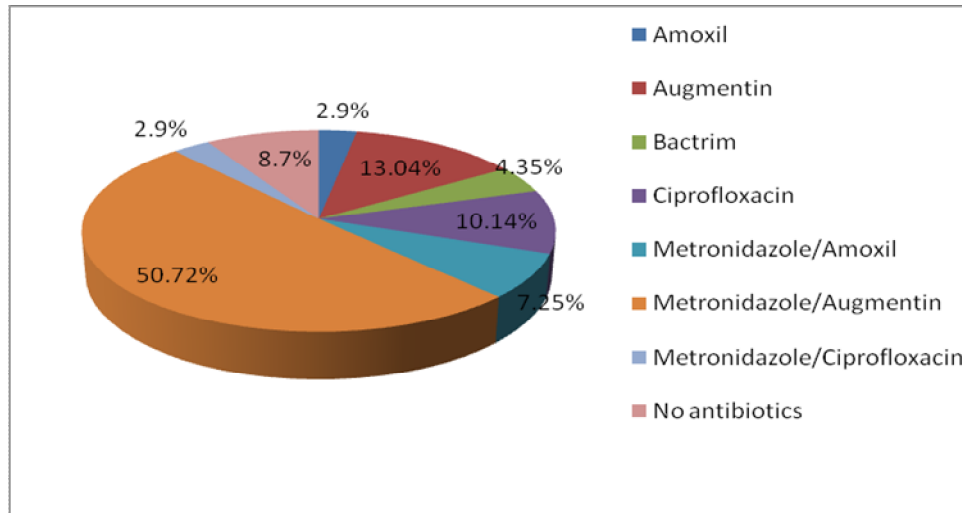


Figure 4.12: Antibiotics usage in patients with gastroenteritis

4.25 Time of presentation of patients with gastroenteritis

Of the patients that presented with gastroenteritis, majority (26.09%), presented to the ED from 16:00 pm to 19:59 pm, followed by 24.64% who presented from 20:00 pm to 23:59 pm. The time of presentation of the patients is presented in Table 4.9.

Table 4.9: Time of presentation of patients with gastroenteritis

Time group	Time	Frequency	Percentage %
1	8.00 am – 11.59 am	23	33.33
2	12.00 pm – 15.59 pm	11	15.94
3	16.00 pm – 19.59 pm	18	26.09
4	24.00 hr – 23.59 pm	17	24.64

4.26 Intravenous fluid use in patients with gastroenteritis

Most patients with gastroenteritis were treated with ringers lactate intravenous fluid (72.46%), followed by those who were treated with normal saline 0.9% (18.84%), and the half-strength darrows (8.70%) respectively.

4.27 Missing data

Out of the 890 patients that presented to the ED, 339 patients files are considered as either having incomplete data, or completely gone missing, the total number of files that had to be excluded was 179, these files were not further analysed, this comprised of 52 missing files, 27 duplicate files owned by patients after their first visit, and 100 files for second visit.

The missing data (220 patients' files) that is, the data of patients that fall under the inclusion criteria but the information supplied were incomplete for one reason or the other were analysed, and these included the 62 patients file with missing age, 60 patients' files with marital status not completed, 40 patients' files with missing employments status, and the 58 patients' files with missing gender and marital status to determine if their exclusion from analyses could alter the research outcome results and conclusions.

The analysis of the missing data revealed that the predominantly male gender (58.02%), most patients were single (96.25%) in terms of their marital status, and all the patients were of black race. Most of the patients seen at the ED were aged 21 to 30 years, followed by patients in the 11 to 20 years age group. The three

leading presenting diagnosis were assault, respiratory tract infection and gastroenteritis, but the predominant presenting diagnosis was assault , which was common in 21 to 30 years age group , and this same age group presented late in the evening (20.00 to 23.59 pm) to the ED for treatment. The beer bottle (29.82%) was the leading object used to attack the assault victims, with the face 55.26% and upper limb (16.67%) being the mostly injured areas. Most of these patients presented to the ED during the summer. The analysis of the missing data also revealed that Saturday and Sunday were the busiest individual days of the week with a patient population of 58.18%. In terms of the treatment given to assault patients, most of them (78.08%), had their wounds sutured and dressed, the most commonly used analgesic for assault patients were Brufen and Paracodeine (52.63%), and Augmentin (61.38%) is the most commonly used cover up antibiotic. The second leading diagnosis after assault was respiratory tract infection, and this diagnosis is common in patients aged 21 to 30 years, followed by patients aged less than 1 year. Most patients were given Augmentin (61.36%) for their respiratory tract infection. In terms of time of arrival, most patients with respiratory tract infection arrived at the ED from 8.00 am to 11.59 am, followed by 16.00 pm to 19.59 pm. The third leading presenting problem was gastroenteritis as presented earlier. Patients with gastroenteritis mostly presented to the ED from 8.00 am to 11.59 am. Gastroenteritis is more common in patients aged 21 to 30 years, followed by patients aged less than 1 year , and most of the patients were treated with Metronidazole and Augmentin antibiotics combination, and most were treated with ringers lactate intravenous infusion (50%), followed by normal saline 0.9%. The majority of the patients also presented to the ED during the month of

