Overcrowding of accident & emergency units: is it a growing concern in Nigeria?

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Abstract

Background: The inability of the Nigeria’s Accident and Emergency Departments (AED) to meet current demands is growing among the public and health care professionals. The data supporting perceptions of insufficient capacity are limited. Therefore, this study was intended to determine the prevalence, causes, and effects of overcrowding AEDs in Nigeria.

Materials and Methods: This was a cross sectional, descriptive study carried out among AED staff of 3 referral teaching hospitals in Nigeria, using a pre-tested and validated structured questionnaire.

Results: The analysis of the 267 AED staff revealed 20-56years (36.40±5.1 mean) age range. One hundred and twenty eight (47.9%) were males, 139 (52.1%) females. Two hundred and fifty nine (97%) agreed that an AED should have a bed capacity of 21-30. Agreement to AED overcrowding in Nigeria was quite considerable. The frequency of AED overcrowding per week was 4-7 times. The average bed occupancy level was 3.25. Agreed common causes of prolonged AED admissions were to be a high volume of critically ill patients, Delayed transfer of patients to the wards, delay in theatre operation, delay in radiological investigations and exceptionally high proportion of patients requiring admission in AED. Also, long pre-review waiting time and haematological delays were more causes. The average waiting time for victims to be seen was 29.7minutes.

Conclusion: There are many causes of AED overcrowding in this environment. However, improving AED bed management, better organized and diligent discharge planning, and reducing access block should be a priority to reduce AED overcrowding

Keywords: Overcrowding, accident, emergency surgery, Nigeria

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facts supporting perceptions of insufficient capacity are limited. This study determined the prevalence, causes, and effects of overcrowding in the AEDs in Nigeria.

Material and methods

Study design

This was a cross-sectional, descriptive study that was carried out among employees of AEDs in three major referral teaching hospitals of Nigeria. The research design consisted of a questionnaire distributed to the members of the Ahmadu Bello University Teaching Hospital Zaria, University of Benin Teaching Hospital Benin and University of Jos Teaching Hospital Jos.

Study Setting and Population

Ahmadu Bello University Teaching Hospital (ABUTH) Zaria was established in 1967. It was formerly known as the institute of health. The statue 15 of the university law (amendment act, schedule 16) by the then acting public services office of the former Nigerian Government established it. The main objective was to provide facilities for the training of doctors and other professionals allied to medicine, primarily for the then northern region. In 1976, the federal government took over all the teaching hospitals in the country including institute of health, Zaria. The institute of health was affiliated to Ahmadu Bello University Zaria. In 1985, the Ahmadu Bello University teaching hospital became legally and operationally separated from the University. It started with a casualty unit which was used to handle only trauma casualties but currently, it is operating as an Accident and Emergency Unit since November 2005. The hospital has a 500 bed capacity serving the North West region of Nigeria. The Accident & Emergency manages over 9,000 AED patients every year. It also provides necessary facilities for training of senior and intermediate level manpower for the health industry and spearheads research opportunities for lecturers in the University and other interested persons with local morbidity burden as research questions.

Jos University Teaching Hospital (JUTH) is a 500 bed tertiary hospital in Jos, the Plateau state capital in northern central Nigeria. JUTH provides a measure of emergency, inpatient and outpatient services. These include surgical, emergency/trauma, obstetrical, gynaecological, paediatric, psychiatric services, medical services and laboratory services.

All these are tertiary care academic medical centers in urban setting. The academic medical centers include both adult and pediatric AED's, and all subsequent discussion in this paper will pertain specifically to the adult and pediatric AED. The study period was defined as the six-month period lasting from September 1, 2010 to February 28, 2011. The first two months were used as the training period, and the last four months were used as the time of data collection. The local Institutional Review Board approved this research.

Data collection

Operational data was obtained from hospital databases; from staffing schedules of attending, residents, and nurses. The use of a structured questionnaire to determine the actual capacity of the AED, whether it can sometimes become crowded, how many time does it get crowded. The questionnaire also asked respondents to indicate their level of agreement with regards to common causes of AED overcrowding in the environment using likert scale from strongly agreed - strongly disagreed. Data was collected on levels of frustration by staff and patients and its outcomes on emergency medical care. AED overcrowding was defined for the purpose of this study as “all AED bed spaces (capacity) occupied but, in addition, have patients on floor, patients on couches, trolleys and wheelchair, full, waiting rooms, full hallways, acutely ill patients waiting >60 minutes to see a physician.

Bed occupancy level was defined as the number of patients in the treatment area divided by the number of licensed AED beds. This value may exceed 100% when patients are doubled in rooms or placed in a hallway.

