

Concept Analysis: Emergency Department Crowding and Length of Stay before and after an Increase in Catchment Area

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Abstract

Several notable issues arise from overcrowding in an emergency department (ED) for both patients and staff. Longer wait times, higher ambulance diversion rates, longer stays, higher incidence of medical errors, higher rates of patient mortality, and greater harm to hospitals due to financial losses are some of these problems. Collaboration is crucial in the healthcare industry since it determines the team's hourly performance in managing patient care. By using Walker and Avant's (2011) concept analysis method, the author reviewed the literature to better understand ED crowding, to ensure that patients receive safe treatment in a timely manner, and to highlight best practices that can be identified through concept analysis and practice evaluations. In conducting this concept analysis, Walker and Avant's framework was applied to examine the nature of the findings selected for the advancement of the concept. Everyone working in the ED, from those who determine policy to those on the front lines continually encounter new obstacles, but has little or no time to formulate fresh concepts or reconsider how ED treatment is provided. Overcrowding occurs when the number of patients requiring attention, awaiting transfer, or undergoing diagnosis and treatment exceeds the physical capacity of ED staff. If a clear plan is not in place to increase and improve services in proportion to a growing population, this situation will persist.

Keywords

Overcrowding, Increasing Population, Emergency Room, Length of Stay, Input, Throughput, Output

1. Background

The primary function of an emergency department (ED) is to administer emer-

gency medical care, it is generally regarded as one of the most important components of a hospital. Overcrowding occurs when the number of patients requiring attention, awaiting transfer, or undergoing diagnosis and treatment exceeds the physical capacity of ED staff. Overcrowding in the ED results in a number of complications for patients and the department's staff, these complications include longer wait times, increased rates of ambulance diversion, lengthier stays, and increased risk of medical errors, increased patient mortality rates, and greater harm to hospitals as a result of financial losses [1].

In fact, long waiting times in the ED are the most common problem that hospitals face around the world, and people in the community may interpret this phenomenon as the hospital closing its doors to sick or injured people, contributing to a proliferation of the problem, as all associated aspects may be interpreted as incompetence or caused by political and social factors. It is simple to affirm that this is an unavoidable and predictable hospital scenario, but the reality is that it is a severe issue that impedes the completion of a healthcare worker's job and impacts patient health when proper treatment is delayed [2].

This concept is very important to nursing administrators because solutions must be targeted at providing healthcare, which is continually more complex compared to the challenges faced in previous years, while dealing with overcrowding and non-urgent presentations to ED, limited staff, lack of resources, and lengthy stays in the ED [3]. Thus, this issue requires collaboration with leadership at a higher institutional level to be resolved. An important indicator of a hospital's service quality is evident in the manner in which the hospital's main point of entry assists patients with initial care promptly after their arrival.

2. Introduction

2.1. Concept Introduction

In the first part of this concept analysis, the role of nursing administrators was identified as critical because resolving the problem has the potential to be expanded in a way that would contribute to achieving the goals of Saudi Vision 2030 and the shifting healthcare and healthcare trends that will follow.

The goals of this analysis are to address ED overcrowding. The aims are to highlight the causes of overcrowding, to illustrate its impact on patients and medical staff and to identify solutions and strategies to help reduce overcrowding, using the concept analysis framework [4].

Walker and Avant's (2011) framework was applied to examine the nature of the findings selected for the advancement of the concept. An activity is not to be confused with urgency. A thorough analysis of this subject must be conducted to provide support for a sense of urgency in the search for answers that will have a beneficial effect in a proactive manner.

An administrator has a pivotal role to play in seeking solutions to current challenges. The strongest evidence comes from working with all of the components that will be mentioned here. In the ED, flexible modeling based on all col-

lected data and scenarios must be continuously evaluated. Nurses, doctors, and relevant teams from various services must collaborate to look for guidance and recommendations for both internal and external factors of healthcare quality [5].

The efforts of emergency physicians, on-call specialists, emergency nurses, and other health professionals, such as those in the laboratory, radiology services, and inpatient wards, must be coordinated to ensure that ED patients receive high-quality care. If one of these interconnected parts is disrupted, the rest of the system is adversely affected [6].

Collaboration is crucial in healthcare, as this determines the hourly accomplishment of managing patient care throughout the facility. No matter how well planned the emergency care is, poor communication will jeopardize it.

Hospitals around the world that offer emergency care are currently dealing with overcrowding. When seeking treatment in today's healthcare system, patients expect to receive high-quality care but maintaining high quality is challenging when patients wait several hours to be seen and doctors wait several hours to receive the results of lab tests due to the high number of patients in the ED [7].

The author's background in ED enables for the consideration of both recent and more conventional strategies to deal with the reality of patients streaming through the door of the hospital. There is an urgent need to devise plans for implementing innovative ways that allow both nursing staff and patients to feel fulfilled at the end of the day and ensure that patients receive optimal care.

