Exploring Strategies To Reduce Emergency Department Overcrowding And Improve Patient Flow

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Abstract

Emergency department overcrowding is a significant healthcare problem that affects countries worldwide. There is much controversy on the factors that contribute to this issue, which makes it challenging to devise effective and specific treatments. The objective of this study was to thoroughly analyze and summarize the results of peer-reviewed academic studies that examined the origins and effects of, as well as potential remedies for, overcrowding in emergency departments. A systematic search was conducted on four databases (Medline, CINAHL, EMBASE, and Web of Science) to locate peer-reviewed research papers that focused on studying the causes, repercussions, or solutions to emergency department congestion. The search covered the period from January 2000 to June 2018. Two reviewers used approved critical appraisal techniques to autonomously evaluate the quality of the research. The adverse effects of emergency department (ED) congestion are well recognized, such as compromised patient outcomes and staff's inability to comply with treatment recommendations outlined in guidelines. This assessment has revealed a discrepancy between the causes and remedies. The primary factors contributing to the issue are the quantity and demographics of individuals seeking care in the Emergency Department (ED), as well as the promptness of their release. Conversely, proposed remedies mostly revolve on optimizing the flow of patients inside the ED.

Initiatives focused on implementing comprehensive system-wide solutions to achieve timely patient disposition goals, together with increased primary care hours, showed encouraging results. The review found that there has been a rise in the number of elderly patients with complicated and chronic conditions seeking medical attention, which has contributed to overcrowding in emergency departments.

Keywords: emergency department, overcrowding, patient flow, databases, review.

1. Introduction

The issue of overcrowding in Emergency Departments (ED) has been identified as a significant concern for patient safety and a global public health hazard [1]. Several nations, including as Ireland, Canada, and Australia, have shown substantial and unsustainable rises in emergency department (ED) visits [2-5]. However, recent research indicates that these increases cannot be solely attributed to population growth. Crowding in the emergency department (ED) may arise from a high number of patients awaiting medical attention (input), delays in evaluating or treating patients already present in the ED (throughput), or obstacles preventing patients from leaving the ED once their treatment is finished (output) [6, 7]. As a result, there are likely to be several distinct factors that contribute to crowding, which vary based on the timing and location along the patient's trip. Hence, in order to effectively handle the global issue of overcrowding in emergency departments, it is imperative that initiatives aimed at solving the problem be specifically planned to target the recognized causes.

In 2003, Asplin and colleagues [7] identified crowding as a significant obstacle to patients obtaining prompt emergency department (ED) treatment. They urged academics and policy makers to prioritize efforts in addressing this issue. A significant number of individuals responded to the request, and as a result, there is now a substantial body of published research that focuses on the issue of overcrowding in emergency departments. However, since there are not many published research on the causes of crowding, there are still many misconceptions about what causes the issue [8-10]. This makes it challenging to adopt effective and long-lasting remedies. An exhaustive and analytical examination of the existing data may assist researchers, doctors, and managers in determining the optimal course of action [11].

The last comprehensive review of the literature, which we have located, examining the causes, consequences, and remedies for ED crowding, was conducted a decade ago [8]. Given the rapid speed of research in the field of emergency care, it was expected that there would be significant advancements in understanding the causes and effects of overcrowding in emergency departments, as well as the effective implementation of remedies. The objective of this study was to elaborate on and provide an up-to-date critical evaluation of the results from peer-reviewed research papers investigating the reasons or effects of, or remedies for, overcrowding in emergency departments (ED).

2. Crowding

The term "crowding" refers to the condition or situation when there are an excessive number of people or objects in a limited space, resulting in a lack of sufficient room or resources for each individual or item. Now, there is no agreement on the appropriate method or unit of measurement to characterize ED crowding. A systematic study found that there are now 71 different metrics being used. Consequently, we decided to include studies that have used any of the widely acknowledged measures. The variables included in the analysis were ED length of stay (EDLOS), rates of 'left without being seen' (LWBS) or did not wait (DNW), hours of ambulance bypass/diversion, hours of access block/boarding hours, proportion of presentations meeting nationally mandated, timed patient disposition targets (e.g. the Australian National Emergency Access Target (NEAT), the UK 4-hour target or the NZ Shorter-stays-in-emergency-departments target), Emergency Department Work Index (EDWIN) score, National Emergency Department Overcrowding Scale (NEDOCS) and ED census. Several research included several measurements as the dependent variable.

3. Methodology

A search was conducted on four electronic databases: Medline, CINAHL, EMBASE, and Web of Science. The search keywords used were: 'emergency department', 'accident and emergency', 'emergency service' combined with 'crowding', 'overcrowding', 'negative effect', 'mortality', 'causes' as well as 'strategies', 'solutions', 'interventions'. Any study that was published in English between January 2000 and June 2018 was considered for inclusion .