December, and during summer season as earlier presented. There was also increased number of patients during the school sessions, followed by another surge during the world cup tournament. There was also increased number of patients seen in the ED during the working day (62.27%), followed by patients (32.27%) seen during weekends and the least number of patients was attended to during the public holiday. In terms of patients' outcome, most patients (68.64%) were treated and discharged from the ED, and all the patients are of black race. Most of the patients were treated for non-emergency (96.36%), ill health problems, and most (97.78%) are unemployed.

In conclusion, the outcome of the analysis of the missing data is similar to the results obtained from the analysis of the research data by having male gender as the predominant patients population that visited the ED, most of the patient population were single, and the leading problem in terms of presentation to the ED was assault in the patients aged 21 to 30 years who presented in the evenings, and most of their presenting problems (96.36%) were not emergencies that necessitated them to be admitted. There was also an increase in the patient population during the summer, working days and during the December periods.

CHAPTER FIVE

5 DISCUSSION

5.1 Introduction

This chapter presents the discussion of results obtained in this research study. The research study was conducted to determine the demography of patients, described the patients' outcome once managed, determine the clinical conditions on presentation and time periods of presentation to the ED was also considered and to establish if the cases seen were true emergencies or they are cases that are expected to be treated at the PHCs.

The total population of patients that attended the ED during the period of study was 890 patients out of which 491 patients' files with complete data were analysed. The marital status was not completed in 60 patients' files, the gender of the patients was missing in 58 files, the age status was not completed in 62 patients' files, 27 of the patients had duplicate files, the employment status was not completed in 40 patients' files, 100 patients had second visits and 52 patients' files were missing. Effort was also made to analyse the data obtained from the files that had incomplete data.

From the results analysed, the three leading presenting primary diagnosis were assault (18.33%), respiratory tract infection (14.40%) and gastroenteritis (14.05%) and are further highlighted in this chapter.

5.2 Age distribution of patients

This section explains the common trend in the developing countries such as South Africa, Kenya, and Tanzania. The analysis of the age distribution of the patients revealed that patients from 21 to 30 years of age group were the predominant patient population that visited the ED, and the mean age was 27 years. The outcome of the research result was similar to the result obtained by Nkombua⁴ in a research study conducted in Middleburg hospital, Middelburg South Africa that revealed that majority of the patients seen in the ED were 21 to 30 years, the result is also similar to the outcome obtained in Eldoret, Kenya that had predominant age group to be from 20 to 30 years¹⁵. The research result is however in contrast to the result obtained by another study conducted by Nkombua in Witbank hospital, South Africa that revealed that the leading age group of assault patients was from 17 to 35 years⁵. Furthermore, the cross-sectional survey of patients presenting to South African urban ED, in New Somerset hospital, South Africa revealed that the peak age group was 20 to 40 years⁶. In addition, the age distribution of patients in Bugando medical centre in Tanzania revealed the predominant age group were patients that were 20-59 years¹⁸. In the United Kingdom, the analysis of the temporal and demographic variations in attendance across the ED of the West Midlands region revealed that in age group 15 to 24 years presented predominantly with assault during the summer month¹¹. The trend is however different in developed countries such as United States, Canada and Australia. The next paragraphs explain the trend in the developed countries.

The predominant age group in the EDs of rural and non-rural hospitals in the United States was 18 to 44 years¹⁷ while the age distribution of patients in Cobram district rural hospital in Australia revealed that the age distribution of the patient population consisted predominantly of patients above 60 years¹³. In addition, the ED utilization in the United States and Canada revealed that those aged 75 years and older had the highest ED visit rate¹⁴ while the use of ED in Elliot Lake, rural community of Northern Ontario Canada revealed that the age distribution of the patient population was predominantly patients from 61 to 70 years²⁴. The trend in the developed countries favours patients that are above 60 years old while patients with lesser age groups were found to be predominant in the developing countries. This contrast in developing countries and developed countries could be due to an increase in elderly population (demographic shift) in rural community that confirms the trend in rural health for older patients with a growing burden of disease that is different from diseases spectrum seen in younger age group and complications that requires hospitalization¹³.

