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Effecting between Emergency Department Overcrowding and Outcomes of nursing care: A Systematic Review at Saudi Arabia 2024

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Abstract

Background: Excessive overcrowding in emergency departments (ED) has become a global challenge, leading to decreased quality of healthcare services, especially in the nursing care, delayed patient treatment, and increased mortality rates. This issue is particularly pronounced in developing countries due to the inefficiency of healthcare systems and a lack of resources. Overcrowding in emergency departments (ED) is driven by several factors, including population growth, an aging demographic, inadequate hospital resources, the increasing complexity of patient needs, and operational challenges faced by healthcare providers and nursing . The emergency departments depend heavily on teams of interdisciplinary healthcare staff to carry out their operational goals and the core business of providing care to the seriously ill and injured. The ED is also recognized as a high-risk area concerning service demand and the potential for human error. Few studies have considered the perceptions and experiences of emergency department's staff (physicians, nurses, allied health professionals, and administration staff) regarding the practice of teamwork in nursing.

The aim of this systematic review: To assess the effecting between emergency department Overcrowding and Outcomes of nursing care in Saudi Arabia 2024.

Methods: This systematic review was conducted based on the Preferred Reporting Items for Systematic Reviews (PRISR) 2024 review protocol. We systematically reviewed the emergency department Overcrowding and Outcomes of nursing care.

Results: Prolonged Overcrowding and Outcomes of nursing care and consultation time, and physical response to the final decision, and leads to burnout nurses and staff, wrong diagnoses, and management plans. Crowding issues are resolved by awareness, triad systems, and technological and telemedicine services .High patient expectations and overcrowding. Respondents emphasized the importance of education, security enhancements, and administrative support to address.

Conclusion: ED crowding is becoming a major problem in the delivery of holistic care services in Saudi Arabia. High demand for emergency treatment should not be a hindrance to quality treatment. Physical, technological and strategic measures should be put in place to fight the crowding problem in the ED in Saudi Arabia, as it may cause adverse effects such as transmission of diseases and deaths of patients.

Key Words: Effecting, Emergency Department, Overcrowding, Outcomes, nursing , care , Saudi Arabia .

Introduction:

Background:

The emergency department (ED) is an important part of the hospital that offers services to the public and provides quick access to unstable patients who require emergency care.[1] However, quick access to medical care and treatment, coupled with a lack of standard procedures related to emergency department visitation, can increase the number of individuals visiting the emergency department, causing overcrowding.[2] the volume of emergency department visits in the United States was approximately 143 million, and approximately 14% of the emergency department visits resulted hospital admission.[3] Saudi Arabia experienced 72,296 emergency department visits from September 2019 to December 2021.[4] A previous study conducted at a university hospital in Saudi Arabia reported 53,309 instances of overcrowding and 57,290 instances of overcrowding in the emergency department, calculated through occupancy rate.[5] Overcrowding in emergency department is a major problem that requires a solution.[6] In addition, the increasing number of emergency department visits due to a lack of standard procedures or poor adherence to protocols related to emergency department visitation remains problematic.[7] Overcrowding in emergency department leads to delayed patient treatment, poor quality of care and poor outcomes of nursing care. [8] The negative effects of overcrowding can influence the entire hospital operations, number of resources, quality of care, and patient outcomes.10 emergency department overcrowding reduces nurses' performance satisfaction regarding the care they provide to patients.[9] This leads to issues such as stress and occupational burnout.[10]

The relationship between effecting between emergency department Overcrowding and Outcomes of nursing care to nurse staffing, skill-mix and quality of care has been well-established in medical and surgical settings, however, there is relatively limited evidence of this relationship in emergency departments. [11] Those that have been published identified that lower nurse staffing levels in emergency departments are generally associated with worse outcomes with the conclusion that the evidence in emergency settings was, at best, weak.[12]

In an attempt to understand the causes and implications of emergency department overcrowding, research on the topic continues. The number of articles focusing on emergency department crowding increases dramatically every year although the topic of emergency department crowding was first described more than 2 decades ago. Much of the research currently being generated regarding emergency department crowding is at an organizational level. [10]

Overcrowding is primarily caused by an excessive number of patients in the emergency department waiting for medical consultation, diagnosis, management, transfer, or discharge that compromise the routine of the department.[13] Overcrowding can be characterized as an inequality between supply and demand in the emergency department.[14] Emergency department overcrowding negatively affects the operations of the entire hospital, and is a globally recognized problem.[10] Emergency department overcrowding is linked to poor clinical outcomes among patients who need immediate care.[15] This has serious

consequences for the workforce and the Emergency department system, including an overall surge in expenses.17 This occurrence is a global public health issue and a matter of patient safety concern.[16]