Data preparation

All data was cleaned. Processing and simple analyses were performed with SSPS (version 17.5)

Results:

A total of 281 questionnaires [ABUTH:119(42.3%), UBTH:112 (39.9%), and JUTH: 50(17.8%)] were distributed to staff and residents on clinical rotation to accident & emergency departments of the three teaching hospitals that participated in the study. A total of fourteen questionnaires were not properly filled and so they were excluded leaving 267. Of these two hundred and sixty seven respondents, the following proportions were considered as valid responses from each center [ABUTH: 112(41.9%), UBTH: 108 (40.4%), and JUTH: 47(17.6%)].

The analysis of the 267 revealed an age range of respondents to be 20-56 (36.40±5.1 mean). One hundred and twenty eight (47.9%) were males while 139 (52.1%) were females. Part of the category of participatory professionals in the study included doctors and nurses (Figure 1).

Figure 1: The category of Professional among respondents

The majority of the respondents agreed that an AED should not exceed a bed capacity of 21-30 (figure 2).

Figure 2: The AED bed capacity
Ninety seven percent of the respondents agreed that overcrowding occurred in AEDs of the hospital studied. The frequency of AED overcrowding in a week was between 4-7 times (Figure 4).

It was noted that high level of critically ill patients in AED (56.6%), high proportion of patients requiring AED admissions (53.2%), insufficient AED space (51.7%) are also known causes of prolonged AED admissions as agreed by the respondents. The average waiting time for victims to be seen was 29.7 minutes. Common causes (table 2) of long waiting period were also noted.

<table>
<thead>
<tr>
<th>S/No</th>
<th>Cause</th>
<th>Value</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Delay theater operations</td>
<td>34</td>
<td>12.3</td>
</tr>
<tr>
<td>2</td>
<td>Delay transfers of patients to wards</td>
<td>57</td>
<td>21.3</td>
</tr>
<tr>
<td>3</td>
<td>Delay in haematological investigations</td>
<td>29</td>
<td>10.8</td>
</tr>
<tr>
<td>4</td>
<td>Long pre-review waiting period</td>
<td>24</td>
<td>9.0</td>
</tr>
<tr>
<td>5</td>
<td>Delay in radiological investigations</td>
<td>32</td>
<td>12.0</td>
</tr>
<tr>
<td>6</td>
<td>Poverty</td>
<td>21</td>
<td>8.0</td>
</tr>
<tr>
<td>7</td>
<td>Absent community health officers</td>
<td>27</td>
<td>10.1</td>
</tr>
<tr>
<td>8</td>
<td>High burden of road traffic accident</td>
<td>39</td>
<td>14.6</td>
</tr>
<tr>
<td>9</td>
<td>others</td>
<td>5</td>
<td>1.9</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>267</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Causes of poor outcome of care in an overcrowded accident and emergency department are as listed in (table 3).
Table 3: Common causes of poor outcome of patients’ management in AEDs

<table>
<thead>
<tr>
<th>S/No</th>
<th>Cause</th>
<th>Value</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Insufficient/faulty monitoring devices</td>
<td>54</td>
<td>20.2</td>
</tr>
<tr>
<td>2</td>
<td>Theater delays</td>
<td>80</td>
<td>30.0</td>
</tr>
<tr>
<td>3</td>
<td>Radiological delays</td>
<td>36</td>
<td>13.5</td>
</tr>
<tr>
<td>4</td>
<td>Haematological delays</td>
<td>34</td>
<td>12.7</td>
</tr>
<tr>
<td>5</td>
<td>AED personnel fatigue</td>
<td>55</td>
<td>20.6</td>
</tr>
<tr>
<td>6</td>
<td>others</td>
<td>8</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>267</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Diversion of patients (figure 5) to privately owned clinics was not so a major concern of AED overcrowding in this environment.