The trend in the African countries is that patients presenting to the ED were predominantly made up of younger age groups, and alcohol usage and intoxication, interpersonal violence, low socio-economic status, history of childhood abuse, posttraumatic stress disorder and illiteracy have effect on the incidence of assault^{4,5,15,25}.

5.3 Gender distribution of patients

Male gender is prone to increased incidence of assault in developing and developed countries. This is confirmed by the outcome of this research study that revealed that the male gender (56.42 %) was the predominant patient population that visited the ED. Other research studies had similar results that revealed that male patient population was the predominant gender in researches conducted in South Africa, Uganda, Kenya, Tanzania, Turkey and Elliot lake, Ontario, Canada^{4,5,15,18,22,23,24,25 24}.

In contrast to most findings, comparison of ED visits in rural and non-rural hospitals in United States revealed that there were more females (54.5%) in rural hospitals and 55% in the non-rural hospitals¹⁷. The analysis of the remaining patients files not included in the study also supported that male gender (58.02%) was the predominant gender that presented to the ED. In summary, male gender is the predominant gender that visited the ED of most hospitals, both in developed and the developing countries. The high rate of visit by the male gender could be due to their risk taking behaviour, increased outdoor activities, and their use of alcohol.

5.4 Marital status of patients

Majority of the patient population in the analysed result were single (99.59%). This is similar to the findings of Nkombua⁵ that had 69% of the patient population being single, but in contrast, most patients seen in the ED of Elliot Lake in Canada were married (42%), followed by Single (29.4%) while Widows / widowers accounted for 8.7%²⁴. The population in Ceza is made up of Zulu tribe who have the culture of

using large numbers of cows and money to pay for dowries (*lobola*) during marriage ceremonies, the high price for this '*lobola*' has made it a bit difficult to pay by the people from the low socio economic level living in Ceza, hence the preponderance of single patients.

5.5 Nationality of the patients

Ceza area is not located close to any neighbouring countries; hence, it may not be possible to see other foreign nationals in this secluded area. This research study analysed the nationality of the patients. It was found that all the patients that presented to the ED were South Africans as evidenced by their South African identity number filled in their files. Historically, Ceza area belongs to the Zulus who are of Black race who had been living in the area for many generations, the lack of social infrastructural development in the area may contribute to the lack of influx of foreigners in search for investment and job opportunities.

5.6 Employment and racial distribution of patients

There is high level of unemployment in South Africa as a developing country; this has extended to other cities and suburbs including Ceza area. Majority of the patients in Ceza were unemployed (99.19%), there were no major factory or company located in that area, there is no tertiary institution located in or close to this area, the absence of social infrastructures may be discouraging to foreigners who wish to seek for job or invest, this could have contributed to the unemployment status. In contrast, Canada is a developed country with a well-established socio-infrastructural system, the result obtained in Saint Joseph's

hospital, Elliot Lake in Ontario, Canada revealed that less number of patients were unemployed (9.7%)²⁴.

In terms of racial distribution of patients, all the patient population that visited the ED were Black. However, a contrasting outcome was obtained by the research study conducted by Nkombua⁵ that revealed mixture of races in Witbank hospital, the majority of the patients in Witbank hospital were Black (91%), followed by White (6.3%), Coloured (1.8%) and lastly the India population (0.9%). The differences in the racial outcome in Witbank hospital was because Witbank is a more developed town that has more social infrastructures than the Ceza area.

In the developed world, the analysis of the racial distribution of patients in the ED of rural and non-rural community hospitals in the United States revealed that White race was predominant in rural (82.8%) and 64.2% in non-rural hospital, followed by black population (12.7%), in rural and 20.9% in non-rural hospitals, and Hispanic population represented by 3.6% in rural community hospital and 12.7% in non-rural community hospital¹⁷.

In conclusion, Ceza area is part of Zulu tribe settlement, and most Zulus are of the black race with interest in cattles rearing and peasant farmers, this may have contributed to the lack of formal employment among the population as revealed in this study.

