



Overcrowding in an Emergency Department of a Referral Centre in Nigeria: A Study of National Orthopaedic Hospital, Igbobi, Lagos

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Authors' contributions

This work was carried out in collaboration between all authors. Authors IEC, NEI and BMR conceived and designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors OOR and MID managed the analyses of the study. Author IEC managed the literature searches. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJMAH/2017/37303

Editor(s):

(1) Nicolas Padilla-Raygoza, Department of Nursing and Obstetrics, Division of Health Sciences and Engineering, Campus Celaya Salvatierra, Mexico.

Reviewers:

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(2) Ali Kemal Erenler, Hitit University Çorum Education and Research Hospital, Turkey.

(3) Poobalan Naidoo, South Africa.

Complete Peer review History: <http://www.sciencedomain.org/review-history/21852>

Original Research Article

Received 10th October 2017
Accepted 1st November 2017
Published 10th November 2017

ABSTRACT

Background: An emergency department (ED) is where acute cases report and require urgent and intensive care. The ED of National Orthopaedic Hospital, Igbobi, Lagos is constantly overcrowded and may be impacting the nursing care that is provided in the unit.

Objective: To identify triggers to ED overcrowding in the study hospital and determine influence of

overcrowding in nursing care of patients.

Methods: In this cross-sectional study, all the thirty nurses working in ED participated in the survey. A self-administered questionnaire was used to collect quantitative data and Focus Group Discussion (FGD) was employed for qualitative data. The questionnaire was administered to thirty nurses and 100% return rate was achieved. Data was analysed using IBM SPSS Statistics 20 and relative importance index (RII) and its ranking (R) was used to establish the relative importance of the various triggers identified as responsible for overcrowding.

Results: Result revealed severe cases managed in ED (76.7%), patients stay longer than expected in the ED (80.0%), lack of space (76.7%), lack of ED equipment e.g. stretchers (73.3%), insufficient beds in the ED (66.7%), heavy patient inflow and the hospital policy of not rejecting patients, and patients' delay in accomplishing their laboratory investigations as triggers of ED overcrowding. The study participants identified increased nurse workload (RII=0.880; R=1), strain in nurse and patients' relations relationship (RII=0.75= 2.0) and long patient wait (RII=0.747; R=3.0) as three most outstanding influence of overcrowding.

Conclusion: The obvious overcrowding in this ED is triggered by the chronic and non-emergency cases accessing the ED, as well as limited bed space which further drives overcrowding increasing nurse work load, frustration and lack of cooperation by the patients.

Keywords: Emergency department; triggers, overcrowding; influence; nursing care; patient.

1. INTRODUCTION

Overcrowding in emergency centres is a worldwide concern and triggers crisis that may affect access to health care and the quality of services [1]. Despite the empirical evidence that suggests that emergency department (ED) overcrowding is a well-researched area, there is no universally acceptable definition or measurement of ED overcrowding [1,2].

ED overcrowding is a situation in which the emergency department function is impeded primarily because the number of patients waiting to be attended to, undergoing assessment and treatment or waiting for departure exceeds the physical or staffing capacity of the emergency department. [2,3] ED overcrowding was also defined as a situation in which demand for emergency services exceeds the ability of a department to provide quality care within acceptable time frames [4,5].

Caring is at the root of nursing and working within an overcrowded ED can compromise this value. This can evoke distress associated with painful feelings and a disequilibrium that occurs when one knows the appropriate action to be taken but is unable to carry it out due to barriers. This type of distress is known as moral distress [6].

Recognizing the influence of overcrowding in providing nursing care to patients in ED will help in developing strategy for coping with or to prevent overcrowding and expectations required

of the nurse, the hospital management and the patient. With ED overcrowding, nurses are saddled with the responsibilities of providing care to patients in an environment with restricted or diminishing resources [7]. Increased workload in a demanding ED with increased patient presentations and limited resources may lead to consequential adverse effects [8].

ED overcrowding is a critical problem causing increased mortality affecting more than 114 million patients annually in the United States [9]. In Africa, statistics show that 56% deaths occurred due to ED overcrowding [8,10]. In Nigeria, almost 60% of increased mortality occurred in children and elderly emergencies [11]. In Lagos, precisely in Lagos State University Teaching Hospital (LASUTH), it was discovered that patients admitted to the hospital during high ED overcrowding times had five percent greater risk of inpatient death than similar patients admitted to the same hospital when there was less overcrowding [12].