Figure 5: Diversion of patients away from AED

Discussion

The potential dangers of AED overcrowding have recently gathered national and international attention including the United States. Although no specific definition exists, AED overcrowding refers to an extreme excess of patients in the treatment areas, exceeding AED capacity and often necessitating medical care to be provided in AED hallways and other makeshift assessment areas. According to a 2002 national US estimate, more than 90% of large hospitals report AEDs operating “at” or “over” capacity. Manifestations of AED overcrowding include (1) “boarding” of patients in the AED, (2) increased risk of medical errors, (3) ambulancé diversion, (4) threat to disaster preparedness, and (5) eroding reliability of the emergency care system. The AED is neither designed nor equipped to provide longitudinal care. In our study, high level of critically ill patients in AED, high proportion of patients requiring AED admissions, insufficient AED space, are also known causes of prolonged AED admissions as agreed by the respondents. Delay in undergoing radiological investigations were due primarily to non availability of personnel on duties, faulty x-ray and/or ultrasonad machines, faulty CT and/or MRI machines and non availability of electric power supply. Common morbidities and mortality from floor patients resulted from poor monitoring, dislodged nasal prungs and face mask. Overcrowding of AED is considered to be a major cause of poor outcome of patient’s management. Therefore, it is important to note that under staffed AED cannot provide adequate or critical care to severely ill patient. Surely, in this circumstance, even to give an undivided attention over a long time will lead to fatigue and this may compromise patients’ safety. Furthermore, management of these patients may be so labour intensive that staff in the accident and emergency may hardly pay attention to other AED patients due to fatigue.

Regardless of the proficiency of the AED staff, AED overcrowding is a prime example of a complex problem creating a high risk environment for medical errors and threatening patient safety. Timely emergency care is often predicted on speedy ambulance transportation of victims thus, diverting first to an inappropriate hospital due to lack of space in an overcrowded AED may endanger patients by delaying appropriate treatment. The inability to get a free AED will also delay first responders/EMS team in returning to duty and responding to other emergency calls. In effect, ambulance diversion endangers anyone who could potentially depend on fast response time. Overcrowded AEDs would be ill equipped to handle mass casualty victims in a disaster scenario. As AED utilization continues to increase, there is substantial concern that Nigeria AEDs will not be able to meet the growing demand for emergency services. The current resources supporting emergency care are insufficient to meet the needs of all patients at all times. AED capacities has been stretched to such an extent that the quality of emergency care is reportedly eroding, and reliability of the entire emergency care system in the US has been called into question. In this study, we found a similar result AED capacities have been over stretched to the extent that the quality of emergency care in Nigeria is not prompt and regular.

In the past, AED overcrowding was attributed to improper use of the AED by a large volume of non-urgent patients. In fact, the total number of AED visits has been reported to have poorly correlated with AED overcrowding. The notion that non-urgent patients are the leading cause of the AED overcrowding crisis has now been abandoned and include (1) inadequate inpatient capacity, (2) higher severity of illness, and (3) hospital system restructuring. An aging population and increasing prevalence of high complexity medical problems have increased the severity of illness among AED patients, and this has become a key determinant of AED overcrowding. For example, the number of critically ill patients presenting to California AEDs from 1990 to 1999 increased by 50%. This sudden increase in critical patients, coupled with a markedly decreased inpatient capacity, forces AEDs to serve as “pseudo-ICUs”. In many parts of the world, AED overcrowding has been reported to be linked to poor inpatient bed availability in the Florida (US), United Kingdom and Australia, and has been recognized as a “global indicator of health care system failure”. Also, long AED admissions, long waiting times as previously reported are known causative factors of AED overcrowding. In developing countries, other causes of AED overcrowding, in addition to the above, have been noted to be poorly functioning National health insurance scheme, extreme poverty with absolute lack of money to pay for medical services. Hence, even those patients that are discharged in the AED ward may not pay and leave.

There is no organized trauma or emergency systems to appropriately direct patients to ED. In addition, due to the abundant poverty and ignorance, a lot of patients often present late to the AED, frequently with complications. There is also a failure of supporting health facilities such as the secondary health care and private establishments resulting in overcrowding of the tertiary hospitals AEDs. Potential solutions for AED overcrowding may affect health care delivery to the emergency department patients internationally. Any threat to the integrity of the emergency care system constitutes a public health emergency. Special measures to strengthen AED infrastructure must be taken.

The recommendations include (1) planning for delivery of care to patients who must be placed in temporary bed locations, (2) coordination with long term health
AED overcrowding threatens public health by compromising patient safety and jeopardising the reliability of the entire US emergency care system. AED overcrowding is an indication of health care system failure on many levels. The main cause of AED overcrowding is a failure to ensure adequate inpatient capacity for an AED population with increasing severity of illness. Alleviating the overcrowding crisis will require a multidisciplinary system-wide approach.

AED overcrowding has been a difficult problem deeply rooted in “issues related to inpatient capacity, inadequacy of alternatives for hospitalization, and hospital resource shortages.” Frustrations of staff and patients are enormous. In our study, outcome of patients who have expressed dissatisfaction revealed, will not come back at all, may come back if the need arises, will always come back. Outcome of frustration expressed by the AED personnel revealed. Work not appealing, Need motivator, still dissatisfaction revealed, will not come back at all, may come back.

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