5.7 Seasonal distribution of patients

The highest number of patient population in the ED of Ceza hospital was in the summer season (34.83%), followed by 24.44% population during winter. Similarly, there was an increase in patient population in Cobram rural hospital, Australia during the warmer months due to increased outdoor activities¹³. Likewise, in the United Kingdom West Midlands region, attendances were higher during the summer months for most ages except in the very young (below 1 year) and very old (above 65 years) patients who have increased attendance in winter because of their increased susceptibility to respiratory tract infection which can be complicated by other medical conditions¹¹.

The trend is that there is increased patient population during the summer months due to increased outdoor activities, influx of tourist and people returning home for holiday during the December month. Patients at the extreme of ages (below 1 year and above 65 years) do have a slight variation in their seasonal presentation, these age groups present more in winter because of their increased susceptibility to infections and complication from their illnesses.

5.8 Time of presentation

Patients have varied time of presentations that could be related to their presenting medical problems or related to their age groups. Patients with assault presented mostly to the ED from 8.00 pm to 23.59 pm. This coincides with the time of increased outdoor activities and the use of alcohol among the patients population in the evenings. Furthermore, most liquor shops operate fully in the evenings. In

addition, many of the patients do admit to the use of liquor during history taking prior to the incidence, and in addition, the most common object used to assault the patients was beer bottle according to the patients, this was followed by patients who were assaulted with unknown objects. The high proportion of patients assaulted by unknown objects was due to the absence of street lights and dark footpaths in the area. Similarly, the time of presentation of patients in the Gattineau memorial hospital, Ottawa in Canada was also mostly in the evenings, the busiest time was from 9.00 pm to 10.00 pm²². Most patients with respiratory tract infection presented from 8.00 am to 11.59 am, followed patients that presented from 16.00 pm to 19.59 pm (Table 4.8 chapter 4), while most patients with gastroenteritis presented from 8.00 am to 11.59 am (Table 4.9 chapter 4).

Australia is a developed country with better health system, the research findings in Cobram rural hospital, Australia revealed a rise in the number of patients presentation from 06.00 to 19.00, and the patient population dropped sharply after 19.00 and remained low until 06.00 the following day¹³. In all, 40% of the patients presented between 18.00 and 24.00, and 70% between 12.00 and 24.00¹³. The differences in time of presentation in Cobram hospital when compared to Ceza hospital could be due to difference in the spectrum of presenting health problem and age of the patients' population visiting the ED. Most patients visiting the ED in Australia, Cobram hospital were elderly, the age distribution of the patient population consisted predominantly of patients above 60 years¹³.

In the United Kingdom, the analysis of the temporal and demographic variations in attendance across the ED of the West Midlands region revealed that in age group

15 to 24 years, attendance rises after 7.00 pm, and peaking between 09.00 and 10.59 pm, and assault was found to be the leading presenting problem in 15 to 24 years age group during the summer months¹¹.

The trend is that patients in the younger age group present to the ED usually in the evenings with assault, usually after the use of alcohol, interpersonal violence in developing country such as South Africa, likewise in the developed country such as United Kingdom.

5.9 Days of presentation

The busiest day of the week at the ED was Saturday and Sunday with a patient population of 38.29% (Table 4.3 in Chapter 4). Ceza hospital is located on the roadside and it is close to the community houses, this makes the hospital easily accessible, hence patients do present with all sorts of illnesses. A similar outcome was obtained from South Huron hospital, Canada that revealed that the ED was used more frequently on weekends²⁰. The day of presentation of patients in the Gatineau memorial hospital, Ottawa in Canada also revealed that weekends were almost twice as busy as weekdays, especially if the weather was sunny²². On the contrary, Monday was the busiest day of the week in the United Kingdom; this was because many people who injured themselves at the weekend do not visit the ED immediately, as they do not consider themselves to need immediate treatment¹¹. The trend in most developing and the developed countries was that the busiest day of the week is during the weekends.

5.10 Monthly distribution of patients

The highest proportion of patients (15.68%), that attended the ED was in December (Table 4.5 in chapter 4), this coincides with the influx of people from the cities returning home to spend the holidays with their families.

Similar outcome was also obtained in Cobram rural hospital in Australia where the greatest number of ED presentation occurred during the summer months, especially in December that coincides with an influx of tourists during the Christmas holidays and fruit pickers who work seasonally in local orchards. In addition, there are increased outdoor activities during the month of December¹³.