Some authors posit that the causes of overcrowding are complex and multifactorial [13]. In a descriptive analysis of ED overcrowding in a hospital in Kigali, Rwanda, the triggers of emergency centre overcrowding were grouped into; those associated with community level services, those associated with the emergency centre and those associated with in-patient and emergency centre support services [14]. Similarly, in a systematic review on the causes and effects of overcrowded ED, Hoot and Aronsky reviewed 93 articles and categorized the

causes of ED crowding as those that interfered with input, through put and output factors [13].

The questions the researchers intend to find answers to are: What are the triggers of overcrowding in the focus care ED? What influence do they have on patient care? How can these be resolved? These informed the decision to undertake this study.

1.1 Significance of the Study

The findings of this study will show the triggers and influence of ED overcrowding on nursing care. This will be the evidence the nurses can use to demand for more staff for the ED. If this is achieved, there will be enough nurses in the ED to provide the necessary, prompt quality nursing care that is appropriately targeted thus reducing the morbidity and mortality that are associated with delay and poor nursing care. The study will also add to the existing knowledge and provide a reference for other researchers in the problem area.

2. METHODOLOGY

The descriptive cross sectional design which included a triangulation approach that combined qualitative and quantitative methods of data collection was adopted for the study. The study population consists of thirty registered nurses working in the ED of a tertiary health facility in Lagos, South West of Nigeria. The inclusion criteria include: must be a registered nurse and working in the ED of the health facility.

The instruments for data collection were a self-administered questionnaire and a focus group discussion guide. The questionnaire consisted of 41 questions arranged in two sections, A and B. Questions in section A, sought to generate demographic data while those in section B addressed the objectives of the study. The questionnaire was designed from previous studies reviewed in this work [8]. The items that sought to measure the influence of overcrowding on nursing care were presented on a likert scale coded Strongly agree = 5, Agree = 4, Neutral= 3, Disagree=2, Strongly Disagree=1.

The focused group discussion guide consisted of 5 open ended questions that sought to elicit responses from the nurses on triggers of overcrowding and perceived solutions to ED overcrowding. The data from the questionnaire yielded a Cronbach Alpha coefficient of 0.81, the

instrument was therefore considered reliable. The content validity of the instrument was established by experts in emergency care who checked them for coverage of the objectives of the study.

Ethical approval to conduct the study was obtained from the Health, Research and Ethics committee of the care facility. Participants were informed of the objectives and purpose of the study, and written informed consent obtained before completing the questionnaire.

Two trained research assistants, with a degree in nursing sciences assisted in data collection.

Eight nurses that were on duty participated in the focus group discussion which was anchored by 2 of the researchers and a tape recorder was used to record the responses. Data was collected between July and August 2014.

Data collected was analysed using IBM SPSS Statistics 20. The relative importance index (RII) was used to establish the relative importance of the various triggers identified as responsible for overcrowding. The score for each trigger was calculated by summing up the scores given to it by the respondents. The RII was used to rank (R) the different triggers of overcrowding. The ranking made it possible to cross-compare the relative importance of the triggers as perceived by the respondents. Each RII as perceived by all respondents were used to assess the general and overall rankings in order to give an overall picture of the triggers of overcrowding and which has more influence on the nursing care of patients.

The relative importance index was computed as: [15]

$$RII = \frac{\sum W}{(A \cdot N)}$$

Where,

W=weight given to each factor by the respondents and ranges from 1 to 5

A= the highest weight=5

N= the population size

The responses of the FGD were transcribed and using a thematic analysis the themes were patterned across data set that are important to the description of phenomenon that were associated to specific research objectives [16].

3. RESULTS

The mean age of respondents was 34.7 ± 11.1 years with a range of 23-58 years. A little over 46% of the respondents were between 20-29 years. They were predominantly female (86.7%). More than half (60.0%) were trained accident and emergency (A&E) nurses while 40.0% were trained Orthopaedic nurses. The mean length of service was 10.5 ± 9.0 years with majority of the respondents having served between 1-10 years (Table 1).

The following triggers were identified as responsible for overcrowding in ED due to underutilization of health services at the community; severe cases accessing ED (76.7%), increase in complex cases and elderly patients who are not emergency cases accessing the ED (66.7%), large volume of patients who did not go through the referral system (50.0%), large volume of patients who are not emergency cases (46.7%), cases that are not orthopaedic or trauma cases like medical and Obstetrics & Gynaecology (O&G) cases accessing ED (40.0%) [Fig. 1].