However, less attention has been paid on the effect that Emergency department crowding has on patient outcomes. During periods of crowding, emergency nurses report perceived decreases in the quality of Outcomes of nursing care provided to patients [17]. Measures of quality care are outcomes that describe the impact on health resulting from care provided by the health care system [18]. The purpose of this review was to summarize the findings of published reports that effecting between emergency department Overcrowding and Outcomes of nursing care [19]

An evidence-based understanding of the causes and effects of overcrowding is crucial to identify appropriate solutions.[20] Furthermore, overcrowding continues in many emergency departments in Saudi Arabia, resulting in long waiting times, delays in treating patients who need urgent care, and, consequently, decreased patient satisfaction. The overcrowding situation in emergency department also increased nurse turnover. An appropriate solution cannot be identified without recognizing the specific cause. Therefore, identifying the root cause of overcrowding in emergency department could help pinpoint appropriate solutions to prevent adverse effects on patients and healthcare professionals, particularly nurses. [21]

Method

Aim of the study:

To assess the effecting between emergency department Overcrowding and Outcomes of nursing care in Saudi Arabia 2024.

Study design:

A literature review study was performed. This design was used to reconceive the presented problem's perspective and facilitate an effective answer. The methodology follows through the included electronic databases: Google Scholar, PubMed, and Saudi Digital Library (SDL). To ensure a comprehensive and robust analysis, the research methodology employed various strategies, including constant comparison, prolonged engagement, member check, and triangulation. The research team consisted of experts in health policy and management and qualitative and quantitative research methodologies , along with specialists in emergency department management.

Search strategy:

This systematic review was conducted based on the Preferred Reporting Items for Systematic Reviews (PRISR) 2024 review protocol .A comprehensive database search of the Web of Science, Scopus, and PubMed databases was conducted in January , using key terms related ("Effecting", "emergency department", "Overcrowding ", "Outcomes ", "nursing", and "care"). The keywords were combined using advanced field code searching , phrase searching, truncation, and the Boolean operators "OR" and "AND".A structured search was conducted to identify peer-reviewed articles aimed at assessing the relationship between overcrowding and Overcrowding and Outcomes of nursing care , published between January 2020 and January 2025. Only Studies that were conducted in the ED settings were included

Search methods

A systematic review was conducted using four databases (CINAHL, PubMed, Scopus, Cochrane Library), following the preferred reporting items for systematic reviews and meta-analysis (PRISR). We went through Google Scholar, the National Center for Biotechnology Information, Science Direct, Ovid, Cochrane, the Saudi Journal of Emergency Medicine, Medline, and PubMed as

databases. Our criteria were articles done in Saudi Arabia from 2020 to 2024. One hundred and ninety-six (190) research papers were extracted; only 20 articles met our paper inclusion-exclusion criteria.

Inclusion criteria

The studies that were chosen were limited to studies published in English full-text articles from 2020 to 2024. Moreover, there should be strategies or solutions that can be used as a basis for the results of this study.

(1) All primary study designs that evaluate the overcrowding in EDs in Saudi Arabia.
(2) Articles published in the last 4 years (2020-2024).
(3) Peer-reviewed articles originally published in English.

The exclusion criteria

The exclusion criteria were studies that had nursing as respondents. The decision was made to focus on doctors and Nurses inside the health sector as a whole. While doctors are an integral part of the healthcare system, the aim of this study was to explore the experiences of a broader range of healthcare workers.

(1) Any research that is related to Saudi Arabia.
(2) Studies published before 2019.
(3) Articles not relevant to our objectives.

Synthesis of Data

Once the data had been extracted, the results were categorized and organized so they could be analyzed and compared to meet the objectives of the review. The authors chose All reviewers collected the articles to create a literature review and then worked together to include articles that addressed ED crowding, including causes, effects, solutions, or all three in Saudi Arabia. The information obtained on screening tools (structure and characteristics, psychometric properties, and availability of validation studies) was collated throughout this time.

Table 1 Characteristics of reviewed articles about effecting between Emergency Department Overcrowding and Outcomes of nursing care .

