

Pattern of inappropriate cases presenting to the Accident and Emergency Department in a Nigeria Tertiary Hospital

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Background: Although the primary mission of the Accident and Emergency Department (AED) is to provide initial treatment for life-threatening conditions, some patients make inappropriate use of the service. This study is aimed to determine the level of inappropriate use and the morbidity pattern of such patients presenting to the department in a tertiary hospital in Nigeria.

Materials and methods: A cross-sectional descriptive study in which inappropriate users of the AED of University of Port Harcourt Teaching Hospital were recruited. Data on socio-demographic characteristics and diagnoses based on ICPC-2 were collected from them and analysed using SPSS version 17.

Results: A total of 430 patients were recruited with age range of 18–62 years and mean of 38.45 ± 7.2 years. Considering the socio-demographic characteristics, only the association between gender and utilisation of the AED was statistically significant ($p = 0.014$). The prevalence of inappropriate use of the AED was 37.7%. The most frequent diagnosis among inappropriate users using the ICPC rubrics was polyuria and glycosuria (9.88%). When the cases were listed by the organ systems according to ICPC chapters, it was found that the commonest diagnoses were gastrointestinal (20.9%) and general and unspecified conditions (17.7%). Psychological conditions were not identified in this study. The most common reason for inappropriately presentation at the AED was patients referring themselves for quick attention (46.3%).

Conclusions: The level of inappropriate utilisation of the accident and emergency department was very high in this institution. Creation of public awareness will curtail this sickness behaviour.

Keywords: accident and emergency department, inappropriate use, morbidity, Nigeria

Introduction

An accident and emergency department (AED) is a medical treatment facility specialising in the management of sudden and unexpected illness, major injuries and life-threatening conditions. The department provides initial treatment for a broad spectrum of illnesses and injuries, some of which may be life-threatening and require immediate attention¹ without prior appointment. Although the primary mission of the accident and emergency department is well known, some patients make inappropriate use of the service.² They refer themselves to the department with primary care problems that are unlikely to require admission and are more suitable for other departments. The significant increase in inappropriate attendance at AEDs is considered a serious threat to the health care system, because of the resultant increased waiting times and treatment delays, impaired access, financial losses for providers, staff stress and ethical consequences.^{3–5} This strained and inefficient service can deprive true emergency cases of quality care.

Estimating of the prevalence of these inappropriate attendances has been difficult due to varying definitions and the subjective nature of measuring inappropriateness. Internationally, the prevalence has been reported between 24% and 40% of all AED attendances.⁶ Previous researchers have reported that between one to two-thirds of patients sampled attended AEDs with problems that would be managed more appropriately by general practitioners (GPs).⁷ In a study in Hong Kong, it was found that 57% of AED attendees would have been better managed by family physicians.⁸ In another study in two health centres in South Essex, UK, the rate of 'inappropriate' attendance was 16.8% [95% confidence interval (CI): 15.7–18.0].⁹ The authors have not identi-

fied any study on inappropriate utilisation of AED conducted in the south southern geopolitical zone of Nigeria. This study is therefore aimed to determine the level of inappropriate use and the morbidity pattern of such patients presenting to the Accident and Emergency department of the University of Port Harcourt Teaching Hospital, Port Harcourt, Nigeria

Materials and methods

Setting

The study was carried out in the AED of the University of Port Harcourt Teaching Hospital, Nigeria. The department is a 22-bed facility which offers services to an average of 120 patients weekly. Some cases are managed and discharged home by the AED doctors within 48 h while others are admitted, resuscitated and referred to the various specialist teams on call for admission into the various specialty wards.

Study design: This was a cross-sectional descriptive study.

Study population

The study population consisted of all consenting patients aged 18 years and above who presented to the department.

Inclusion criteria:

All adults patients (18 years and above) who presented in the AED for treatment and consented to the study.

Exclusion criteria:

Unconscious patients without relations.

Patients of the paediatric age group since they are treated in the children emergency room.

Sample size

Using the formula; $n = z^2 pq/d^2$ for determining sample size when population is over 10 000, with a prevalence of 50% since no known prevalence study has been conducted in this environment, the determined minimum sample size was approximately 430.