Majority of the respondents acknowledged the following as triggers responsible for overcrowding within the ED; admitted patients stay longer than expected in the ED (80.0%), limited space in the ED (76.7%), inadequate ED equipment to use like stretchers (73.3%), insufficient care beds in ED (66.7%) inadequate trained ED doctors on duty (56.7), and inadequate number of experienced ED nurses on duty (53.3%) [Table 2].

Fig. 2 shows the following as perceived support services related triggers to ED overcrowding: delay in receiving laboratory services (43.3%) and radiological delay (33.3%) [Fig. 2].

The study participants identified increased nursing workload (RII=0.880; R=1), Strain in nurse and patients' relations relationship (RII=0.753; R= 2.0) and long patient wait (RII=0.747; R=3.0) as three most important influence of overcrowding in the nursing care of patients. Other identified influences of overcrowding on nursing care of patients are inaccurate or hurried assessment (RII=0.740, R=4.0) and Omission of some patients' care (RII=0.687; R=5.5) [Table 3].

Table 1. Socio-demographics characteristics of study participants

Characteristics	Frequency(N=30)	Percentage
Age(years)		
20-29	14	46.7
30-39	7	23.3
40-49	3	10.0
50-59	6	20.0
Mean	34.7 ± 11.1	
Gender		
Male	4	13.3
Female	26	86.7
Rank		
Nursing Officer II	6	20.0
Nursing Officer I	4	13.3
Senior Nursing Officer	4	13.3
Principal Nursing Officer	3	10.0
Assistant Chief Nursing Officer	3	10.0
Chief Nursing Officer	8	26.7
Assistant director of nursing	2	6.7
Specialty		
Orthopaedic nursing	12	40.0
A&E	18	60.0
Year of service		
1-10	20	66.7
11-20	4	13.3
21-30	6	20.0
Total	30	100.0
Mean	10.5 ± 9.0	