Author, Date, Country	Region	Study design	Study aim	Results
Guerrero et al (2024) [22]	Saudi Arabia A Multicenter Study	Descriptive cross-sectional design .	To assess nurses' perceived causes and effects of overcrowding in the EDs of five tertiary hospitals in Saudi Arabia.	the results imply a strong relationship between the overall identified causes and effects of ED overcrowding in the questionnaires as perceived by the nurses. Nurses perceived that ED overcrowding may be due to a lack of standard procedures or poor adherence to protocols related to ED visitation, shortage of inpatient beds at the hospitals due to infrastructure challenges and a growing population, and prolonged patient length of stay in the ED due to the incapacity of the hospital to transfer patients from ED to the ward. These factors cause nurses to be unable to manage incoming patients to the ED, inevitably creating pressure from worried family members. These daily encounters affect nurses' mental health, leading to stress, burnout, and staff resignations. **Conclusions** Patients seeking immediate medical attention in EDs should receive necessary emergency care in a timely manner to avoid the worsening of their conditions. However, factors such as an increasing number of patients in EDs being accompanied by their family members and a shortage of inpatient hospital beds affect ED patient capacity. This leads to a prolonged patient length of stay in the ED due to inability to transfer patients to other wards. This situation leads to overcrowding and may prolong patient waiting time in the ED, causing the patient's health to deteriorate.
Alanazi (2024) [23]	Saudi Arabia Northern Borders region	A qualitative case study was employed to achieve the aim , Semi-structured interviews were	To explore teamwork practices from the perspectives and experiences of staff (physicians, nurses, allied health	The first key contribution extends the framework to include individual factors such as the emotions of individuals, experience and support, multitasking skills, stress management, and the ability to perform effectively in fast-paced situations. These skills are essential for effective team dynamics and better patient outcomes in the ED. These findings suggest the need for professional training programmer that help develop these personal abilities, which would improve patient care and teamwork.

		conducted, Direct observations,	professionals, and administration staff) when interacting in the ED admission area in a public hospital.	In addition, this case study made a second theoretical contribution to relational factors. These factors include disputes, harmony and compatibility, and forming relationships, which were not included in the framework. **Conclusions** The study provided insights into interdisciplinary teamwork practices from the perspectives and experiences of staff when they interacted with each other in the admission areas in the ED of a public hospital in the Northern Borders region of KSA. This study demonstrated that organized, effective teamwork in the ED had considerable benefits for patient safety, quality of care, staff satisfaction, and patient satisfaction.
Alhabib et al (2024) [24]	Saudi Arabia	Applied the qualitative framework analysis method	To assess the effectiveness of patient-centered care models in improving patient outcomes in hospital settings, and to investigate the impact of prolonged waiting time on healthcare utilization in the ED.	Was reported that the availability of primary health care (PHC) helped a lot in decreasing the flow of patients towards ED which decreased crowdedness in ED and hence decreased the waiting time as well. In line with these results, there was a recent study that reported that placing primary care staff in the ED to triage patients significantly reduced waiting time in the ED or time to return home. In Saudi Arabia, primary healthcare (PHC) was neglected, leading to overcrowding in ED. To address this, the KSA government introduced the 2030 vision, which aims to promote the use of PHC as a first point of contact by expanding family medicine residency programs across the country. **Conclusions** Patient-centered care is a holistic approach to forming a trusting relationship between patients and care providers; this is achieved via providing care that includes patient involvement, communication, well-trained staff, and meeting all patients' psychosocial, physical, emotional, medical, social, cognitive, and cultural needs. To reach a well-organized and successful PCC many axes should be targeted at the same time, like improvements to healthcare providers and increasing their qualifications along with dealing with patient needs to shorten the process rather than application of one thing alone.