In Sundre hospital, Canada the increased patient population in the ED in December during the Christmas holiday was because of the influx of tourists²¹. Similarly, the highest ED attendance across the West Midlands was also found to be in December during the winter months in patients under 1 year and above 65 years. Patients above 65 years have increased susceptibility to respiratory illness, which can be complicated by other medical conditions, which increases their chances of presenting to the ED¹¹. The percentage attendance for patients above 65 years reached 11.6% in December, which has the highest attendance in a single month of all age groups¹¹.

The trend in developing and the developed countries is that patient population tend to increase in the December month due to influx of tourists and crop harvest,

there is also an increase in patient population in the summer season due to increased outdoor activities.

5.11 Primary presenting diagnosis

The leading presenting primary diagnosis in trauma at the ED was assault in Ceza hospital, (Table 4.6 in chapter 4). Similarly, analysis of various the health institutions in South Africa revealed that assault was the leading diagnosis in ED of New Somerset hospital, in Paarl hospital, in Middelburg hospital, in Alexandra health centres, and in the nine community health community centres in Cape Town^{3,4,6,7,8}, likewise the leading presenting diagnosis in Eldoret, Kenya and Bugando medical centre, Tanzania was assault, but in contrast, RTA was the leading diagnosis in Kuvula hospital, Uganda^{15,18,25}. Furthermore, the epidemiology of childhood injury in Wesley Guild hospital, Nigeria revealed that RTA was the leading cause of presentation to the ED¹⁹.

United Kingdom as a developed country also has assault as the leading diagnosis in patients aged 15 to 24 years during the summer month¹¹. However, the leading diagnosis in South Huron hospital, Canada was injury and poisoning (26.6%), followed by ill-defined illness (24.6%)²⁰, the analysis of the ED utilization in the United States and Ontario, Canada also revealed that injury and poisoning were the leading diagnosis, and patients aged 75 years and older had the highest ED visit rate¹⁴.

The use of ED of Saint Joseph's hospital in Elliot Lake, a rural community of Northern Ontario, Canada revealed that musculoskeletal problem was the leading presenting diagnosis, and the majority of the patients are from 61 to 70 years old²⁴. Another contrasting result was obtained in the comparison of the ED visits in rural and non-rural community hospitals in the United States that revealed that sprains and strains were the leading presenting diagnosis¹⁷.

The trend is that assault is the leading diagnosis in most developing countries such as South Africa, Kenya, United Kingdom and Tanzania, but in contrast, RTA was the leading diagnosis in Uganda and Nigeria. Assault as the presenting diagnosis, is aided by increased outdoor activities in summer, increased tourists influx during the month of December, the use of alcohol in younger age group, inter-personal violence and hazardous environmental conditions, while the RTA in Uganda and Nigeria is due to high speed while driving, the use of alcohol while driving, and most of the motor vehicles being used are often old and poorly maintained. The variations in the presenting primary diagnosis in the developed countries such as United States and Canada was due to the increased elderly patient population presenting to the ED, and notable elderly patients have different diseases spectrum when compared to patients in the younger age group.

5.12 Patients outcome

Most patients seen in the ED of developing and the developed countries are discharged after treatment; the trend is similar in Ceza hospital (Table 4.7 in chapter 4).

In South Africa, most patients seen in the ED of New Somerset hospital were discharged⁶. Likewise, the majority of the patients (81.4%) were treated and discharged in Witbank hospital and 26.5% patients were observed in Paarl hospital, South Africa^{3,5}. In developed countries, about 70% of patients that presented to the ED of South Huron hospital, Canada were seen and discharged²⁰, and 98.7% of patients were treated and discharged in Mus hospital, Turkey²³. In addition, musculoskeletal problem was the leading cause of visit to ED, in Saint Joseph's hospital, Canada, and this does not require admission²⁴.

The trend is that the majority of the patients that visited the ED have presenting diagnosis that does not require them to be admitted into the hospital for treatment.

5.13 Pattern of injuries sustained by assault patients

The majority of the patients with assault have injuries on the face (30.00%) and upper limb (24.44%). The majority of the assault patients in Witbank hospital have injuries on the head (65.5%) and the neck (11.8%), while in Mus hospital, Turkey, head-neck and extremities are the most frequently injured parts^{5,23}. The trend in assault patient is the head, neck and upper limbs are the predominant area that are affected during assault, this can be due to increased vulnerability of these body parts, or in addition it can be due to the process of self-defence during assault.