Sampling method

Each working day, a systematic sample of patients was identified by taking every fourth registered patient until the sample size was attained. The first patient was chosen by random sampling. The process lasted for a period of three months.

Procedure

Ten volunteer nurses with at least one year's experience in the accident and emergency department (AED) and had gone through training in triage were recruited and trained for one week on questionnaire administration by the researchers. Attendances were assigned to two groups of appropriateness as described by Dale *et al.*¹⁰

Primary care/inappropriate users:

- Self-referred patients with symptoms likely to be caused by conditions not in need of immediate resuscitations or urgent care, and unlikely to require hospital admission.
- Self-referred patients with non-urgent complications of chronic conditions.

Accident and emergency/appropriate users:

- All patients referred by letter or phone by a general practitioner
- All emergency presentations in need of immediate care or likely to require hospital admission
- Trauma requiring urgent hospital assessment (for example, fractured bones and dislocations, head injuries with loss of consciousness)

Research instrument

The data collection instrument was a two-part questionnaire. The first part consisted of the socio-demographic characteristics and was completed by the nurses. The second part of the instrument consisted of a structured questionnaire based on the International Classification of Primary Care – 2nd edition (ICPC-2) questionnaire as developed by the World Organisation of Family Doctors.¹¹ ICPC-2 is a morbidity classification system designed for primary care as clinical contact in this setting does not necessarily result in a definitive diagnosis. The classification system is structured in 17 chapters and seven components, which remain the same for each chapter. It encompasses 686 symptoms and diagnostic rubrics. It also classifies data relating to patient reasons for encounter, problems managed, non-pharmacological treatments, referrals, and orders for pathology and imaging. Diagnoses in this study were coded using the International Classification of Primary Care (ICPC-2).

Statistical analysis

The questionnaires were cross-checked after each interview to ensure that they were properly completed before data entry into the computer for analysis using Statistical Package for Social Science software (Windows version 17.0; SPSS Inc., Chicago, IL, USA). Descriptive statistics were used to describe socio-demographic characteristics of the respondents. Appropriate charts were used to illustrate categorical variables. The Chi-square test was used to assess association between categorical variables. A *p*-value of < 0.05 was considered statistically significant.

Ethical consideration: Ethical clearance was obtained from the Research and Ethics committee of the University of Port-Harcourt Teaching Hospital. The importance of the research was explained to the subject eligible for the study and a written consent was obtained before inclusion into the study.

Results

A total of 430 patients were recruited with age range of 18–62 years. Their mean age was 38.45 ± 7.2 years. Although most of the patients who used the AED were in the 20–29 years age bracket (34.65%), females (53.02%), married (47.44%), self-employed (55.81%) and with secondary education (38.37%), the association between inappropriate usage and these characteristics was not statistically significant ($p > 0.05$). However, there was a significant association between gender and utilisation of the AED ($p = 0.014$) as more females use the facility inappropriately (Table 1). The prevalence of inappropriate use of the AED in this study was 37.7% (Figure 1). Most of the inappropriate users of AED (62.23%) attended in the afternoon and night shifts. The association between the number of appropriate and inappropriate users and the different shifts was not statistically significant ($p = 0.95$) (Table 2). The most frequent diagnoses among inappropriate users using the ICPC rubrics was polyuria and glycosuria (9.88%), retroviral infection (9.26%), URTI (9.26%) and hypertension (9.26%). The least frequently diagnosed was chronic cough (3.09%) (Table 3). When the cases were listed by the organ systems according to ICPC chapters, the most commonly diagnosed conditions were gastrointestinal (20.9%) and general and unspecified (17.7%). Inappropriate users of the AED were significantly more than appropriate users ($p < 0.05$). However psychological conditions were not identified in this study (Table 4).

The most common reasons for inappropriate presentation at the AED were: patient referring themselves for quick attention (46.3%), inadequate medication stock at Health Centre (41.4%), check-ups given at AED are more comprehensive (32.7%) and doctors at AED being more skilful and efficient (29.0%). Proximity of AED to the residence of the patient (93%) was the least common reason (Table 5).