Tohary et al (2024) [25]	Saudi Arabia	Descriptive study	To optimize ED operations strategies for Managing Overcrowding in Emergency Departments.	Telemedicine has emerged as a critical tool, particularly in rural or resource-limited areas. Virtual consultations allow patients to connect with healthcare providers without the need to visit overcrowded ED. This approach has significantly decreased non-urgent ED visits, as evidenced by a reduction of 30% in urban centers employing telehealth platforms. Additionally, telemedicine supports continuity of care by connecting patients to specialists, expediting treatment decisions, and reducing unnecessary admissions. Automated triage systems represent another innovative application. These systems leverage artificial intelligence to assess patients' conditions upon arrival and prioritize care based on severity. An evaluation of such systems showed a 40% improvement in triage efficiency, as well as a decline in errors associated with manual evaluations. **Conclusions** In addressing emergency department overcrowding, a multifaceted approach combining innovative triage systems, resource optimization strategies, and technology-driven solutions is essential. These interventions not only improve patient flow and outcomes but also alleviate systemic inefficiencies. Investments in staff training and infrastructure are crucial to maximize these advancements. By fostering collaboration and leveraging technology, healthcare systems can create sustainable, patient-centered emergency care environments.
Drennan et al. (2024) [26]	Multi in hospital, center Study Internationally	A systematic review	To relatively limited evidence of this relationship in emergency departments. Those that have been published identified that lower nurse staffing levels in emergency departments are generally associated	The majority of the studies reviewed did not comment on or measure the structure of the team in terms of experience, specialist qualifications in emergency nursing or length of service and patient outcomes, with the exception who found no association between years of staffing experience in ED and time to analgesia. Other studies that have explored the structure of the team have reported variability in the association between years of RN experience and mortality, failure to rescue, and adverse patient events in acute care hospitals with the majority of studies reporting no association. This paper confirms that lower levels of nurse staffing are associated with an increase in patients leaving without being seen, time patients spend in the department and patient satisfaction. Outcomes not reported in a previous review are identified, including that lower levels of

			with worse outcomes with the conclusion that the evidence in emergency settings was, at best, weak.	nurse staffing are associated with an increase in time to therapeutic interventions and unexpected cardiac arrest and mortality within the ED. **Conclusions** The heterogeneity and low overall quality of the studies within this Review makes it difficult to draw definitive conclusions. The heterogeneity stems from a number of compounding variables which include the variability in health systems in which the research is conducted, the differences in hospital size and infrastructure, presence/absence of support staff, variability in nursing roles and associated scope of practice. It was identified, however, that there is evidence of adverse effects on patient care from low staffing including unexpected cardiac arrest, delayed time to treatments and, in particular, leaving without being seen. There is also a need for longitudinal studies coupled with economic evaluations which take account of patient dependency, acuity, and staffing levels where interventions are clearly defined and build upon the existing body of knowledge outlined in this review.
Almass, et al (2023) [27]	Saudi Arabia	A systematic review of the literature was conducted according to the PRISMA guidelines	To understand the impacts of ED overcrowding on emergency medical healthcare services and patient outcomes.	Our review points out that the demand for emergency care services is strong in Saudi Arabia, and this has led to overcrowding in emergency rooms, which might compromise patient treatment. Time spent waiting for care in the ED may be considerable, and patients who need to be admitted to the hospital typically have to wait much longer. Both the ED's flow and the overcrowding issue has been the subject of several efforts at resolution. Few solutions have been presented despite numerous efforts to do so. This report examines the factors that lead to overcrowding in Saudi Arabia's emergency rooms and discusses how those issues could be resolved. Overcrowding in emergency rooms may be caused by a number of factors, one of which is the shortage of physicians and nurses. The ED personnel are under pressure due to the high patient volume and the limited number of available staff members. Medical procedures take a lot of time. **Conclusions** ED crowding is becoming a major problem in the delivery of holistic care services in Saudi Arabia. High demand for emergency treatment should not be a hindrance to quality treatment. Physical, technological,

				and strategic measures should be put in place to fight the crowding problem in the ED in Saudi Arabia, as it may cause adverse effects such as transmission of diseases and deaths of patients. This systematic review revealed multiple factors behind the issue of ED crowding, such as a shortage of medical and nursing staff, the large influx of patients, insufficient beds in the ED, and the lack of integration of telemedicine services. As a result, the quality of care is compromised, and the medical staff is unable to deliver holistic care services to the patients. Long working hours also affect the care providers and cause work-related burnout.
Al-Qahtani et al (2021) [28]	Saudi Arabia.	Retrospective, medical record-based study	To examining the characteristics of pediatrics ER visits, the rate of hospital admissions and its associated predictors at King Fahd Hospital .	This study supports the evidence that pediatric ERs are very much being used by patients as the first point of contact with the healthcare system, rather than visiting their local primary health care physician. This is a problem which should have eased with the current governmental initiative in promoting the use of primary healthcare. Furthermore, Triage I was associated with the highest odds of admission in these patients. Similar patterns were found in a US study, although the Emergency Severity Index level was used rather than CTAS . Triage V was associated with lower odds of admission, which again highlights that the ER may suffer from overcrowding due to the presentation of non-urgent cases. Neither the shift nor the season of the pediatric patients visiting the ER had any association with the rates of admission. It may be of notice that Spring, Autumn and Summer, despite their non-statistical significance, did show lower odds of admission when compared to Winter. **Conclusions** This study examined pediatric ER visits at a large teaching hospital in the Eastern Province of Saudi Arabia. It showed that the admission rate of ER visits is extremely low. It also showed that neonates, patients with hematological conditions and patients classified as triage I had the highest odds of admission. However, patients classified as triage V had lower odds of admission. Clear guidance should be used to inform patients and parents of the proper process for seeking medical assistance, as well as ensuring more accessibility to primary health care centres. Moreover, further analysis focused on the predictors identified in this research is highly