2.2. Use of Concept

It is essential that those in charge of formulating public policy, supervising healthcare facilities, and treating patients in the ED have access to the most recent statistics available on common medical conditions [2]. ED crowding can be partitioned into three interdependent components for conceptual model analysis—input, throughput, and output. In a unit defined by the delivery of unscheduled care, input is an appropriate component to investigate [1].

2.3. Input Component

Data acquired from national statistics or, in the case of a hospital that provides specific treatment to a select patient group, all demographic information and categories of health risk must be regularly collected to appropriately plan for the needs in the foreseeable future. Hospital catchment areas define the primary population of a hospital and are central to assessing the potential demand for that hospital due to, for example, infectious disease outbreaks [8]. In the case of the author's current institution, mapping the finely detailed geographical regions that the program covers was possible through clustering domains of responsibility to define their contributory role in hospital vision and expected activity, and determining the projected burden of disease and related admission rates. In many healthcare systems, general practitioners serve as gatekeepers. Patients are re-

quired to see a primary care practitioner who determines whether they require care from a specialist. This practice is known as gatekeeping. Access to diagnostic procedures, hospital treatment, and specialist medical services is controlled by the use of such referrals [9]. The referral of patients to regional primary care hospitals may be either less than or more than necessary, and may generate ethical questions if the policy in place is insufficient [10]. One of the efforts of the New Models of Care described in June 2016 as part of healthcare transformation is patient access to healthcare providers when they have an urgent need, and how the current system can keep them well. Under the auspices of the Saudi Arabian Minister of Health, Vision 2030 seeks to diversify its strategic vision based on future challenges and trends in the healthcare industry [11].

Nevertheless, even with the most sophisticated service layers, patients' personal experiences and word of mouth from relatives or close friends regarding the reputation of the extended clinic nearest their home may prompt them to choose another hospital freely. The solution is to improve intangible dimensions, such as ensuring an adequate number of competent healthcare providers in various covered regions. Improving patients' treatment experience can result in fewer patients visiting the ED with non-urgent medical conditions [12].

2.4. Throughput Component

Managing the flow of patients through the ED is fundamental to providing timely and effective care. One of the most significant issues is the lack of adherence to an established flow protocol [13]. Triage connects the hospital's most important front-line workers. By investing in training an ED flow coordinator, significant progress in nursing has been demonstrated. This measure has the potential to regulate patient flow and generate a significant return for the hospital by expediting and facilitating overall operations [14].

To facilitate decision making for the purpose of strategic flow improvement, nurses serving in operational roles make use of their experiential knowledge relevant to numerous unseen components of patient flow issues [15].

Real-time visualization of capacity and knowing which services can realistically be offered, based on available resources, greatly affect implementation. A hospital ED can make use of high-tech capabilities, such as sophisticated systems, to measure patient flow and modern point-of-care diagnostics as part of its efforts to improve clinical and operational outcomes in this area of the hospital [15]. This will streamline the testing process and reduce the time required for clinical action. This represents the second step in enhancing effectiveness and efficiency.

2.5. Output Component

Overcrowding occurs when there is insufficient space to meet the immediate needs of the next patient in need of emergency care [16]. Thus, prompt onboarding of patients awaiting admission significantly contributes to reducing pa-

tient accumulation. Numerous studies have shown the impact of overcrowding on patient care, and resolving this issue requires clinical and administrative expertise. Clinically, the primary cause of delay in one study at Makkah Referral Teaching Hospital was multiple consultations, followed by file creation, critical care management, investigation, and multiple assessments in several ED areas. Fewer patients were delayed due to an inadequate response to treatment [7]. All these exhaustive steps bombarded not only the ED but also all the sections related to patient care.

Administrative expertise in such areas as increasing bed capacity and bed turnover, a clear understanding of ongoing strategy, and improving nursing reports through the provision of electronic health information systems will be crucial for implementation, thereby eliminating the onboarding of admitted patients, enhancing patient safety, improving capacity, and enhancing the financial health of the institution [17].

3. Critical Attributes

Critical characteristics of this concept include clinical decision making during patient triage and admission, technological advances in the ED, and administrative initiatives and involvement, such as increasing bed capacity, providing training, and enhancing services from various regions covered by the catchment area. Recent advances in healthcare underscore the need to form partnerships and networks to stay abreast of innovative approaches to address long-standing issues.

Rushing from one problem to the next in search of instant but temporary answers risks allowing others to determine the course of action. Everyone in the ED, from the people in charge of policy to the people who work on the front lines, constantly faces new challenges, and as a result, they have little or no time to formulate new ideas or rethink the way care is delivered in the ED.