Discussion

The inappropriate use of AEDs is a problem that has been discussed widely by researchers.^{12,13} Since general societal and cultural factors determine healthcare-seeking behaviour, interventions to reduce the amount of inappropriate use are likely to fail.⁴

Overall, the level of inappropriate utilisation of AED services in this study was 37.7%. This is within the range of between 24% and 40% reported internationally,⁶ but lower than 57% reported in Hong Kong⁸ and higher than 16.8% reported in South Essex, UK.⁹ These differences could be attributed to the definition of inappropriate utilisation which may differ from one location to the other and the experience of the staff involved in the triaging. In some of the studies, the definition of inappropriate attendance was not clear enough. In the light of this fact, the most accurate assessment of urgency status would be achieved by having experienced emergency physicians screen patients on site. This is not possible in this study as in most developing countries considering the cost, hence nurses were used. This could have influenced the validity of the triaging process.

Of all the socio-demographic characteristics considered, only gender was significantly associated with inappropriate use of the AED. This corroborates with findings in previous studies worldwide.¹⁴⁻¹⁶ This could be attributed to the fact that women are more available than men to attend the health facilities because they are

Table 1: Socio-demographic characteristics of patients attending AED

Characteristics	Inappropriate (%) n = 162	Appropriate (%) n = 268	Total (%) n = 430	χ^2	p-value
Age (years)					
≤ 20	7 (4.32)	10 (3.73)	17 (3.95)		
20–29	52 (32.10)	88 (32.84)	149 (34.65)		
30–39	42 (29.93)	68 (25.37)	119 (27.67)		
40–49	32 (19.75)	53 (19.78)	85 (19.77)		
50–59	16 (9.88)	28 (10.45)	44 (10.23)		
≥60	13 (8.02)	21 (7.84)	34 (7.91)	0.154	0.9
Sex					
Male	76 (46.91)	126 (47.01)	202 (46.98)		
Female	86 (53.09)	142 (52.99)	228 (53.02)	5.98	0.01
Marital status					
Single	61 (37.65)	101 (37.69)	162 (37.67)		
Married	77 (47.53)	127 (47.39)	204 (47.44)		
Divorced	0 (0.00)		2 (0.75)	2 (0.47)	
Widowed	24 (14.91)	38 (14.18)	62 (14.42)	1.24	0.74
Educational level					
Non-formal	16 (9.88)	26 (9.70)	42 (9.77)		
Primary	26 (16.05)	42 (15.67)	68 (15.81)		
Secondary	62 (38.27)	103 (38.43)	165 (38.37)		
Tertiary	58 (35.80)	97 (31.19)	155 (35.99)	0.017	0.9
Occupation					
Civil servants	42 (25.93)	70 (26.12)	112 (26.05)		
Self-employed	90 (55.56)	150 (55.97)	240 (55.58)		
Unemployed	20 (12.34)	33 (12.31)	53 (12.33)		
Others	10 (6.17)	15 (5.60)	25 (5.81)	0.067	0.9

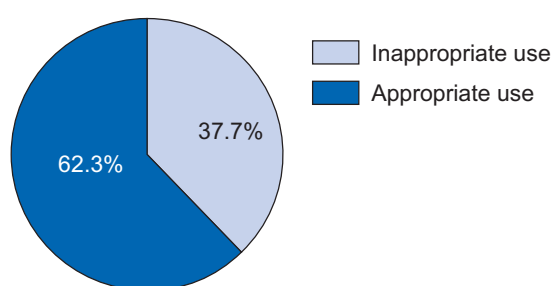


Figure 1: Prevalence of inappropriate use of AED

more anxious of their health, or maybe more vulnerable because of their reproductive health life (e.g. child bearing, genital activities, *postpartum*).¹⁷

The high level of inappropriate utilisation of the AED during the afternoon and night shifts may be attributed to many factors. The Primary Health Centres in Nigeria which should cater for most of the patients are in most cases non-functional. The General Outpatient Department (GOPD) which is a primary care clinic in the teaching hospital attends to a large population of patients as compared to the AED and does not have the night shift. There is a resultant long waiting time as compared to the AED. The AED therefore becomes a safe option since services are offered round the clock. The afternoon and night shifts are also outside the office or business hours and are more convenient because most

Table 2: Pattern of clinical presentations of non-urgent and urgent cases over different work shifts.