				recommended to inform hospital administrators of potential minor changes that could lead to significant reduction in the over utilization of the ER.

Results and discussion

the result of systematic review nurses remain particularly due to their constant patient interaction regarding effecting between Emergency Department Overcrowding and Outcomes of nursing care : A Systematic Review at Saudi Arabia 2024. Prolonged Overcrowding and Outcomes of nursing care and consultation time, and physical response to the final decision, and leads to burnout nurses and staff, wrong diagnoses, and management plans . Crowding issues are resolved by awareness, triad systems, and technological and telemedicine services. High patient expectations , and overcrowding. Respondents emphasized the importance of education, security enhancements, and administrative support to address. Through 7 cross-sectional studies published between 2020 and 2024 present systematic review (Table 1).

Our review points out that the demand for emergency care services is strong in Saudi Arabia, and this has led to overcrowding in emergency rooms, and poor outcomes of nursing care which might compromise patient treatment. Time spent waiting for care in the emergency department may be considerable, and patients who need to be admitted to the hospital typically have to wait much longer. Both the emergency department flow and the overcrowding and poor outcomes of nursing care issue has been the subject of several efforts at resolution. Few solutions have been presented despite numerous efforts to do so. This report examines In Saudi Arabia, emergency crowding and Outcomes of nursing care is an important topic of research. It is a known reason associated with increasing the rate of patients being unseen, delaying treatment for patients who need urgent Care, and expanding the burnout of medical staff [29]. According to Previous research zone at a university hospital in Saudi Arabia, there is a correlation between the degree of emergency department congestion and the average duration of a patient's stay in the emergency room. A study of 350 people in KSA revealed that 63% did not have a regular healthcare provider and 62% wanted to obtain care on the same day and came because of the availability of medical care around the clock [30]. Over two-thirds of patients disagreed with the triage nurse's assessment of the severity of their illness [31]. The researchers came to the conclusion that most of these emergency department trips were caused by a lack of knowledge about the emergency department function and an incorrect belief that primary care was unavailable [30]. A cross-sectional study was conducted at King Abdul-Aziz Hospital ER departments, King Fahd Hospital in November 2020 on 300 patients with an interview-based questionnaire and found that a higher proportion of patients visited the emergency department three to four times a year with non-urgent

visits. Moreover, another cross-sectional study conducted between December 2018 shows that, out of 127,888 visits, 81% were non-urgent, and some of the patients requested ER services
due to the limited services and working hours of PHC centers [17]. Through the articles that are included in our research, there are common reasons for emergency crowding that can be solved, such as shortage of medical staff, nurses, and doctors, shortage of equipment [31], lack of emergency department process, lack of patient knowledge about telemedicine services, and PHC [30], which lead to unsatisfactory services and can be associated with higher mortality rates [31]. A large number of patients would come to the emergency department for non-urgent causes. A cross-sectional study was done on 400 patients who visited the emergency department during morning shifts and showed that almost 78.5% of patients who visited the emergency department were non-urgent visits. Less urgent patients might be sent to primary care facilities, and the problem could be remedied with an urgency transfer strategy [29].

Conclusions

Emergency department (ED) overcrowding is a significant challenge faced by healthcare systems worldwide. It adversely affects the quality of care, patient outcomes, and the efficiency of healthcare providers. Solutions such as establishing alternative care centers, improving infrastructure, optimizing bed capacity, and strengthening referral systems can play a crucial role in alleviating this crisis. Implementing these strategies will not only enhance the quality of services but also reduce costs, improve patient satisfaction, and increase the overall efficiency of the healthcare system. These measures can be adapted and customized to suit local conditions in any country. Continuous evaluation and updating of these approaches are essential for their long-term sustainability and effectiveness.

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