Assessment of Daily Burden and Factors for Overcrowded Emergency Department at Tertiary Care Hospital of Karachi

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Authors’ contributions

This work was carried out in collaboration among all authors. The concept of study, data analysis, drafting and finalizing of the results were done by author AF. The article was critically reviewed and finally drafted by author FA. Finally reviewed and approved by authors AZ and AF. All authors read and approved the final manuscript.

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ABSTRACT

Background: When in emergency room there is no enough area left to serve or to admit the subsequent sick patients who may require urgent attention and observation the setting is called as the overcrowded emergency room. Due to overcrowded emergency department the quality of services provided by the staff and doctors is compromised ultimately patients with severe diseases are ignored and this may be one of the causes for causalities.

Objective: To assess the daily burden and factors responsible for overcrowding at emergency department of tertiary care hospital of Karachi.

Methodology: It was a cross sectional study conducted at tertiary care hospital of Karachi from October 2020 to January 2021. Data of patients coming to adult emergency department of either gender were collected. Patients age <14 were excluded as these were referred to pediatric emergency department. Data collection was done according to Canadian emergency department triage and acuity scale (CTAS).

Results: Total number (N) of patients who visited emergency department in study duration was
13434. The mean number of patients who visited ED was 141±13 during our study duration. There was no any significant difference in presenting complaint. Delay in investigations was found to be a reason of prolong stay and overcrowding in ED in our setting.

**Conclusion:** Overcrowding of patients in our ED of our setting was a common problem. The number of staff, doctors and beds were not matching the number of patient flow in the department. The main reason of prolong stay in ED was delay in investigations.

Keywords: Factors; overcrowding; emergency department; Karachi.

1. INTRODUCTION

When in emergency room there is no enough area left to serve or to admit the subsequent sick patients who may require urgent attention and observation the setting is called overcrowded emergency room [1]. It is a matter of concern across the globe and if not dealt properly it may result in serious issues such as loss of any life [2]. Prolong waiting due to overcrowded emergency room may put someone’s life in danger and it also affects the credibility of the doctor and staff along with that also put a question mark on the services provided by the hospital [3-4].

In literature the documented reasons for overcrowded emergency room are large population size in different cities and shortage of hospitals, delay in the results of investigation of people and deficient investigation tools [5-6]. It was highlighted by Rose et., al. that one of the reasons behind overcrowded emergency room also could be the deficiency of supporting staff such as nurses [7]. As a consequence of overcrowded emergency room researchers have investigated that the quality of services provided by the staff is compromised ultimately patients with severe diseases are ignored and this may be one of the cause for casualities [8-9]. Increase in number of medication error are also found to be associated with rush in emergency room [10].

Hurry in emergency room not only affects the care of patients it also causes stress and anxiety among medical staff [11]. “The assignment of degrees of urgency to wounds or illnesses to decide the order of treatment of a large number of patients or casualties is termed as TRIAGE”.

By following this methodology, we can manage the overburden in emergency room [12]. In our country due to lack of basic facilities and trained staff the triage is performed by paramedical staff [13]. Due to less accuracy more severe patients do not get space in emergency room for initiation of treatment. So identification of basic problem behind the jam packed emergency room is essential to serve quality of services on time. To assess the daily burden and factors responsible for overcrowding at emergency department of tertiary care hospital of Karachi.

2. MATERIALS AND METHODS

It was a cross sectional study conducted at tertiary care hospital of Karachi from October 2020 to January 2021. Data of patients coming to adult emergency department of either gender were collected. Patients age <14 were excluded as these were referred to pediatric emergency department. Data collection was done according to Canadian emergency department triage and acuity scale (CTAS) [14]. The Canadian triage and acuity scale is world-wide used tool order to classify patients coming to emergency room. There are five levels of Canadian emergency department triage and acuity scale which includes resuscitation (LEVEL I), emergent (LEVEL II), urgent (LEVEL III), less urgent (LEVEL IV), non-urgent (LEVEL V) [15]. We sub classify the patients according to clinical conditions such as cardiovascular, neurological, trauma, gynecological, genitourinary, gastrointestinal and other disorders i.e. patients who need investigations while their stay in ED.

Data was analyzed by SPSS version 20. Anova was applied as test of significance at 95% confidence interval p<0.05 will be considered as significant. All other variables are reported as mean and SD.

3. RESULTS

We conducted the study for three months, During the study duration the total number of beds, Doctors, staff, and their duty shifts were recorded the data is presented in Table 1.

Total number (N) of patients who visited emergency department in study duration was 13434. The mean number of patients who visited ED was 141±13. Highest number of patients was reported in triage 5 i.e. 3818 in 95 days.
However, 2301 patients with cardiovascular complaints were reported in emergency department during the study. There was no any significance in number of patients in receiving TRIAGE level I, II, IV and V or with different presenting complaints. Table 2. Describes the total number and mean patient flow per day along with the presenting complaints of patients.

After initial management of reported patients at emergency department they were either discharged or referred to the specific unit for further investigation and management. Table 3 shows the number of patients admitted, discharged or shifted to specific wards. Furthermore, the maximum time spent in ED was 3-4 hours/patient, delay in investigation report was the major issue for 3-4 hours stay.