Time period(Shifts)	Appropriate n (%)	Inappropriate n (%)	Total n (%)	χ^2	p-value
8 am–3 pm	78 (29.10)	45 (27.78)	123 (28.60)	8.85	0.003
3 pm–8 pm	99 (36.94)	60 (37.04)	159 (36.98)	9.97	0.002
8 pm–8 am	91 (33.96)	57 (35.19)	148 (34.42)	7.81	0.005
Total	268	162	430		

Note: $\chi^2 = 0.107, p = 0.95, n = 430$.

Table 3: Clinical presentation of inappropriate cases by ICPC rubrics in AED

Diagnoses	Frequency n = 162	Percentage (%)
Polyuria and glycosuria	16	9.88
Retroviral infection	15	9.26
URTI	15	9.26
Hypertension	15	9.26
Arthritis	13	8.02
Epigastric pain	13	8.02
Myalgia	11	6.79
Diabetic foot ulcer	10	6.17
Chronic renal failure	9	5.56
Constipation	9	5.56
Mild to moderate pallor (weakness)	8	4.94
Hepatitis	7	4.32
Frequent stooling	7	4.32
Pneumonia	6	3.70
Ear pain	6	3.70
Chronic cough	5	3.09

patients may be unwilling to leave their means of livelihood to attend to health matters especially if it is not very serious.

Table 4: Problems diagnosed in AED by ICPC chapter

	Inappropriate (n = 162)	Appropriate (n = 268)	Total	χ^2 (df = 1)	p-value
Gastrointestinal	35 (38.89)	55 (61.11)	90 (20.9)	4.4	0.035
Respiratory diseases	26 (83.87)	7 (22.58)	33 (7.7)	10.94	<0.001
Endocrine/metabolic	26 (57.78)	19 (42.22)	45 (10.5)	1.095	0.030
Musculoskeletal	23 (39.66)	35 (60.34)	58 (13.5)	2.48	0.12
Cardiac or vascular diseases	15 (62.5)	9 (37.50)	24 (5.6)	1.5	0.22
General & unspecified	15 (19.74)	61 (80.26)	76 (17.7)	27.84	<0.001
Genitourinary diseases	9 (37.50)	15 (62.50)	24 (5.6)	1.5	0.22
Blood	8 (66.67)	4 (33.33)	12 (2.9)	0.75	0.39
Central nervous	5 (10.64)	42 (89.36)	47 (10.9)	29.13	<0.001
Obstetric or contraception	0 (0.0)	21 (100.0)	21 (4.9)	19.05	<0.001

Table 5: Reasons for attending the AED inappropriately

Reasons	Frequency	Percentage
Self-referral for quick attention	75	46.3
Inadequate medication stock at Health Centre	67	41.4
Check-ups given at AED are more comprehensive	53	32.7
Doctors at AED are more skilful and efficient	47	29.0
Perception that the illness is serious and should be given due attention at AED	33	20.4
Ignorance of the hospital setting	28	17.3
Friends of hospital staff	20	12.3
Referred by doctors to specialist	19	11.7
Referred by churches and others	15	9.3
Proximity of AED to residence	10	6.2

Note: Total number of patients more than 162 due to multiple responses.