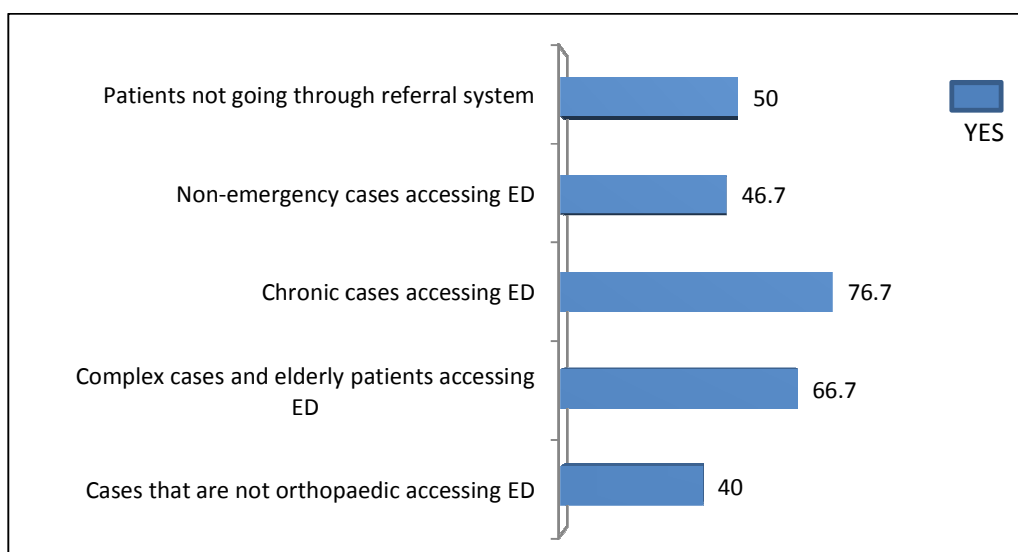


Fig. 1. Patient related triggers

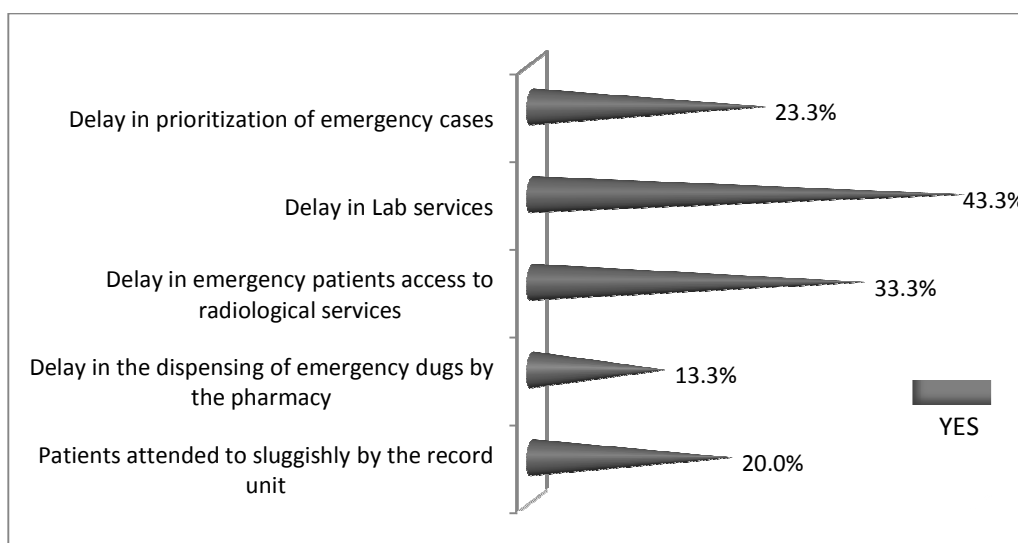


Fig. 2. Support services related triggers to ED overcrowding

Table 2. Facility related triggers

Which of these are responsible for overcrowding within the ED	Yes N(%)	No N(%)
Insufficient care beds in ED	20(66.7)	10(33.3)
Limited space in the ED	23(76.7)	7(23.3)
Admitted patients stay longer than expected in the ED	24(80.0)	6(20.0)
Urgent cases not prioritized appropriately in the ED	1(3.3)	29(96.7)
Inadequate number of experienced ED nurses on duty	16(53.3)	14(46.7)
Excessive numbers of non-urgent investigations requested e,g Biopsy	13(43.3)	17(56.7)
Doctors take long time to complete consultation on patients	8(26.7)	22(73.3)
Inadequate ED equipment to use like stretchers	22(73.3)	8(26.7)
Ineffective triage system in the ED	9(30.0)	21(70.0)
Inadequate trained ED doctors on duty	17(56.7)	13(43.3)

Table 3. Influence of overcrowding on nursing care of patients

Overcrowding in the ED may lead to	SA N(%)	A N(%)	N N(%)	D N(%)	SD N(%)	RII	R
Too much time spent with individual patients	5(16.7)	12(40.0)	4(13.3)	5(16.7)	4(13.3)	.660	9.5
Increased nursing workload	18(60.0)	10(33.3)	0(0.0)	0(0.0)	2(6.7)	.880	1.0
Inaccurate or hurried assessment	10(33.3)	9(30.0)	4(13.3)	6(20.0)	1(3.3)	.740	4.0
Effective communication and patient education	7(23.3)	13(43.3)	0(0.0)	6(20.0)	4(13.3)	.687	5.5
Omission of some patients care	5(16.7)	15(50.0)	1(3.3)	6(20.0)	3(10.0)	.687	5.5
Delay in transfer of patient	4(13.3)	9(30.0)	6(20.0)	6(20.0)	5(16.7)	.607	12.0
Medication errors	3(10.0)	12(40.0)	3(10.0)	6(20.0)	6(20.0)	.600	13.0
Strain in nurse and patients' relations relationship	4(13.3)	18(60.0)	5(16.7)	3(10.0)	0(0.0)	.753	2.0
Inter professional clashes	3(10.0)	15(50.0)	5(16.7)	4(13.3)	3(10.0)	.673	7.5
Defective documentation	4(13.3)	13(43.3)	4(13.3)	6(20.0)	3(10.0)	.660	9.5
Strain in nurse patient relationship	5(16.7)	13(43.3)	2(6.7)	8(26.7)	2(6.7)	.673	7.5
Increase patient suffering and pain	6(20.0)	9(30.0)	4(13.3)	5(16.7)	6(20.0)	.627	11.0
Increase patient morbidity and mortality	4(13.3)	7(23.3)	5(16.7)	10(33.3)	4(13.3)	.580	15.0
Long waiting time	9(30.0)	12(40.0)	4(13.3)	2(6.7)	3(10.0)	.747	3.0
Delay in discharge	3(10.0)	9(30.0)	4(13.3)	12(40.0)	2(6.7)	.593	14.0

Key: SA-Strongly Agree, A- Agree, N-Neutral, D-Disagree, SD- Strongly Disagree
RII=relative importance index; R = Rank

4. FOCUS GROUP DISCUSSION (FGD) RESULTS

in the affirmative. Here is an excerpt of one of the nurses:

4.1 Thematic Analysis

Yes, there is overcrowding in the ED because when the ED is in its full section, the beds are not enough to accommodate all patients whether infected or not.