5.14 Age distribution of patients with assault

The assaulted patients in Ceza hospital are predominantly made up of patients aged 21 to 30 years. In terms of age distribution, the peak age group was 20 to 40 years in New Somerset hospital⁶, while over 75% of the patients in Gattineau memorial hospital, Ottawa in Canada are under 35 years²². The majority of the patients in Eldoret, Kenya are from 20 to 30 years¹⁵, while most patients are from 20 to 59 years in Bugando medical centre, Tanzania¹⁸. In the United Kingdom, most patients with assault are from 15 to 24 years in the Mid Westland region¹¹.

The trend observed is that patients with assault are of younger age group, their increased activities, adventurous behaviours, interpersonal violence and the use of alcohol predisposes to assault.

5.15 Analgesic use in assault patients

Most patients required analgesics to treat the pain that resulted from the assault injury. Brufen and Paracodeine (68.48%) are the most common analgesic being used; this is followed by Brufen (17.39%). Most research studies seen did not analyse into detail the use of analgesics in the patients that visited the ED, so it may be difficult to make any comparison to other studies.

5.16 Age distribution of patients with respiratory tract infection

The respiratory tract infection (14.46%) is the leading second cause of patients visit to the ED, (Figure 4.9 in chapter 4). Most patients with respiratory tract infection are from 21 to 30 years followed by patients aged less than 1 year. The

cause of respiratory tract infection patients under 1 year of age can be due to their increased susceptibility to infection and them been raised in hazardous environment (informal settlement) that can increase their susceptibility to illness.

5.17 Antibiotic usage in patients with respiratory tract infection

The most commonly used antibiotics in patients with respiratory tract infection was Augmentin (75.71%), Bactrim (11.43%), followed this. The increased usage of Augmentin in the treatment of respiratory tract infection was due to the recommendation in the Essential Drug List (EDL) book being used at the district hospital level in Kwazulu Natal province.

5.18 Age distribution of patients with gastroenteritis

Most patients with gastroenteritis are from 21 to 30 years of age, followed by patients less than 1 year old. People in the Ceza area live in informal homes with inadequate water and electricity supplies, which are evidenced by the use of untreated water from the river for all their domestic activities, the use of wood to cook their meals as stated by some of the patients, this can cause gastrointestinal infection.

5.19 Antibiotics usage in patients with gastroenteritis

Most patients that presented with gastroenteritis were treated with Augmentin and Metronidazole (52.24%); this was followed by only Augmentin (13.43%). The use of untreated water from the river by the patient population makes the use of antibiotics necessary in the greater proportion of these patients.

5.20 Intravenous fluid use in patients with gastroenteritis

Most patients with gastroenteritis were treated with ringers lactate intravenous fluid (72.46%), this was followed by 18.84% who were treated with normal saline intravenous fluid. The use of these intravenous fluids was based on the recommendations in the Essential Drug List (EDL) book being used by the district hospital.

5.21 Emergency status of patients

Majority of the patients that visited the ED presented with non-emergencies problems. These patients presented with non-urgent health problems that can be treated at their local clinics. In Witbank hospital, South Africa, overwhelming majority of the patients (81.4%) were not admitted because of the non-acute nature of their problems⁵. In a developed country such as Canada, the most frequent reason for attending the ED in Saint Joseph's hospital, Ontario, Canada, was non-emergency (musculoskeletal problems)²⁴. In addition, in Huron hospital, Ontario, Canada only 35% of their admissions through the ED were rated by the physicians as emergencies, urgent visits, or necessary non-elective procedures²⁰ while only 9.4% of the patients that visited the ED of Gatineau memorial hospital (Canada) were considered as essential or life threatening²². In United States, the majority of the patients in the rural and non-rural community hospitals in have non-emergency (sprain and strains) for visiting the ED¹⁷. The trend in the developing and developed countries is that majority of the patients presenting to the ED are non-emergency.

CHAPTER SIX

6 CONCLUSIONS

6.1 Conclusions

A research study on the analysis of patients that presented to the ED of the Ceza district hospital in Kwazulu Natal from 1st January 2010 to 31st to December 2010 have been presented and discussed.

The research results showed that the majority of the patients that presented to the ED of the Ceza district hospital has assault as the presenting primary diagnosis, most of them were single and of male gender, they were of black race and predominantly unemployed. They were majorly youths within the age range of 21 years to 30 years, and most of them presented to the ED in the evenings after being assaulted at the face or upper limb with the beer bottle. Most of the injuries sustained by the patients at the ED were not severe, since only three patients were transferred to other health institutions for further management in a period of one year considered for this study. Majority of the patients had their wounds sutured, wounds dressed, and they were given Brufen and Paracodeine as analgesics. Antibiotic (Augmentin) was given to most patients that were assaulted as a means of preventing infection.