Simply put, this idea can be broken down into three component parts—input, throughput, and output. Any circumstance that contributes to augmenting the demands placed on the ED, such as a “surge of patients,” is understood as an “input.” The term “throughput” refers to the various processes that must be completed in order to provide the required care and services. Finally, “output” refers to the result of care management, which can be either immediate admission to the ward or a discharge home. These components are essential to resolve the issues in the ED, and exploration of the solutions must be considered.

3.1. Model Case

Walker and Avant (2011) defined a model case as follows: A model case is one that demonstrates all of the concept’s defining characteristics. In other words, the model case should be a pure case of the concept, a paradigmatic example, or a pure exemplar [18]. The following is an example of a model case that is consistent with this concept. A 70-year-old woman with a history of hypertension and

diabetes, has recently experienced dizziness and palpitations, as well as cold sweats. Her daughter, a nurse, takes her to the hospital to rule out existing complications from her comorbidities. With a large number of patients in the emergency room, she arrived at the triage section.

Her daughter, who has a background in the medical field, follows up on her mother's assessment and management. After an hour, the triage nurse presents an admission slip and asks her to register the patient and pay for opening the file. After another hour, vital signs are taken. The patient is seen by the triage physician after another hour, and her point-of-care blood glucose is determined.

The patient returns to the station, and it is finally decided to discharge her as the initial screening and blood pressure were normal. The patient felt that her complaint was seen as a burden and a waste of time, and her daughter was dissatisfied with the healthcare system.

3.2. Borderline Case

A borderline case contains some, but not all, of the critical attributes of the concept under consideration. The following is an example of the repercussions of an overcrowded ED. A patient in a remote community complains of intermittent chest pain spreading to his back and abdomen. His health insurance allows him to visit various hospitals in his area, but he chooses to travel three hours to his preferred hospital. He is placed in the screening area upon arrival because the triage nurse suspects, based on his interview, that his presenting symptoms are due to a digestive disorder. When the patient is eventually seen by the doctor, a two-minute medical history is taken, and tests, including laboratory and others, are ordered.

The above incident was segmented by inquiring about the primary reason for his travel, which was revealed to be his family's previous negative experience resulting in a tragic death due to mismanagement, information derived solely from interviews. The patient was transferred to another department for all necessary tests before returning to the ED. The release of test results took three hours, and the doctor was occupied with other cases. The patient remained in the ED for a total of five hours before being diagnosed with myocardial infarction and transferred to the intensive care unit.

This instance illustrates all the essential characteristics of emergency room overcrowding based on the three components described in the preceding section. The patient's subjective analysis of his complaint and his personal preference were based on the experience of his relatives with an incompetent care provider at the local hospital in his area, which demonstrates discontent and reflects the need to improve the gatekeeper function of the doctors in the catchment area. When the patient arrived at the hospital, he was confronted with ED antecedents, such as overcrowding, prolonged stays, a poor triage system, and time-consuming laboratory tests. Although these repercussions were imposed as a result of the ED's frequent obstacles, the patient was unaware of all the va-

riables that contributed to the delay, and he was ultimately satisfied because he was managed through hospital admissions. There are numerous possible outcomes that could worsen the current situation. If the patient's past experience recurs, the rest of the community to which he belongs will have an even worse perception of healthcare.

3.3. Related Case

Cases that are related to the concept being studied but lack critical attributes are referred to as related cases. The primary complaints of a 40-year-old male who presented to the ED triage were a cough, shortness of breath, and fever. Because all the respiratory zone's screening stations in the ED were occupied, the patient remained in the waiting room. After two hours, he and other standby patients with the same complaint were transferred to a different unit with adequate ventilation equipment to handle and contain the cases. Later stages revealed instances that were consistent with an outbreak of an airborne infectious disease.

3.4. Contrary Case

Contrary case scenarios are clear examples of this "non-concept." Contrary cases illustrate situations that do not fall within the concept. For example, a 50-year-old female patient with continual complaints of headaches and body malaise frequently visits the ED. Every time she presents, she reports malingering symptoms that oblige the healthcare team to admit her so she can get the attention of her family. Her frequent visits to the unit disturb other patients and create chaos in the triage area. She frequently moans or calls out for help and says she wants to die. This case exacerbates the critical attributes of overcrowding in the ED. The patient defines her problem subjectively according to her wants, and there is no context for her complaint that can relate to the different dimensions. This is a so-called ED doctor shopper who seeks medical treatment to get attention. The practice of patients visiting many clinicians without clear indications that they are truly in need of essential medical therapy is referred to as "doctor shopping."

3.5. Antecedents

Antecedents are events or incidents that must be present before a concept can occur. This investigation uncovered a number of potential factors that contribute to overcrowding, including inpatient onboarding, patient triaging, hospital organizational dilemmas, and a high level of patient complexity, defined as the need for multiple specialties.