4.1.1 Theme 1: Meaning of overcrowding

The result shows that the participants viewed ED overcrowding from different perspectives. This can be seen from the following excerpts:

ED overcrowding is when the ED is filled up with patient and there are more cases waiting to be admitted.

ED overcrowding is when the bed spaces are less than 15 meters apart just as we have here.

When there are infectious cases and there is no space to barrier nurse them.

When the ED is small and there are not enough couches to admit other cases.

4.1.2 Theme 2: Perception of existence of overcrowding in the ED

When the nurses were asked from their views if ED overcrowding exists in their unit, they replied

4.1.3 Theme 3: Perceived triggers to ED overcrowding

A further probe on the triggers of overcrowding in the ED of this facility elicited the following responses from the nurses:

The Hospital is a special centre for trauma and fracture so a lot of cases are brought to this centre. (So its peculiar nature of being a special and referral centre).

The ED is the cheapest, so other health facility like LASUTH refers patients to this hospital.

The hospital does not reject any patient even when there is not enough space, but must first take patient in, stabilize them, administer first aid, before referring.

Delay in patients doing their investigation due to lack of finance, this in turn delays

diagnosis and treatment, occupying bed space, causing overcrowding.

Patients coming straight from accident scene.

No enough equipment and it delays work.

4.1.4 Theme 4: Perceived influence of ED overcrowding on nursing care

The nurses when asked how overcrowding influences their nursing care responded:

Overcrowding makes it difficult for nurse to administer care.

In this ED, three nurses are on duty in each shift managing so many patients and this leads to ineffective care.

Patients have wrong impression that they did not receive adequate care and have bad image about the hospital.

Even when they get to the wards, they will not cooperate with the nurses because they feel they were not treated well in the ED.

Some of them take to smoking and drinking due to frustration while still on admission.

4.1.5 Theme 5: Perceived solution to ED overcrowding

Again probing the nurses' view on how ED overcrowding in the hospital could be solved elicited these responses:

Increase in staff strength, the hospital management should as a matter of urgency employ more nurses and doctors to help the situation. For expanding the ED though very important but may take longer time.

Patients should pay pre-admission into casualty to reduce patients waiting to be evacuated before another patient could be admitted because when they are stabilized, they will not be willing to make payment early

Prompt review of patients by the Doctors on call, so that patients can go in for any procedure reducing the workload.

ED Doctors should be available at the casualty more often not only when they are on rounds.

Build a bigger ED- Expand the ED so that there can be space for fresh cases, cold cases and older cases

The ED should specifically be for fresh cases instead of a unit for all cases. This will reduce the workload on the Nurses.

There should be prompt referral of medical cases and other non-trauma cases because these medical cases occupy the limited beds for some days preventing new cases from getting bed space.

The hospital to provide more equipment for investigations to facilitate faster result and diagnosis like sphygmomanometer.

Sourcing of Nurses from less busy wards or units, but this is a slim relieve because there might not even be a less busy ward.

5. DISCUSSION

Findings from the study showed acceptance in the ED of non- emergency cases, limited space in the ED, keeping patients longer than expected in the ED, delay in support services like laboratory investigations and supply of emergency drugs as major triggers to ED overcrowding. These conditions result in presence of more cases than the unit can accommodate and cope with. This finding is in line with the finding in the descriptive analysis of ED overcrowding in a selected hospital in Kigali, Rwanda which showed acceptance in the ED of chronic cases as a trigger for overcrowding [8]. However, it differs from the finding of the 2007 study in Rwanda on injury profile in the ED which showed minor injuries as major triggers of ED overcrowding [17].

The consequences of poor referral system as observed in Nigeria and other African countries is that national hospitals are flooded with patients that should have been treated in primary and secondary level hospitals. Findings from this study revealed that poor referral system, on-orthopaedic or trauma like medical cases (66.7%) accessed the ED triggering overcrowding in the ED. This finding is similar, although lower to what was observed in a Rwanda study of 2014 where the majority (90%) of the respondents acknowledged that overcrowding was caused by poor referral system [8].

The situation of non-urgent cases overcrowding the ED is not unique to Nigeria; a similar observation was made in a Rwanda study where (95%) of the respondents acknowledged that large volume of patients who are not emergency cases contributed to overcrowding [8]. A systematic review of ED crowding: causes, effects and solutions reflected similar findings [7]. Similar concern was also raised in an emergency center survey on utilization and overcrowding of hospital emergency in the New York City where 43% of the cases were non-emergency cases [18].