The most common diagnoses based on ICPC chapters in this study were respiratory and endocrine/metabolic conditions. The occurrence of respiratory conditions as one of the most common problems among the inappropriately attending patients corroborates with previous studies.^{15,18} High blood pressure and atherosclerosis ranked first in China.¹⁹ This inappropriate utilisation of AED by these patients with respiratory diseases could be attributed to the impact of emotions in patients suffering from respiratory diseases.²⁰ Anxiety has also been associated with respiratory problems hence predisposing to urgent health-seeking behaviour and visit to the AED inappropriately.²¹ The preponderance of patients with endocrine/metabolic conditions among the inappropriate patients cannot be readily explained in this study. It is curious to note the absence of social and psychological problems among the diagnoses in this study. This corroborates with findings in previous studies.²² This could be explained by the fact that patients occasionally somatise their illness and express non-specific complaints, which would be classified under other organic ICPC chapters and rubrics.²² The teaching of the biopsychosocial model of patient care in medical schools as against the present biomedical model will create awareness of the presence of the psychosocial aspect of ill health among medical practitioners and thereby improve the search for social and psychological problems in patients.

Polyuria and glycosuria, retroviral infection, URTI and hypertension being the commonest diagnoses using the ICPC rubrics is a matter of serious concern in the environment of study. The change in lifestyle among the people resulting from affluence has made these problems very common. This implies that there should be intensification of health education to control them. The

prevalence of URTI is not surprising considering the degree of atmospheric pollution sequel to oil exploration, automobiles and electric power generators in the communities.

The reasons for inappropriate presentation to the AED in this study are similar to findings by other researchers.^{23,24} They include the need of quick attention, AED having better technical equipment, offering superior services, skillfulness of the doctors, to mention but a few. Patients need to be made aware that outpatient clinics are the first line clinics for minor cases where not many investigations will be required. Furthermore, patients need to be made aware that they can seek consultations the following day in outpatient clinics rather than going to the AED. Public education is therefore important.

Strengths and limitations of the study

The strength of this study lies in the fact that this is the first time this type of study has been conducted in the AED of the University of Port Harcourt Teaching Hospital. The results will provide a good insight into the level of inappropriate utilisation of its AED.

There are several limitations with this study warranting caution in the interpretation of the findings. The study was conducted over a short period of time using a sample size in comparison to the overall annual attendances and hence the results may not provide a true reflection of the reality. The study being performed in a single centre may not be generalisable to the other AEDs in different parts of the country. Furthermore, some health problems could not be classified and were thus included among the general and unspecified conditions.

Conclusions and recommendations

The level of inappropriate utilisation of the AED is very high in the University of Port Harcourt Teaching Hospital. This is caused by some misconceptions about the efficiency in the primary care system.

Curbing inappropriate utilisation of AED can be achieved using a three-pronged approach. These include education, improvement of primary care accessibility and locating primary care clinics in the AED or close to the AED.

The importance of education in the modification of health-seeking behaviour cannot be over emphasised. Michelin *et al.* in an evaluation of three educational interventions (health education, teaching patients how to use the health care system and providing counselling in social/emotional issues) reported a significant decrease in AED visits.²⁵ Bird *et al.* similarly reported a 20.8% reduction in AED visits after educating patients in aspects of self-management.²⁶ These reductions could be due to inappropriate users of the facilities seeking alternative sources of care such as primary health centres, community pharmacists and general practitioners. Considering the small population of physicians in Nigeria, educational intervention has to be the duty of all health care providers to avoid physicians being overwhelmed by the large number of patients.

Interventions to enhance primary care accessibility include opening new centres and services, or expanding access to existing services.²⁷ This will entail longer opening hours, increase in health care personnel and technical resources, deploying of primary care doctors to populations without this service and elimination of appointments.²⁸ This was confirmed by Sjonell *et al.*, who reported a 40% reduction in AED utilisation after a primary care centre was established and medical doctors were employed.²⁹

Co-locating primary care services near or within AEDs will curb inappropriate utilisation of the services. This enables patients to self-select for urgent primary care rather than attending the AED as it becomes easier to choose which service they feel is most appropriate, given that they have made the decision to seek health care urgently. This has been reported in a study by van Uden *et al.*, comparing attendance of the AED with a nearby primary care service and another one without such services, in which a difference of 35% was observed between them, with fewer patients attending the former.³⁰

We further recommend future multicentre research on this subject which will span a longer duration. This will include a nationally representative sample of patients attending A&E departments of all types to provide a further estimate of the percentage that inappropriately attend the AED and the reasons for such attendance. This study will provide generally accepted methods of curbing inappropriate use of AEDs.

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