The high volume of patients that visited the ED during the summer months and in December was due to increased outdoor activities during the summer months and the influx of people from the cities who came for holidays. Most of the patients that

were attended to at the ED are non-emergency cases that could have been treated at the PHCs.

6.2 Limitation

The year 2010 was an extra ordinary year for South Africans since we hosted the FIFA World Cup, 2010, hence the result of this study cannot be extrapolated to other years as being the true representation of the situation at the ED of the Ceza hospital.

There was no data on the HIV status of these analysed patients files, the author would have analysed if there is any relationship between their HIV prevalence rate and the incidence of gastroenteritis and respiratory tract infection in the Ceza patient population studied.

The patients' files did not contain any relevant information that is needed for appropriate triaging; hence, it was difficult triaging the patients.

6.3 Bias

Information regarding the HIV status of the patients were not collected and documented in the patients files at the ED, hence it will be difficult to specify if the relationship between the HIV status of the patients and the occurrence of gastroenteritis even though the patients use contaminated water for their domestic chores.

There is increased usage of antibiotics in patients having gastroenteritis and respiratory tract infection; this may be partly due to the prevalence of HIV infection in the area.

6.4 Recommendations

The Ceza district hospital has three full time medical officers who cover the hospital wards, outpatient department, and the ED on 24 hours basis. Majority of the patients seen at the ED of the Ceza district hospital were non-emergency cases that could have been treated at PHC to ease the workload on the already overburdened medical officers, and to facilitate their efficient performance. The gateway clinic in Ceza district hospital is under-utilised due to lack of infrastructure and human resources resulting in the influx of non-emergency patients to the ED of the Ceza district hospital. The population in the Ceza area need to be educated on the proper use of the PHC to facilitate the efficient and appropriate use of the ED. The national department of health should provide adequate budget facilities to the gateway clinic to enable the recruitment of qualified primary health care personnel and to allow the gateway clinic to be operating on a 24 hours basis. In addition, emphasis should also be placed on improving patients' record keeping methods to improve the safety of the medical records and for patients data to be properly completed when patients are been issued with files at the registry and during clinical examination. The increased usage of antibiotics in patients having gastroenteritis and respiratory tract infection may be partly due to the prevalence of HIV infection in the area, the risk of developing increased resistance to these antibiotics should be considered, hence there is need for appropriate protocol on

the management of gastroenteritis and respiratory tract infection. Most patients present to the ED with various ailments, the medical officers working in the Ceza hospital should have adequate skill to treat various illnesses, most especially trauma.

Provision of basic social infrastructures such as formal settlements and safe water for domestic use will ultimately reduce the incidence of communicable diseases such respiratory tract infection and communicable diseases such as gastroenteritis; while the provision of educational institutions such as primary and high schools with improved curriculum and qualified educators will foster healthy social relationships among the students population.

Efforts should also be made to set up a task team who will verify if the taverns in Ceza area have liquor license to operate and to also monitor the operating hours of these taverns if it is in accordance with the government regulations. This will in turn reduce the access to liquor usage and incidences of assault, since beer bottle is the most common object used to assault the patients that presented to the ED of Ceza hospital.

The national department of health should recruit more medical officers to work in the remote rural areas especially in the Kwazulu Natal province. This will enable the effective and efficient performance of the medical officers in such areas.

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APPENDIX 1

DATA TOOL

Research No_____

1. Age : <1yr [], 1-10yrs [], 11-20yrs [],

 21-30yrs [], 31-40yrs [], 41-50yrs [],

 51-60yrs [], above 60yrs []
2. Patient gender: Male [], Female []
3. Patient race: Black [], White [], Colored [],

 India [], Asian []

**4.0 The time period of presentation for patients presenting to the
Emergency department.**

4.1 School holiday periods:

Summer School Holiday: 12th December 2009 - 12th January 2010 []

Autumn School Holiday: 27th March 2010-11th April 2010 []

Winter School Holiday: 10th June-12th July 2010 []

Spring School Holiday: 2nd October-10th October []

Summer School Holiday: 11th December 2010-11th January 2011 []

4.2 Seasons of the year:

Summer: December [], January [], February [].

Autumn: March [], April [], May [].

Winter: June [], July [], August [].

Spring: September [], October [], November [].