Overcrowding may be expected in Nigerian hospitals due to problems experienced in the health system with a rapidly growing population. Most of the hospitals lack adequate personnel and equipment to work with, competing space and dilapidated structures. The results of this study revealed insufficient ED equipment to use like stretchers, insufficient care beds in ED as triggers of overcrowding within the ED. This finding is in line with that observed in the Rwanda study [8].

The Canadian Association of Emergency Physician stated that proper functioning of the emergency centre depends on having appropriate space and suitably qualified staff that match the volume and nature of emergency patients [19]. Lack of resources to use, inefficiencies and lack of prompt responses to patients could further drive overcrowding in an ED. Yet in this study, the respondents identified lack of trained ED doctors on duty, and lack of experienced ED nurses on duty, as triggers to ED crowding. However, in a study on the effect of ED expansion on ED overcrowding, the researchers cautioned that although hospitals may attempt to address overcrowding by expanding the ED, and increasing the numbers of emergency beds, that it may be an insufficient solution if other bottle necks in the health system were not addressed [20,21].

The findings of the FGD revealed that; the hospital being a special centre for trauma and fracture and with only three of its kind in the nation attracts a lot of cases, the hospital ED is affordable hence other hospitals refer patients to this centre, the ED treat patients coming straight from accident scene, the hospital does not reject any patient even when there is not enough space and obvious cases where patient cannot pay bills, these in turn delays diagnosis and

treatments, occupying limited bed space, driving further overcrowding. This is in line with a Netherland study on ED overcrowding where laboratory delay was identified as trigger to ED overcrowding [22].

The study participants identified increased nursing workload (RII=0.880; R=1), Strain in nurse and patients' relations relationship (RII=0.753; R= 2.0) and long patient wait (RII=0.747; R=3.0) as three most important influence of overcrowding in the nursing care of patients. This is in consonance with a Canada study where majority (80%) of the respondents identified increased stress on nurses as an influence of overcrowding. [23] Increase nursing workload ranking first indicate a prompt need to increase the staff strength to avoid inefficiencies that might result from such strain. Findings from the FGD revealed insufficient staff strength going by World Health Organization recommendation of 1 nurse to 4 patients drives further overcrowding [24]. The implication is that there are so many patients as compared to the Nurses' strength which leads to increase nurse workload [25].

Other influence of overcrowding in nursing care of patients as identified by the respondents were inaccurate or hurried assessment (RII=0.740, R=4.0) and omission of some patients care (RII=0.687; R=5.5) which is in consonance with a USA study which revealed that overcrowding results in errors of omission by the nurses [3,26].

Findings from the FGD revealed that; immediate increase in man power, prompt review of patients by the doctor on call, availability of ED doctors at the casualty, immediate referral of non-trauma cases, expansion of ED to accommodate fresh cases, provision of space and separate units for cold and fresh cases were possible solutions to overcrowding in the ED. They also perceived that increasing staff strength by sourcing for Nurses from less busy wards or units to argument the nurses in the ED may provide temporal relief. A similar study among Dutch health workers showed that decreasing the number of patients whose cases are minor and not urgent will save time and decrease the crowding [16]. In contrast, a study on the effect of emergency department expansion on emergency department overcrowding revealed that expanding the ED and effort expended on directing patients away from the emergency department once they have arrived is rarely worthwhile [22].

6. LIMITATION OF THE STUDY

- A limitation to this study was the sample size, which may affect generalization of these findings.
- The nurse's opinion that was evaluated thus may be subject to bias.

7. CONCLUSION

The major triggers of ED overcrowding as identified in this study are chronic cases accessing the ED (76.7%), non-urgent and trauma cases (66.7%), length of stay of admitted patient in the ED (80.0%), and limited bed space (66.7%). Some of these triggers may lead to increased nurse workload, strain on the nurse-patients relations relationship, with consequential patients' suffering, ineffective care, frustration and lack of cooperation by the patients as well as making the patients have a wrong impression about the hospital.

CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the authors.

ETHICAL APPROVAL

As per international standard or university standard, written approval of Ethics committee has been collected and preserved by the authors.

ACKNOWLEDGEMENTS

The authors wish to acknowledge the support provided by Oseni Magaret and Akinola Mary with data collection during the focus group discussion, and Abolarin Thaddeus Olatunbosun for transcribing the data. We also appreciate the management of National Orthopaedic Hospital Igbobi Lagos, Nigeria for their approval for this study.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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