However, the investigation revealed that only one of these factors is an absolute prerequisite-determining the definition of overcrowding in terms of locally established times and assessment methods. As a result, the possible consequences are those events or incidents that occur as a result of the interpretation of the concept. There may be even more confusion as a result of the healthcare team's failure to properly manage the patients in front of them, as well as the consistent

perception of an overcrowded ED without actually knowing what that means or how to properly manage it, all of which will eventually lead to dissatisfied patients, disorder within the unit, improper management of cases, and inefficient use of the available resources.

This has deterred researchers, doctors, administrators, and policymakers from reaching a consensus on the definition of ED overcrowding. There is no universally accepted definition of overcrowding. According to the researcher [19], overcrowding refers to an extreme excess of patients in treatment areas. Many definitions were gathered that could serve to define overcrowding. The imbalance between the number of people who require emergency care and the capacity of the hospital to offer it leads to overcrowding in the facility [20]. Another definition declares that overcrowding is the state that causes the ED to malfunction because the number of patients (awaiting attention, awaiting transfer, or undergoing diagnosis and treatment) exceeds the department's physical or staffing capacity [20]. A variety of attempts have been suggested to identify the many characteristics of overcrowding; nevertheless, there is no standard measure for quantifying crowding in a way that is both effective and unambiguous [21].

3.6. Empirical Referents

Mitigating the real problems in EDs is critical, as serious overcrowding can harm patients and lead to negative operational and financial burdens for hospitals. Previous studies have proposed methodologies for measuring and resolving the issue in real day-to-day settings.

Empirical referents are classes or categories of actual phenomena whose presence demonstrates the occurrence of the concept itself [22]. One example is the Six Sigma methodology based on the acronym "define, measure, analyze, improve, and control" (DMAIC). This approach can be used to analyze ED overcrowding, diagnose its causes, and monitor performance improvement plans [23]. The method offers a prognosis for the anticipated performance under suggested improvement scenarios and is used during the improvement phase to assess the impact of these scenarios on unit performance measures.

Previous studies show the effectiveness of specific methods, such as the removal of fold-down horizontal stretchers and replacing them with chairs that allow assessment and administration of medications to patients who are sitting upright [24]. In the case of pediatrics, hospitals having a neonatal and pediatric intensivist and trained neonatal nurses present in the ED at all-time reflected greater agility [25]. In addition, when there is no available bed, the strategy of not holding critically ill patients long by stabilizing them and referring them to another hospital immediately can alleviate overcrowding in the ED's waiting area [26].

In light of technological advances, a service-based solution explored how to change the perception of patients who wait for medical care and the amount of time they have to wait rather than how to reduce overcrowding and lengthy

waiting times [27]. The goal was to lessen the tension commonly associated with waiting and, as a result, improve the patient's overall experience and level of satisfaction with the healthcare treatment provided. The method constructs a virtual waiting platform that can be accessed online using mobile phones to communicate anticipated waiting times to users, in addition to other pertinent notifications. The waiting information can be gathered thanks to the platform's capability to interact with an organization's queuing management system. During this phase, all information about other services offered can be presented, as well as other data entered manually by the ED's users and staff.

4. Conclusions

The ED scenario will continue to be a public health concern as a consequence of all the causes described in the components, taking into consideration both internal and external influences. Management through flexible modeling is strongly encouraged, and collaboration between all departments, carried out through open communication and the continuous building of possible solutions, will be helpful in eliminating avoidable crowding in the ED, limiting its services to those who require urgent medical care.

One way to do this is to provide more access to primary care practitioners (gatekeepers) and improve their functions. Improving services in the catchment area and providing better patient experiences in clinics is recommended to help prevent non urgent cases presenting to the ED.

We can reduce the amount of time spent in the ED by having a sufficient number of trained and competent nurses and doctors on hand, especially during peak hours, and having enough clerks at the registration desk. Thus, nurses and doctors will collect all patient information at the bedside, and clerks will register everyone on time. Frequent triage training and classes must be made available. Experienced ED nurses must be heavily involved in patient flow issues. Electronic documentation is recommended to provide better care such as fast creation of medical files and better nurse reports.

Other recommendations are to have real-time visualization of capacity and high tech, sophisticated technologies to measure patient flow and modern point-of-care diagnostics. The evaluation of the effectiveness of technological innovation in resolving difficulties related to these matters in the unit should be included.

Finally increasing bed capacity and providing better turnover by having more efficient services and staff should help reduce ED overcrowding.

Regular follow-up is required for all measures that have been put in place to guarantee that they are effective in lowering waiting times.

5. Implications

The implications of addressing ED overcrowding are improved patient safety, shorter waiting times, and safer treatment in a timely manner, reduced mortali-

ty, and reduced financial losses. It is imperative that we continue to find ways to reduce ED overcrowding and its impact on both patients and staff.

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Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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