4. Implications of overcrowding

An important discovery of this study is that the repercussions of ED crowding are well established. The reported repercussions may be classified as impacting patients, personnel, and the healthcare system, with some degree of overlap. Several detrimental consequences of overcrowding were found, such as unfavorable outcomes for patients, including delays in treatment and higher death rates, which were comparable to the findings in Hoot's analysis [8]. Nevertheless, the previous analysis highlighted that provider losses might have a detrimental impact [8], but this outcome was not seen in the present review. In a similar vein, Hoot et al. found that there were difficulties in accessing emergency department (ED) treatment, as shown by high rates of patients leaving without being seen (LWBS) and ambulance bypass. These factors were considered possible repercussions of the hindered access. In the present investigation, both LWBS and ambulance bypass were utilized as indices of crowding.

The studies examining the effects of crowding varied in terms of quality, with just one high-quality, prospective research being included [12]. Furthermore, it is worth noting that this particular research was the only one that failed to establish a correlation between overcrowding and the main end measure, namely an increase in death rates among hospitalized patients [12]. It seems that the authors of some research of lesser quality were committed to demonstrating a negative correlation between ED crowding and their specific outcome of interest. Kulstad and Kelly [13] found that crowding had a negative impact on the probability of receiving prompt treatment for acute myocardial infarction (AMI). However, their study did not establish a correlation between crowding and the time it took to perform the first electrocardiogram or to arrive at the cardiac catheterization laboratory (CCL). These time stamps are the ones that emergency department (ED) staff can directly control. Their research discovered a correlation between overcrowding and the duration it takes to inflate the balloon in the cardiac catheterization laboratory (CCL). This delay is likely beyond the emergency department's control.

Furthermore, Hwang and colleagues [14] determined that there is a substantial correlation between crowding and subpar pain treatment. Their investigation revealed a detrimental correlation between crowding and the duration it took to

evaluate and record pain. However, there was no connection found between crowding and the time it took to provide pain-relieving medication, which is a crucial factor in patient care. Instead than demonstrating worse outcomes for patients who arrive to overcrowded emergency departments, both of these research may be interpreted to demonstrate the contrary. Even when the emergency department (ED) is experiencing high levels of stress, patients who are recognized as having urgent clinical requirements, such as those suffering from an acute myocardial infarction (AMI) or severe pain, nonetheless get appropriate and timely treatment. We recognize that the intricate nature of health services research presents difficulties in terms of study design, which often affects investigators' choices to assess outcomes that are readily available in data. However, it is important to use caution when planning research and evaluating findings to ensure that the stated outcomes are strong and accurately represent the best suitable measure of the phenomena being studied.

5. Strategies to address overcrowding

Implemented strategies to address ED congestion including offering alternate treatment choices outside of the ED, improving patient flow inside the ED, and accelerating patient discharge after their care is complete. Several remedies were highlighted in the previous study [8], namely those targeting the resolution of access block and the provision of alternate entry choices. Nevertheless, Hoot's research discovered several demand management measures, such as redirecting patients to other types of treatment and concentrating on frequent visits. It is worth noting that this evaluation only included one older study that specifically focused on this aspect [15]. The demand management and patient diversion studies in the previous evaluation were all published over twelve years ago, suggesting a potential lack of sustained effectiveness of these approaches in mitigating overcrowding in the emergency department.

All research included in this review, except for two [16,17], indicated substantial improvements in measures of crowding linked to the intervention, regardless of whether it was tested or simulated. In Nagree's research [17], it was observed that the Sprivulis approach [18] was used to quantify the influence of AHs GPs on LAPs to EDs, and it was determined that there would be little effect. This technique consistently provides a

lower estimate of the percentage of presentations categorized as 'GP-type' compared to previous methods [19, 20].

6. Conclusion

Extensive evidence demonstrates the adverse effects of overcrowding in emergency departments on patients, staff, and the healthcare system. Although several solutions have been tested and simulated, with differing degrees of success, there exists a discrepancy between the recognized factors contributing to overcrowding and the measures adopted to address the issue. Recent studies examining the impact of timed disposition targets and extended GP opening hours have yielded encouraging findings, indicating the need for additional research and assessment. It is crucial to determine which interventions were effective in specific situations, taking into account the underlying causes of overcrowding. An notable discovery from this analysis is the rising amount of information indicating that older individuals with complicated, multiple health issues are becoming a substantial cause of overcrowding in emergency departments. This analysis has emphasized the need for more, rigorous research on the particular, situational factors that contribute to overcrowding in emergency departments (EDs), as well as the customization of evidence-based interventions to effectively tackle the identified root causes. It is widely acknowledged that the issue of ED congestion, as well as its remedies, mostly exists outside of the ED. Hence, it is crucial that the whole system, including patients as well, actively participate in discovering the underlying factors contributing to and viable, long-lasting remedies for overcrowding in the emergency department.

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