4. DISCUSSION

Emergency department faces many issues in delivering quality services in available resources. When ED does not significantly match with the demand of patients at available resources crowding occur [16]. In our study we observed that mean patient flow per day was 141 ± 13, delivering quality services to this number of patients with limited resources i.e. 12 staff, 6 doctors and 17 beds was difficult and one of the reason of jam-packed ED. Similar to our findings Salway et., al. in 2017 reported that when there is mismatch between need and resources capacity problems arise that lead to overcrowding [17]. Number of allotted staff and doctors is one of the key factor in managing the

<table>
<thead>
<tr>
<th>Presenting Unit/Complaint</th>
<th>Total number of patients in 95 days</th>
<th>Mean ± SD per day Patient flow</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRIAGE 1</td>
<td>1237</td>
<td>13 ± 4</td>
<td></td>
</tr>
<tr>
<td>TRIAGE 2</td>
<td>2343</td>
<td>24 ± 7</td>
<td></td>
</tr>
<tr>
<td>TRIAGE 3</td>
<td>3137</td>
<td>33 ± 11</td>
<td>0.344</td>
</tr>
<tr>
<td>TRIAGE 4</td>
<td>2840</td>
<td>29 ± 11</td>
<td></td>
</tr>
<tr>
<td>TRIAGE 5</td>
<td>3818</td>
<td>40 ± 11</td>
<td></td>
</tr>
<tr>
<td>No. of patients presented need investigation in ED:</td>
<td>2070</td>
<td>22 ± 6</td>
<td></td>
</tr>
<tr>
<td>No. of patients presented with neurological issues:</td>
<td>1174</td>
<td>12 ± 5</td>
<td></td>
</tr>
<tr>
<td>No. of patients presented with cardiovascular issues:</td>
<td>2301</td>
<td>24 ± 4</td>
<td></td>
</tr>
<tr>
<td>No. of patients presented with GIT issues:</td>
<td>1974</td>
<td>20 ± 5</td>
<td></td>
</tr>
<tr>
<td>No. of patients presented with trauma:</td>
<td>927</td>
<td>9 ± 3</td>
<td></td>
</tr>
<tr>
<td>No. of patients presented with genitourinary issues:</td>
<td>1065</td>
<td>11 ± 4</td>
<td>0.098</td>
</tr>
<tr>
<td>No. of patients presented with other issues:</td>
<td>5503</td>
<td>60 ± 18</td>
<td></td>
</tr>
<tr>
<td>No. of patients with gynecological issues:</td>
<td>03</td>
<td>3 ± 0</td>
<td></td>
</tr>
<tr>
<td>No. of patients bought dead in ED</td>
<td>400</td>
<td>8 ± 3</td>
<td></td>
</tr>
</tbody>
</table>
operation of ED when there is no sufficient staff provided in ED crowding occur as mentioned by Ningshi DK et al. [18]. After admission in ED we found that patients use to wait for the results of investigations so that after diagnosis they can be shifted to inpatients units. Multiple studies have correlated the crowding in ED due to delay in investigations reports [19]. Stay of patients for 3-4 hours due to delay in laboratory investigation report was common in our setting. This delay has been associated with safety of other patients and staff in literature [20]. To cope-up with the overcrowding United Kingdom introduced 4-hour rule that was to amuse a patient in ED in 4-hours. The staff of hospital is bound to shift the patient in inpatient departments or discharge in 4 hours of its admission in ED [21]. Overcrowding in hospitals is not only issue of doctors and staff working in ED but it should be a concern of management and government as well. The management should allocate resources to ED according to data and should monitor it on regular basis to overcome the need [22]. To the best of our knowledge this was the first study that reported the patient flow in ED of a tertiary care hospital. Furthermore, studies are required to report the resources allocation problems and other reasons of overcrowding in ED of our setups.

5. CONCLUSION

The mean patient flow per day in ED was 141 ± 13. Overcrowding of patients in our ED of our setting was a common problem. The number of staff, doctors and beds were not matching the number of patient flow in the department. The main reason of prolong stay in ED was delay in investigations.

Table 3. The number of patients admitted, discharged or shifted to specific wards

<table>
<thead>
<tr>
<th>Management</th>
<th>Total number of patients in 95 days</th>
<th>Mean ± SD per day Patient flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of patients discharge home:</td>
<td>10397</td>
<td>112 ± 25</td>
</tr>
<tr>
<td>No. of patients admitted to ICU:</td>
<td>509</td>
<td>6 ± 2</td>
</tr>
<tr>
<td>No. of patients admitted to ward:</td>
<td>1143</td>
<td>12 ± 4</td>
</tr>
<tr>
<td>No. of patients need dialysis:</td>
<td>146</td>
<td>2 ± 1</td>
</tr>
<tr>
<td>No. of patients shifted to OT:</td>
<td>211</td>
<td>3 ± 1</td>
</tr>
<tr>
<td>No. of patients LAMA</td>
<td>516</td>
<td>6 ± 2</td>
</tr>
</tbody>
</table>
CONSENT
As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL
As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS
Authors have declared that no competing interests exist.

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19. Sariyer G, Ataman MG, Kiziloğlu I. Factors affecting length of stay in the emergency department: a research from an


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