4.3 Time of Day:

1:00-3:00am [], 3:01-6:00am [], 6:01-9:00am [],
9:01am-12:00pm [], 12:01-15:00 pm [], 15:01-18:00pm [],
16:01-21:00pm [], 21:00pm-24:00hr [], 24:01am-24:59am []

4.4 Public Holiday

1-Jan	New Year's Day	[]
21-Mar	Human Rights Day	[]
22-April	Good Friday (Friday before Easter Sunday)	[]
25-April	Family Day (Monday after Easter Sunday)	[]
1-May	Workers Day	[]
2-May	Public holiday	[]
16-Jun	Youth Day	[]
9-Aug	National Women's Day	[]
24-Sep	Heritage Day	[]

16-Dec	Day of Reconciliation	[]
25-Dec	Christmas Day	[]
26-Dec	Day of Goodwill	[]
Others		[]

4.5 Month Day

January	[]	Monday	[]
February	[]	Tuesday	[]
March	[]	Wednesday	[]
April	[]	Thursday	[]
May	[]	Friday	[]
June	[]	Saturday	[]
July	[]	Sunday	[]
August	[]		
September	[]		

October []

November []

December []

5.0 Presenting Primary diagnosis condition of patients presenting to the Emergency department.

5.1 Medical

Asthma	[]	Respiratory tract infection	[]
		Peptic ulcer disease	[]
		Gastroenteritis	[]
Hypertension	[]	Diabetes	[]
		Cardiac failure	[]
Cardiac arrest	[]	Poisoning	[]
		Snake bite	[]
Meningitis	[]	Soft tissue infection	[]
Epilepsy	[]	cardiovascular accident	[]
Sexual assault	[]	Suicide	[]
		Arthritis	[]
Mental disorders	[]		

5.2 Trauma

Fracture	[]	Human bite	[]
		Stab injury	[]
Dog bite	[]	Gunshot	[]
Road traffic accident	[]	Assault	[]
		Soft tissue injury	[]

5.3 Obstetrics and Gynaecology

Vaginal bleeding [], Hypertensive disorders [], Infections []

5.4 Infectious disease [].

6. Patients outcome once managed in the Emergency department.

Admitted [], Referred [], Discharged [], Dead []

7. Marital status.

Single [], Married/Partner [], Widow(er) []

8. Employment status

Employed [], Unemployment []

9. Patients nationality.

South African [], Non-South African []

10. Residential location.

Non-residents of Ceza area [], Residents of Ceza area []

11. Patients Classification at the Emergency department

Emergency []

Non-emergency []

APPENDIX 2

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG
Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Dr Ogungbire JA Abiola

CLEARANCE CERTIFICATE

M110710

PROJECT

Analysis of Patients Presenting to the Emergency
Department at Ceza Hospital for Period 1 Year
(1st January to 31st December 2010)

INVESTIGATORS

Dr Ogungbire JA Abiola.

DEPARTMENT

Department of Emergency Medicine

DATE CONSIDERED

29/07/2011

DECISION OF THE COMMITTEE*

Approved unconditionally

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 29/07/2011

CHAIRPERSON


(Professor PE Cleaton-Jones)

*Guidelines for written 'informed consent' attached where applicable
cc: Supervisor : Dr E Gordon/Prof E Kramer

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University.

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. I agree to a completion of a yearly progress report.

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES...

APPENDIX 3



THE DEPARTMENT OF HEALTH,
CEZA DISTRICT HOSPITAL,
The Office of the Hospital Manager,
Ceza Hospital, Main Road, Ceza,
Private Bag X 200, Ceza, 3866
Tel.: 035 8325000, ext: 5163, 0834609427
Fax: 035 8320027, 035 8320022
E Mail: bonginkosi.dlamini@kznhealth.gov.za

DATE: 2011-05-11

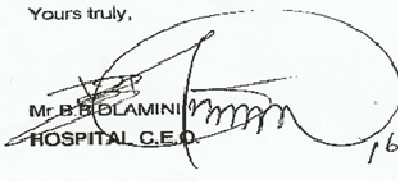
Dear Dr. J.A.A OGUNGBIRE

PERMISSION TO DO A RETROSPECTIVE RESEARCH STUDY IN CEZA DISTRICT HOSPITAL

In response to your application to conduct a retrospective research study towards your MSc. Med (Emergency Medicine) in Ceza District Hospital. I am glad to inform you that you have been granted permission to do your research study in Ceza Hospital.

Wishing you all the best in your academic career.

Yours truly,


Mr. B. B. DLAMINI
HOSPITAL C.E.O.

16/05/2011